

PRESENTED BY: KSU Graduate Student Senate



Standing Together: Building A Better Tomorrow

Graduate Research Symposium

04-21-2017

Kent State Student Center



**KENT STATE**
UNIVERSITY

On behalf of the entire Graduate Student Senate Executive Board, I want to welcome you to this year's 32nd Annual Graduate Research Symposium. As this semester comes to a close, I hope you find a moment to reflect on all of your major accomplishments, successes, and achievements. We look forward to celebrating one of your academic achievements here today. Thank you for joining us for this exciting exchange of research findings, ideas, and future goals. The theme for this year – *Standing Together: Building A Better Tomorrow* – charges all of us to think about how our academic work can ignite, empower, and encourage change. Whether your work speaks to artists, scholars, scientists, researchers, or the general public, know that we can strive towards building a better future for everyone. In a time of social and political unrest, standing together is pivotal. Therefore, I want to personally thank each and every one of the presenters today for submitting their work. The first step toward change is awareness and sharing your work today allows us to take one stride forward together.

As you might have noticed, to complement the establishment of five research institutes here at Kent State, we are highlighting interdisciplinary work through special thematic sessions this year. These sessions are organized around the five research institutes: Brain Health, Advanced Materials, Global Understanding, Healthy Communities, and Environmental Science & Design. Please take a moment to explore the interdisciplinary posters, which will be on display during our poster session, and the interdisciplinary oral sessions scheduled during Oral Session II. Kent State University prides itself on the exciting interdisciplinary work done by students and faculty across the university and it is my honor to represent and highlight this work here today. Last year we had roughly 320 presenters, which was the largest submission numbers to date. This year, I am excited to announce that we over 325 presentations keeping up the steady involvement of students from all different colleges, departments, and majors. I also want to acknowledge the joint effort that this event requires. The GSS executive board has continually supported my efforts as the planning unfolded and the culmination of the event arrived.

Admittedly, it takes an army to support an event this large. In particular, I want to thank the 30+ student volunteers, the roughly 100 faculty judges who graciously gave their time to judge sessions, the Graduate Studies Staff who always provided assistance when needed, Research and Sponsored Programs who supported the establishment of the interdisciplinary thematic sessions, and everyone who submitted their research – you are all the reason why this event is a success. Thank you for your support and participation.

Finally, it is my honor to welcome and thank this year's keynote speaker: Dr. Justin Lathia, from the Cleveland Clinic and CWRU. Dr. Lathia will present work related to Brain Health, which is the first of the five research institutes to be established. Please join me in welcoming Dr. Lathia to our event. We are thrilled to have everyone here today.

Sincerely,

Brooke L. Long, M.A.

GSS Symposium Chair, 2016-2017

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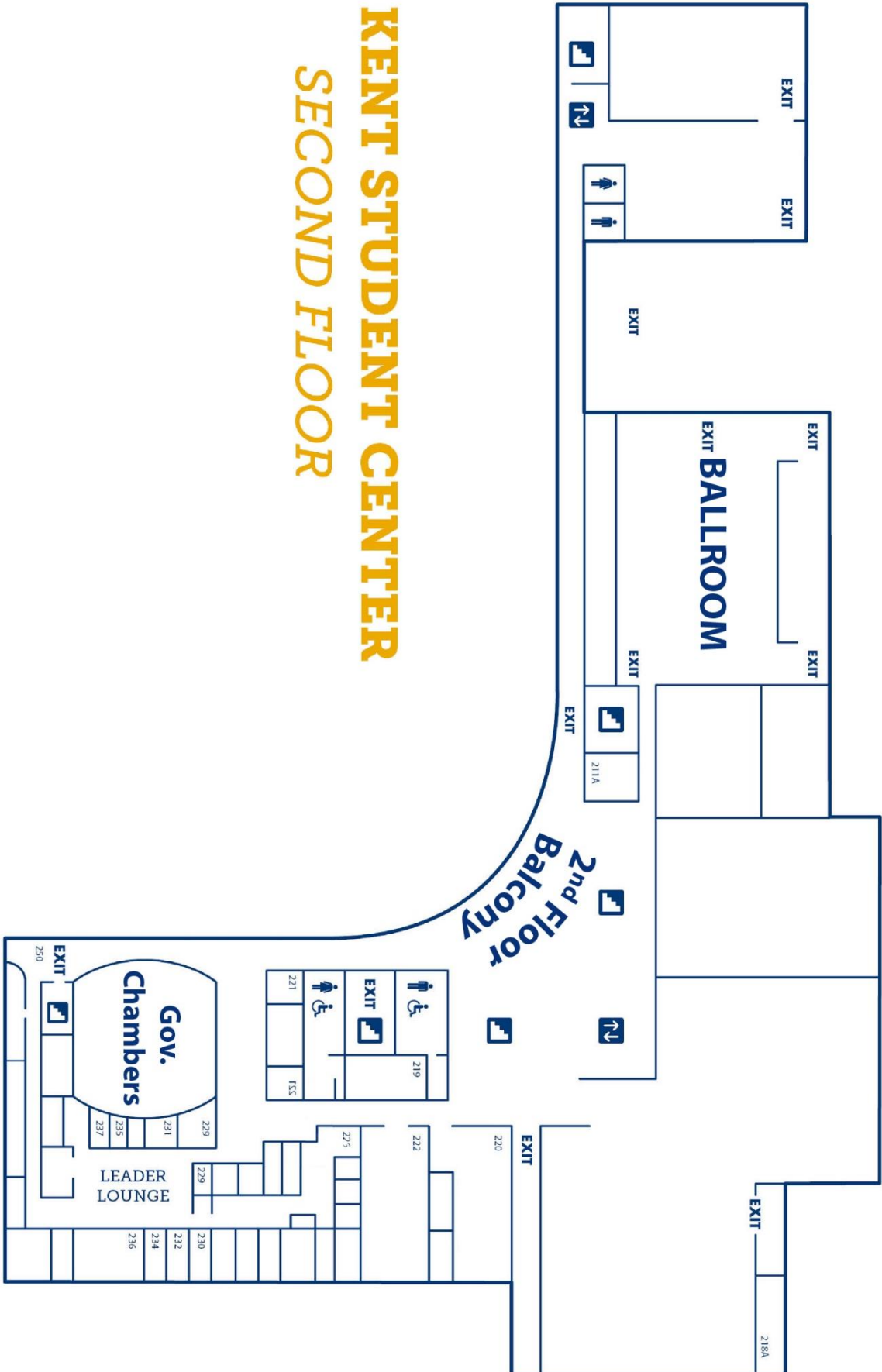
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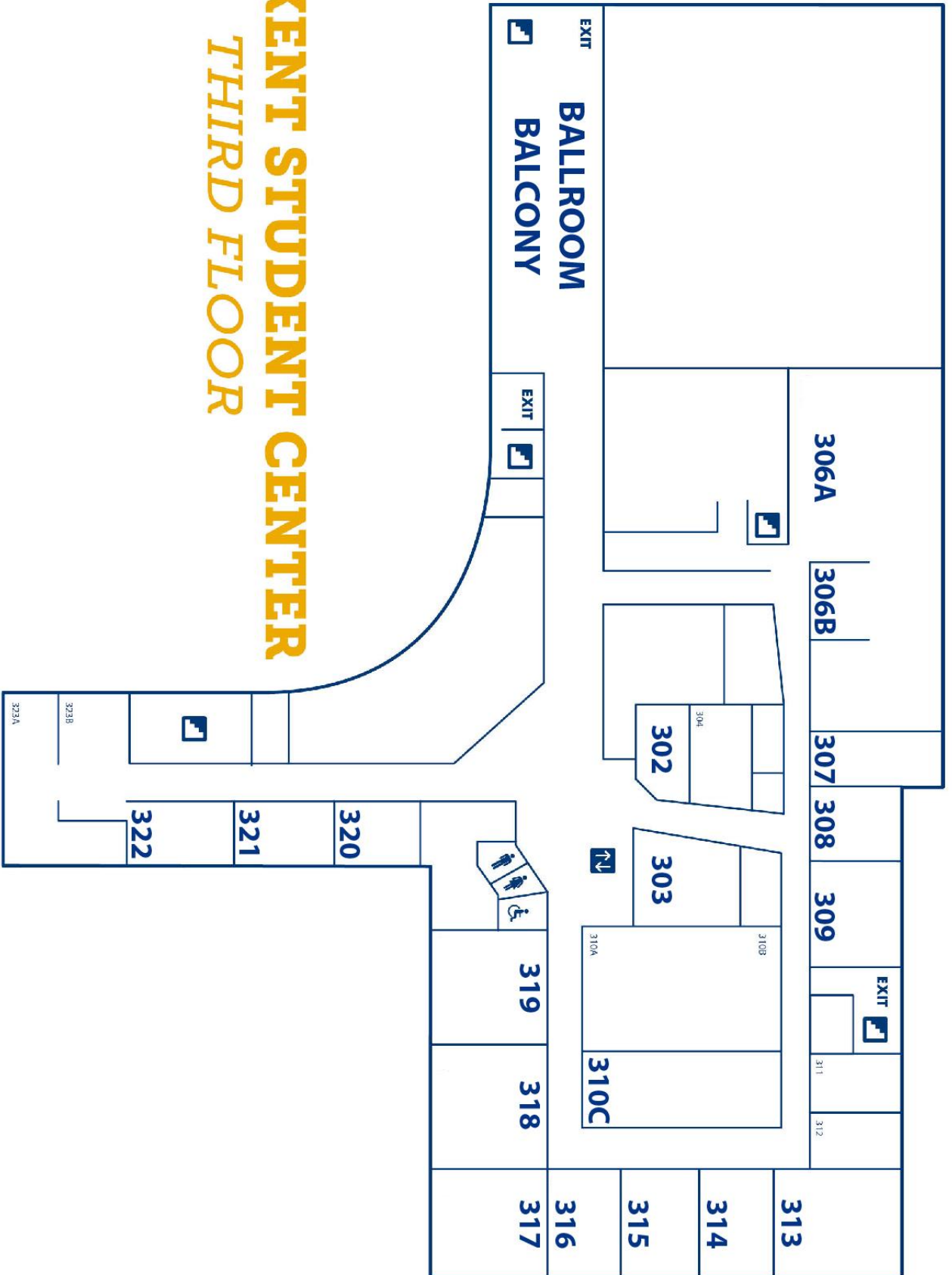
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KENT STUDENT CENTER SECOND FLOOR



KENT STUDENT CENTER THIRD FLOOR



ORAL PRESENTATIONS I

9:00-10:15 AM

Culture and Identity I

Room 318

JUDGE(S): Dr. Frank X. Ryan;

Dr. Julia J. Huyck

9:00 Jason Adkins

Political Science

Preaching politics: How religious denominations transmit political cues to their members

9:15 Maya Brown

Music

Jumping Jim Crow Across the Pond: Analyzing How American Blackface Minstrelsy Became British

9:30 Kristen Traynor

Political Science

War of words: A comparison of the framing of prisoner treatment during Guantánamo Bay's two largest hunger strikes

9:45 Ashley Gauer

Modern and Classical Language Studies

The Influence of Education on Political Views: An Investigative Look at Japanese Portrayals of Russia in History Textbooks

Culture and Identity II

Room 308

JUDGE(S): Dr. Yuko Kurahashi; Cynthia R. Stillings

9:00 Alan Walker, Alex Catanese, Jordan Kauffman

Visual Communication Design

Place Into Words: A participatory design installation immersed in the journey between Earth and Mars

9:15 Jason Carruthers

History

One manly tear o'er Southern dust: An Ohio monument to Confederate dead and Civil War memory

9:30 Lydia Snyder

Music

Trance-forming music: Healing through Communal Drumming

9:45 Jim Bray

Theater & Dance

Action and movement through crisis: Investigating character building within Larry Kramer's "The Normal Heart"

Biology and Health I

Room 306A

JUDGE(S): Mr. Thomas Long; Dr. Sheryl L. Chatfield

9:00 Sumirtha Balaratnam

Chemistry & Biochemistry

G-quadruplex driven functional modulation in the human piwi interacting RNAs

9:15 Surya sruthi Bhamidipalli, Dr. Rebecca Fischbein, Dr. Lauren Nicholas

Public Health

Familiarity of Twin Anemia Polycythemia Sequence among Perinatologists: A descriptive study

9:30 Suranjana Goswami, Souvik Dey, Srinivasan Vijayaraghavan

Biological Sciences

Identification of Substrates of Sperm Protein Kinase A using a Chemical-Genetics Approach.

9:45 Prakash Kharel, Soumitra Basu

Chemistry & Biochemistry

Synthesis of a novel nucleotide analogue to study the effect of oxidative stress on RNA folding and its implications on the pathophysiology of neurological disorders

Biology and Health II

Room 306B

JUDGE(S): Dr. Vincent Hetherington; Dr. Vinay K. Cheruvu

- 9:00 Binaya Adhikari, Andrea Case**
Biological Sciences
Why are selfish male sterility genes expressed naturally among flowering plants?
- 9:15 Rahul Bhattacharjee, Suranjana Goswami, Souvik Dey, Srinivasan Vijayaraghavan**
Biological Sciences
Isoform specific role of Glycogen Synthase Kinase 3a in male fertility
- 9:30 Prakash Shrestha, Sagun Jonchhe, Masayuki Endo, Hanbin Mao, Tomoko Emura, Kumi Hidaka, and Hiroshi Sugiyama**
Chemistry & Biochemistry
Transition dynamics of a human telomere G-quadruplex in confined space
- 9:45 Fatima Jaber, Gregory Sondag, Mohammad Ansari, Fouad Moussa**
Biomedical Sciences
GpnmB/Osteoactivin Plays a Novel Role in Autophagy-Mediated Osteoblast Differentiation and Function

Environmental Research I

Room 319

JUDGE(S): Dr. Sarah Smiley

- 9:00 Jennifer Sensor**
Biomedical Sciences
Exploring the Life History of Bowhead Whales
- 9:15 Tim Rose**
Sociology
Rural Resistance and Fracking: The Impact of Perception on Resistance Formation
- 9:30 Adiyana Sharag-Eldin**
Geography
Examining Public Opinions on Fracking Issues Using Geography and Communication Theories

9:45 Erik Smith

Geography

The Influence of Extreme Temperature Events on Mortality in the Eastern United States

Environmental Research II

Room 309

JUDGE(S): Dr. Roberto M. Uribe; Dr. Chang-Geun Oh

- 9:00 Anjali Krishnan**
Biological Sciences
Identification of a novel microbial degradation pathway for microcystins
- 9:15 Shreejit Sunil Shitole**
Applied Engineering, Sustainability, & Technology
Tiny sustainable house using a shipping container
- 9:30 Theo Woodson**
Applied Engineering, Sustainability, & Technology
Fabrication and Characterization of Freeze Cast Tubular Solid Oxide Fuel Cells
- 9:45 Mark Brotman**
Environmental Health Sciences
Reduction of Strontium using residential ion exchange water softeners

Health and Exercise I

Room 310C

JUDGE(S): Dr. Lisa Custer; Dr. Amy B. Petrinec

- 9:00 Jennifer Hemphill**
Theater & Dance
AIDS and the Effect on Broadway Musicals: The Emergence of RENT
- 9:15 Sureporn Suwannasod, Dr. Ratchneewan Ross**
Nursing
Lessons Learned from a Research Study Involving Thai Adolescents with Cancer

9:30 Fatemeh Dehghan Manshadi
Lifespan Development &
Educational Sciences
*International students utilization of
mental health services in the United
States*

**9:45 Yu Lun Tai, Erica Marshall, Alaina
Glasgow, J. Derek Kingsley**
Health Sciences
*Bench Press With And Without
Blood Flow Restriction On Pulse
Wave Reflection And Arterial
Stiffness*

Math and Physics I

Room 313

JUDGE(S): Dr. Vic Perera; Dr. Jonathon I.
Maletic

9:00 Nasim Eshghi, Lothar Reichel
Mathematics
*Approximation of matrix functions
based on the Lanczos process*

**9:15 Anthony Harrison, Jenya
Soprunova**
Mathematics
*Computing the lattice size of a lattice
polygon with respect to the 2-
simplex*

**9:30 Mykhailo Kuian, Lothar Reichel.
Sergij Shiyanovskii**
Mathematics
*Rectangular Vandermonde-type
matrices with application to
microscopy.*

9:45 Arne Leitert, Feodor F. Dragan
Computer Sciences
On Strong Tree-Breadth

Psychology and Cognition

Room 314

JUDGE(S): Dr. Christopher Was; Dr. Judith
Gere

**9:00 Michael Baranski, Christopher A.
Was**
Psychological Sciences *Mindfulness
Meditation and Working Memory*

**9:15 Rachel DeFranco, Maria Zaragoza,
Patrick Rich**
Psychological Sciences

*Mock jurors' belief in witness
testimony: The role of witness
certainty and uncertainty*

9:30 Eric Rindal, Maria Zaragoza
Psychological Sciences
*Lie to me: The effect of lying on a
liar's memory*

9:45 Álvaro Marín García
Modern and Classical Language
Studies
*Epistemological pluralism and
translation process research (TPR)*

Educational Studies I

Room 315

JUDGE(S): Deniz U. Koptur; Dr. Clarissa A.
Thompson

9:00 Emtiaz Ahmed
Foundations, Leadership, &
Administration
*Racial gaps in student-level
constructs that influence
mathematics and science
achievement of U.S. Eighth grade
students*

9:15 Neete Saha
Foundations, Leadership, &
Administration
*Advising matters for international
students*

9:30 Dr. Natasha H. Chenowith
Teaching, Learning, & Curriculum
Studies
*Teaching Adolescent English
Learners to Write*

9:45 Shabnam Moini Chaghervand
Teaching, Learning, & Curriculum
Studies
*Effects of Picture Books on Reading
Comprehension*

Educational Studies II

Room 316

JUDGE(S): Dr. Md Amiruzzaman; Dr. Manfred van Dulmen

- 9:00 Dmitrii Pastushenkov, Cameron Camp**
English
Effects of L1 usage and peer familiarity in ESL group interaction
- 9:15 Sebiha Balci, Bradley J. Morris, Jonathan Secaur**
Lifespan Development & Educational Sciences
Comparing the effects of badges vs. leaderboards on motivation and academic performance in an online Physics course
- 9:30 Kelsey Phillips**
Communication Studies
The Anxious Teacher
Communication apprehension and motivation in the classroom
- 9:45 Jennifer Worthington, Frank Sansosti**
Lifespan Development & Educational Sciences
A meta-analysis of single-subject research investigating the use of peer-mediated instruction and intervention for teaching social skills to students with autism spectrum disorder

Technology

Room 317

JUDGE(S): Dr. Evren Koptur; Dr. Xinyue Ye

- 9:00 Naser Al Madi**
Computer Sciences
A comprehension-based framework for measuring semantic-similarity between unstructured documents
- 9:15 Leah Bergquist**
Liquid Crystal Institute
An Optically Isotropic Antiferroelectric Liquid Crystal (OI-AFLC) Display Mode Operating over a Wide Temperature Range using Ternary Bent-Core Liquid Crystal Mixtures

- 9:30 Mohammed Mubeen Raof**
Digital Science
Human Sensing Wifi Access Points
- 9:45 Vinay Joshi, Merrill Groom, Dr. Liang -Chy Chien**
Liquid Crystal Institute
Topology-enhanced electro-optical performance of reverse-mode polymer stabilized cholesteric shutters for volumetric 3D devices

TRADITIONAL POSTER

PRESENTATIONS 10:20-11:35 AM

Poster Session 1

JUDGE(S): Dr. Suzy D'Enbeau; Ms. Sonali Kudva

- 1 Brandi Dodge**
Architecture
Thoughts toward social interaction within a lifestyle center
- 2 Elizabeth Ellis**
Architecture
Utopia; Unrealized
- 3 Zach Humphries**
Communication
Online and Offline Soccer Fandom: A Performative Perspective
- 4 Franklin Krouse**
Architecture
Suggested acoustic treatments for Kent State's College of Architecture and Environmental Design

Poster Session 2

JUDGE(S): Dr. Kathy Kerns

- 5 Jessica LaBuda, Judith Gere**
Psychological Sciences
Accuracy and bias of romantic partners' approach and avoidance motives
- 6 Kelly Markowski**
Sociology
Individual change and social change: How identity processes foster success in the vegan identity

7 Andy Martinez
 Anthropology
The ballad of Frankie Silver: A tale of murder and mystery

8 Annette Miro Ojeda
 Architecture
"Catalan Modernisme influences from Barcelona's Park Guell to Cuba's Masía L'Ampurdà"

Poster Session 3

JUDGE(S): Dr. Jennifer Mapes

9 Casey Poe
 Architecture
Wanted: Cities For People; Re-Imagining Public Space for Social Inclusion

10 Alexander Scott
 Architecture
CITY The Urban Canvas: An exploration into graffiti within the city and the potential of it to influence the urban landscape.

11 Daniel Socha, Kelsey Husnick
 Communication
A Qualitative Investigation of Queerness in Ghana

12 Kevin Wilson
 Music
AN UNDULATING DESIGN: THE LIFE OF JAZZ IN AKRON, OHIO

Poster Session 4

JUDGE(S): Dr. Gregory C. Gibson

13 Eleanor Asquith
 Architecture
Assessment of the Performance of Pervious Concrete to Drain and Filter Water

14 Michael Carnessali
 Architecture
Sustainability through LEED's framework

***15 Tejas Dnyaneshwar Dudhade**
 Applied Engineering, Sustainability, & Technology
Thermal management in solid oxide fuel cell system

16 Andrea Fitzgibbon, David Costello
 Biological Sciences
Biofilm-sediment interactions: Micron-scale spatial and diel variation in oxygen

17 EmmaLeigh Given, Dr. Oscar Rocha, Dr. Ferenc De Szalay
 Biological Sciences
How do stream organisms respond to foreign food? / Leaf Type Preference of Tropical Aquatic Macroinvertebrate Communities

Poster Session 5

JUDGE(S): Dr. Richard L. Mangrum

18 Sean Hasson
 Architecture
Reducing Cleveland's industrial carbon footprint

***19 Amber Huston, Joseph Ortiz**
 Geology
Holocene Aquatic Ecosystem Variability from Birch Lake and Lost Lake, Alaska, Using Visible Reflectance Spectroscopy

20 Jonathan Penvose
 Architecture
Recycling low density polyethylene (LDPE) into long-term building applications

21 Duncan Randall
 Architecture
Effects of evergreens in expanding the use of urban outdoor spaces in cold conditions in northeast Ohio.

22 Kalpani Ratnayake, Joseph D. Ortiz, Beverly Z. Saylor
 Geology
Holocene paleoclimate reconstruction records from Lake Erie sediment

Poster Session 6

JUDGE(S): Dr. Scott Sheridan

23 Bethany Schmidt, Dr. Darren Bade, Christopher Boehler
 Biological Sciences
Influence of micronutrients on nitrogen fixation rates in northern Ohio lakes

- 24 Caitlyn Scoville**
Architecture
toxicity
- 25 Haley Wachholz**
Geography
Straight-line vs. Tornadic: The Current Knowledge of Severe Thunderstorm Wind Hazards and the Perceived Risk of Regional College Students
- 26 Justin Wharrey, Rui Liu**
Architecture
Shell structure built using bricks made from dredged material

Poster Session 7

JUDGE(S): Dr. Vinay K. Cheruvu;

- 27. Obianuju Aguolu, Dr. Lynette Phillips, Dr. Tara Smith, Dr. Vinay Cheruvu**
Public Health
Development and evaluation of the effectiveness of a theory-informed, culturally specific, graphic narrative messaging about HPV and HPV vaccine among college students in northeast Ohio: an application of the integrative model of behavioral prediction
- 28. Ashley Davis, Amber Titus, Devanshi Mehta**
Biomedical Sciences
Every-other-day fasting is more effective in weight reduction for obesity-prone rats than for lean rats
- 29. Eric Dorsch, Yu Lun Tai, Erica Marshall, Dr. J. Derek Kingsley**
Health Sciences
Autonomic modulation after an acute bout of bench press with and without blood flow restriction
- 30. Stephen Fischer, Jon Stavres, John McDaniel**
Health Sciences
Metabolic differences between a bout of eccentric, concentric and traditional resistance exercise

Poster Session 8

JUDGE(S): Dr. Maggie Stedman-Smith

- *31. Brittany Followay, Jeremiah Vaughan, Hayden Gerhart, Ellen Glickman**
Health Sciences
The effects of added inspiratory resistance during exercise in hypoxia on lactate and hemoglobin
- 32. Christopher Forchione**
Architecture
Sedentary behavior in the architecture studio
- *33. Rachel Hamilla**
Anthropology
The impact of diet manipulation on the health and behavior of captive Bornean orangutans
- 34. Erica Marshall, Alaina Glasgow, Yu Lun Tai, Dr. J. Derek Kingsley**
Health Sciences
Sex-specific differences in Pulse Wave Reflection and Arterial Stiffness After Resistance Exercise

Poster Session 9

JUDGE(S): Dr. Andrea Warner Stidham; Dr. Kimberly A. Williams

- 35. Alex Petruso**
Architecture
Promoting Healthier Lives for Humans and Domestic Dogs Through the Better Design of Dog-Friendly Urban Space
- 36. Charles Scarbrough**
Architecture
Analysis of multi-person rooms in creating patient satisfaction in inpatient hospitals: Using post-occupancy evaluations and social media to evaluate the correlation between patient happiness and their proximity to other patients
- *37. Maya Shamailov**
Nursing
Pain management for Medical-Surgical patients can be Painless

38. **Tyler Singer, Erica Marshall, Alaina Glasgow, Yu Lun Tai**
Health Sciences
The effects of resistance exercise on forearm blood flow and vasodilatory capacity between sexes

Poster Session 10

JUDGE(S): Dr. J. Derek Kingsley; Dr. Julia J. Huyck

39. **Lydia Snyder**
Music
Musical Understandings: Undergraduate Perceptions of Human and Non-human Music
40. **Jon Stavres, Steve Fischer, John McDaniel**
Health Sciences
Post exercise hypotension and blood flow characteristics following eccentric and concentric exercise
41. **Jeremiah Vaughan, Brittany Followay, Hayden Gerhart, Ellen L Glickman**
Health Sciences
Impact of inspiratory resistance on cognitive function in normobaric hypoxia after exercise
42. **Anna Wise, Sarah Delahanty, Douglas Delahanty**
Psychological Sciences
The influence of parent gender on child symptom development following an acute traumatic event
43. **Shane Draper, John McDaniel**
Health Sciences
Blood Glucose Control Following Single-Leg and Double-Leg Cycling

Poster Session 11

JUDGE(S): Dr. Vic Perera

44. **Matthew Alexander**
Mathematics
Volume product in Lipschitz-free Banach spaces.
45. **Nowayer Alwabsi**
Computer Sciences
Finding Minimum-Width Trounulus

46. **Daniel Gavazzi, John Protman**
Physics
The folding mechanism and kinetics of the domains of α -spectrin: Results from a variational model
47. **Ammar Kirmani, Khandker Quader, Maxim Dzero**
Physics
p-wave super fluid with imbalanced atomic population in harmonic trap
48. **Mona Matar, Lothar Reichel, Omar De La Cruz**
Mathematics
Most Important Nodes Depending on Specific Targets in Directed Networks

Poster Session 12

JUDGE(S): Dr. Barbara A. Broome

49. **Kholoud Alkhayer**
Biological Sciences
Hemoglobin is neuroprotective in cortical neurons
50. **Layla Almutairi**
Biomedical Sciences
The Effect of Magnetic Nanoparticle Hyperthermia on the Antibiotic Susceptibility of Staphylococcus aureus
51. **Abdulaziz Aloliqi, Janarthanan Ilangovan, Dr. Gail Fraizer**
Biomedical Sciences
Does Cx43 regulate motility of prostate cancer cells
52. **Monica Ghosh, Spencer Andrei, Ian N. Bratz, Derek S Damron**
Biomedical Sciences
Stimulation of TRPA1 ion channels increases intracellular Ca²⁺ transients and contractile function in mouse ventricular myocytes
53. **Alaa Eisa, Nidaa M. Awaja, S. Vijayaraghavan, D. Kline**
Biomedical Sciences
The presence of PP1 γ 1 and PP1 γ 2 in mouse oocytes and eggs.

Poster Session 13

JUDGE(S): Dr. Vincent Hetherington

54. **Elizabeth Aulino, Angela R. Freeman, Rodrick D. Wiggins, Heather K. Caldwell**
Biological Sciences
Maternal investment in vasopressin 1b receptor knockout mice
- *55. **Emily Brahler, Dr. Robert Mensforth**
Anthropology
Hypovitaminosis D and associated mortality within the Hamann-Todd Human (HTH) Osteological Collection
56. **Morgan Chaney, Anthony J. Tosi, Helen Piontkivska**
Biomedical Sciences
Duplication and deletion of CYP2C genes among ape and human genomes
57. **Stacy Leigh Deraway**
Anthropology
Beyond a traditional view of language processing: Insights from comparative examination of dopaminergic innervation of thalamic nuclei across primate species
58. **Megan Linscott, Wilson C.J. Chung**
Biological Sciences
Epigenetic regulation of FGF8 expression in the olfactory placode during murine gonadotropin-releasing hormone neuron emergence.

Poster Session 14

JUDGE(S): Cindy A. Wilk

59. **Alexandra Niemczura, Alyssa Carvalho, Maeson Latsko, Jasmine Grimsley**
Biomedical Sciences
Effect of mouse vocalization playback on the listener
60. **Nicole Perrone**
Anthropology
Parental Investment Strategies and Glucocorticoids: A Comparative Study of 3 Lemur Taxa

61. **Priyanka Rana, Nathan J Mudrak, Michael A Model**
Biological Sciences
Measuring intracellular protein concentration: Why and how?
62. **Cody Ruiz**
Anthropology
The question of Y: A unique case of primate Y chromosome introgression in the context of mating competition
63. **Sangeetha Selvam, Shankar Mandal, Prof. Hanbin Mao**
Chemistry & Biochemistry
Quantification of Population Dynamics of Tetraplexes in Duplex DNA using Magneto-Optical Tweezers

Poster Session 15

JUDGE(S): Dr. John A. Updegraff; Ginny L. Natale

64. **Aimee Hammer, Marissa Gastelle, Stephanie Silberman**
Psychological Sciences
Dyadic Synchrony in Latina Adolescent Mothers and Their Toddlers: The Role of Maternal Behavior and Child Temperament
65. **Elizabeth Jean, Dr. Angela Neal-Barnett, Dr. Robert Stadulis, Martale Davis**
Psychological Sciences
Is mindset associated with the usage of self-affirmation, cognitive processing or discovery of meaning?
66. **Danielle Jones**
Anthropology
The evolution of aggression: Insights from a macaque model of MAOA polymorphism
67. **Megan Mitchell**
Architecture
A Concern for Mental Well-Being in Urban Design
68. **Karin Maria Nylocks, Karin Coifman**
Psychological Sciences
Spontaneous emotion regulation and recovery: Preliminary data from a novel in-vivo emotion elicitation paradigm

Poster Session 16

JUDGE(S): Dr. Frank X. Ryan

- 69. Ahlam Alghamdi, Dr. Aryn C. Karpinski**
 Foundations, Leadership, & Administration
Measuring Saudi Faculty Members' Satisfaction with and Productivity in the Office: Reliability and Validity Evidence
- 70. Torri Appling, Brett Tippey**
 Architecture
The Bilbao Anomaly: A Critical Examination of The Iconic Architectures of Basque Country, Spain
- 71. Samantha Ayotte**
 Architecture
AgriHousing: A social byproduct of urban housing and agriculture
- 72. Michelle Bebbler**
 Biomedical Sciences
Prehistoric ceramic vessel performance: an experimental materials-science approach to evaluating chemically similar tempers from Late Woodland - Late Prehistoric (AD 600 - 1400), Ohio, U.S.A.
- 73. Ryan Carrick, Dr. Adil Sharag-Eldin**
 Architecture
Energy Usage in Cities: Urban Micro-climates

Poster Session 17

JUDGE(S): Dr. BoSheng Liu

- 74. Bryan Daily**
 Architecture
An Analysis of Daylight Impact on LEED EQc8.1 1 Credit Ohio Educational Facilities
- 75. Thomas DeLullo**
 Architecture
Masonry and modularity in Rafael Moneo's Museum of Roman Art and Kursaal Congress Center

- 76. Thomas DeLullo**
 Architecture
Evaluation of flexible formwork in increasing design and construction efficiency
- 77. Justin Gleason, Dr. Adil M.K. Sharag-Eldin**
 Architecture
Interior Acoustic Vegetation
- 78. Marwa Ibrahim**
 Architecture
Implementing evidence based design in HONRs Hospital

Poster Session 18

JUDGE(S): Dr. Richard Adams

- 79. Taylor Killen, Dr. Adil M.K. Sharag-Eldin**
 Architecture
Reforming Modern Day Suburbia
- 80. Catherine Puleo**
 Architecture
Community, Architecture, and Place Attachment in the Revitalization of Post-Industrial Downtown Canton: An Analysis of Social, Political, and Architectural Theory
- 81. Jonathan Rankin**
 Architecture
Architecture of Acoustics
- 82. Olivia Reilly, Gabi Boehm, Trudy Adler, Deanna Duffy, Hannah Crawford**
 Public Health
Research mob to evaluate visibility and accessibility of blue light security phones on Kent State University's campus
- 83. Jacob Sas**
 Architecture
Understanding how form in architecture affects users' states of consciousness
- 84. Stephen Scabora**
 Architecture
Way-Finding and Mental Mapping in the Built Environment

Poster Session 19

JUDGE(S): Dr. Thomas Long

- 85. Samata Shrestha, Dr. Adil Sharag-Eldin**

Architecture

Mapping an urban transect profile by combining heat stress exposures and socio-economic conditions in Chicago during midsummer condition.

- 86. Joe Tokosh**

Geography

Constructing a Shopping Mall Typology for the City of Pittsburgh, Pennsylvania

- 87. Jonathan Visgaitis,**

Architecture

Pedestrian Patterns in an Interior Environment: A study of Movement in the Center for Architecture and Environmental Design

- 88. Christopher Willer**

Geography

Using remote sensing to assess land-use change in Kent, OH

- 89. Ziyang Ye**

Architecture

Vertical Urbanism

Poster Session 20

JUDGE(S): Dr. Belinda S. Zimmerman

- 90. Khatija Ahmed, Carlynn Hinish, Dr. Abraham Osbourne**

Health Sciences

The Significance of an MBA Degree for a Podiatric Physician, Is It Worth It? A Survey Study.

- 91. Bushra Aldosari, Christopher Was**

Lifespan Development & Educational Sciences

Learning a Second Language for Arabic Speakers: / Can Word Pair Directionality Make a Difference?

- 92. Allyson Chicowski**

Nursing

Developing clinical imagination in nursing education: Moving beyond critical thinking

- 93. Colleen Douglas**

Lifespan Development & Educational Sciences

Using Enhanced Milieu Teaching Strategies and Sign Language to encourage a child with autism to use vocalizations, gestures, and signs with caregiver during play interactions.

- 94. Ashley Drungil**

Lifespan Development & Educational Sciences

Parent-Implemented Intervention Strategies to Increase Child Communication

- *95. Ke-Jui Yen**

Lifespan Development & Educational Sciences

The Effectiveness of Responsive Teaching on Parent's Engagement with Children During Play

Poster Session 21

JUDGE(S): Dr. Rashmi Singh; Dr. Ching-I Chen

- 96. Paul Earp**

Library & Information Science

An evaluation of accessibility policies in academia at public and State universities with student populations of 17,000 to 25,000.

- 97. Rebecca Eberly**

Lifespan Development & Educational Sciences

The Effects of Parent-Implemented Dialogic Book Reading on Child Communication

- 98. Sarah Faul**

Lifespan Development & Educational Sciences

The Effects of Parent Use of Intervention Strategies to Enhance Child's Communication

- 99. Rachael Fleischaker**

Music

Exploring the Core Music Standards Through the Lens of a General Music Teacher

- 100. Rachel Haupt, Dr. Richard Cowan, Sara Boyle**
Lifespan Development & Educational Sciences
Choice as an Antecedent Based Intervention for Students with Autism

- 101. Cara Welch**
Architecture
A Critique of Architecture Juries at the College of Architecture and Environmental Design, Kent State University [KSU]

Poster Session 22

JUDGE(S): Dr.Sanna Harjusola-Webb; Dr. David Pereplotchik

- 102. Kylie Levin**
Lifespan Development & Educational Sciences
The effects of coaching caregivers on prelinguistic strategies to increase child's engagement
- 103. Jennifer Manthey**
Lifespan Development & Educational Sciences
The Effects of Parental use of Pre-Linguistic Milieu Teaching on Intentional Communication.
- 104. Krystina Rygel**
Lifespan Development & Educational Sciences
The Effects of Coaching Caregivers on Enhanced Milieu Teaching to Enhance Communication.
- 105. Rashmi Singh**
Teaching, Learning, & Curriculum
Writing conjectures using GeoGebra: A better alternative to teach proofs in secondary school
- 106. Yong Seng 'Jonathan' Tan**
Teaching, Learning, & Curriculum
Palm leaf weaving steps by applying the first principles of instruction
- 107. Kimberly Travers**
Lifespan Development & Educational Sciences
Individualized Family Service Plan Outcome Assessment Tool: Validation and Community Implementation

Poster Session 23

JUDGE(S): Dr. Xinyue Ye

- *108. Naser Al Madi**
Computer Sciences
Hermès: A smart sports helmet
- 109. Ismael Ali, Naser Al Madi, Austin Melton**
Computer Sciences
Using Text Comprehension Model for Learning Concepts, Context, and Topic of Web Content
- 110. Aisha Aljohani, Gokarna Sharma**
Computer Sciences
Complete Visibility for Mobile Agents with Lights Tolerating a Faulty Agent
- 111. Morgan Gundlach**
Architecture
An autonomous change
- 112. Preoyati Khan, Robert J. Clements, Cheng Chang Lu**
Computer Sciences
Cluster based image processing for ImageJ

Poster Session 24

JUDGE(S): Dr. Chang-Geun Oh

- 113. Kara Konieczny**
Architecture
Visual comfort: Interior, kinetic, shading device
- 114. Shankar Mandal, Sangeetha Selvam, Prakash Shrestha, Hanbin Mao**
Chemistry & Biochemistry
Highly sensitive mechanochemical sensing of Hg(II) ions using polyvalent principles
- 115. Sai Srinath Mekala**
Applied Engineering, Sustainability, & Technology
Physical Characterization of a 200 keV Electron Accelerator
- 116. Hemant Naik**
Applied Engineering, Sustainability, & Technology
Optimization of Spiral Fuel Cell Design & Production of Functional fuel cell

117. **David Sidick**
Architecture
Agile design in architecture: A computer science paradigm applied to architectural design process
118. **Elizabeth Weiss**
Architecture
The city is a game: Towards a user oriented urbanism

INTERDISCIPLINARY POSTER PRESENTATIONS 10:20-11:35 AM

Healthy Communities I

JUDGE(S): Dr. Laurie M. Wagner

119. **Talib Alboslemy, Bing Yu, Min-Ho Kim**
Biomedical Sciences
Reprogramming macrophages toward the anti-biofilm phenotype by silencing Kruppel-like factor 2
120. **Waleed Alshahrani**
Health Sciences
Attitudes towards Patients with Mental Illness
121. **Ezinne Anaba, Melissa Zullo, Lorriane Odhiambo**
Public Health
Assessing the impact of enrollment time to Cardiac Rehabilitation for Older Adult patients post Myocardial Infarction.
122. **Spencer Andrei, Monica Ghosh, Ian N Bratz, Derek S Damron**
Biomedical Sciences
Propofol restores diminished nitric oxide bioavailability in diabetic cardiomyocytes

Healthy Communities II

JUDGE(S): Dr. Joel W. Hughes

123. **Pallavi Aurora, Lindsey Matt, Shaima Al-mahmoud, Karin Maria Nylocks, Karin Coifman**
Psychological Sciences
Unpacking social avoidance in social anxiety disorder via experience sampling methods; An interaction

- between personality dimensions and momentary negative affect*
124. **Sabana Bhatta, Mark Dalman, Noor Ramahi, T.C. Smith**
Public Health
A Comparison of Staphylococcus Aureus Nasal, Throat, and Hand Carriage in Identical Twins
125. **Ampaiwan Boonkaewwan, Dr. Busakorn Punthmatharith, Dr. Ratchneewan Ross**
Nursing
Facebook HIV transmission prevention intervention among Thai HIV-infected adolescents: Sequential exploratory mixed methods research
126. **Edward Chiyaka, Ndidi Edeh**
Public Health
Effect of parenting style on initiation of Marijuana use among teenagers in the United States

Healthy Communities III

JUDGE(S): Dr. Amanda K. Burke

127. **Rachael Nolan, Ashley Johnson, Olivia Reilly, Jeffrey S. Hallam**
Public Health
A Systematic Review of High Utilizers, Mental Illness, and Cost across the Service Sectors of Healthcare, Homelessness, and Criminal-Justice Involvement
128. **Wimonthip Phuangkhem, Dr. Ratchneewan Ross**
Nursing
Quality of life among women experiencing intimate partner violence (WIPV): An integrative review
129. **Bishal Thapa Chhetry**
Architecture
Freestanding Outpatient Care Center and its significance in Nepal
130. **Britain Wetzal, Dr. James Connors, DPM, Dr. Duane Ehredt Jr., DPM, Dr. Allan Boike, DPM**
Podiatric Medicine
Adjunct sesamoid fixation to strengthen first metatarsophalangeal joint arthrodesis

Healthy Communities IV

JUDGE(S): Dr. Jill S. Kawalec

- 131. Monica Garcia, Angela Junglen, Anna Wise, Douglas Delahanty**
Psychological Sciences
The role of pain catastrophizing in the relationship between childhood trauma and subsequent drug use
- 132. Yu-Lin Hsu**
Health Sciences
Contributors to limited health literacy among older adults with chronic conditions
- 133. Angela Junglen, Bryce Hruska, PhD, Douglas Delahanty, PhD, Alec Boros**
Psychological Sciences
The dual mediating effects of PTSD and negative urgency on the relationship between emotional abuse and substance use
- 134. Monika Khurana, Sheryl L. Chatfield**
Public Health
Peer mentoring to increase physical activity: A content analysis of published qualitative research

Global Understanding I

JUDGE(S): Kevin D. Wolfgang

- 135. Angelina Bair**
Library & Information Science
African-American Children's Picturebooks: Examining the Genres of Childhood, Resistance, and Cultural Identity Through Storytelling
- 136. Rob McKinney**
Lifespan Development & Educational Sciences
Storied-experiences of gay males' interactions with Christianity: A narrative analysis

137. Rachael Nolan

Public Health

A qualitative analysis on 'coming out' experiences and perceived level of community supports of LGBT persons

138. Suwatana Rockland, David Costello

Theater & Dance

East Meets West - Costume design that illustrates harmony between eastern and western design and aesthetics.

Global Understanding II

JUDGE(S): Dr. Jennifer Taber; Emmanuel Dechenaux

139. Tongfei Wang

Communication

Media exposure to terrorism and its impact on rising nationalism and xenophobia in the U.S.

140. Carrie Winters

Communication

Britain after Brexit: A qualitative evaluation of what it means to be British in the wake of Brexit

141. Lauren Wood, Josefina Grau

Psychological Sciences

Child-rearing environments of Latina adolescent mothers and their toddlers: A person-centered examination

Environmental Science & Design I

JUDGE(S): Dr. Christopher Blackwood

142. Kiersten Duroe, Jonathan Mills, Lauren Kinsman-Costello, Elizabeth Herndon

Geology

Iron redox cycling and impacts on phosphorus solubility in tundra and boreal ecosystems

143. Hayden Erdman

Architecture

Suitability of mycelium media filters as a means of water filtration in urban areas

- 144. Donna Grigonis, Dr. Adil Sharag-Eldin**
 Architecture
Assessing the impact of environmental conditions on potentially drug-consuming large-crowds: Case of Sunset Music Festival, Tampa FL2016
- 145. Xin Hong, Jay Lee, Pengyan Zhang, Chengbing Deng**
 Geography
Geographical Disparity of Livestock Production in Northern China

Environmental Science & Design II

JUDGE(S): Dr. Mark Mistur

- 146. Emily Appelbaum**
 Architecture
Concrete batched using lightweight aggregate made from dredged material
- 147. Torri Appling, Adil Sharag-Eldin**
 Architecture
Exploration of bio-based phase change materials as architectural insulation
- 148. Zach Butler, Dr. Adil M.K. Sharag-Eldin, Mark W. Kershner**
 Architecture
Architecture and its Identity as a Platform
- 149. Colleen Cosgrove, Andrew C. Eagar, Mark W. Kershner, Christopher, B. Blackwood**
 Biological Sciences
Temporal shifts and spatial source-sink dynamics of tree species in a diverse forest in northeast Ohio
- 150. Arosha Dassanayake, Rohan Dassanayake**
 Chemistry & Biochemistry
Functionalized Nanocrystalline Cellulose Sorbents for Efficient Carbon Dioxide (CO₂) Capture at Elevated Temperatures

Environmental Science & Design III

JUDGE(S): Dr. Joe Ferut

- 151. Eric Kelly**
 Architecture
How has the Perception of Students in Internships changed since 2003?
- 152. Ashley Kerwood, Dr. Adil M.K. Sharag-Eldin**
 Architecture
Temporary Architecture: A natural response to resilience
- 153. Qingsong Liu, Zheyue Wang, Xinyue Ye**
 Geography
Delineating the human movement pattern: A geo-big data perspective
- 154. Dorothy Ly**
 Visual Communication Design
Creating a better environment one step at a time

Environmental Science & Design IV

JUDGE(S): Terry Schwarz

- 155. Bree Richardson, Lauren Kinsman-Costello, Laura Johnson, Kristin Arend**
 Biological Sciences
Hydrologic effects on phosphorus storage in a freshwater estuary
- 156. Meaghan Shaw, Elizabeth Herndon**
 Geology
Investigation of trace metal transport in an AMD-impacted stream and treatment system in Northeastern Ohio
- 157. Janelle Slivka**
 Architecture
Experiential retail design and the importance of environmental branding: Understanding the visual cues and psychology of consumers
- 158. Michael Sweterlitsch**
 Architecture
Impact of changing the scale at which energy storage and production is implemented in residential developments

Environmental Science & Design V

JUDGE(S): Dr. Joshua Pollock

- 159. Matthew Tolodzieski**
Architecture
The economic impact of a tiny movement
- 160. Brendan Wolfe**
Architecture
Adaptive Architectural Design as a Practical Method of Sustainable Design
- 161. Brianne Yarger, Hannah Frederick, Laura Zemanek, David Singer**
Geology
Biogeochemical cycling of manganese in abandoned piles of coal mine waste in eastern Ohio
- 162. Huanyang Zhao**
Geography
Spatial Analyses of High Ozone Days in Northeast Ohio

Advanced Materials I

JUDGE(S): Dr. Antal Jakli

- 163. Srijana Bhandari, Barry Dunietz**
Chemistry & Biochemistry
Photophysical study of environmental effects on charge and energy transfer in molecular aggregates of perylene dyes and encapsulated coumarin
- 164. Hai Feng**
Applied Engineering, Sustainability, & Technology
Solid-Oxide-Fuel-Cell: resolution of power conditioning for practical use
- 165. Nicholas Penman, Bogdan Benin, Adam Cooke, Olivia White**
Chemistry & Biochemistry
Multilayer Au@Cu₂MoS₄ nanoparticles as potential cancer therapeutics
- 166. Nilin Rao, Craig Verdin, Nicholas Williams, Michelle Hurless**
Health Sciences
A Thermochromic Leuco Dye Coated Glove for the Prevention of Frostbite in Cold Environments

- 167. Jinghua Jiang**
Liquid Crystal Institute
Bipolar to Toroidal Configuration Transition in Liquid Crystal Droplets

Brain Health I

JUDGE(S): Dr. Olena Piontkivska; Dr. Angela Ridgel

- 168. Sabina Bhatta, Jeffery A. Blair, Gemma Casadesus**
Biomedical Sciences
Knockdown of the luteinizing hormone receptor using CRISPR/CAS9 system
- 169. Jeffrey Blair, Sabina Bhatta, Gemma Casadesus**
Biomedical Sciences
Human chorionic gonadotropin increases ERK phosphorylation, neurite outgrowth and rescues ovariectomy associated deficits in spatial memory
- 170. Bryan Dowdell, Bryan Dowdell, Sara Harper, Ph.D, Angela Ridgel, Ph.D**
Health Sciences
Effects of acute dynamic cycling on emotional recognition in individuals with Parkinson's disease.
- 171. Eric Dyne, Lynn Bekris**
Biomedical Sciences
Teasing Apart the Underlying Mechanisms Behind Elevated TREM2 Levels in Alzheimer's Disease.
- 172. John Grizzanti, Sara' Patrick, Gemma Casadesus**
Biomedical Sciences
Increased STAT3 expression in SH-SY5Y transfected with the tau40 mutation

Brain Health II

JUDGE(S): Dr. Gemma Casadesus Smith

- 173. Leah Kershner, Dr. Kristy Welshhans**
Biological Sciences
RACK1 is necessary for the formation of point contacts and regulates axon growth

- 174. Prakash Kharel, Anshuman Chattopadhyay, Venkat Gadepalli, Jennifer McDonough, Soumitra Basu**
Chemistry & Biochemistry
An investigation of the transcriptome-wide damage in the human neuronal cells during oxidative stress
- 174. Adam Kulp, Hannah Kennedy, John Johnson**
Biomedical Sciences
The DREADDs technique utilized to control the hypothalamus-pituitary-adrenal axis of rodents.
- 175. Amanda Penko, Jacob E. Barkley**
Health Sciences
Physical activity behavior is not influenced by balance confidence in individuals with Parkinson's disease.

Brain Health III

JUDGE(S): Dr. Sara Newman

- 176. Lolagul Raimbekova**
Teaching, Learning, & Curriculum
Bringing bilingualism into U.S. mainstream schools. The benefits of learning a second language in early years.
- 177. John Shelestak**
Biomedical Sciences
Changes in the Blood-Brain Barrier under Toxic Demyelination
- 178. Courtney Stewart, Wilson Chung**
Biomedical Sciences
Cuprizone Induced GFAP+ Astrocyte Activation is FGF8 Signaling Dependent
- 179. Mahtab Tehrani, Sean Veney**
Biological Sciences
The specific G-protein coupled estrogen receptor 1 antagonist, G15, reverses select sexually dimorphic features within the Zebra Finch song system

Brain Health IV

JUDGE(S): Dr. Jennifer Roche

- 180. Alyx Weaver, Dr. Ernest Freeman, Dr. Heather Caldwell**
Biomedical Sciences

- Tumor Necrosis Factor-alpha drives changes in Ceramide Ratios in Oligodendrocytes.*
- 181. Shannah Witchey, Dr. Eric Mintz**
Biological Sciences
Oxytocin Receptor Expression in Endocannabinoid 1 Receptor Knockout Mice
- 182. Alexandra Yaw, J. David Glass**
Biomedical Sciences
Transgenerational epigenetic effect of cocaine on circadian behavior and cocaine reward
- 183. JP Zalar**
Lifespan Development & Educational Sciences
How coaching parents to use EMT strategies effects child engagement

President's Award Nominees

These nominees were selected because of their excellent abstracts, and they will be judged by a delegation of faculty from the Office of the President.

- *15 Tejas Dnyaneshwar Dudhade**
Applied Engineering, Sustainability, & Technology
Thermal management in solid oxide fuel cell system
- *19 Amber Huston, Joseph Ortiz**
Geology
Holocene Aquatic Ecosystem Variability from Birch Lake and Lost Lake, Alaska, Using Visible Reflectance Spectroscopy
- *31. Brittany Followay, Jeremiah Vaughan, Hayden Gerhart, Ellen Glickman**
Health Sciences
The effects of added inspiratory resistance during exercise in hypoxia on lactate and hemoglobin
- *33. Rachel Hamilla**
Anthropology
The impact of diet manipulation on the health and behavior of captive Bornean orangutans

- *37. Maya Shamailov**
Nursing
Pain management for Medical-Surgical patients can be Painless
- *55. Emily Brahler, Dr. Robert Mensforth**
Anthropology
Hypovitaminosis D and associated mortality within the Hamann-Todd Human (HTH) Osteological Collection
- *95. Ke-Jui Yen**
Lifespan Development & Educational Sciences
The Effectiveness of Responsive Teaching on Parent's Engagement with Children During Play

Excellent Presentations from the Undergraduate Research Symposium

These award-winning undergraduate presentations can be found in rooms 320 and 321 on the third floor during Oral Session III 2:10-3:25 pm.

Padraigin O'Flynn

Senior, Economics

Property Tax Salience An Analysis of Voting Patterns on Ohio School Levies. Padraigin will need a room with a projector – we can provide just let me know what room. She was an oral presentation but will have a slide that she used for the Three Minute SURE presentations earlier in the fall.

Kathleen Moorman

Senior, Political Science

“Draw A President”: An Analysis of Children's Images of the Presidency and How They Affect Women in Politics

Ashley Buersmeyer (Senior, Dance); **Brittany Kloes**, (Senior, Chemistry) **Madison DeLong** (Senior, Dance) **Abigail Schneider** (Senior Dance)
East Meets West: A Tribute to King Bhumibol Aduyadej

Devanshi Mehta

Senior, Biological Sciences.

Intermittent Fasting Induces Weight Loss Preferentially in Obesity-Prone Rats. Tentative had to check with the grad student who was co-author.

Katherine Greskovich (Sophomore, Biochemistry) and **Vincent Serapiglia** (Junior, Integrated Life Sciences.)
Investigation of Novel Application of Gallium Cysteinate Nanoparticles in Antibiotic-Resistant Bacterial Therapies

Abigail Dummermuth

Senior, Interior Design (Tentative)
How the Route Angularity Effect Influences Customer Behavior

Rachel A. Sutter

Junior, Psychological Sciences
Measures Matter: Reading Comprehension May Not Be the Best Measure of Reading Ability

ORAL SESSION II 11:40-12:55 (INTERDISCIPLINARY)

Healthy Communities V

Room 318

JUDGE(S): Dr. Joel W. Hughes; Dr. Greg E. Blundell

11:40 Samir Abdelmagid, Gregory R. Sondag, Fouad M. Moussa, Fayeze F. Safadi

Biomedical Sciences
Mutation in Osteoactivin Promotes Receptor Activator of NFkB Ligand (RANKL)-mediated Osteoclast Differentiation and Survival but Inhibits Osteoclast Function

11:55 Amal Alhadabi, Khalid Alhumaidi

Foundations, Leadership, & Administration
The relationship between self-awareness and five factors of the wellness evaluation of a lifestyle among Omani society

12:10 Nawal Alissa
Health Sciences
BMI and stress levels among domestic and international university students in the U.S.

12:25 Ezinne Anaba, Madhav Bhatta, Lorriane Odhiambo
Public Health
Understanding the healthcare providers' communication regarding HPV vaccine in college students aged 18- 26 years.

Healthy Communities VI

Room 308

JUDGE(S): Dr. Elizabeth E. Graham; Dr. Ratchneewan Ross

11:40 Soon Young Ha, Patricia Vermeersch
Nursing
Data from the Centers for Medicare and Medicaid: What and How

11:55 Diana Kingsbury
Public Health
The role of social networks in providing social support to resettled female refugees during their pregnancy in the United States

12:10 Sanguk Lee, Dr. Nichole Egbert
Communication
The effects of culturally designed health messages on individuals from different cultures.

12:25 Kris Murniadi, Dr. Nichole Egbert
Communication
Curbing pornography consumption using fear appeal messages

Healthy Communities VII

Room 306A

JUDGE(S): Dr. Jan D. Yoder; Dr. Gregory C. Gibson

11:40 Lindsey Myers
Communication
Reporting Tuskegee: A comparison of African-American and mainstream newspaper coverage of the Tuskegee Experiment in 1972

11:55 Ginny Natale
Sociology
Negotiated: How chronic illness impacts life course trajectories and transitions

12:10 Lorriane Odhiambo, Melissa D. Zullo, PhD, MPH, MA, Mary A. Dolansky, RN, PhD, Rich Josephson, MD from University Hospitals Medical Center
Public Health
Are programs located where there is need?

Healthy Communities VIII

Room 306B

JUDGE(S): Dr. Susan Roxburgh; Dr. Laurie M. Wagner

11:40 Hilla Sang
Public Health
Outcomes and challenges in creating a national health system: Lessons from Mexico's Seguro Popular

11:55 Carissa Smock, PhD, MPH, Lynn Falletta, PhD, Sonia Alemagno, PhD
Public Health
Health care provider characteristics, knowledge, perceived barriers, practices, and needs related to place-based exercise referrals and prescriptions: A questionnaire survey

12:10 Logan Stigall, Elizabeth Baker, Haylee DeLuca, Manfred van Dulmen
Psychological Sciences
He said, she said: Self-report and observational assessments of alcohol abuse and emotional/verbal aggression

Global Understanding III

Room 319

JUDGE(S): Joe Clark; Dr. Yuko Kurahashi

11:40 Kristin Coen-Mishlan

Music

Mentors, Role Models, and Goals: Experiences of Female Band Directors

11:55 Rachel Davis

Art

Alluding to the Preciousness and Fragility of Life through Objects

12:10 Alex Fleet

History

Citizens and Subjects: Race, Citizenship, and Immigration in Modern French History

12:25 Kathryn Hannum

Geography

Grappling with bi-lingual harmony: Language law application in Galicia, Spain.

Global Understanding IV

Room 309

JUDGE(S): Dr. Alexa L. Sandmann;

11:40 William Kelvin, Tianhong Zhang

Communication

What you see is not what you get: Advertising culture, performing propaganda.

11:55 Fitim Krasniqi, Steven Turner

Teaching, Learning and Curriculum

Re-conceptualizing teacher education in countries in transition: The case of Kosovo

12:10 Kristine Newton

Foundations, Leadership, & Administration

Rising Valor: A Research Study of Chinese Women Working in Factories, Educating Themselves and Redefining Women's Empowerment

12:25 Wendy Owens

English

Identity and the in-between space in Transracial, Transnational Adoptee Literature: Making space for the missing voice

Global Understanding V

Room 310C

JUDGE(S): Dr. Ching-I Chen; Dr. Ralph Lorenz

11:40 Maya Satlykgylyjova

Foundations, Leadership & Administration

Identity Transformation: The Impact of American Higher Education system to Central Asian Female Students

11:55 Nattapol Wisuttipat, Lydia Snyder, Elizabeth Recob, Yuan Ni

Music

Wai Khruu: Performance and Experience of Kent State University Thai Music Ensemble

12:10 Nisreen Yamany

English

Empathy in the movie 12 Years a Slave.

Environmental Science & Design VI

Room 313

JUDGE(S): Dr. Tom Schmidlin; Dr. Andrea Warner Stidham

11:40 Ryan Adams

Geography

Self-organizing maps and the synoptic climatology of western North Atlantic bomb cyclones

11:55 Dulcinea Avouris, Dr. Joseph Ortiz

Geology

Keeping an eye on Lake Erie: Airborne hyperspectral imaging

12:10 Sandra Bempah

Public Health

The association between socio-economic status, poor sanitation and malaria in Teshie, a suburb of Accra, Ghana

12:25 Shruti Bhairappanavar, Rui Liu, Reid Coffman
 Architecture
Ecological Green Wall Built using Dredged Material- Cement Bricks

Environmental Science & Design VII

Room 314

JUDGE(S): Dr. Richard L. Mangrum

11:40 Brigid Callaghan, Adil Sharag-Eldin, Brian Peters
 Architecture
Using three-dimensional printing to compare the thermal performance of biomimetic walls with integrated insulation

11:55 Chenjian Fu, Christopher J. Rowan
 Geology
Comparing similarity between multiple pairs of paleomagnetic apparent polar wander paths: A synthetic evaluation method

12:10 Erik Hartung, David Costello
 Biological Sciences
Aging Bioretention Cells: Do they still function for water quality improvement?

12:25 Rumman Hossain, Miao Jiang, Dr. QiHuo Wei, Dr. Laura Leff
 Biological Sciences *Characterization of bacterial colonization on microplastics in freshwater*

12:40 Huiyu Lin, Xinyue Ye
 Geography
Socioeconomic and Spatial Pattern of Local Communities with Their Responses to Wildfire Using Twitter Data

Environmental Science & Design VIII

Room 315

JUDGE(S): Dr. BoSheng Liu

11:40 Raissa Mendonca, David Costello, Christian Schlekot, G. Allen Burton
 Biological Sciences

Dissolved nickel partitioning behavior in five geochemically distinct sediments

11:55 Sarah Morrison, David M. Singer, Elizabeth Herndon
 Geology
Metal(loid) release from coal mine spoil during simulated weathering

12:10 Forrest Paige
 Architecture
A Phenomenological Study of the Alternative Appropriation of Urban Space by Parkour Practitioners

12:25 Laura Sugano, Anne J. Jefferson, Lauren Kinsman-Costello, Pedro Avellaneda
 Geology
A Green Roof is a Net Source of Phosphorus in Parma, Ohio

12:40 Liping Zhang, Mietek Jaroniec
 Chemistry & Biochemistry
Development of mesoporous δ - Bi_2O_3 for selective removal of iodide

Brain Health V

Room 316

JUDGE(S): Dr. J. Derek Kingsley; Dr. Justin Lathia

11:40 Rebecca Curry, Yong Lu
 Biomedical Sciences
Differential modulation of inhibition: Insights from the mouse auditory brainstem

11:55 Michael Donohue, Surya Sruthi Bhamidipalli, Vinay K. Cheruvu
 Public Health
Association Between Adverse Childhood Experiences and Depression: Is Insufficient Sleep a Mediator or Moderator?

12:10 Zahra Ghasemahmad, Anthony Zampino, Muhammad Hussein, Jeffrey Wenstrup
 Biomedical Sciences
The extended pattern of the release of neuromodulators and changes of the behavior to social vocalizations

Brain Health VI

Room 317

JUDGE(S): Dr. Jennifer Taber

- 11:40 Olivia Hogue, Darlene Floden**
Public Health
Predicting early cognitive decline in Parkinson's disease: A multi-symptom prognostic tool
- 11:55 Lisa Manderino, John Gunstad**
Psychological Sciences
Examination of the Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT) validity indices
- 12:10 Ashwin Maniyan, Colin Campbell**
Business Administration
Native Advertising: Role of congruent banner ads & brand mentions
- 12:25 Lydia Snyder**
Music
Bamboo Roots: History and Demonstration of the Shakuhachi Flute

Advanced Materials II

Room 320

JUDGE(S): Kyle Reynolds

- 11:40 Nathan Beals, Prakash Kharel, Werner Geldenhuys, Soumitra Basu**
Chemistry & Biochemistry
New Outlook on Parkinson's Treatment: A Dual Targeting Nanoparticle Complex for More Efficient Delivery of Curcumin Improves Neuroprotection
- 11:55 Arosha Dassanayake, Mietek Jaroniec**
Chemistry & Biochemistry
In-situ activated Nitrogen-doped carbon spheres for extraordinary CO₂ adsorption
- 12:10 Karla Gutierrez Cuevas, Quan Li**
Liquid Crystal Institute
Frequency-Driven Dynamic Superstructures Impregnated with Mesogen-Coated Silica Nanoparticles

- 12:25 Vinay Joshi, Kai-Han Chang, Dr. Liang-Chy Chien**
Liquid Crystal Institute
Fast Flexoelectro-optic response of Bimesogen-doped Polymer Stabilized Cholesteric Liquid Crystals in Vertical Standing Helix mode
- 12:40 Lin Li**
Chemistry & Biochemistry
Homochiral helical nanofilament phase assembled by bent-core liquid crystal molecules

Advanced Materials III

Room 321

JUDGE(S): Dr. Bjorn Lussem

- 11:40 Matthew Murachver, S. M. Saliil, A Jakli**
Liquid Crystal Institute
Even Numbered Methylene-Linked LC Dimers in Magnetic Field
- 11:55 Sasi Kiran Nallapaneni**
Digital Science
An innovative process - Testing the frequency of receiving and transmitting by the antenna (example a copper particle)
- 12:10 Shokir Pardaev, Samuel Sprunt, Antal Jakli, James Gleeson**
Physics
Layer Dynamics in Free Standing Membranes of Smectic Liquid Crystals
- 12:25 Lewis Sharpnack, D. Agra-Kooijman, D. Rodrigues-Lojo, Guatam Singh, A.D. Panov, P.J. Stevenson, Satyendra Kumar**
Physics
Signatures of the deVries Smectic Phase and Their Role in the Future of Ferroelectric Liquid Crystal Displays

Keynote Luncheon: 1:00pm – 2:00pm, Ballroom

Keynote Speaker: Justin Lathia, PhD
Lerner Research Institute, Cleveland Clinic
Cleveland Clinic Lerner College of Medicine of Case Western Reserve University
Case Comprehensive Cancer Center

Dr. Justin Lathia leads a translational cancer stem cell research laboratory and is an Associate Professor in the Department of Cellular and Molecular Medicine at the Lerner Research Institute, part of the Cleveland Clinic. Dr. Lathia is a native of central Pennsylvania and received a B.S. and M.S. from Drexel University in Philadelphia, PA in 2003. While at Drexel, he developed targeted ultrasound contrast agents which preferentially bound to newly formed vessel in breast cancer models.



After graduation from Drexel, Dr. Lathia completed his Ph.D. as part of the NIH-Cambridge Graduate Partnership Program. His work focused on the role of cell adhesion molecules during the development of the nervous system. After completing his Ph.D. in 2008 he completed post-doctoral fellowships at Duke and the Cleveland Clinic where he focused on the role of cell adhesion in regulating cancer stem cells in brain tumors. In 2012, Dr. Lathia moved to the Department of Cellular and Molecular Medicine as an independent investigator and the work in his lab focuses on how the stem cell state is regulated in advanced cancers. He currently mentors 5 undergraduate students, 1 technician, 3 graduate students, 1 medical student, 7 post-doctoral fellows, 1 medical fellow, and 1 senior scientist. His previous mentees (>10) are currently completing post-doctoral fellowship, working in industry, or enrolled in graduate or medical school program. Projects in the Lathia laboratory involve understanding how cancer stem cells interact with their surrounding microenvironment as well as one another with the goal of identifying unique pathways for therapeutic development. Work in the Lathia laboratory has resulted in a Phase 1 clinical trial aimed at targeting myeloid-derived suppressor cells that interact with cancer stem cells to suppress the immune system in glioblastoma.

Dr. Lathia has co-authored over 110 publications and work in his lab is currently supported by multiple National Institutes of Health grants and foundation grants. Dr. Lathia also contributes as a peer reviewer to over 85 journals, serves on the editorial board for Cell Reports and Neuro-Oncology, has served on multiple grant review panels for the National Institutes of Health and private foundations. He recently served as a co-editor for a cancer stem cell textbook. Dr. Lathia also serves as a co-organizer for the cancer stem cell meeting held in Cleveland in 2014 and 2016. At each meeting, the 3 day meeting drew over 300 attendees from over 25 states and 15 countries.

ORAL SESSION III 2:10-3:25 PM

Culture and Identity III

Room 317

JUDGE(S): Dr. Daniel-Raymond Nadon;
Melissa M. Spohn

2:10 Timothy "Mavis" Jennings

Theater & Dance

The Mr. Magoo in you: An analysis of the decision to follow a career path into the Arts.

2:25 Elizabeth Melick

English

Editing from the London Thornton: Middle English Charlemagne Romances and Graphic Tail-Rhyme

2:40 Jess Tanner

Theater & Dance

A character of collaboration: An exploration of the actor's process in Irena's Vow

2:55 Angelia N. Werner

Anthropology

Experimental assessment of proximal-lateral edge grinding on haft damage using replicated Clovis points

Biology and Health III

Room 318

JUDGE(S): Dr. Omar De la Cruz; Dr. Soumitra Basu

2:10 Nazar J. Hussein, Thomas Mbimba, Asaad Aladlaan, Mohammad Y Ansari

Biomedical Sciences

A Novel Regulatory Role of TRAPPC9 in L-Plastin-mediated Actin Ring Formation and Osteoclast Function

2:25 Prithviraj Nandigrami, Daniel Gavazzi, John J Portman

Physics

Thermodynamic and Kinetic Representations of Cooperative Allosteric Ligand Binding in Calmodulin

2:40 Noel-Marie Plonski, Madara Hetti Arachchilage, Edgar Koojiman, Helen Piontkivska

Biomedical Sciences

A search for phospholipases in Kinetoplastida: a phylogenetic analysis.

Environmental Research III

Room 309

JUDGE(S): Dr. Tom Schmidlin

2:10 Amber Hill

Geography

Building climate resilient communities in Southwest Alaska

2:25 Anna Solberg

Geography

International tourist perceptions of their environmental impacts in Tanzania

2:40 Theresa Wolanin, Oscar Rocha

Biological

Sciences *Impact of delayed flowering events on declining bee populations in Costa Rica*

Math and Physics II

Room 314

JUDGE(S): Dr. Jonathan I. Maletic; Dr. Murali Shanker

2:10 Pablo Jimenez-Rodriguez, Richard Aron

Mathematics

Interpolation of Analytic functions

2:25 Brandon Kroupa, Michael Strickland

Physics

Predictions for bottomonia suppression in 5.02 TeV Pb-Pb collisions

2:40 Parastoo Maleki, Hamza Balci

Physics

A case study of small molecule and DNA interactions at the single-molecule level

2:55 Sergii Myroshnychenko

Mathematics

On optical characterization of polytopes.

Educational Studies III

Room 315

JUDGE(S): Dr. Belinda S. Zimmerman; Dr. Aviad A. Israeli;

2:10 Mel Dickey

Foundations, Leadership, &
Administration
*Violence against women:
Mansplained*

2:25 Katherine Austin

English
*English Morpheme Acquisition Order
of Students Who Speak Arabic as a
First Language*

2:40 Naser Al Madi

Computer Science
*From reading to Comprehension:
Measuring learning performance by
modeling eye-movement*

2:55 Shweta Singh

Foundations, Leadership, &
Administration
*You are what you study or you study
what you are? Identity affirmation
through choice of major among
emerging adults*

Work, Business, and Politics

Room 308

JUDGE(S): Dr. I. Richmond Nettey; Dr. Donald R. Williams

2:10 Weichuan Dong, Xinyue Ye

Geography
*Who Win the Online Debate?
Exploring People Behind Social
Media*

2:25 Divya Haritha Katari

Applied Engineering, Sustainability,
& Technology
*The Impact of Potential Trade
Agreement Modifications on the
Construction and Construction
Services Industry within Canada and
the United States*

**2:40 Christina Perry, Jennifer Wiggins,
Colin Campbell**

Business Administration
*When A Successful Service
Experience Leads a Consumer to
Abandon the Firm for a Do-It-
Yourself Alternative*

2:55 Mujeeb Ur Rehman Syed Abdul

Applied Engineering, Sustainability,
& Technology
*Compared evaluation of vendor
selection by using different methods*

AWARD RECEPTION 3:30-4:30, Ballroom

Graduate Student Senate

The Graduate Student Senate (GSS) represents the concerns of the graduate student community at Kent State University. By serving as an allocation body, the Graduate Student Senate is responsible for assisting with graduate student travel and research funding. Additionally, the Graduate Student Senate organizes and provides financial support for social activities for graduate students. Each spring the Graduate Student Senate sponsors the Graduate Research Symposium, an event that displays, recognizes, and celebrates research and scholarship across all academic disciplines. The Graduate Student Senate meets four times each semester, and lunch is always provided. The Friday following each general meeting, a social event known as GradFest is held at a local establishment. All graduate students are welcome to become involved with the Graduate Student Senate.

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Acknowledgments

The following KSU faculty, staff, and students made this event happen: President Warrern, Patty Bujorian, Dr. Paul DiCorleto; Dr. Douglas Delahanty, Joelle Bettura, Jennifer Butto, Ann Gosky, Kyle Reynolds, Dr. Melody Tankersly, Dr. Christopher Was, Jewon Lyu, Laxman Panthi, Nisreen Yamany, William Willoughby, Mila Rosa Librea, Ilfa Zhulamanova, Morgan Chaney, Kathryn Hannum, Guangci Yang, Ahlam Nemati, Mohammad Najafi, Elizabeth Melick, Hanieh Haji Molana, Sonali Kudva, Niraj Kumar Shukla, Soumya Yalamanchili, Ashwin Maniyan, Mohammad Rahman, Hanieh Haji Molana, Nisreen Yamany, Layla Almutairi, Bala Raghavendra Sai Vamsi Pani Kiran Betha, Antonina Pakholkova Mohamed, MaryAnn Harris, Kristen Traynor Sasi Kiran Nallapaneniand, Taylor Michael, Robert Woodruff, Amber Sitz, Nathan Mudrak, and anyone who hung a flier, sent an email, or gave out postcards to publicize the Symposium. Of course, our judges and volunteers deserve many thanks for their invaluable service.

Abstracts by Session Type**Oral Presentations, Listed Alphabetically by First Author**Adhikari, Binaya, *et al.*

Biological Sciences

Most flowering plants have both male and female function. However, 'selfish' mitochondrial male sterility (MS) genes may prevent pollen production, turning a plant into a female. 'Restorer of fertility' (Rf) genes located in nucleus usually suppress MS action. In some plants, MS genes are naturally expressed forming a sexual dimorphism with co-occurring females and hermaphrodites. Why MS genes are naturally expressed is a puzzle. Theory suggests that presence of multiple MS types within a population causes this condition. However, empirical evidence for MS polymorphism is scarce. In fact, no MS gene has been identified in any species with natural MS expression. The goal of this research was to locate MS genes in mitochondrial genome of a wildflower *Lobelia siphilitica* and to seek for the evidence of MS polymorphism. Because MS genes are expressed in females but not in hermaphrodites, we predicted that there should be a difference in MS-associated transcripts between two sexes. By screening sex-specific transcript variation among maternal families we identified that MS genes in two families within an Ohio population were associated with mitochondrial genes *atp4* and *atp6* respectively. This supports the hypothesis that multiple MS types characterize plant populations with natural MS expression.

Adkins, Jason

Political Science

It is well established religious leaders attempt to influence their congregations via subtle and not-so-subtle political cues delivered from the pulpit. Political messages issued at the denominational level also have the potential to influence members of religious groups. Religious denominations, though, vary in what types of political cues they issue. Through a content analysis of sermons, public statements, and articles issued by leaders of denominations in denominational-owned publications, I establish that there are substantial differences in the type and content of political cues that are delivered. Specifically, I will analyze sermons, public statements, and periodicals delivered by the United States Conference of Catholic Bishops, the Southern Baptist Convention, and The Church of Jesus Christ of Latter-day Saints. These three denominations represent three of the four largest denominations in the United States and have significant differences regarding theology, organizational structure, and the autonomy of local congregations. I establish differences in the types of political cues delivered and the topic of the cues are more related to organizational differences and local autonomy rather than theological differences.

Ahmed, Emtiaz

Foundations, Leadership, & Administration

The No Child Left Behind Act of 2001 requires bringing all students from all major racial groups to the level of proficiency or above in mathematics and science by the 2013-2014 academic year. According to the TIMSS 2015 international findings, students who endorsed themselves as liking learning mathematics very much scored much higher (average 56 points) than the students who do not like learning mathematics. Liking learning mathematics is one of the

indicators of the construct—intrinsic motivation—towards mathematics, and this type of other constructs, such as confidence, attainment and utility value, were found to have significant contributions in students' academic achievements in previous studies. This dissertation proposal is considering the expectancy-value theory of achievement motivation, as well as the social equity theory for the investigation framework. Using the TIMSS 2011 U.S. eighth grade student questionnaire data on mathematics and science, and utilizing several confirmatory factor analysis and structural equation models, this study is aiming to explore the racial gaps in those constructs, as reducing these construct-level gaps might reduce the racial achievement gaps. Also, this study will be able to identify specific individual characteristics/constructs that might need further development to push forward any certain racial group that fell behind.

Al Madi, Naser

Computer Sciences,

Humans have this unique ability to learn, and expand their knowledge through the process of comprehension. Computational models of cognitive skills such as comprehension allow us to form an understanding of how humans perform these skills, simultaneously they allow us to build systems that are able to perform these skills in a way that mimics humans. In this research we aim at investigating the interaction between eye-movement during reading and comprehension. In other words if we can measure comprehension performance from eye-movement. Existing research in psychology has established that cognitive and linguistic processing influence eye movement during reading. At the same time reading models so far have focused on the speech production and eye-movement aspects of reading. Little attention has been given to comprehension although it is the goal and outcome of reading.

Al Madi, Naser

Computer Sciences,

We present a comprehension-based framework for measuring semantic-similarity between unstructured documents of text. Vector-based similarity measures fail to capture deep semantic relations between terms. Using computational comprehension model we can process textual content in a way that resembles human readers, paying attention to context, location, and acquisition time of semantic concepts. The model extracts key semantic structures that are representative of the document. Our framework provided correct results in cases where vector-based methods fail. These results highlight the importance of using computational cognitive methods, such as comprehension models, in semantic analysis and text mining.

Austin, Katherine

English,

This study was designed to emulate and expand upon previous morpheme acquisition order (MAO) studies which analyzed learner corpora from seven different first language (L1) groups and computed Target Language Use (TLU) scores for each investigated morpheme. These studies found that the L1 of the learners affected the learners' MAO. Despite the significant number of L1 Arabic English learners, Arabic was not among the languages evaluated in these previous studies. This study analyzed a learner corpus of English comprised of Emirati/UAE L1 Arabic student essays to determine the TLU scores of six commonly studied morphemes

(Progressive "-ing," Simple Past "-ed," Possessive "-s," Third Person Singular "-s," Plural "-s," and Articles "a, an, the"). The discovered TLU scores are used to propose the general MAO for L1 Arabic English learners. Possible explanations for the proposed MAO are explored by comparing the morphological, syntactical, or lexical methods employed by the Arabic language to convey the information communicated by the target English morphemes. Finally, implications for teaching L1 Arabic student populations are discussed.

Balaratnam, Sumirtha

Chemistry & Biochemistry,

The piwi interacting RNAs (piRNAs) are small non-coding RNAs mostly 24-32 nucleotides in length. Among all types of non-coding RNAs, piRNAs are by far the most numerous, existing only in animals. The piRNAs are defined by their specific binding to the PIWI proteins, a requirement for their function. The piRNAs do not have conserved secondary structure, because piRNA sequences are not known to contain any conserved motifs. Using bioinformatics analysis, we discovered the presence of putative G-quadruplex (GQ)-forming sequences in human piRNAs that is higher in number compared to the piRNA pools of most other organisms that were analyzed (exclude chicken). We investigated the propensity to form the G-quadruplex structure in one (piRNA 48164) of the potential GQ forming sequence in human. Circular dichroism and RNase T1 footprinting data confirmed the formation of stable G-quadruplex structure by piRNA 48164. GQ formation led to inhibiting the piRNA-target complementary base pairing which consequently affects target gene silencing. Further studies are underway to analyze the effect of PIWI protein binding on GQ forming piRNAs. These studies begin to unravel the role of GQ in piRNA function.

Balci, Sebiha, *et al.*

Lifespan Development & Educational Sciences

One challenge of online education is to motivate students without direct face-to-face interaction. In this study, we sought to investigate whether badges and leaderboards, gamification tools, are effective in increasing student performance and motivation in an online learning environment. Digital badges are defined as credentials given for achievements and leaderboards are the digital ranking of learners based on their performance on a task. The investigation was conducted in an 100% online undergraduate physics course taught via Blackboard Learn System. Students who agreed to participate (N=102) were randomly assigned into one of four groups: a) no badges/no leaderboard group (control group), b) badges only group, c) leaderboard only group and d) leaderboard with badges group. Students in the badges groups were awarded badges based on students' quiz performance through Blackboard Learn system. As for the leaderboard groups, students were ranked based on their quiz scores. Subject information questionnaire and a self-report questionnaire about students' attitudes and motivation toward gamification tools were collected. Preliminary data analysis showed no statistically significant difference between groups, $F(3, 98) = .640, p = .591$. However, students expressed positive attitudes toward gamification tools. The data collection phase is still underway.

Baranski, Michael, & Was, Christopher A.

Psychological Sciences

Working memory capacity, the amount of information someone can temporarily maintain despite ongoing processing, varies among individuals and consistently correlates with performance on reading comprehension, reasoning, problem solving, and complex learning tasks. Extant research is mixed as to whether computerized training can reliably increase working memory capacity (WMC), and suggests future work should include an active, adaptive comparison group and multiple, validated WMC measures different from those trained on to demonstrate improvement. Separately, mindfulness meditation has been demonstrated to improve performance on individual, validated measures of WMC. The present study compares groups randomly assigned to 2 weeks of mindfulness meditation or active, adaptive computerized memory and attention training. WMC was operationalized via the operation, symmetry, and reading span tasks as pretest and posttest measures. The present research is ongoing, and made possible by the Kent State GSS Research Award.

Bergquist, Leah, *et al.*

Liquid Crystal Institute

We report on the synthesis and characterization of bent-core liquid crystal (LC) compounds and the preparation of mixtures that provide an optically isotropic antiferroelectric (OI-AFLC) liquid crystal display mode over a very wide temperature interval and well below room temperature. From the collection of compounds synthesized during this study, we recognized that several ternary mixtures displayed a modulated SmCaPA phase down to below -40°C and up to about 100°C on both heating and cooling, as well as optical tilt angles in the transformed state of approximately 45° (optically isotropic state). The materials were fully characterized and their liquid crystal as well as electro-optical properties analyzed by polarized optical microscopy, differential scanning calorimetry, synchrotron X-ray diffraction, dielectric spectroscopy, and electro-optical tests.

Bhamidipalli, Surya sruthi, *et al.*

Public Health

Twin anemia polycythemia sequence (TAPS) is one of the major and less studied complications of monochorionic-diamniotic (Mo-Di) pregnancies. TAPS is a rare condition which occurs due to unequal blood counts between the twins in the mother's womb. This results in recipient twin and in donor twin. Untreated TAPS can be fatal to either one or both the twins. The objective of the current study is to describe the findings of a study administered to perinatologists regarding their familiarity with TAPS and its screening and diagnostic methods. An online survey was administered via email to perinatologists which takes no more than 5 minutes for completion. To increase the response rate, the physicians were incentivized a \$5 worth Amazon gift card upon completion of the survey. Of the physicians receiving the email invitation, 93 of them responded. Questions were asked about their familiarity with TAPS, its screening and diagnostic techniques. Although above 85% of physicians reported familiarity with TAPS, one third of them said that they do not perform TAPS monitoring at a regular basis in Mo-Di pregnancies. Also, one third of them were found to be conducting diagnostic tests at an inappropriate frequency and at inappropriate gestational time. Conclusion: Our findings have implications for physicians and

also researchers about the need for education among perinatologists regarding TAPS to increase familiarity about screening and diagnostic methods.

Bhattacharjee, Rahul, *et al.*

Biological Sciences

The signaling enzyme glycogen synthase kinase 3 exists as two isoforms - GSK3A and GSK3B. It was shown before that both isoforms of GSK3 are present in sperm and testis. Increase or decrease in sperm motility *in vitro* resulted in changes in GSK3 phosphorylation. GSK3 activates a mammal specific protein phosphatase isoform protein phosphatase PP1g2, which is known to be a key enzyme essential for sperm function. Messenger RNAs for both GSK3 isoforms are highly expressed in testis. Their levels increase coinciding with the onset of spermatogenesis reaching a maximum in adult testis. We examined the role of Gsk3a in male fertility using a targeted gene knockout approach. Global knockout of Gsk3a results in male infertility, while females are normal. The purpose of this study was to determine whether GSK3A is required only in testis and whether this requirement is isoform specific. Cre-Lox strategy is used to eliminate each of the GSK3 isoforms in developing spermatocytes and spermatids. Selective loss of Gsk3a in testis alone also resulted in male infertility as in global Gsk3a null mice. The GSK3B isoform was present and unaltered in testis and sperm of Gsk3a (-/-) mice. In contrast mice lacking Gsk3b in testis were normal and fertile. Mice lacking one allele each of Gsk3a and Gsk3b were also normal fertile. Sperm motility in Gsk3a (-/-) mice is compromised: forward motility of mutant sperm is altered, characterized by markedly attenuated amplitude of flagellar beat. Capacitation associated changes in tyrosine phosphorylation of proteins, thought to be downstream effects of protein kinase A (PKA), are absent or significantly lower in Gsk3a (-/-) sperm. Moreover the glycolytic enzyme, hexokinase, which is constitutively tyrosine phosphorylated in WT type sperm, is not phosphorylated in Gsk3a (-/-) sperm. Interestingly Hexokinase protein level was unaltered in Gsk3a (-/-) sperm, but the catalytic activity of Hexokinase was significantly low. Sperm ATP levels were significantly lower in Gsk3a (-/-) mice compared to wild type animals in presence of glucose, lactate and pyruvate as energy substrate. Surprisingly cAMP levels were found to be almost 50% lower in Gsk3a (-/-) sperm compared to wild type sperm. Our results clearly show that both GSK3A is essential for normal sperm function and male fertility, GSK3A, which has a highly conserved N-terminus in mammals, has an essential isoform-specific role in testis and sperm.

Bray, Jim

Theater & Dance

Using the techniques of acting and movement master teachers Sanford Meisner, Rudolph Laban and Michael Chekhov, I will investigate how to build a three-dimensional character applicable to Larry Kramer's Tony Award winning play "The Normal Heart". Incorporating historical and medical circumstantial and psychological research, I will attempt to shed light on how these implications influence characters living in the dawn of the birth of the AIDS epidemic.

Brotman, Mark

Public Health

Long term intake of naturally occurring Strontium is associated with childhood rickets and other bone-related health issues. Natural Strontium is present in the groundwaters of central Ohio. This contaminant exists in water as a divalent cation, suggesting an effective treatment might be to use a cation exchange water softener while water enters the home. For the field survey, households were selected for their a) likelihood of having influent Strontium and b) use of a water softener. The results show that a household water softener, configured normally for hardness reduction, can reduce influent Strontium from as high as 28.8 mg/L to below the US EPA's Health Reference Level of 1.5 mg/L. Softener beds with apparent ages of up to 20 years were effective at reducing Strontium. Follow up work under controlled laboratory conditions confirmed Strontium can be adequately reduced by a household water softener, and that the softener can be regenerated effectively. Further work is required to ascertain the limitations of household water softening for the reduction of Strontium.

Brown, Maya

Music

This study follows the tradition of blackface minstrelsy from the United States to the British Isles through the examination of tours conducted by 19th century American minstrel troupes. Blackface minstrelsy manifested in the United States in the early 1800's and by the end of the century evolved into a global phenomenon. Such shows were created by Irish and Scottish male immigrants who painted one's own skin black with burnt cork makeup and performed variety acts of song, dance, and comedic jokes that projected distorted African American stereotypes. As blackface minstrelsy was the most popular form of entertainment in 19th century America, this study compares American reception to how British audiences accepted the musical tradition. Additionally, a deeper look is taken into how American minstrelsy influenced the manifestation of British blackface minstrel performance.

Carruthers, Jason

History

This paper will discuss the memory of the Civil War, as seen through the lens of public discourse surrounding the Confederate Cemetery at Camp Chase in Columbus, Ohio. This former Union P.O.W. camp, and the monument erected in 1902 to honor the Confederate dead who were buried there, is unique because of its location on northern soil. This monument dedication came at a period in history when the memory of the war was in constant flux and there was still a question of how – or if – former bitter enemies would reconcile their bloody past and achieve true national reconciliation. It engages with modern scholarship surrounding reconciliation, reunion and memory, entering an ongoing conversation about who supported or opposed national harmony and on what terms historical memory was forged. To that end, it draws primarily on accounts of the 1902 monument dedication coverage by newspapers, magazines and journals – both local to Columbus and from around the country. It will analyze the language used by northerners and southerners, veterans and civilians alike, as well as the metaphorical meaning conveyed by the monument itself, to consider the public memory of the war.

Chenowith, Natasha H.

Teaching, Learning, & Curriculum Studies

This research examines how middle school ESL teachers teach writing to students whose first language is not English. This multiple case study compares two ESL teachers in two districts in Ohio. Two research questions guided this research: (a) How do middle school ESL teachers teach writing to English language learners? (b) How do ESL teachers explain their pedagogical decisions for second language writing instruction? Data sources for this study included classroom observations, field notes, six semi-structured interviews, a qualitative survey, and collection of lesson plans and classroom materials. There were three major findings that emerged from this research: a lack of instructional time devoted to teaching writing, the influence of standardized assessments on writing instruction, and a lack of teacher preparation for writing instruction. These are significant problems given the importance of writing for both academic and vocational success.

DeFranco, Rachel, *et al.*

Psychological Sciences

Do jurors believe all testimony provided by a credible witness? Even a credible witness is likely to be confident about well-remembered aspects of a witnessed event, but still express uncertainty about those aspects that are remembered poorly. A series of studies conducted in our lab has shown that the answer depends on the timing of the judgment. At short retention intervals, mock jurors' belief in witness testimony was well calibrated with the amount of certainty or uncertainty the witness had expressed in that piece of testimony, but after a one-week delay, mock jurors accepted as valid all testimony provided by the witness, regardless of the confidence with which it had earlier been provided. The present study tests the hypothesis that these findings reflect a selective deficit in memory for uncertainty such that, relative to certainty, memory for the uncertainty with which testimony was expressed may be disproportionately susceptible to forgetting over time.

Dehghan Manshadi, Fatemeh

Lifespan Development & Educational Sciences

Mental health counselors at universities play an important role in helping international students deal with the challenges they face resulting from their transition from their home country to the United States. Even though international students face many problems in the United States and given that emotional adjustment plays an important role in their academic success, university mental health counseling centers have consistently reported that only a small percentage of international students have used mental health counseling services. Higher education international students in America have used university counseling center less than the other minorities. In addition, according to a study result, just 62% of the international students returned after their intake session to access counseling services. Therefore, mental health counselors at university counseling centers look for the ways that they can encourage international students to use their services. In addition, international students' perceptions of mental health counseling is an internal barrier that cause some of them to not use mental health counseling services. Additionally, although, some international students have trouble in variety of areas of their life while in America, they usually underutilize mental health services. Many

international students' perceptions of mental health are often in conflict with those held by Americans.

Dickey, Mel

Foundations, Leadership, & Administration

One in five college-aged women will experience sexual violence at some point during their college career and in nearly all of these cases, the aggressor is a male that the woman knows. Recognizing the lack of programming for men in sexual violence prevention, this research utilizes theories of planned behavior, diffusion of innovation, bystander intervention, and social norms to create and implement effective sexual violence prevention programming for college men. This research also intends to educate the campus community on ways to effectively respond to this issue.

Dong, Weichuan, *et al.*

Geography

Social media have generated large volumes of spatial footprints, which are potentially a valuable source of knowledge about the physical environment and social phenomena. Meanwhile, social media have become a major platform for people discussing public policies. In Twitter, popular tweets can be retweeted thousands of times in a short amount of time, helping distribute specific opinions. Using georeferenced tweets, this research explores geographic factors and socioeconomic characteristics of people who act as supporters of Twitter celebrities with opposite opinions in the debate of California Vaccination Bill SB277. Correlation between dependent and independent variables in ordinary least square regression indicate that socioeconomic characteristics, including education attainment, median family income, and health insurance coverage, are related to the decision of people supporting specific popular opinions in online social media debate. This study would be informative to policy makers who intend to understand where and whom different voices come from, and to sociologists who study the behaviors of social media users and their connections to real world people.

Eshghi, Nasim, *et al.*

Mathematics

We are concerned with methods for reasonable estimates of matrix functions $f(A)v$, where A is a large symmetric matrix, f is a function, and v is a unit vector. It is well known that $f(A)v$ can be approximated by first applying a few steps of the Lanczos decomposition to A with initial vector v , and then evaluating $f(T)$, where T is the small symmetric tridiagonal matrices produced by the Lanczos process.

Gauer, Ashley

Modern and Classical Language Studies

Japan's relationship with China, Korea and the United States is well-known to most people, but many people do not think about Russia when they think of Asia. Russia is a major player in the economies of the many nations there, as well as in the economies of its European neighbors. Japan's relationship with Russia is varied and long, and this research investigates how this relationship is portrayed in the Japanese educational system. Looking at public response,

Ministry of Education guidelines and through translation of selected textbooks, we can understand how the relationship fares currently and how it may evolve in the future.

Goswami, Suranjana, *et al.*

Biological Sciences

For normal fertilization of the egg, a number of changes must occur in sperm function to enable the sperm to reach the egg and permit fertilization. These changes are dependent on modification of sperm proteins by phosphorylation in which kinases transfer a phosphate from ATP to a substrate protein. Phosphorylation by Protein Kinase A (PKA) is particularly important. PKA is activated by cyclicAMP produced by the enzyme adenylyl cyclase. To evaluate a complex changes in protein phosphorylation that appear to modify sperm motility and fertilizing ability, we are using a novel chemical-genetic approach to identify proteins which are phosphorylated by PKA. In this approach the structurally conserved ATP-binding pocket in PKA is genetically modified (analog-sensitive-mutant-PKA). This mutant PKA, in addition to binding and utilizing ATP, can also utilize specific ATP analogs designed to determine which substrates are phosphorylated. The N6-(benzyl)-ATP- γ S analog tags proteins phosphorylated by PKA. The labeled proteins can be recognized by specific antibodies. In this approach following labeling of substrates with N6-(benzyl)-ATP- γ S, the thio-phosphate group on the polypeptides is alkylated by para-nitrobenzylmesylate (PNBM) to create an epitope that can be detected by specific antibodies to the thio-phosphate ester. Identification of the protein substrates of sperm PKA will be a major advance in our understanding of the regulation of sperm function and male fertility.

Harrison, Anthony, *et al.*

Mathematics

The lattice size of a lattice polygon P , denoted $ls(P)$, is the smallest number n such that the image of P under an affine unimodular transformation T is contained within the n -dilate of the standard 2-simplex. An optimal transformation T , one such that TP fits in the smallest possible dilate, can be used to find a “better” parametrization of a toric surface. Results from Castryck, Cools, and Shicho show that there is a recursive algorithm to find such a T by relating $ls(P)$ to the lattice size of the convex hull of the interior lattice points of P . We have developed an algorithm that needs only the vertices of P and so avoids the computational expense of determining the interior lattice points. We show that if a fixed, finite set of transformations does not yield a “smaller” image of P , then P can be translated to fit in the smallest possible dilate of the simplex.

Hemphill, Jennifer

Theater & Dance

The purpose of this paper is to discuss how the effect of the AIDS pandemic on young adults in New York City during the 1980s and 1990s influenced the state of the Broadway musical in those decades. I will examine a phenomenal new style of singing and the subject matter of the musical RENT (1996). Jonathan Larson, who wrote the book, presented his “one song” as a response to the epidemic and the affected people particularly in the show business in NYC. His “battle cry” was manifested in organic and visceral vocalization. I will also refer to such musicals

as AMERICAN IDIOT, SPRING AWAKENING and HAMILTON in order to demonstrate the continuing “legacy” of RENT.

Hill, Amber

Geography

Changes in climate are already affecting the Southwestern part of Alaska faster than other parts of the United States. Increases in temperature and precipitation in the Bristol Bay region of Alaska have already impacted these resource dependent communities that rely on the land for subsistence activities and culture. Understanding the observed environmental and climatic changes in this region will be the first step in building climate resilient communities.

Communication between community members, scientists, and policy makers must be established in order to create partnerships and share resilience strategies throughout the region. Alaska’s environment is changing faster than other states, which makes it a leader in resilience strategies that can be used to build climate resilience communities in different parts of Alaska as well as other communities around the world facing similar risks around the world.

Hussein, Nazar J, *et al.*

Biomedical Sciences

Vesicular trafficking is critical for osteoclast function. Recent studies dissected the role of the endolysosomal system and its associated factors in osteoclast-mediated bone resorption. These factors include proteins that coat the vesicle, GTPases of the Rab family, fusogenic SNARE proteins and tethering factors that coordinate or participate in membrane tethering and trafficking. Trafficking Protein Particle Complex 9 (TRAPPC9) is a major subunit of the TRAPP Complex. TRAPPC9 has been reported to bind IKK2 and NIK where it plays a role in the canonical and non-canonical NFκB signaling, respectively and plays a role in osteoclast differentiation and function. On the other hand, L-Plastin is an actin-bundling protein critical for actin regulation in eukaryotes. L-Plastin was initially found in transformed human fibroblast. L-Plastin is highly expressed in hematopoietic lineage. It is also called lymphocyte cytosolic protein 1 (LCP1). L-Plastin binds F-actin through Actin Binding Domains (ABDs) that each consists of two calponin-homology domains. It has been reported that L-Plastin is required for T- and B-cell motility and activation. L-Plastin $-/-$ mice are deficient in marginal zone B cells. During bone resorption, complete morphologic changes of actin-based take place in osteoclast. Actin aggregates are generated within osteoclast following attachment to bone matrix, which provide traction for membrane protrusions. Maturation of actin aggregates result in actin ring formation. It has been reported that during the early process of bone resorption, L-Plastin is localized with the actin aggregates. Further, recent studies reported that L-Plastin null osteoclasts demonstrated normal osteoclast differentiation phenotype and peripheral podosomes aggregation. However, significant disruption in actin ring formation and the adhesive contact region (sealing zone) were observed. Although, the role of L-Plastin in osteoclast-mediated bone resorption has not been reported in details. Here, we investigated the potential regulatory role of TRAPPC9 and its impact on L-Plastin-mediated osteoclast motility and function.

Jaber, Fatima, *et al.*

Biomedical Sciences

Autophagy plays an important role in bone homeostasis where it regulates both osteoblast and osteoclast differentiation and function. Glycoprotein nmb (Gpnmb), also called osteoactivin (Gpnmb/Osteoactivin) is a novel protein discovered in our lab that positively regulates osteoblast and negatively regulates osteoclast differentiation and function. Recent evidence has shown that Gpnmb/Osteoactivin binds to microtubule-associated protein light chain 3 (LC-3), a marker indicative of autophagic activity and stimulates the recruitment and formation of autophagosomes. In this study, we investigated whether Gpnmb/Osteoactivin regulates osteoblast differentiation and function by mediating the autophagy pathway. First, we examined the expression of Gpnmb/Osteoactivin in osteoblast following induction of autophagy. MC3T3-E1 and primary osteoblasts were treated with Trehalose (TH), an mTOR-independent autophagy enhancer. TH treatment induces mRNA and protein expression of autophagy markers including ATG5, ATG7, LC3 and Beclin-1 as well as Gpnmb/Osteoactivin in a dose- and time-dependent manner. Next, we assessed the effect of TH treatment on autophagosome formation using transmission electron microscopy (TEM) analysis and found that TH treatment causes induction of autophagosome formation associated with the formation of double membrane autophagic vesicles compared to untreated control cells. To determine whether Gpnmb/Osteoactivin binds LC3II in osteoblasts, MC3T3-E1 and primary osteoblast cells were transfected with either GFP-LC3II or control empty vector (GFP-EV) followed by TH treatment. Immunofluorescent analysis revealed that osteoblasts treated with TH display a punctate distribution of LC3 that co-localized with Gpnmb/Osteoactivin compared to untreated cells, suggesting a role of Gpnmb/Osteoactivin in autophagy in osteoblasts. Next, we examined the expression of autophagy markers in bones and osteoblast derived from Gpnmb/Osteoactivin mutant (D2J) mice and found that ATG5, ATG7, LC3 expression were downregulated in mutant compared to WT mice. These markers were correlated with a significant reduction of markers of osteoblast differentiation and matrix mineralization. Next, we examined the ability of osteoblast-derived from Gpnmb/Osteoactivin mutant mice to induce autophagy in response to TH treatment. Gpnmb/Osteoactivin mutant osteoblasts showed significant reduction in the expression of autophagy markers associated with LC3, ATG5, ATG7 and Beclin-1 in response to TH treatment when compared to WT TH-treated osteoblasts. Furthermore, ultrastructure analysis showed defective autophagosome formation in Gpnmb/Osteoactivin mutant compared to WT osteoblasts, while overexpression of Gpnmb/Osteoactivin in mutant osteoblasts rescued autophagy pathway and autophagosome formation. These data suggest that Gpnmb/Osteoactivin regulates osteoblast differentiation and function, at least in part, through the autophagy pathway. This study is the first to report a role of Gpnmb/Osteoactivin in autophagy in bone.

Jennings, Timothy "Mavis"

Theater & Dance

Finding the Mr. Magoo in you. In my presentation, I will discuss a young artist's decision to follow their dream for a career in the arts and discuss matters to think about when making such a decision. From my life's observation, I have found several different paths taken into a career in the arts and I have had the opportunity to see similar choices made by various individuals which lead them to their goals. What if you are told, by your parents or advisors, to find a stable

job and income although you arrive at the realization that in you are a dancer, an actor, a singer, a musician, a visual artist? I will support my perspective from my own experience as well as interviews I've conducted with professional artists and mentors.

Jimenez-Rodriguez, Pablo, *et al.*

Mathematics

We will extend some of the techniques used by Cwikel, Kalton and Cobos to prove interpolation results for compact operators, to homogeneous polynomials and therefore to analytic functions.

Joshi, Vinay, *et al.*

Liquid Crystal Institute

Topology-enhanced electro-optic performance of reverse-mode polymer stabilized cholesteric shutters (R-PSCT) with mixture of two reactive monomers, is experimentally demonstrated. Significantly distinct morphology of polymer network generated by two reactive monomers provides an unique combination of high optical contrast and low driving voltage along with excellent electromechanical stability that ensures longer life time of the shutters without any loss in electro-optical performance, which has been main concern in R-PSCT shutters. We demonstrate a R-PSCT with optimum composition of reactive monomer mixture for electro-mechanically sustained polymer network with 150K switching cycles for its application in optical shutters used in volumetric 3D devices.

Katari, Divya Haritha

Applied Engineering, Sustainability, & Technology

As a new presidential administration, Congress, and the associated cabinet modifications that come with this, is installed in the United States, certain existing trade agreements, specifically NAFTA, have been identified as being targeted for renegotiation and revision. The current agreements have helped to influence and form the trade and business climate within the construction industry, which includes the purchase and trade of commodities, building materials and intellectual capital and services. The purpose of this study is to attempt to establish the impact of these new or perceived agreements. This will be accomplished by first understanding the existing agreements, and the current materials, commodities and intellectual capital environment. Next. The potential modifications to the current agreements will be analyzed and studied, through multiple input sources such as public policy statements, news releases, and social media outlets. Although these sources may not be completely reliable, when analyzed together, a consensus understanding of the general ideas and directives will be established.

Krishnan, Anjali, *et al.*

Biological Sciences

Excessive nutrient loading in the form of industrial waste and fertilizer run off has led to the formation of harmful cyanobacterial blooms (CyanoHABs) in Lake Erie. These CyanoHABs

produce a number of cyanotoxins, predominantly, a class of liver toxins called microcystins (MCs). MCs share a cyclic structure that possesses integrity under a wide range of temperature and pH. In natural environments, MCs are removed through microbial activities. A bacterial MC-degrading pathway encoded by *mlr* genes has been previously identified. However, recent metagenomics study has indicated an alternative pathway for MC degradation in MC+ bacteria from Lake Erie. The aim of this study was to prove and identify this novel pathway. Of the 40 MC+ bacteria we isolated from Lake Erie, LE_24 (affiliated with *Pseudomonas aeruginosa* based on 16S rRNA genes) showed the highest rate in MC degradation and absence of *mlr* genes. The given isolate was mutated with Tn5 and a gene knockout library was created. The library was screened for non MC degrading (MC-) mutants which were cleaved using HindIII and XhoI. Of the mutants obtained and screened, 6 were MC-. These 6 mutants were treated with XhoI and HindIII and the mutated region sequenced. The future direction for this project would be identification of the degradation products using LC-MS.

Kroupa, Brandon, *et al.*

Physics

We compute the suppression of the bottomonia states $Y(1S)$, $Y(2S)$, $Y(3S)$, $\chi_b(1P)$, $\chi_b(2P)$, and $\chi_b(3P)$ states in LHC 5.023 TeV Pb-Pb collisions. For the background evolution we use 3+1d anisotropic hydrodynamics with conditions extrapolated from 2.76 TeV and self-consistently compute bottomonia decay rates including non-equilibrium corrections to the interaction potential. For our final results, we take predictions made for RAA as function of centrality, rapidity, and p_T for the $Y(1S)$ and $Y(2S)$ states including feed down effects and compare against recently announced ALICE and CMS experimental data. In order to assess the dependence on some of the model assumptions, we vary the shear viscosity to entropy density ratio, $4\pi\eta/s \in \{1,2,3\}$, and the initial momentum-space anisotropy parameter, $\xi_0 \in \{0,10,50\}$, while holding the total light hadron multiplicity fixed.

Kuian, Mykhailo, *et al.*

Mathematics

Vandermonde matrices arise frequently in computational mathematics in problems that require polynomial approximation, differentiation, or integration of functions that are known at finitely many distinct nodes, only. These matrices are defined by these nodes and a monomial basis. A difficulty with Vandermonde matrices is that they typically are quite ill-conditioned when / the nodes are real. The ill-conditioning often can be reduced significantly by using a polynomial / basis different from monomials. This was first observed by Gautschi. The matrices so obtained / are commonly referred to as Vandermonde-like matrices. We extend Gautschi's analysis for square Vandermonde-like matrices to rectangular ones, as well as to the situation when the nodes live on the unit circle in the complex plane. An application to microscopy of liquid crystal imaging with a polarizing light microscope is described.

Leitert, Arne, *et al.*

Computer Sciences

We introduce and investigate a model to describe the structure of networks called strong tree-breadth. With this model, networks can be described using multiple parameters. Existing results

analyse the case that either all parameters are flexible or that all parameters are very strict. We investigate the case that only some parameters of these networks are flexible and some are restricted. Formally, we say that a graph G has strong tree-breadth r if there is a tree-decomposition T for G such that each bag of T is equal to the complete r -neighbourhood of some vertex v in G . We show that it is NP-complete to determine if a given graph has strong tree-breadth r ; if a graph G has strong tree-breadth r , then we can find a tree-decomposition for G with tree-breadth r in polynomial time; with some additional restrictions, a tree-decomposition with strong breadth r can be found in polynomial time; some graph classes including distance-hereditary graphs have strong tree-breadth 1.

Maleki, Parastoo, *et al.*

Physics

G-quadruplex (GQ) is a physiologically significant secondary structure of DNA which is formed by guanine-rich nucleic acid sequences. In addition to their physiological functions in telomeres and regulatory sites of the genome, these structures have been used as sensors in biotechnological applications. GQs are stabilized by small molecules which have potential as anti-cancer drugs since stabilizing GQs inhibits telomerase, which is up-regulated in most cancers. However, the underlying dynamics of small molecule-GQ interactions are not known. In this study, our goal is to attain a detailed understanding of these interactions at the single molecule level. We worked with oxazole telomestatin derivatives (OTD) which are some of the most prominent of such small molecules. By fluorescently-labeling an OTD (L1Cy5-7OTD) and using single molecule Förster resonance energy transfer (smFRET), we studied GQ-OTD interactions in real-time. We showed that L1Cy5-7OTD remains bound to GQ for 100-200 seconds, with significantly longer dwell times and higher binding frequencies for more stable GQ. We also observed multiple stacking orientations for L1Cy5-7OTD on GQ and transitions between these orientations, which have important implications for design and synthesis efforts on these molecules.

Marín García, Álvaro

Modern and Classical Language Studies

Epistemological pluralism recognizes there are different valid methodologies for describing a given domain of knowledge, thus promoting integrated interdisciplinary research. Epistemological pluralism can be a valuable method to prompt open theoretical discussions, accept diversity, and integrate different perspectives in a field where continuous growth and disciplinary borrowings have introduced concepts that coexist to explain empirical findings. Following epistemological pluralism, we can articulate assumptions behind competing concepts, and explicitly discuss their validity and explanatory power in the light of existing research. While we can argue that TPR theories and models all belong to the same basic empirical epistemological tradition, not all of them concur on the same ways to gain knowledge and interpret it, which generates pluralism. This is of particular interest in cases where recent approaches to the cognitive processes of translation complement the existing traditions, presenting the opportunity of revising how compatible our interpretative tools are to better accommodate new discoveries. As a way to evaluate and combine different positions in one research agenda, epistemological pluralism could help the TPR scholar to examine which

models and theories better suit specific research purposes, allowing for the integration needed to study the cognitive processes of translation as a situated task.

Melick, Elizabeth

English

Many Middle English romances are written in tail-rhyme, a rhyme scheme that alternates between couplets and a shorter, "tail-rhyme" line. Tail-rhyme romances were sometimes copied in "graphic tail-rhyme," a complicated—and often difficult—manuscript layout in which the tail-rhyme line is written to the left of the corresponding couplet and linked with a bracket. Robert Thornton, a scribe who copied numerous romances, used graphic tail-rhyme for three of the romances in his books but not for the others, which suggests that the form had some significance. Though no modern editions of any graphic tail-rhyme romance has attempted to preserve the form, Thornton's proclivity for the graphic tail-rhyme arrangement should prompt modern editors to consider preserving the form in their editions. Furthermore, it is possible that modern readers are missing important thematic and poetic aspects of these romances when the original manuscript arrangement is neither preserved nor discussed. In this paper, I discuss my experiences as editor of the graphic tail-rhyme romance *Duke Roland and Sir Otuel of Spain*, and argue that modern editors of graphic tail-rhyme romances should address the original form and aim to visually represent graphic tail-rhyme in a way that considers modern readers' needs.

Moini Chaghervand , Shabnam

Teaching, Learning, & Curriculum

The purpose of this genealogy will be to describe the possible values and effects of picture books reading on reading comprehension. Previous studies have shown both positive and negative sides of visual images and picture books in relation to comprehension. The reason why I chose this topic is my personal experience as a second language learner having reading difficulties in both first and mostly in the second language.

Mubeen Raof, Mohammed

Digital Science

This project is based on access points of a wifi network. In this project, the access points of wifi network turn on and off depending upon the presence of the human. This is a new idea which I thought and I am working on it.

Myroshnychenko, Sergii

Mathematics

Let P and Q be two convex polytopes in Euclidean space E^d , both contained in the interior of a unit ball B^d . Assume that their shadows from sources of light at every point on the boundary of B^d are pairwise congruent. We show that $P=Q$.

Nandigrami, Prithviraj, *et al.*

Physics

Conformational dynamics are essential to a protein's ability to control regulatory functions through allosteric interactions between a binding site and a distal region of the protein.

Calmodulin (CaM) is a well-characterized allosteric protein that undergoes a conformational transition between closed and open conformations upon binding two calcium ions to each of its two domains. This induced conformational change provides an effective coupling between the binding sites essential for fine-tuned molecular control. We study the thermodynamics and kinetics of calcium binding to CaM through a coupled molecular dynamics/Monte Carlo simulation scheme. Here, the protein dynamics is simulated explicitly, while ligand binding/unbinding are treated implicitly with a ligand concentration treated within the grand canonical ensemble. Binding thermodynamics are analyzed in terms of the classic Monod-Wyman-Changeux model of allostery. Within this framework, we characterize the free energy of each ligation state and identify the contribution of microscopic cooperativity to its stability. The kinetic binding mechanism of CaM is described through quantifying the kinetic flux of pathways through this heterogeneous ligation space as a function of concentration.

Pastushenkov, Dmitrii, *et al.*

English

This study focuses on first language (L1) usage and familiarity of students in second language classroom group work. Research shows that group work promotes interaction and L1 use can be beneficial in group work. Furthermore, research found that most students allowed to use their L1 within the task employed it to assist in task completion far more than off-task discussions that most ESL teachers fear. Few studies have considered student familiarity in group work. Research shows that students accustomed to working together performed better in groups than students who were unfamiliar before grouping. However, the effects of both variables (L1 and familiarity in group work) and correlations with each other have not yet been researched. This study is based in Kent State University's ESL Center. Student familiarity with each other is measured with a questionnaire. The students are then placed into four groups (same/different L1 x familiar/unfamiliar) who complete a timed interaction problem-solving task. Students are recorded while accomplishing the task. L1 percentage and task completion time will be measured, along with task completion accuracy. Both L1 background and familiarity levels are expected to have a positive impact on task implementation, but familiarity should be the more powerful factor.

Perry, Christina, *et al.*

Business Administration

Today's business environment has changed such that do-it-yourself (DIY) alternatives are more available than ever, creating a unique challenge for service firms. We suggest that consumers who attribute a successful service experience to themselves may be more likely to leave the firm for a DIY alternative. We further investigate how service firms can mitigate this risk by involving consumers in service delivery and by manipulating the type of employee feedback given to consumers.

Phillips, Kelsey

Communication Studies

"The test of a first-rate intelligence is the ability to hold two opposed ideas in the mind at the same time and still retain the ability to function." – F. Scott Fitzgerald, *The Crack Up*, 1936.

From balancing the roles of friend and authority to exhibiting competency while encouraging critical thinking, there are many opposing ideas faced by instructors in the classroom that challenge their effectiveness. Interpersonal communication theorists call these conditions relational dialectics – when one or both parties in a relationship feel a push-pull tension between interdependent yet opposing needs. The following paper will propose a relational dialectic between instructor communication apprehension and achievement motivation. Individuals with high communication apprehension alone would not choose the teaching profession. However, because previous literature suggests instructors do experience communication apprehension and those instructors are still choosing to put themselves in a theoretically uncomfortable environment, there must be some opposing pull to communication apprehension that is strong enough to make them come to class every day. Achievement motivation, among other dominant motivators for goal attainment, affiliation, and power, could serve as its opposition. Consequences of such a relational dialectic may result in significant effects on teacher immediacy behaviors and instructional methods.

Plonski, Noel-Marie, *et al.*

Biomedical Sciences

Kinetoplastida is a family of organisms including *Trypanosoma cruzi*; causing Chaga's disease, and *Trypanosoma brucei*; responsible for African sleeping sickness. The current treatments for these diseases are toxic to the host organisms and they can only treat the acute form of the disease. The current study focuses on investigating phospholipases as potential drug targets. Phospholipases are responsible for maintaining cell membrane composition during life cycle changings and for generating second messengers in response to environmental stressors and other signals. The study attempts to find homologs for phospholipase D, A1, and A2. Phylogenetic trees were constructed with the protein sequences of the homologs found. *B. saltans* displayed the only PLD homologs thought to perform the same function as plant PLDs. These phylogenetic trees showed a novel outgroup for *T. cruzi* and other *Stercoraria* within the PLA2 sequences and a novel outgroup for PLA1 sequences containing *T. brucei* and other *Salivaria*. Protein 3D structures, conserved domains and binding sites were predicted using bioinformatic tools in an attempt to predict function of the outgroup protein sequences. Further studies are needed to determine the potential to use any of these novel PLA sequences for drug targets.

Rindal, Eric , *et al.*

Psychological Sciences

Lying, or knowingly providing false information to deceive another, has been researched extensively in the context of lie detection. However, there are very few studies investigating the effect of lying on a liar's own memory. The present study sought to determine whether lying can lead a liar to develop false memories for their own lies. That is, after lying, can a liar come to believe their own lies were true. Participants were asked to fabricate events and details they had never seen during an eyewitness video with a goal of deceiving another set of participants. After a retention interval their memory for the originally witnessed event was tested. While participants were successfully able to reject unseen details, they had previously fabricated at a short retention interval (1 week), they falsely assented to their own fabricated details at a longer

retention interval (4 weeks). These results provide evidence that over time a liar may come to believe their own self-generated lies were the truth.

Rose, Tim,
Sociology

Hydraulic Fracturing (“fracking”) is a traditionally unconventional form of natural resource extraction that has gained notoriety in recent years. Currently, several studies have documented communities that have come together in an attempt to ban fracking. However, these studies leave unanswered the question of how perceptions of fracking and the affected community explain the lack of a resistance movement in many rural communities, despite the presence of several negative consequences of fracking (e.g., more dangerous traffic, the potential for environmental contamination)? To answer this question, I have conducted a series of interviews with residents of Scio, a small rural town in Ohio that has been dramatically affected by the construction of one of the largest oil and natural gas hubs in the Eastern United States. While previous research has found that resistance movements against resource extraction development may fail to coalesce due to the moral exclusion of arguments presented by anti-fracking groups, I will examine how a sense of powerlessness to resist or even ban fracking in (due to the strength of the gas and oil companies and the social disorganization of the community) have also impact resistance formation.

Saha, Neete
Foundations, Leadership, & Administration

The purpose of this basic interpretive qualitative study was to understand and describe undergraduate international students’ experiences with academic advising. My primary research question was: What are undergraduate international students’ experiences with academic advising? Thirteen students from Asia, the Middle East, South America and Africa participated in this study, and their country of origins included India, China, Malaysia, the Philippines, Saudi Arabia, Oman, Bahrain, Bolivia, Brazil, Tanzania, and Somalia. The data analysis for this exploratory study was guided by constant comparative method of analysis. Overall, the overwhelming majority of the participants were satisfied with academic advising. They appreciated the service and saw a need for academic advisors for international students.

Sensor, Jennifer Biomedical Sciences Many whale species are endangered and the management and conservation of their populations requires that we know their life history. Age composition of populations is an important part of this. There are several methods for determining the age of whales, but none are perfect or work for all species. For my PhD thesis, I designed a new technique to age endangered bowhead whales (*Balaena mysticetus*), a species that only lives in the Arctic. I examine the microstructure of ear bones and correlate these structures with chemical (stable isotope, $\delta^{13}\text{C}$) analysis of baleen (ever-growing, keratin plates that bowheads use in place of teeth). The microstructure of the bone provides information on how fast the animal is growing during different periods of its life as well as estimates of age. Because the chemistry of the oceans between which these whales migrate differs, baleen formed at different times will retain a record of the oceans in which they swam, even recording chemically where they were born. This allows me to match yearly migration patterns to bone microstructure and develop a chronology of the life of the whale.

Sharag-Eldin, Adiyana

Geography

The purpose of this study is to examine a theoretical framework of Multilevel Model of Meme Diffusion (M3D) that was developed by Spitzberg (2014) into an empirical study using fracking controversy. The communication theory of M3D involved with diverse sets of social dynamics to predict public opinions related to human interaction, human geography, and environmental concerns. This analysis tries to prove the M3D theory in a case study in the digital technologies of controversial opinions regarding natural gas fracking operations. The extent of innovation diffusion theories such as M3D may provide near real-time access to monitor and register the social opinion trends. This study integrates the fields of geography and computer-mediated communication technology to predict social phenomena.

Shitole, Shreejit Sunil

Applied Engineering, Sustainability, & Technology

Tiny housing is an emerging trend as it enables people to live in confined places. It not only includes all the basic amenities that people need like sanitation, kitchen, and living space, but also help people in situations like disaster relief, affordability and independent homes. It helps people to know the sustainable and economical factor in a house made up of shipping container. My project revolves around four main aspects, namely; affordability, sustainability, environmental quality and energy efficiency. As a part of my individual research I have built a similar house in a shipping container at Kent State University campus. This house is mobile and can be easily transported to remote locations that proves to be a potential example of low cost sustainable housing.

Shrestha, Prakash, *et al.*

Chemistry & Biochemistry

The folding and unfolding of macromolecules in a confined space is prevalent inside cells. Notable examples include those in proteasome machinery or entry/exit channels of ribosomes and polymerases. Molecular simulations have suggested that the stability of a folded macromolecule increases in a confined space due to entropic effects. However, owing to the potential interaction between the wall of a constrained space and the confined structure, clear-cut experimental evidence for this prediction is lacking. Here, using DNA origami nanocages, we investigated the pure effect of confined space on the property of individual human telomeric DNA G-quadruplexes. We induced targeted mechanical unfolding of the G-quadruplex while leaving the nanocage unperturbed and found that the mechanical and thermodynamic stabilities of the G-quadruplex inside the nanocage increase with decreasing cage size. Compared to the case of diluted or molecularly crowded buffer solutions, G-quadruplex inside the nanocage is significantly more stable, showing a 100 times faster folding rate. Our findings suggest the possibility of co-replicative or co-transcriptional folding of G-quadruplex inside polymerase machinery in cells.

Singh, Shweta

Foundations, Leadership, & Administration

One of the critical developmental challenges of emerging adulthood is identity development, maintenance and affirmation. This process continues throughout college when many undergraduate students experience increased independence and are thus free to “try on” new identities, or affirm existing identities. Previous research has established that leisure provides students with an opportunity for identity development and affirmation. Leisure activities have discreet sets of identity images which students can freely choose for themselves through regular participation. Another area of a student’s life where they may have freedom of choice is selection of a college major. Thus, it may be that selection of a college major is an opportunity for identity development or identity affirmation. Opting for a major is a big leap towards shaping a student’s future and defining their desired adult identities. This choice may be the equivalent of a public self-description and a symbolic declaration of, “This is who I am”. This study aims to understand the role of this choice in the process of expressing and affirming one’s identity. This study tests the hypothesis that selection of a major provides an opportunity to affirm a student’s identity because it denotes certain desirable characteristic traits, or identity images.

Smith, Erik

Geography

Many studies analyze the effects of extreme heat on human mortality, however fewer studies focus on the effects of cold related mortality due to the complicated nature of the lagged response. This study utilized a distributed lag non-linear model (DLNM) with a 30-day lag to determine the cumulative effects of extreme temperature events (ETE) on mortality across 16 metropolitan statistical areas (MSA) in the eastern United States for a period of 1975 – 2010. ETEs were divided into specific categories based on duration, magnitude, and timing of occurrence. Mortality was divided in to all age mortality and mortality of individuals ≥ 65 . The findings suggest a strong relationship between a MSAs latitude and the timing of an ETE with mortality. Early season ETEs result in a much higher relative risk (RR) of increased mortality, particularly in southern cities, while the RR of mortality of individuals ≥ 65 was consistently higher for each city. This study suggests early season ETEs should receive enhanced preparedness efforts as individuals are particularly vulnerable when not acclimatized to extreme cold.

Snyder, Lydia

Music

Music has a profound ability to alter consciousness, heal the body and calm one’s emotions. Many traditions use music to heal and connect with another plane of existence or the subconscious. Felicitas D. Goodman was a German-American anthropologist and linguist who studied trance among cultures. After witnessing a Native American corn dance in New Mexico, she experienced a vision in which the Pueblo Indians asked her to follow them. From that point, she dedicated her life to understanding this experience. She studied these altered states of consciousness at The Ohio State University while living among the Pueblo Indians. In her research, she discovered various body postures aid in facilitating trance experiences when combined with specific percussive patterns. She used this knowledge to found the Cuyamungue Institute in New Mexico, where she taught classes on the history of ecstatic trance and shamanic rituals. One of her students, Dr. Nicholas Brink, continues her practice of

communal drumming to create a trance experience for those involved. This paper details my experience as a participant in this ecstatic trance session, and how the various body postures and rhythm affected me. I question whether continuing these practices beyond the source culture is appropriate appropriation.

Solberg, Anna

Geography

Tourism is an ever-growing industry in the world; it is particularly popular in places of cultural, historical, and natural significance. The diverse countries of sub-Saharan Africa constitute one such area. Sub-Saharan Africa's tourism sector has been substantially increasing over the last few decades, so questions must be posed in order to understand the impact of the drastic contrasts and interactions between the tourists of the developed world and the local destination of the developing world. A tremendous amount of research has been done pertaining to social, economic, and global impacts of tourists within both developed and developing countries. However, there has not been an ample amount of questions posed relating to how the tourists feel that they influence the local environment of a destination. With nature-based tourism as the primary draw for tourists to sub-Saharan African countries, it is crucial to understand what role travelers are playing within the destination. This research explores significant perceptions of the tourists that visit such areas within Tanzania through web-based surveys of both international tourists as well as tour operators.

Suwannaosod, Sureeporn, *et al.*

Nursing

As required by federal regulations, research involving humans must be approved by an Institutional Review Board (IRB) in order to protect the participants' rights and to ensure their safety. Because my research involved both adolescents with cancer, a vulnerable population, and the sensitive concept depression, I was required to obtain IRB level III approval which has the most demanding criteria. During the IRB and data collection processes, I learned some valuable lessons. First, anticipating risks and establishing protocol to manage issues that might arise are critical IRB components. For example, they helped me to recognize completing the depression questionnaire might cause adolescents emotional distress, and so, I added a debriefing session to my plans. Second, detailed steps regarding participant recruitment and data collection were required and involved writing a blueprint/script that answered "when, where, what, how, and why". This forced me to think through the whole process in a way I had not yet done. Third, I learned that all the complicated preparation was worth it. By following the procedures I had established, I was successful in recruiting participants and collecting data without causing any harm. I will share this process based on both Thai and U.S. contexts.

Syed Abdul, Mujeeb Ur Rehman

Applied Engineering, Sustainability, & Technology

In the era of highly competitive and global operating environment, it is the responsibility of the organization to focus all its activities to meet the never-ending demands of the knowledge able

customers. Hence, holistic approaches from all the departments of the organization are required to achieve the objectives. One of the functions that attained a prominent place in the organizations these days is the supply chain management and a vital sub-function of this includes the supplier selection, which helps in achieving a low cost high quality, on-time delivery of the products. The present work basically concentrates on this vital area of supplier selection which is a multi-criterion problem including both the qualitative and quantitative factors. The problem is dealt with the help of a case-study, where in many alternatives of selecting a supplier is done with the help of linear weighing model technique is called the VIKOR method. This result is then compared with the results of the already existing traditional method called TOPSIS method, which is more reliable while going for a supplier selection.

Tai, Yu Lun, *et al.*

Health Sciences

Pulse wave reflection (PWR) and arterial stiffness (AS) responses to bench press with and without blood flow restriction (BFR) are unclear. PURPOSE: To evaluate the differences between bench press with and without BFR on PWR and AS in men. METHODS: Sixteen men participated in the study. PWR and AS were assessed before and after low-intensity bench press with BFR (LI-BFR), high-intensity bench press without BFR (HI), and control (CON). A repeated measures ANOVA was used to evaluate the conditions (LI-BFR, HI, CON) across time (rest, recovery) on PWR and AS. RESULTS: There were significant ($p \leq 0.05$) increases in heart rate after LI-BFR and HI compared to rest and CON with no changes in aortic or brachial systolic blood pressure (BP). However, there were significant ($p \leq 0.05$) reductions after LI-BFR in aortic and brachial diastolic BP compared to rest. There were significant ($p \leq 0.05$) interactions after LI-BFR and HI for measures of PWR such that they were augmented compared to rest and CON. CONCLUSION: These data suggest that LI-BFR significantly decreases diastolic BP while LI-BFR and HI significantly alter PWR in a similar fashion without change in AS.

Tanner, Jess

Theater & Dance

This presentation will explore the actor's process of creating the role of Irena Gut Opdyke in Kent State University School of Theatre and Dance's production of Irena's Vow by Dan Gordon. It will examine the journey to the character as a collaboration of the full ensemble, cast and crew alike, in which rehearsals were used to collectively shape the form for the character to

Traynor, Kristen

Political Science

Since the Abu Ghraib scandal in 2004, the treatment of prisoners at U.S. military detention centers as part of the "War on Terror" has become a widely-covered issue and the framing of such treatment in the media has become a focus for many scholars. However, most researchers have ignored Guantánamo Bay prison in favor of the more publicized Abu Ghraib case. This study examines how the mainstream media and governing elite framed prisoner treatment at Guantánamo Bay and seeks to explain whether the media were reliant on governmental framing or acted more autonomously in reporting on the issue. With the use of QDA Miner with WordStat, this project employs a mixed-methods content analysis of elite and media portrayals

of prisoner treatment during the two largest hunger strikes: one that occurred from August 2005-February 2006 and another that lasted from February to August of 2013. On a broader scale, this project speaks to the question of how the media frame human rights and foreign policy issues and who influences such framing.

Walker, Alan, *et al.*

Visual Communication Design

Many of us have experienced moments where we can't help but stop. We slow down to take in our surroundings; the single sliver of orange hanging onto the end of a sunset, or the subtle shift in colors on a lush rolling countryside. It's hard to describe or identify why these locations express beauty, but they move us all the same. Place Into Words challenges viewers to imagine Mars, a planet often characterized as desolate and barren, as beautiful terrain. One day future generations may know nothing other than Mars's vast canyons or sheer volcanos. Could a distant planet offer their most beautiful place? Place Into Words was originally produced as a part of KSU's School of VCD MFA exhibit, inspired by NASA's Orion program, titled Survey's. The exhibit was backed by a semester long research process of secondary and primary methods, including interviews with NASA personnel nationally and at The Glenn Research Center. Visitors to the exhibit were met with a 20ft projection collaging archival NASA footage and landscape photography of Earth and Mars, combined with documentary style audio of ordinary people's responses to what they consider their most beautiful place.

Werner, Angelia N.

Anthropology

In the 1930s, archaeologist Dr. F. H. H. Roberts proposed that proximal-lateral edge grinding was executed on Paleoindian projectile points to limit damage to the lashings that attached them to their shafts. This assumption is logical and widely accepted, but remains empirically untested. Here, we present an experiment that examines the role of proximal-lateral edge grinding in replica Clovis projectile points made of Texas chert. We compare via controlled ballistics experiments large samples of points with lateral edge grinding versus those with sharp lateral edges, but otherwise similar in every other morphometric aspect. By analyzing and comparing the hafting performance of the ground-edged specimens and the sharp-edged specimens, we hope to better understand the function of lateral basal grinding, as well as any differences in use-wear between animal-based and plant-based lashings.

Wolanin, Theresa, *et al.*

Biological Sciences

In the endangered seasonally dry tropical forests of Costa Rica, the plant-pollinator relationship between flowering trees and solitary bees is at critical risk. Changes in precipitation rates linked to climate change cause the flowering trees to bloom asynchronously with bee activity, resulting in a loss of resources for reproducing bees. The decoupling of this relationship will greatly impact the plant and pollinator communities, decreasing pollinator diversity, and abundance of more effective specialist pollinators in favor of generalists. To determine the state of this

relationship, the plant and pollinator communities were monitored during the dry season at Palo Verde National Park in Costa Rica from January to May 2016. Overall, over half of the trees species surveyed flowered up to two months later than historical records indicate. Pollen swabs and community sampling indicated that the pollinator community was severely impacted, showing lower diversity of pollinators visiting flowering trees, and low to non-existent visitation rates for specialist pollinators. Clearly, the delayed flowering events have taken a toll on the pollinator community of Palo Verde National Park, although additional seasons and use of museum specimens will be necessary to establish this trend. Timing in plant-pollinator relationships is critical- if resources are not available when the bees need them for reproduction, they will be limited in their production of offspring. If this mismatch is maintained from year to year, as the data suggests, continued population decline and community restructuring can be expected.

Woodson, Theo

Applied Engineering, Sustainability, & Technology

The need for renewable energy and power systems is becoming more important in order to advance beyond traditional methods of energy generation. Among the most promising of these technologies are fuel cells: electrochemical devices that convert the energy in a fuel directly into electricity. Among the major types, solid oxide fuel cells (SOFCs) are an excellent choice, due to their fuel flexibility, high energy density and portability. Freeze casting is a fabrication process in which a suspension of solid and liquid particles is frozen. As the solvent freezes, the solidifying growth front separates the solid particles, templating them into a distinctive pattern. After solidification, the frozen solvent is removed via sublimation. In this work, porous anode substrates were crafted in a repeatable process then coated with functional layers and tested for characterization. This report will discuss manufacturing methodology in its novel form and display and compare results of performance data as well as the effects of casting conditions on microstructure evolution. This work yields an encouraging and exciting path for the future of SOFC research as it is the first to display results of Tubular-SOFC manufactured with the freeze casting technique.

Worthington, Jennifer, *et al.*

Lifespan Development & Educational Sciences

This presentation will discuss a meta-analysis, in which researchers analyzed the effectiveness of 18 single-subject peer-mediated interventions and supports (PMII) for teaching social skills to students with autism spectrum disorder (ASD) using the calculation of improvement rate difference (IRD) as a measurement of effect size. Studies were analyzed for overall effectiveness and effectiveness by intervention type. Additionally, studies were reviewed for treatment fidelity and generalization measurement and demonstration, as well as for study, participant, and intervention characteristics. Overall, results yielded a strong IRD (.83) for PMII and the strongest IRD for peer network approaches, followed by peer modeling and pivotal response training approaches. This presentation will discuss the results of this investigation in detail, as well as their implications for practitioners and other researchers.

Interdisciplinary Oral Sessions by Research Institute**Brain Health**Kharel, Prakash, *et al.*

Chemistry & Biochemistry

8-Hydroxy guanosine (8-OHG) is the most common oxidative modification in the cellular RNA under oxidative stress and considered as a marker for oxidative stress. This base modification is mutagenic since it can participate in faulty base pairing with adenine. It base pairs with adenine at the same efficiency as cytosine which can eventually lead to the protein aggregation resulting in the neurodegeneration among other consequences. Our previous studies have discovered a significant presence of 8-OHG molecules in the neuronal cells of the multiple sclerosis patient brains and other research groups have reported substantial evidence of a higher level of RNA oxidation in many neurological disorders including Alzheimer's and Parkinson's disease. Although the detrimental effects of 8-OHG in aging, neurological disorders and various cancers have been widely proposed there is a clear lack in the mechanistic understanding of the downstream effect of these modifications. We hypothesize that the presence of 8-OHG moieties in RNA affects its folding and can lead to a detrimental effect on the RNA function. To test our hypothesis, we have already successfully synthesized a novel compound 8-OHGTP α S (-phosphorothioate modification of the 8-OHG triphosphate). The synthesis of this compound is crucial for studying the effect of 8-OHG on RNA folding to satisfy the requirement of identifying the effect of the modification on the folding and structure. We will accomplish this by incorporation of 8-OHGTP α S in the RNA molecules, separate the active from the inactive pool via a functional assay and treat the samples with iodine to cleave at the sites of analog incorporation, techniques termed as Nucleotide Analog Interference Mapping (NAIM). Based upon the existence or nonexistence of a band in the active pool we will be able to determine at which site the analog is detrimental to the RNA structure or function. This will be the first attempt at beginning to understand the effect of 8-OHG on RNA folding and function using a high throughput assay.

Curry, Rebecca, *et al.*

Biomedical Sciences

The medial nucleus of the trapezoid body (MNTB) provides inhibition throughout the auditory brainstem. However, little is understood of the inhibition the MNTB itself receives and how this inhibition may be modulated. Here, we investigated group I metabotropic glutamate receptor (mGluR I) modulation of the glycinergic and GABAergic inputs to MNTB neurons in both wildtype (WT) mice and a fragile X syndrome mouse, in which the fragile X mental retardation gene 1 is knocked out (Fmr1 KO). Loss of the FMR protein results in exaggerated mGluR I activity, allowing for comparisons of mGluR I function under normal and altered conditions. Whole-cell voltage clamp in brainstem slices was used to record spontaneous and electrically evoked inhibitory postsynaptic currents (sIPSC and eIPSC) in MNTB neurons. The mGluR I agonist 3,5-DHPG increased sIPSC frequency and amplitude in WT and KO neurons for glycinergic transmission, but not GABAergic transmission. For evoked release in WT, 3,5-DHPG suppressed GABAergic eIPSCs only and produced variable modulation of eIPSCs in KO. The differential modulation of sIPSC and eIPSC suggests differences in the mechanisms

responsible for spontaneous and evoked release. Additionally, mGluR I activity in the Fmr1 KO may compromise evoked inhibition throughout the auditory brainstem.

Donohue, Michael, *et al.*

Public Health

Adverse childhood experiences (ACEs) have been associated with negative health outcomes and behaviors. No studies have examined the role of frequent sleep distress (FSD) in the association between ACEs and depression. Therefore, the objective of this study is to examine if FSD is a mediator or a moderator in the association between ACEs and depression. Data from the 2010 BRFSS were analyzed using logistic regression models ($n = 25,334$). The ACEs were assessed based on a total of 11 questions in the BRFSS ACE module. FSD (in the past 30 days) was categorized as < 14 days vs. ≥ 14 days. The Patient Health Questionnaire 8 (PHQ-8) item scale was used to measure depression. Overall, 59% of adults reported a history of ACEs. Among those with ACEs, 13.0% reported depression and 32.1% reported FSD. The current study findings suggest that FSD is neither a mediator nor a moderator in the association between ACEs and depression. FSD may be an independent risk factor for depression among individuals with ACEs. Future research should confirm findings from this study to better understand how specific intervention program may help reduce the prevalence of FSD and depression among individuals with ACEs.

Ghasemahmad, Zahra, *et al.*

Biomedical Sciences

Introduction: Vocalizations reflect the emotional state of a sender and influence the emotional state of a listener. Previous studies indicate that the amygdala contributes to the analysis of vocalizations and other acoustic stimuli. Neuromodulators within the amygdala plays an important role in this process and influencing a listener's behavior. This study examines release of neurochemicals into amygdala and the behavior in response to vocal sequences. Method: After 2 consecutive days experiencing periods of restraint or mating, mice were implanted with a microdialysis probe into the amygdala and tested for levels of neurochemicals using microdialysis while their behavior was monitored. Results: Exposure to vocalizations associated with restraint resulted in a gradual increase in the level of extracellular norepinephrine and of dopamine metabolites. These mice showed increased duration of attention to the sound. These changes persisted after playback ended. In contrast, mating vocal sequences resulted in transient changes in the level of norepinephrine and the dopamine metabolite DOPAC and the behavior. Conclusion: positive and negative vocal sequences evoke differential release of neurochemicals into amygdala and change the behavior. Further, change in the release of neuromodulators to these vocalizations is very likely to affect the processing of acoustic signals in a context-dependent manner.

Hogue, Olivia, *et al.*

Public Health

Around a third of people with Parkinson's disease (PD) will experience cognitive impairment. Substantial heterogeneity exists regarding the clinical predictors of cognitive decline in PD and little is known about which factors may predict early decline. The goal of the current study was

to predict early cognitive decline using assessments easily obtained in standard-of-care neurological examination for newly-diagnosed PD patients. Data were obtained from the Parkinson's Progression Markers Initiative, a long-term international cohort study. Selected variables representing the array of PD symptoms were considered as candidate predictors and best subsets selection was used to develop a logistic regression model. Bootstrap resampling was used to validate the model, and the optimism-adjusted concordance (c) statistic measured the model's overall discriminatory ability. A prognostic nomogram was created for clinical utility. The final model included the following baseline predictors: subjective cognitive complaints, right-sided bradykinetic symptoms, word-learning recall, REM sleep disorder, and education. Model discrimination was good, with an optimism-adjusted c-statistic of .748. In practice, this tool would allow clinicians to determine each newly-diagnosed PD patient's personal risk of early cognitive decline and tailor treatment plans accordingly.

Manderino, Lisa, *et al.*

Psychological Sciences

Objective: ImPACT is widely used in the management of concussions. Athletes may suppress baseline performance to mask post-injury deficits. ImPACT uses low scores on five subtests to identify poor effort, though includes other scores which have been proposed as validity indices. The present study compares existing and proposed validity indices (WMCD, DMCD, TSS) to external validity measures. **Methods:** The ImPACT, WMT, and MMPI-2-RF were administered to 242 undergraduates. Participants were instructed give good effort (N = 124) or simulate a head injury (N = 118). A simulation script including common concussion symptoms was used. **Results:** ImPACT demonstrated significantly higher specificity (0.94) and lower sensitivity (0.42) compared to the WMT and MMPI-2-RF. Alternative score thresholds may maintain 0.90 specificity while improving sensitivity. The three proposed indices showed higher sensitivity than the standard ImPACT indices (WMCD = 0.74, DMCD = 0.69, TSS = 0.75), though lower sensitivity (WMCD = 0.66, DMCD = 0.65, TSS = 0.68). **Conclusions:** ImPACT validity indices show high specificity but lower sensitivity compared to external validity measures. Improvements to existing ImPACT validity indices may raise sensitivity while maintaining acceptable specificity. Currently, low sensitivity rates raise concern, as unidentified poor-effort may result in premature return-to-play, putting athletes at risk.

Maniyan, Ashwin, *et al.*

Business Administration

Native Advertising is the new age advertisement, deceiving people into reading an editorial look like content sponsored by companies. Advertorial content is tailored to look like an article written by a journalist surrounded by banner ads and disclosures. Although Native advertising is relatively new and not much research has gone into the role of a banner ad placed adjacent to native article as well as the ideal number of brand name mentions within the content of the article. Advertisers invest thousands of dollars for a native ad article because people tend to like them even if they recognize it's an ad based on disclosures. Ad recognition increases with brand mentions and disclosures but at the same time there is an optimal limit which helps advertisers maximize brand awareness. Native article is low on selling intent resulting into less persuasion felt by the readers. Based on survey results, when native advertisement article is

placed with the same brand banner ad as the article people tend to feel less persuaded increasing the attitude towards brand and on the contrary native advertisement article when placed with a different brand banner ad affects the attitude of the brand in a negative way.

Snyder, Lydia

Music

The Shakuhachi, originally from China, is an end-blown Japanese bamboo flute. It was traditionally used as a meditation tool for the Fuke sect of Buddhist monks through their practice of *suizen*, or "breathing meditation." In this practice, a single note is often sustained for the length of the breath, drawing the attention to the breath and to the frequency of the universe. History of the instrument, playing style and technique, and aesthetics will all be explored in this presentation through demonstration of pieces inside and outside of the Fuke Tradition. Through guided meditation, I suggest how understanding various musical and cultural practices, such as *suizen*, could positively impact the American lifestyle as well as expand our global awareness.

Healthy Communities

Abdelmagid, Samir, *et al.*

Biomedical Sciences

We previously reported on the importance of osteoactivin (OA/GpnmB) in osteogenesis. In this study, we examined the role of OA in osteoclastogenesis, using mice with a nonsense mutation in the GpnmB gene (D2J) and wild-type controls (D2J/GpnmB(+)). In these D2J mice, micro-computed tomography and histomorphometric analyses revealed increased cortical thickness, whereas total porosity and eroded surface were significantly reduced in D2J mice compared with wild-type controls, and these results were corroborated by lower serum levels of CTX-1. Contrary to these observations and counterintuitively, temporal gene expression analyses supported up-regulated osteoclastogenesis in D2J mice and increased osteoclast differentiation rates *ex vivo*, marked by increased number and size. The finding that MAPK was activated in early differentiating and mature D2J osteoclasts and that survival of D2J osteoclasts was enhanced and mediated by activation of the AKT-GSK3 β pathway supports this observation. Furthermore, this was abrogated by the addition of recombinant OA to cultures, which restored osteoclastogenesis to wild-type levels. Moreover, mix and match co-cultures demonstrated an induction of osteoclastogenesis in D2J osteoblasts co-cultured with osteoclasts of D2J or wild-type. Last, in functional osteo-assays, we show that bone resorption activity of D2J osteoclasts is dramatically reduced, and these osteoclasts present an abnormal ruffled border over the bone surface. Collectively, these data support a model whereby OA/GpnmB acts as a negative regulator of osteoclast differentiation and survival but not function by inhibiting the ERK/AKT signaling pathways.

Alhadabi, Amal, *et al.*

Foundations, Leadership, & Administration

This study aimed to identify self-awareness types, the relationship between the self-awareness types and the five factors of evaluating a healthy lifestyle, and investigate the differences in the level of self-awareness with its four types and the five factors of the healthy lifestyle (Creative, Coping, Social, Essential, Physical self) in terms of gender among a representative sample of the Omani society. The study applied self-awareness scale and Five Factor Wellness Inventory (5F-Wel) to approximately (640) participants. Study results indicated that there was a difference between the levels in self-awareness types among Omani society. It also showed that the most common self-awareness type is the reflective and the least common one is defensive. The results indicated the presence of statistically significant relationship between individual and reflective self-awareness with all five factors and a negative relationship between defensive awareness and social and essential self. Additionally, there is a positive relationship between the outer self-awareness and all five factors except the physical self. Moreover, there are significant differences in the individual, reflective self-awareness and essential, social and physical self between males and females. Finally, it recommended conducting empirical studies about the effectiveness of self-awareness program in promoting the five factors of a healthy lifestyle.

Alissa, Nawal

Health Sciences.

The increased rates of overweight and obesity among college and university students have elicited the need for an investigation to determine the implications to students. The U.S. has a broad range of universities comprising substantial groups of international students that study together with the domestic cohort. The new environment exposes foreign students to lifestyles that are characterized by aspects of poor diet and lack of physical exercise. This paper explores the correlation between body mass index (BMI) and stress levels among domestic and international university students in the U.S. An exploratory secondary data analysis of ACHA-NCHA II data was conducted utilizing descriptive and correlational analyses methods. Study results indicated that 54% of domestic students had experienced above normal levels of stress over the past 12 months, compared with 48% of international students. The results showed a statistically significant relationship between BMI and stress among college students. The results of this study indicate that continued research in this area is warranted. Future research could explore why and how an international student's level of stress affects their BMI level. Future studies should consider the development, implementation, and effectiveness of stress management intervention programs specific to international students.

Anaba, Ezinne, *et al.*

Public Health

Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States affecting approximately 80 million Americans. Eighty percent of the 25 million women between the ages of 14 and 59 years will acquire genital HPV infection before the age of fifty. College students, both men and women aged 20-24 years have been found to be at especially high infection risk. Currently, three vaccines are available and recommended for use in persons

aged 9 to 26 years. The purpose of this study is to examine the status of HPV vaccine uptake among Kent State University (KSU) students aged 18 to 26 years, identify reasons for lack of vaccine uptake and investigate whether physician's age is associated with HPV vaccine recommendation. This is a cross-sectional online survey distributed to 37,185 graduate and undergraduate students aged 18-26 from all KSU campuses enrolled in spring semester 2017. The willingness of a physician to recommend the HPV vaccine is an essential element for its successful uptake. The results of this study have important implications in health care as greater emphasis can be placed on developing interventions that encourage recommendation of HPV vaccine in physician age-groups with lower recommendation rates.

Ha, Soon Young, *et al.*

Nursing

With the advancement of data analytics, using existing data such as big data from healthcare is highly recommended in healthcare research. However, using "big data" from healthcare for healthcare researchers has some obstacles. One obstacle is that big data do not share common data elements, standardized terminology, and data display, which impedes the comparison of study outcomes. Another obstacle is that many healthcare researchers do not have the experience or skills to work with big data. Conversely, the Centers for Medicare and Medicaid Services (CMS) has federal data collected by using federally mandated and standardized tools that have been utilized for research in many disciplines. Therefore, the purpose of this presentation is to inform healthcare researchers of existing federal data available from the CMS for research and the process required to obtain it. The Long-term Care Minimum Data Set (MDS) is presented as an example to explain the data request process. This presentation will present the CMS or the federal agency as a data resource; Research Assistance Data (ResDAC) as an interface between the CMS and researchers; and federal data request process.

Kingsbury, Diana

Public Health

Worldwide, 65.3 million people are forcibly displaced, 21.3 million of whom are refugees. Females comprise 50% of the refugee population and the hardship associated with their experience can be significant. Considering the health needs of refugee women in the United States, of particular concern are those related to achieving a healthy pregnancy. The provision of social support before, during, and after pregnancy are important to the well-being of both the mother and baby. This study considered the role social networks play in providing social support to 45 resettled Bhutanese refugee women during their pregnancies in the United States. Interviews were conducted to determine the size and composition of each participant's personal social network, as well as to calculate the average social support score for each network using the Norbeck Social Support Questionnaire (NSSQ). On average, participants reported a personal network of about 3.09 people. Husbands, sisters, and sisters-in-law were most commonly identified as important sources of support. Social support scores ranged from 23 to 107, with an average score of 58.71 (SD = 20.94). Participants perceived their networks to be supportive during pregnancy, particularly in the provision of advice, tangible assistance within the household, and practical matters related to pregnancy.

Lee, Sanguk, *et al.*

Communication

Researchers have argued that to be more threatening and instill more efficacy in a target audience, fear appeal designers should consider cultural factors. Providing uniform messages would not be effective across cultures. Given that the perception of fear appeals can be differentiated depending on one's cultural orientation, fear appeals that match one's cultural frame will be more persuasive and effective. This study will investigate the effects of culturally-oriented threats (individual versus group) and self-efficacy (through an individual-focused smoking cessation program versus a group-focused smoking cessation program) on the perceptions of people from different cultures (South Korea versus the United States). Although there are a number of campaigns using fear appeals to call for health behavior change, often they are unsuccessful. The absence of considering cultural effects can be one of the reasons. By providing better comprehension of fear appeal effectiveness in a cross cultural perspective, this study will contribute practical and theoretical implications.

Murniadi, Kris, *et al.*

Communication

Pornography is consumed by 75% U.S. male adult population. Unfortunately, excessive consumption of Internet pornography often leads to negative effects on individuals' sexual health, mental health, and marital satisfaction. This study aims to test fear appeal messages intended to limit males' consumption of pornography. Among the variables being measured include social identity, self-monitoring, identification with the message source, fear, self-efficacy, and behavioral intention. The result suggested that fear and efficacy in anti-pornography messages correlate with the behavioral intention.

Myers, Lindsey

Communication

In 1932, the United States Public Health Service (PHS) began what was originated as a six-month study of the outcomes of untreated syphilis in African-American males; however, the study continued for 40 years. In 1972, the study became front-page news and was terminated by the PHS within a month of the first media coverage. Although substantial health communication literature cites the Tuskegee Experiment as having lasting effects on the African-American population, little research has addressed the news coverage that African-Americans would have been reading in 1972. Understanding differences in news coverage of the Tuskegee Experiment by the African-American press compared to the mainstream press may identify and clarify the nature of the factors that contributed to ongoing and current repercussions of the Experiment regarding health-care seeking behaviors and clinical trial participation in the African-American community. Newspaper article evaluation criteria are based on agenda setting theory and framing theory. The systematic evaluation of news coverage of the Tuskegee Experiment yields guidance for developing more effective health communication with African-Americans and provides a better historical understanding of Tuskegee's impact on African-Americans' trust in medical treatment and clinical trials. This understanding will inform the professional practices of journalists, health care providers, and health communicators.

Natale, Ginny

Sociology

It is unknown how the illness impacts the decision-making process that leads patients to value pursuing certain adult milestones and forgo others. My study offers an unprecedented look at the ways in which Crohn's patients cope with their illness, while simultaneously weighing decisions to pursue or forgo expected adult milestones. Through the data I collected, I will better understand how individuals with a chronic illness work around the constraints of their illness and achieve social milestones—specifically marriage, parenthood, work and retirement. These four milestones capture the breadth of work-family transitions that are crucial transitions in adulthood and later life. A diagnosis of Crohn's disease serves as a turning point that alters a patient's social pathways across both domains of family and work. While people with a chronic illness desire to live without the constraints of constant medical care, sometimes the limitations are unavoidable and the individual is forced to adapt to a different way of life. My research examines how patients choose to live within the constraints of their illness, and adapt to a new lifestyle.

Odhiambo, Lorriane, *et al.*

Public Health

Cardiovascular diseases contribute the highest mortality rates in the United States (US). Cardiac rehabilitation (CR) is a critical aspect of cardiovascular disease rehabilitation; however, patients may not have access due to financial or geographic constraints or programs may not have capacity to manage patients. The purpose of this study was to examine the distribution of CR programs and to describe the density of programs per Myocardial Infarction (MI). This was a cross sectional study using Medicare data of Beneficiaries with MI in 2008 combined with address data from the American Hospital Directory of the 2,551 CR programs. Two Geographical Information Systems (GIS) techniques, spatial data analysis and density point mapping were used. The distribution showed a higher density of CR sites in the Midwest and Northeastern regions of the US, where a higher cluster of CR to patient ratio was greater. Some areas lack program availability and clusters of patients do not have access. This is the first research to describe the locations of CR programs in the US and to demonstrate relationships between program location and number of MIs. Future research will explore the patient count of programs to determine capacity and will include other CR eligible cardiac diagnoses.

Sang, Hilla

Public Health

In 2002, the Mexican government created seguro popular (SP), a national health coverage program aimed at providing financial protection for more than 50 million previously uninsured Mexicans. I traveled to Puebla, Mexico, to discuss the program's outcomes and challenges with different stakeholders. In-depth interviews took place in October, 2016, with Mexican medical students and health providers. The discussions were conducted in English and Spanish and were translated by a licensed translator. SP improved overall access to health services and reduced incidence of catastrophic health expenditures. However, the program's design, in which SP recipients receive care only in designated facilities separate from the rest of the health

system, has created a stratified system in which doctors prefer to work in non-SP hospitals and thus further marginalizes those who are underserved. Additionally, the medical education curriculum was not updated to include this expansion and train physicians to communicate with the newly-insured population. As the American health system contemplates structural changes, it is imperative to study other countries' successes and opportunities in their pursuit of national health coverage. Specifically, physician preparedness and communication should be emphasized to facilitate the health needs of all members of society.

Smock, Carissa, *et al.*

Public Health

Introduction: Only 14% of healthcare providers provide exercise prescriptions and referrals despite provider association and government initiative support for this economical, lifesaving solution to physical inactivity. The purpose of this pilot study is to identify provider characteristics, knowledge, perceived barriers, practices, and needs related to place-based exercise prescription and referral. Methods: An 88-item survey was developed and administered electronically and in paper to nurse practitioner alumni and two hospital systems' provider networks. Descriptive statistics were generated, factor analysis was conducted, bivariate analyses were utilized to identify scales or variables significantly related to exercise prescription and referral. A binomial logistic regression was performed to determine factors related to whether or not providers refer patients to place-based exercise. Results: 166 providers responded; 61.5% female, 86.9% white. 15.2% prescribe, 35.9% refer, 89.9% ask about, 64.3% document, and 13.9% assess exercise. Logistic regression yielded five significant ($p < .05$) variables: asking about, documenting, and prescribing exercise, knowledge of exercise guidelines, and providers' perception patients' lack time to exercise. Conclusion: Provider's believe patients lack time to exercise and need guidance scheduling and assessing locations to exercise. Improving provider knowledge of guidelines may increase uptake of exercise prescription or referral. /

Stigall, Logan, *et al.*

Psychological Sciences

The positive association between alcohol abuse and emotional/verbal aggression (EVA) is well documented. However, research is limited because studies examining this association rely solely on self-report measures. Similar to alcohol abuse, perception of partner's alcohol abuse is associated with relationship outcomes but it is unclear whether perception of partner's alcohol abuse affects EVA. The current study extends literature and examines the associations among alcohol abuse, perception of partner's alcohol abuse, and EVA. These associations were investigated utilizing self-reports, observational assessments, and dyadic data from romantic couples. / Participants included 251 heterosexual couples (Mage = 20.0). Participants reported on alcohol abuse, perception of partner's alcohol abuse, and EVA. Observed EVA was assessed during a conflict resolution task. Male alcohol abuse was positively associated with male self-reported EVA ($\beta = .15$, $p = .03$). Male's perception of partner drinking predicted his own observed EVA ($\beta = .20$, $p = .003$, Figure 2). Self-reports of alcohol abuse were not associated with observationally assessed EVA. Findings extend the literature by showing that (a) perception of partner's alcohol abuse is potentially an important construct to consider in

understanding EVA in romantic relationships and (b) this association is especially important for males.

Global Understanding

Coen-Mishlan, Kristin

Music

Literature identifies the need for female band directors to have mentors and role models, the lack of female band directors at the secondary level, and their varied experiences in the field. Therefore, the purpose of this study was to collect demographic information of female band directors, including their relationship with mentors and role models, their personal and professional goals, and their experiences as women in the field using a survey method. Descriptive data analysis addresses the basic demographic information including age, race, marital status, number of years teaching, and level of education. Thematic qualitative data analysis addresses the open-ended responses of the survey in order to present participants' experiences as women in the field. The findings of the study indicate that females are communicating with their role models and mentors; however, they may not be sharing their experiences with one another. There was a tendency to discuss their professional goals rather than their personal goals. The majority of responses about experience as women in the field were negative. Future research may address specific experiences concerning gender in instrumental music education, the hierarchy of personal and professional goals, and statistical significance of responses.

Davis, Rachel

Art

Death and loss are universal, yet very personal, experiences. In the Victorian era, mourning was a public process, dictated by societal standards. There were requirements for dress, jewelry, behavior, and even the length of the mourning period. Now, mourning has become a more personal process, often hidden from the outside world. Death and mourning have become taboo topics in the Western world, particularly in the United States, where ability to work long hours and always appear high functioning is key. Being surrounded by death puts living into a different perspective. It has a weight to it that those who have not experienced loss can never fully understand, hard as they may try. There is a cycle to grief, an overlapping and repetition of emotions. Some days, weeks, or months are smooth, the sense of loss diminished to a tiny ripple in a still pool. The calm is broken up by extreme grief, tumultuous waves bearing down upon the soul. Through my usage of materials and forms, I seek to create objects that allude to the preciousness and fragility of life, an outward expression of the various faces of mourning.

Fleet, Alex

History

As an empire, France has held colonies across the globe and inserted its presence into the lives of many people. During France's process of decolonization, many of its former subjects traveled to France for myriad reasons and faced many different reactions. This presentation will examine the relationship between France and its colonial subjects, as well as how French society

throughout the 19th and 20th Century constructed notions of citizenship and French identity. My examination into French history will cover Algeria, the Caribbean, Southeast Asia, and France itself. I will examine the interactions between France's domestic and colonial governments, how both governments have treated colonial subjects, how France's domestic education system described the country's colonies, how people of mixed race (French and People of color) were treated, and how the relationship between France and its colonies changed during the processes of both decolonization and, in other cases, the overthrow of the colonial regime.

Hannum , Kathryn

Geography

Bilingual communities face many obstacles when considering the legal and applied aspects of language use in schools. The autonomous community of Galicia, Spain is one such region, wherein all education must be divided equally between the two co-official languages of Castilian and Galician. Application of the law has been tenuous, however, given that there exists a linguistic bifurcation of the region along urban-rural lines. An urban-rural divide like this is common in many bilingual countries, which exhibit the following pattern: prestigious state language is predominately spoken in cities and familial regional language is predominately spoken in the countryside. This study seeks to understand how teachers perceive the efficacy of Galician language laws, and how these laws are applied between urban and rural locales. Findings suggest that while sentiment for language preservation is high in both locales, code switching is a common occurrence, especially in rural schools. On average, teachers expressed dissatisfaction with the required legal framework and perceived disingenuousness on the part of the government in preserving linguistic harmony in Galicia.

Kelvin, William, *et al.*

Shen Yun Performing Arts is a traveling music and dance troupe based out of New York. Its performances are billed as opportunities to learn about ancient Chinese culture. However, they are light on culture and heavy on propaganda concerning the way the People's Republic of China treats practitioners of Falun Gong, the religious movement that formed the troupe to popularize their plight. The disconnect between what is advertised as cultural education and comes across as political indoctrination makes these performances fascinating studies in public relations and intercultural exchange. My research partner and I attended consecutive years' performances for on-site observations and compared themes found in the shows with ideas present, and omitted, in the group's advertisements to judge the ethicality of their advertising.

Krasniqi, Fitim, *et al.*

Teaching, Learning and Curriculum Studies

Sixteen years ago Kosovo emerged from a devastating war that finally put an end to more than five hundred years of occupation of the Albanian population in Kosovo. Faced with the new political, economic, and social realities, the change in education is seen as the most sustainable pathway to a prosperous peaceful future for the region much troubled by conflicts. In the face of new circumstances, Kosovo teacher preparation programs face an enormous challenge in preparing future teachers that are able to drive the change needed. Reconceptualizing the

deep-seated beliefs about the purposes behind teacher preparation is not an easy task but one that is a necessity for the future of the region.

Newton, Kristine

Foundations, Leadership, & Administration

Few empirical studies directly address the sense of agency, power, character and awareness in women factory workers in China. This dissertation examines the gradual transformation of Chinese women factory workers in the Yangtze River Delta region of China, and analyzes their patterns of interaction, attitudes, and perceptions of some traditional Chinese values. Data collection for this dissertation was conducted from October 2014 through October 2015 using a basic interpretative qualitative approach to examine whether the factory experiences of Chinese women increase their self-awareness, sense of independence, and ability to make personal choices. This dissertation also seeks to discover whether educational opportunities and other tools help women factory workers in China make more subjective choices, increase their independence, and build a greater awareness of themselves and their role in this world. Results of the study discovered that women factory workers in China, no matter familial status, education level, or position in the workplace, continuously sought improvement, and that improvement led their path to empowerment. These women used multiple or varying forms of education to improve themselves, and many of the participants acknowledged that continuing their education had the potential to significantly impact their sense of awareness, self-sufficiency, and decision-making.

Owens, Wendy

English

In contemporary literary studies, there are two major issues facing the emerging genre of transracial/transnational adoptee literature: 1) carving out a space within the monolith of works created about adoptees from the non-adopted and privileged perspective, and 2) when recognized, taking corrective action against the “balanced” identity expectations imposed by adoption professionals, adoptive parents, and others who share ethnic and/or immigrant status but not adoption and, instead, creating a space for understanding the existence of a dual identity space (aka: the in-between) and diverse identifications and journeys of transracial and transnational adoptees. Emanating from the Transnational Studies lens, this study strengthens the conversation about the intersectionality faced by transracial and transnational adoptees and the importance of understanding their in-between identity status as unique as well as calling for privileging adoptee texts over those of non-adopted persons. The argument for a transracial/transnational adoptee subheading within ethnic literature is clear as these texts do not neatly fit into their author designated ethnic literary categories alone because of transracial and transnational adoptees’ upbringings in dual ethnic identity environments comprised of a temporary umbrella of white privilege when young to facing American culture as outwardly fully ethnic as adults.

Satlykgylyjova, Maya

Foundations, Leadership, & Administration

For women, studying in a foreign country carries implications for their sense of identity – namely, the way they choose to practice their agency and view themselves as well as their intimate attachments and identifications with family, traditions, landscapes, and society. The changes that international students experience lead them to place themselves in a narrative of agency and of strength. However, cultural change implies the capacity to relinquish at least aspects of a given identity. These changes allow students to live in a parallel universe one that belongs to them alone. Despite the sprawling theoretical and empirical discourses on identity, our knowledge of whether and how identity changes in the context of Central Asian women studying in American higher education is still limited. Therefore, in this study I explore Central Asian female students' critical examination of their cultural and social identities after studying in the United States. Initially I contextualize Central Asian women's identity in historical perspective by delineating two distinct arguments. First, I argue that postcolonial discourse must be extended to encompass contemporary Central Asian countries because the seven decades of Soviet rule made a big impact on women's contemporary identities. Understanding the power relations within such system allows us understand the ambivalence Central Asian women face today. Second, I argue that a certain conception that is mimicry, a form of hybridity theory, housed in postcolonial discourse best explains the hybridization of Central Asian women's identities during the Soviet regime. Following these arguments, I seek a position from which to identify possibilities for identity construction of Central Asian female graduate students through negotiations of cultural differences in global educational times. Using basic interpretive approach, I portray six female students' experiences and their critical examinations of their identities from five Central Asian countries. The findings of the study will be presented at the conference as the study is currently being analyzed.

Spence, Kevin

Foundations, Leadership, & Administration

The Republic of Cuba and the United States on July 20, 2015 restored diplomatic relations in an effort to normalize relations for the first time since they suspended them in 1961. With a long contentious history, the two nations also began higher education academic exchange discussions. Socialist Cuba, suffering from an economic embargo, gradually increased private enterprise in the country over the past decade. Known for its robust and universal education system in recent years, the Cuban government influenced enrollment in its professional and technical education programs, yet simultaneously, decreased enrollment in higher education institutions. Then, in November 2015, the Ministry of Education launched a requirement for Cuban college students to be proficient in English within years prior to graduation. / The purpose of this research includes a proposal for a naturalistic multiple case study to explore how comparative perspectives inform English language policy choices in Cuban professional and technical education. At this stage of the research, the perspectives will incorporate influences of English as an economic vehicle. Through study of scholarly literature, the research attempts to present findings about the experiences of Cuban administrators, teachers and students with English as a foreign language and its affect on higher education.

Wisuttipat, Nattapol, *et al.*

Music

Wai Khruu is a Thai-Hindu/Buddhist ritual in which students and musicians pay respect to teachers and instruments. The ritual involves offerings of flowers, food, incense, as well as prayer and musical performance. Rarely performed outside Thailand, the Wai Khruu ritual was held at the University of California in Los Angeles. The Kent State University Thai Music ensemble, a group consisting of undergraduate and graduate music and non-music students, was invited to perform at this monumental event. This presentation will describe our experience in two parts- an account of the event and a musical demonstration of our performance. We performed the classical Piphat piece called Hoh. "Hoh" translates as "to fly," and it represents the act of flying. In participating in this event, we experienced firsthand cultural immersion. Not only did we engage in interactive musical performance experience, we witnessed the ritual itself and musics of professional Thai musicians. This experience gave us insight to Thai culture, and connections to other musicians of Thai music around the United States. It enhanced our cross-cultural understanding, which is vital in today's multi-cultural world as well as represented Kent State University as a global Institute.

Yamany, Nisreen

English

Lots of audience who watched the film; 12 Years a Slave experienced such strong emotional reactions. In fact, several online reviews and articles on the movie reported that some viewers were so shocked that they left the screening while others were moved to tears and gave the film a standing ovation. Other viewers looked deeply shaken as they left the theater. These strong emotional reactions testify to the film's power not only to deeply affect its audience but also to evoke feelings of empathy. Empathy is generally defined as the ability to understand and respond to the unique experiences of another person. Empathetic feelings include feelings of sympathy, compassion, tenderness and the like. Such emotions have been clearly experienced by viewers of the movie and this paper examines the various techniques by which the movie succeeded in eliciting various types of empathy such as perspective taking (cognitive empathy), memory-based empathy and emotional contagion or what is sometimes called mimicry or virtual empathy.

Environmental Science & Design

Adams, Ryan

Geography

Extratropical cyclones that undergo 'bomb' cyclogenesis (pressure drop generally ≥ 24 mb in 24hrs) remain an under-predicted phenomenon in operational weather forecasts. This research aims to explore the climatology of bomb cyclones in the western North Atlantic and their associated circulation patterns. Sea level pressure data from the NCEP-NCAR Reanalysis (1948-2016) was used to objectively identify bomb cyclones of the western North Atlantic basin. Implementing a circulation to environment approach, 500-hPa geopotential height patterns were defined by month across the western North Atlantic using self-organizing maps (SOMs). Bomb cyclone proportions were mapped with each SOM pattern for the months of October through April. Bomb cyclones exhibit a high degree of spatial variability throughout the course of the year. Results of the SOMs illustrate the 500-hPa geopotential height patterns characteristic of

bomb environments. The tilt of the 500-hPa trough associated with higher bomb probabilities differs across seasons and the 300-hPa geopotential height trend leading up to bomb cyclogenesis illustrates unique rising and falling patterns that portend bomb cyclone occurrence. Avouris, Dulcinea, *et al.*

Geology

Rapid identification of color-producing agents (CPAs) is an essential part of monitoring and assessing Harmful Algal Blooms (HABs) in Lake Erie. These HABs can be comprised of nuisance algae and diatoms, or of more harmful cyanobacteria. Cyanotoxins are seriously detrimental to human and animal health at relatively low concentrations. The use of satellite-based and airborne remote sensing imagery has become common due to the ease of access to data and large scale coverage areas of these instruments. However, careful pre-processing is necessary to maximize the utility of these images for CPA identification. Pre-processing of hyperspectral airborne sensor imagery includes noise removal in both the spectral and spatial dimensions. Here we present the pre-processing of Western Lake Erie image swaths acquired by the NASA Hyperspectral Imager (HSI2) during the 2016 field season, and identification of CPAs using derivative spectroscopy.

Bempah, Sandra

Public Health

Malaria continues to be one of the deadliest infectious diseases in West Africa. Various factors associated with the high prevalence of malaria include poor sanitation, low socio-economic status (SES), poor urban development and individual behaviors. What makes the curbing of malaria more challenging, is that many malaria impacted areas have little data for modeling or prediction. Spatial videos were collected using Global Positioning System (GPS) enabled video cameras in the communities around LEKMA hospital, in Nungua, a suburb of Accra, Ghana. Contour storyteller software was used to simultaneously view these videos and this provided the data source for risk mapping in Google Earth with the subsequent analysis being completed in a Geographic Information System (GIS). Building condition was used as a measure of SES status. Environmental risk factors mapped included open drains, stagnant water, trash, food stands and stray animals. Aggregated patient data including suspected malaria cases between 2012 and 2016 from LEKMA hospital were used to identify the highest disease reporting communities. The SES and poor sanitation risk maps were then compared to the community pattern of malaria. The communities were predominantly of low SES level. Open drains were observed on both sides of the road and these were often filled with trash and stagnant water. Some visible bathrooms were connected to these open drains resulting in a stable inflow of water. This makes it conducive for mosquito breeding all year round. An overlay of visible building quality, and the highest densities of risk factors suggested an association with malaria risk based on malaria reported case data. Spatial video can provide a visual assessment of areas known to be high risk for malaria. This can both help explain why disease is present, and help develop strategies for intervention.

Bhairappanavar, Shruti, *et al.*

Architecture

Cladded on the bare wall, green walls are built with multi-different layers using different construction materials and a variety of plants. However, the cladding devices, built using processed materials, are reported to have high embodied energy, which questions the sustainability of the green wall system. Also, to maintain economic viability and sustainable development of harbors and ports built along the coast of Lake Erie, 1.5 million cubic yards of dredged material need to be removed annually. Landfill of the dredged material is costly, while open water placement will be banned in the State of Ohio after July 1, 2020. An alternative to disposal is to reuse the dredged material in built environment. A new and sustainable approach to build an innovative green wall system is proposed in this study, using dredged material – cement bricks. 5%, 10%, and 15% of cement will be mixed with the dredged material taken from Cuyahoga River to make bricks. The performances of the dredged material-bricks will be revealed through the compressive strength, water adsorption, and resistance to freeze thaw cycling testing per ASTM standards. A prototype of innovative integrated green wall system will be designed and built using the bricks.

Callaghan, Brigid, *et al.*

Architecture

Though not yet a standardized manufacturing tool, 3D printing has gained a lot of attention within the architectural and construction industries. In recent years, this interest has grown exponentially and many investigations regarding its possibilities within the field have emerged. However, there is limited research pertaining to biomimetic 3D printing and even less so concerning the thermal potential of 3D printing. Therefore, this research aims to understand the thermodynamics of a concrete biomimetic wall with embedded insulation produced using 3D printing technology. The methods of research in this study include simulation and experimentation. Walls were designed to be reflective of natural organisms which have high insulation such as hemp, cotton, etc. The cell structures of these organisms were reflected within the interior of the wall itself, in an attempt to mimic their thermal properties. These walls were then simulated using Computational Fluid Design software to understand their thermal resistance. Following simulation, the designs with the highest thermal resistance were fabricated using 3D printed formwork and tested through hotbox experiments. This process was repeated several times to develop the most successful wall system. Initial tests indicate comparable or better results in terms of thermal resistance in regards to traditional wall designs.

Fu, Chenjian, *et al.*

Geology

A new synthetic evaluation method is proposed in this paper to serve as a quantitative tool for paleomagnetic apparent polar wander path (APWP) matching. APWPs based on paleomagnetic data are the principal approach of describing plate motions through most of Earth history. Comparing the spatiotemporal patterns and trends of APWPs between different tectonic plates is useful in looking for clues that indicate they were part of the same supercontinent. However, thus far there is no clearly defined quantitative approach to determine the degree of similarity between APWPs. A common approach used by paleomagnetists to determine the most similar pair of APWPs when multiple pairs are given is finding the shortest average great circle distance (GCD). An average GCD is simply derived from all individual GCDs between coeval poles.

However, such comparison may miss some important information about the paths, such as directions and lengths of APWP segments. Most importantly, it does not give a quantitative degree of the similarity about error ellipses that indicate coeval poles could be actually statistically indistinguishable. This paper presents a synthetic evaluation method to address these issues. The similarities are quantified in terms of three types of distances: (i) shape distance, which / includes (a) direction difference and (b) length difference between each pair of coeval segments of two APWPs; (ii) spacial statistical distance (percentage of number of pairs of distinguishable coeval poles calculated using a modified / "bootstrap" test). The advantage is that multidimensional information (i.e. the three indexes) that indicates relationships between APWPs is considered. In addition, these three indexes are not correlated with each other, so the evaluation result will not be distorted. The final result can be adjusted by changing weight of each index. So this enables users to determine the degree of influence of each index on the final synthesized distance for different research scenarios. It is shown that, [eg] the third index "spacial statistical distance" is considered to be the most important one for paleomagnetism, so the weight that is assigned to this index can be set higher than the other two. However, through discussion of results from equal, unequal and random weights, for the six given cases, setting up a higher weight for a preferred index is in fact not always necessary for the proposed methodology.

Hartung, Erik, *et al.*

Biological Sciences

Bioretention cells are being widely used as tools for stormwater management. However, questions remain about how to optimize their long-term functioning for water quality improvement. This study explored some of the factors that may affect the long-term functioning of bioretention for water quality improvement via metal removal from stormwater. A survey of metal concentrations (i.e., Cu, Pb, and Zn) in bioretention cell media of cells ages < 1 to seven years old aimed to determine the typical spatial distribution of metals in bioretention cells. Additionally, a microcosm scale leach column experiment investigated the removal capacities of 27 parking lot bioretention cells in the greater-Cleveland area. The spatial distribution of metals within bioretention cells was found to be rather homogenous and uninfluential on bioretention cells' long-term functioning. Bioretention cell functioning may be reduced when cells receive an influx of high concentrations of metals. Bioretention cells less than eight years in age were found to be able to reduce the concentration of metals in stormwater to concentrations below EPA thresholds for freshwater, but this function may be hindered by road salt. Management to ensure bioretention cells' functioning for metal removal from stormwater should consider these factors.

Hossain, Rumman, *et al.*

Biological Sciences

Plastic debris in aquatic ecosystems possessing a diameter of less than 5 mm are classified as microplastics. Microplastics have been shown to be colonized by bacteria upon entering aquatic ecosystems. However, there is a scarcity of information on bacterial colonization of microplastics in freshwater. Since 80% of microplastics entering the oceans pass through freshwater systems, this study will provide valuable insights on the bacterial colonization in

freshwater. Our research indicates that variations in the physicochemical properties of different types of microplastics influence bacterial colonization in freshwater. Plastic debris have been shown to undergo surface modification and reductions in buoyancy due to bacterial colonization in saltwater. This has led to sinking and sedimentation of plastic debris in saltwater. Therefore, studies have been planned which will focus on determining the consequences of colonization by freshwater bacterial communities on different types of microplastics, which will include surface modification and sedimentation of microplastics in freshwater.

Lin, Huiyu, *et al.*

Geography

Social media data are increasingly being used for enhancing situational awareness and assisting disaster management. In the face of a major event, such as wildfire, the public tend to communicate situational updates related to damage, evacuation, and appreciation to firefighters through social media platforms. Natural hazards cause damage to the environment and have significant socioeconomic impacts on local communities. Hence, the effectiveness of local responses reflect how fast and to what degree of a local community be informed and act on a specific event. We suggest a framework to analyze the wildfire-related Twitter activities at the community level, so as to gain insights into how and why situational awareness vary across locales. San Diego City has a high diversity of ethnic groups and it has experienced several wildfires during May 2014. An OSL and a GWR models are built to examine the relationship between the twitter responses to the fires and the socioeconomic status of local communities at the census block group level. The model reveals factors such as land use, ethnicity, and gender lead to the uneven distribution of twitter responses. As a result, agencies can intervene and improve the information dissemination process by targeting those communities in need.

Mendonca, Raissa, *et al.*

Biological Sciences

In aquatic systems, the cycling and toxicity of nickel (Ni) are coupled to other elemental cycles (e.g, iron, carbon, sulfur). Sediment geochemical characteristics can strongly influence metal partitioning behavior. Understanding the relative influence of geochemistry on metal partitioning to different sediment types will allow us to model Ni partitioning behavior and removal rates. The objective of our study was to assess Ni partitioning behavior in five geochemically distinct oxic sediments collected from Ohio streams under different pH scenarios. Sediment aliquots were placed in septa jars. We used three Ni concentrations (0.5, 2 and 5 mg/L) and three pH values (5, 7 and 9) in a fully factorial experimental design. Jars were continuously aerated and were destructively sampled in 6 sampling days (day 0, 1, 4, 7, 14 and 28). Water and sediment samples were properly processed and analyzed in the ICP-OES for metals. Ni in overlying water declined in a biphasic manner, rapidly dropping early in the experimental period but slowing by day 7. Across all sediment types, pH and particle size had the strongest effect on the Ni removal rate (k). Multivariate analysis will allow us to further explore the relationship between sediment geochemistry and Ni partitioning behavior.

Morrison, Sarah, *et al.*

Geology

Coal mine spoil, a mixture of black shale parent rock and other lithologies, continue to impact water quality across Appalachia as a legacy of historic coal mining operations. Spoil material is chemically similar to the ore they once contained and have historically been deposited at the point of removal without any environmental considerations for potential impacts. Coal-bearing black shales are known to contain significant concentrations of the metal(loid)s such as Mn, Fe, Ni, Cu, Zn, As and Se as well as high sulfur concentrations. The release of trace metals from the shale during weathering is directly related to textural and morphological properties of the metal-host phase. The main hypothesis for this study is that the metal(loid)s from the pyrite are being incorporated into the secondary minerals forming in the soil with only small losses as dissolved species. This investigation will combine: (1) a synchrotron-based x-ray microprobe analysis of the soils forming on coal mine spoil to describe the speciation and distribution of contaminants at the micron scale and mineralogical abundance and distribution, and (2) batch reactor experiments to simulate the weathering of the parent rock by simulated rain water and quantify fluxes of metal(loid)s released from the parent shale. Microprobe analyses indicate that the metal(loid)s are remaining in the soil and are primarily associated with Fe. Preliminary analyses of metal(loid) leaching, measured by ICP-OES, indicates that there is an initial pulse of As, Se, Cr, Cu, and Zn release but Fe concentrations are increasing with time. These patterns persist across the range of particle size being weathered.

Paige, Forrest
Architecture

Parkour is both a movement art and an urban sport, a discipline of movement and self-improvement, where practitioners utilize natural body movements such as running, jumping, and climbing to overcome obstacles, both physical and mental, in the urban environment efficiently and creatively. This phenomenological study investigates parkour practitioners and their alternative appropriations of urban spaces, defining the essence of their lived experience. The purpose of this study is to understand the contemporary perspective through which parkour practitioners view and experience the urban environment in order to contribute to the scholarly conversation between architecture, parkour, and urban space. Employing a qualitative phenomenological research methodology that is built upon the theories and writings of Henri Lefebvre, Ian Borden, Edmund Husserl, Maurice Merleau-Ponty, Juhani Pallasmaa, Michel Serres, and Bruno Latour, this investigation addresses the main research question: What defines the essence of the lived experience that parkour practitioners have when they alternatively appropriate urban space through the practice of parkour? Utilizing the interview as the primary data collection method, as well as first and third person video investigation, data was collected from parkour practitioners and parkour communities from the Midwest in the United States in order to define the essence of their collective lived experiences. The importance of this study is to investigate a new, contemporary perspective on, and interaction with, urban space. Through defining the meaning and the essence of the lived experience that parkour practitioners have when they execute parkour movements in urban spaces, this study will expand upon the current scholarly conversation between architecture, parkour, and urban space. This perspective has the potential to redefine how urban space is fundamentally conceived, utilized, and understood by designers.

Sugano, Laura, *et al.*

Geology

Phosphorus (P) is the limiting nutrient that leads to eutrophication. Green infrastructure is one solution being used to address the water quality issues that runoff creates in streams and lakes. Green roofs are a form of green infrastructure designed to decrease and slow down runoff through evapotranspiration and infiltration. Infiltration should decrease P loads because P sticks to sediment. We monitored a green roof during 80 storms from June 2015 through October 2016. To assess water quality, we collected precipitation and samples from the green roof downspout, where discharge was recorded. We measured phosphate (PO_4^{3-}) and total P concentrations using a colorimetric assay and a persulfate digestion. Average outflow PO_4^{3-} concentrations are 2x greater than rainfall concentrations and outflow total P concentrations are two orders of magnitude more than inflow concentrations. However, outflow PO_4^{3-} concentrations decreased by ~3x after fertilizer application ceased in 2016. Many cities are promoting green roofs as part of their stormwater management policies. If these policies result in green roofs that are connected to downstream water bodies, they may exacerbate water quality problems in urban areas. Re-consideration of the maintenance and construction of green roofs is required before further adoption of the practice.

Zhang, Liping, *et al.*

Chemistry & Biochemistry

Radioactive iodine, such as iodine-129 and iodine-131, can be discharged by nuclear power plants and medical research laboratories. Because of their high toxicity, these radioactive wastes are required to be disposed before being released to the environment. δ - Bi_2O_3 has been reported to be a great material for capturing iodide from solutions thanks to its high removal capacity and fast kinetics. In this work, mesoporous δ - Bi_2O_3 with high surface area and small crystallite size was prepared by using SBA-15 as a hard template. The obtained mesoporous δ - Bi_2O_3 showed high iodide removal capacity and fast kinetics as compared with other reported materials.

Advanced Materials

Beals, Nathan, *et al.*

Chemistry & Biochemistry

Common features in the pathogenesis and progression of the neurodegenerative disease Parkinson's (PD) has been correlated with oxidative damage and activation of the inflammatory cascade. Therapeutic small molecules have been shown in research to decrease biochemical inflammatory molecules (cytokines, cyclooxygenase-2 (COX-2), nuclear transcription factor-kB (NF-kB)) and oxidative damage by decreasing reactive oxygen species (ROS) in neuronal cell and mouse models. Curcumin, a dietary small molecule found in the common Indian spice turmeric, has been established as an encouraging therapeutic for these neurodegenerative precursors but flaws in bioavailability do to low blood solubility and low retention in the brain have resulted in little success in recent human trials. To overcome these issues, we developed a novel hexameric nanoparticle drug delivery complex that emphasizes on 1) increase in curcumin solubility and 2) two targeting aptamers that are designed to improve migration across

the blood brain barrier and specifically target dopaminergic neurons. Our goal is to demonstrate a substantial increase in the therapeutic effect of curcumin in terms of neuroprotection by subsiding negative effects correlated with PD progression. In vitro, confocal microscopy done on SHSY5Y cells recognized a targeted response when comparing complexes with and without the TrkB aptamer. Reactive oxygen species concentration was measured through DCFDA assays, showing up to a 50% decrease when treated with the full complex compared to control cells. 30 minutes post treatment in mice evidence of the presence of curcumin was found in the brain. Additionally immunohistochemistry showed reduction of the presence 8OHG and 8OHdG indicating decrease in oxidative stress. The hexameric complex potentially can be an effective therapeutic agent against Parkinson's.

Dassanayake, Arosha, *et al.*

Chemistry & Biochemistry

Nitrogen doped porous carbons play appreciable roles as materials in various fields such as energy storage, oxygen reduction and gas adsorption. In relation to carbon dioxide (CO₂) capture, the presence of doped nitrogen enhances adsorption of acidic CO₂ molecules, whereas the volume of accessible ultra-micropores (pore diameter <0.7nm) in the material determines its CO₂ sorption capacity. In-situ activation of carbons with the presence of incorporated Potassium based organic salts, has become a growing interest due to single-step carbonization/activation, facileness and efficiency. This study elaborates a one-pot synthesis strategy to produce nitrogen doped carbon spheres with high ultra-microporosity, with the aim to achieve high CO₂ uptake. Nitrogen doping was performed by co-polymerizing ethylenediamine and polypyrrole with resorcinol and formaldehyde primary precursors. Microporosity in the three series of carbon spheres was tuned by varying the amount of potassium citrate in the synthesis mixture, followed by carbonization of the resulting polymer spheres under N₂ at 700 °C. All the in-situ carbon spheres possessed narrow pore size distributions below 1nm and unprecedented CO₂ uptake of 7.35 mmol g⁻¹ at 0 °C and 1 bar pressure was achieved for CS-Py-K100 sample, which possessed the highest ultra-micropore volume of 0.42 cm³ g⁻¹ among all samples studied.

Gutierrez Cuevas, Karla, *et al.*

Liquid Crystal Institute

Design and fabrication of liquid crystalline nanocomposites with desired properties and functionalities is a growing research topic with tremendous potential for applications in displays, optics, sensors, biomedicine, etc. These hybrid systems combine the uniqueness of inorganic nanoparticles (NPs) with the characteristics of liquid crystals (LCs) in a single system. Here, we discuss our recent research in the design and study of novel colloidal hybrid silica nanoparticles coated with a mesogenic monolayer and their interaction in a LC host. The resulting hybrid SiNPs were characterized by spectroscopy and microscopy techniques and were soluble in common organic solvents and in the LC medium. The prepared nanocomposites were able to dynamically self-organize into three different states (Homeotropic, Focal Conic, and Planar) with an enhanced contrast ratio for the silica nanocomposites. The resulting functional nanocomposites described in this research could provide impetus in the design of smart windows with a low voltage operation.

Joshi, Vinay, *et al.*

Liquid Crystal Institute

A strong flexoelectro-optic effect is demonstrated in bimesogen-doped and polymer stabilized vertical standing helix. On applying AC field, the electro-optic device shows change in the direction of tilt of helical axis as the polarity switches between positive and negative, depicting the typical flexoelectric effect in vertical standing helix. The demonstrated electro-optic device shows a wavelength independent intensity modulation, low hysteresis and sub-millisecond response with optical contrast ratio of 350:1. The reported investigation provides an application for bimesogen molecules in fast-switching electro-optic and photonic devices with simple fabrication techniques.

Li, Lin

Chemistry & Biochemistry

One ubiquitous phenomenon in nature is chirality and it can be achieved at various hierarchical scales from a single molecule to macromolecular superstructures with chiral elements or not. While many bent core liquid crystal molecules are achiral, they can assemble in a chiral fashion generating chiral layer structures (B2 textures), dark conglomerate (DC) phases, helical nanofilaments (HNF), and modulated helical nanofilament (HNFmod) phases depending on the specific chemical structures. New bent core liquid crystal molecules with tris-biphenyl di-ester cores and chiral side chains was synthesized and characterized by NMR, elemental analysis, DSC, POM, circular dichroism (CD), x-ray diffraction (XRD), transmission electron microscopy (TEM), and atomic force microscopy (AFM). We demonstrate that phase transition temperatures and phase sequence of these bent core molecules depend not only on the number of carbon atoms, but more so on the position of the carbon atoms in (i.e. the chirality of) the side chain. The HNF phases formed by the chiral side chain derivatives are stable over large temperature intervals with reduced clearing points (~ 100 °C). POM images, CD spectra, and TEM images indicate homochirality, and SAXS data imply an altered, dual, 3D phase modulation (HNFmod2 phase). Synthesis of more homologues of these bent core liquid crystals and their composites with a variety of gold nanoparticles dopants are currently under investigation.

Murachver, Matthew, *et al.*

Liquid Crystal Institute

Recently thermotropic liquid crystals composed of dimers with odd number methylene linkages showed an anomalously large (up to 13°C in $B=25T$) increase of the isotropic – nematic phase transition. This shift is orders of magnitude higher than Landau theory with realistic physical constants would suggest. Motivated by these results, here we studied dimers with even numbered methylene linkages which exhibit a linear shape & nematic order. Even dimers contrast their odd-numbered counterparts in phase sequence & range of magnetic enhancement. We propose, in contrast with conventional calamitic nematogens, dimeric molecules have a rich spectrum of conformations with varying magnetic susceptibility. Under

high magnetic fields both ordered states & lower molecular bend angles are promoted.
 Research chemicals provided in collaboration with Georg Mehl (University of Hull) Gabi Tauba
 (Otto von Guericke University Magdeburg) Hao Wang (CPIP, KSU) Quan Li (CPIP, KSU)

Nallapaneni, Sasi Kiran
 Digital Science

This paper describes the innovative process of testing the frequency range of antennas receiving and transmitting by them. In this research the small copper particle is an example to check the transmitting and receiving range in different locations and directions. After checking and noting the values and the research continues how to increase the throughput in the frequency loss areas.

Pardaev, Shokir, *et al.*
 Physics

We report the layer dynamics of free-standing smectic liquid crystal membranes with a particular focus on the surface parameters that control these dynamics. Photon correlation spectroscopy reveals the contribution of distinct under- and overdamped processes. The frequency and damping rate of the former scale with scattering wavenumber in a manner that can be explained by the effect of a surface elastic constant (associated with gradients in surface tension) in addition to the average surface tension. The damping is shown to be quite sensitive to the presence of an atmosphere surrounding the film. The dispersion of the overdamped mode, observed in sufficiently thick films, can be explained as a composite of a surface elastic mode (hydrodynamic mode) and surface molecular tilt (non-hydrodynamic mode).

Sharpnack, Lewis, *et al.*
 Physics

In ordinary liquid crystal displays, switching speeds are rate limited by the relaxation of the molecules in the device. In a simple twist cell, applying an electric field switches the display to the dark state and the display relaxes back to the bright state at a rate that is limited by the elastic properties of the liquid crystal. For faster display and optical switches, new modes of operation are sought after. Ferroelectric devices would represent a significant jump in the response time for a display, since switching to both light and dark states is driven by an applied electric field. Unfortunately, ferroelectric liquid crystals are notorious for forming large defect structures that result from layer shrinkage in the Smectic C* phase. To overcome this challenge, displays based on deVries smectic liquid crystals, which have unusually low layer shrinkage in the Smectic C phase have been proposed. In order to make displays, we must first find deVries mesogens with desirable phases near room temperature. Herein, we discuss comprehensive X-ray Diffraction studies of a host of mesogens and their potential for display applications.

Poster Presentations, Listed Alphabetically by First Author

Aguolu, Obianuju, *et al.*

Public Health

Human papillomavirus (HPV) cause the most common sexually transmitted infection (STI) (genital warts, cancers) among males and females in the United States (USA). Vaccination is effective in preventing HPV consequences. Studies show HPV vaccines are safe and effective, yet coverage in the USA is low compared to other vaccines recommended for youths. This implies missed vaccination opportunities and the need to improve vaccination promotion strategies. Comic is a potentially effective medium for educating a diverse population on health behaviors, including HPV vaccination because it is easily accessible, inexpensive, attention-getting, and non-intrusive. A theory-informed message targeting youths could improve their knowledge and attitudes towards HPV/HPV vaccine and increase vaccination intention; thereby improving coverage and ultimately decrease HPV consequences. We developed a theory-informed, culturally-specific, graphic narrative messaging about HPV and HPV vaccine for youths in Northeast Ohio based on the Integrative Model of Behavior Prediction (IBM), and will study its effects on participants' knowledge, beliefs, and intention to HPV vaccinate using a self-administered survey. Findings will aid researchers who work with youths to develop effective, tailored interventions for increasing HPV vaccine coverage. Future research will explore the application of this intervention in a clinic setting and its effect on HPV vaccine coverage.

Ahmed, Khatija, *et al.*

Health Sciences

The purpose of this paper is to evaluate the benefits of incorporating a dual degree Doctor of Podiatric Medicine and Masters of Business Administration Program into the curriculum at Kent State University College of Podiatric Medicine. The incorporation of a DPM/MBA dual degree program to the curriculum would allow podiatric medical students the ability to obtain their medical education and focus on business and professional development during an uninterrupted program. This degree would allow graduates to integrate their clinical skillset and broaden their scope of practice. A questionnaire was developed to examine the benefits and risks of establishing a DPM/MBA dual degree program. Within the survey results, the physicians' stated the MBA degree helped them better understand the marketplace, increase their income potential, and better manage a private practice. Overall, 50% of the physicians stated they would encourage current students to obtain their MBA. In conclusion, graduates with a DPM/MBA degrees have mostly favorable attitudes towards the development of a DPM/MBA dual degree curriculum at KSUCPM. According to the survey results, the MBA has made them more marketable as an employee due to the unique skillset they obtained as a dual degree holding practicing physician.

Al Madi, Naser

Computer Sciences

Helmet design has seen drastic changes since ancient times, although the tasks humans use helmets for have expanded. We present a smart sports helmet designed to sense user and surroundings to enhance safety in active sports. The helmet includes EEG electrodes that

sense mental fatigue, speakers with stereo bionic hearing, and HUD display providing the user with information about surroundings for better decision making.

Aldosari, Bushra, *et al.*

Lifespan Development & Educational Sciences

Text structure (e.g., left-to-right orientation) can bias later task performance by supporting scanning strategies on related tasks (e.g., scanning left-to-right when learning word pairs). The current study was designed to investigate how the reading habits of native Arabic speakers might affect the acquisition of English vocabulary in word lists? Forty Arabic-speaking ESL students were asked to learn two word lists. The experimental materials were two lists of low-frequency English words with their Arabic translations. In each of two sessions, 20 pairs of English–Arabic words were presented to the participants, and the presentation order and position of the words in the list was counterbalanced across students (e.g., Arabic–English). The participants were asked to complete the English–Arabic directional translation test. The results suggest that learning the word pairs from Arabic–English resulted in greater recall of English words.

Alexander, Matthew

Mathematics

We consider embedding Lipschitz-free Banach spaces as polytopes in Euclidean space and the corresponding volume product. Doing so allows us to study the relationship between the extreme cases of the volume product and the underlying space associated to the corresponding polytope.

Alghamdi, Ahlam, *et al.*

Foundations, Leadership, & Administration

Several measures have been constructed to assess workspace satisfaction and productivity. However, very few previous studies have developed measures to examine university staff and/or faculty satisfaction with and productivity in relation to office design factors, especially using samples outside the United States and Europe. The aim of this study was to determine the psychometric properties of a survey of ambient factors closely related to office design (e.g., spatial arrangement, privacy, noise, lighting, and temperature) that may significantly impact faculty members' satisfaction and productivity in Saudi Arabia. The survey included two scales with 22 items in total. Fifteen of the items comprised the satisfaction scale including three content domains (i.e., environmental characteristics, privacy, spatial arrangement), and seven of the items formed the productivity scale. Participants were recruited through social media yielding 83 valid responses ($n = 41$ Males and $n = 42$ Females). Items were analyzed with two statistical approaches: (1) Descriptive Statistics (e.g., Item Difficulty and Discrimination), and (2) Internal Consistency Reliability (Coefficient α). The internal consistency reliabilities for the satisfaction subscales were .78, .85, and .86, respectively, and for the productivity scale, α was .79. The results from this study indicated that the psychometric properties of the newly developed measure using Classical Test Theory analysis techniques were satisfactory. Furthermore, the study proposes validation techniques for the resulting survey scores.

Ali, Ismael, *et al.*

Computer Sciences

Concepts in web ontologies help machines to understand data through the meanings they hold. Furthermore, learning contexts and topics of web documents also have helped in better semantic-oriented structuring and retrieval of data on the web. In this research we present a novel approach for domain-independent open learning of domain concepts, context and topic of any given web document. Our approach is based on a computational version of the Construction-Integration (CI) model of text comprehension. Our proposed system mimics the way humans learn the meanings of textual units and identify domain concepts, contexts and topics in the form of semantic networks. We apply our system on a number of web documents with a range of topics and domains. The resulting semantic networks provide a quantitative and qualitative insights into the nature of the given web documents.

Aljohani, Aisha, *et al.*

Computer Sciences

We consider the distributed setting of N autonomous mobile agents that operate in Look-Compute-Move (LCM) cycles and communicate with other agents using colored lights (the agents with lights model). We study the fundamental COMPLETE VISIBILITY problem of repositioning N agents on a plane so that each agent is visible to all others. We assume obstructed visibility under which an agent cannot see another agent if a third agent is positioned between them on the straight line connecting them. We are interested in fault tolerant algorithms; all existing algorithms for this problem are not fault-tolerant. We study fault-tolerance with respect to failures on the mobility of agents. Therefore, any algorithm for COMPLETE VISIBILITY is required to provide visibility between all non-faulty agents, independently of the behavior of the faulty ones. We model mobility failures as crash faults in which each faulty agent is allowed to stop its movement at any time and, once the faulty agent stopped moving, that agent / will remain stationary indefinitely. In this paper, we present and analyze an algorithm that solves COMPLETE VISIBILITY tolerating one crash-faulty agent in a system of $N \geq 3$ agents.

Alkhayer, kholoud

Biological Sciences

Hemoglobin beta (Hbb) is present in the nucleus and the expression of Hbb in SH-SY5Y cell line increased the trimethylation of histone H3 on lysine4 (H3K4me3), a histone mark that regulates cellular metabolism. We performed immunohistochemistry (IHC) to localize Hbb in postmortem cortex and found that Hbb is enriched in pyramidal neurons in the internal layers of the cortex. Moreover, co-IP followed by LC MS/MS experiments showed that Hbb interacts with subunits of ATP synthase, histones, and a histone demethylase. Furthermore, we found that oxidative stress and mitochondrial toxicity changes the localization of Hbb in subcellular fractions. Therefore, we hypothesize that Hbb may be a part of a mechanism linking mitochondrial energetics with epigenetic changes to histones in the nucleus that may provide neuroprotection in MS by supporting neuronal metabolism. We are looking into the mechanisms that Hbb might alter mitochondrial genes transcription via upregulating histone methylation. By knocking down H3K4me3 with siRNA and the Hbb-O mutant construct that is

incapable of binding oxygen approaches we will verify that Hbb upregulates the genes involved in electron transport chain therefore, mitochondrial respiration

Almutairi, Layla
Biomedical Sciences

Hospital-acquired infection are commonly caused by *Staphylococcus aureus* (*S. aureus*), which has been shown to be the main cause of lower respiratory tract infection, surgical site infections, nosocomial bacteremia, and wound infections. However the increased incidence of *S. aureus* infections that are resistance to various antimicrobial drugs necessitates the development of novel treatment strategies. It has been shown that hyperthermia treatment to increase the temperature up to 45°C could significantly enhance the antibiotic susceptibility of *S. aureus*. The question is how heat can be applied topically and used for a long period without risking thermal burns in the host tissue, since the increase in the temperature to 45°C, particularly for a prolonged period, may be associated with thermal burn injuries. The objective of this study is to provide a proof of concept for applying magnetic nanoparticle (MNP) hyperthermia as a potential enhancer to antimicrobial therapy on *S. aureus*. The principle of this method is to induce a localized increase in temperature in bacteria by targeted activation of MNPs with externally applied energy source of alternating magnetic field. Using this, we have examined whether pre-treatment of MNP hyperthermia to the culture of *S. aureus* can enhance the antibiotic susceptibility of *S. aureus* by varying MNP dose and magnetic field intensity.

Aloliqi, Abdulaziz, *et al.*
Biomedical Sciences

Prostate cancer (PC) is one of the most common male cancers in United States. PC lethality is due to metastatic growth, a process whereby cancer cells move from primary site to secondary site. We examined the importance of a cell membrane protein, connexin43 (Cx43) up-regulated in metastasizing PC. We tested the necessity of Cx43 by silencing its expression in highly motile PC3 prostate cancer cells. Knockdown of Cx43 decreased motility of PC3 cells in Boyden chamber migration assays two-fold. To confirm these results, we also performed wound healing assays. The PC3 control cells moved into the scratched area of the monolayer filling in the wound, unlike PC3 with silenced Cx43. These results indicate that loss of Cx43 decreases significantly the migration ability of PC3. To determine whether Cx43 expression is sufficient to drive prostate cancer cell migration, we now are testing non-migratory LNCaP cells that lack Cx43. After engineering LNCaP cells to overexpress Cx43, we will examine their cell motility. Our overall goal is delineate the mechanism whereby the connexins contribute to cell migration and tumor metastasis. Once these pathways are identified they can provide both prognostic markers and targets for therapy.

Alwabsi, Nowayer
Computer Sciences

My graduate thesis, entitled "Finding a minimum-width trounulus covering a set of points on the plane" develops an algorithm for determining the minimum-width between two concentric equilateral triangles containing in their betweenness a set of n points of the Euclidean plane. The name "trounulus" specifically refers to the region between the two concentric triangles. This

is a new development in the field of computational geometry. While algorithms have been developed for other concentric geometric shapes (like, circles, squares, etc ...), any attempts to develop algorithms for equilateral triangles are unknown. My research acknowledges the significance of the equilateral triangles in the field of geometry and computer science and proposes an efficient solution to the problem. Finding an optimal trounulus may find multiple practical applications in robotics, graphics, visualization and many other areas of algorithms and computer science.

Ghosh , Monica, *et al.*

Biomedical Sciences

Transient receptor potential channels of the ankyrin subtype-1 (TRPA1) are non-selective cation channels that show high permeability to calcium. The functional significance of TRPA1 ion channels in the modulation of cardiomyocyte contractile function has not yet been explored. Freshly isolated cardiomyocytes were obtained from murine heart and subjected to simultaneous measurement of intracellular free Ca^{2+} concentration ($[Ca^{2+}]_i$) and contractility. Our findings demonstrate that TRPA1 stimulation with AITC results in a dose-dependent increase in peak $[Ca^{2+}]_i$ and a concomitant increase in cardiomyocyte fractional shortening. Further analysis revealed a dose-dependent acceleration in time to peak $[Ca^{2+}]_i$ and velocity of shortening as well as an acceleration in $[Ca^{2+}]_i$ decay and velocity of relengthening. These effects of TRPA1 stimulation were not observed in cardiomyocytes pre-treated with the TRPA1 antagonist, HC-030031 (10 μ M) nor in cardiomyocytes obtained from TRPA1 null mice. We further demonstrate these inotropic and lusitropic changes in Ca^{2+} and contractility are virtually identical to those observed following α -adrenergic receptor stimulation with isoproterenol. These novel findings demonstrate that stimulation of TRPA1 ion channels results in activation of cellular signal transduction pathways associated with increasing $[Ca^{2+}]_i$ and contractility in adult mouse ventricular cardiomyocytes.

Appling, Torri, *et al.*

Architecture

During the latter half of the 20th century the Basque country administration attempted a renaissance of the region. Examples of this can be seen with two major architectural projects that occurred almost simultaneously with the Guggenheim Bilbao in 1991, and the Kursaal Congress Centre and Auditorium during 1989 in San Sebastian, when design proposals were sought for a cultural center that could bring international recognition to the city. The purpose of this research is to examine the critical perception of these two iconic 20th century Spanish buildings, as well as the role these structures played in developing a national identity. What can be gained from comparing the two is an understanding of the impact of “innovation” in design. While both buildings are well known in Spain, the Guggenheim largely outpaces the Kursaal in notoriety and international recognition. The goal is to synthesize an explanation of the effect of these two built forms in relation to each other, development of Basque Country, and Spanish architecture. The methodology employed will be literature review based examination of original manuscripts composed by both architects, as well as other primary sources relating to economic impact, theoretical, and critical response.

Asquith, Eleanor

Architecture

This research will demonstrate the performance and characteristics of pervious concrete within the cold climate of northeast Ohio. By studying the baseline properties and testing the performance under various conditions, alterations will be studied and applied to improve water drainage and filtration of contaminants. As the built environment continues to grow, there is a need to cover the ground with a paved surface, in the form of sidewalks, roads, and parking lots, in turn reducing absorptive and permeable surfaces. With the growing concern of environmental health within the built environment, it is important to better understand methods which provide water drainage and filtration systems. This research will aid in the consciousness of environmental health through the study and improvement of water quality and storm water management methods in colder climates. Baseline pervious concrete will be studied and tested under a variety of climatic conditions, considering temperature, precipitation, and particulates, to determine its permeability and water filtration. Baseline results will be used to alter the properties for improved performance. This research will be beneficial to organizations such as the EPA and designers of the built environment who are concerned and interested in the health and impacts of the built environment.

Aulino, Elizabeth, *et al.*

Biological Sciences

The Bruce effect is the spontaneous termination of pregnancy after exposure to an unfamiliar male early in pregnancy. Similarly, there is evidence that exposure to an unfamiliar male late in pregnancy can result in compromised maternal care, which represents a shift in maternal investment. Previous work has demonstrated female vasopressin 1b receptor knockout (Avpr1b $-/-$) mice have impairments in their Bruce effect, in that they do not abort pregnancies when exposed to a novel male. Thus, we hypothesized that Avpr1b $-/-$ females would also have impairments in maternal investment. Avpr1b wild type (Avpr1b $+/+$) and Avpr1b $-/-$ mice were mated and exposed to familiar or unfamiliar males at approximately gestational day 14. Once born, pups were weighed every three days, as a proxy of maternal investment. Preliminary data suggests that Avpr1b $-/-$ dams have reduced maternal investment, as their pups have low weights compared to controls. Interestingly, these early differences in pup weights are reconciled by weaning age. While we intend to add animals to this study, the current data suggest that impairments in the ability of Avp to signal via the Avpr1b result in compromised maternal investment, which could have lasting effects on the offspring.

Ayotte, Samantha

Architecture

Urban agriculture is trending in cities across the U.S. as of recent, due to a large scale of available land. However, these public spaces of food production aren't integrated into the urban fabric in a valuable or meaningful way. Current urban agriculture case studies are generally found on vacant lots or are community gardens that are not fully connecting the surrounding neighborhood. On the opposite side, many case studies of urban living consist of private units with little to no shared public space. In most cases, shared space fails to truly connect the residents. Through this analysis, an opportunity for advancing the urban agriculture discourse

appears. My project intends to bring urban agriculture to the city in a different way. By creating a new housing ideology in a higher density location, I can begin to mesh together analysis from urban agriculture case studies as well as communal-living case studies. Creating a space that is a social byproduct of communal living and urban agriculture provides the opportunity to create a larger sense of community in a city like Cleveland, Ohio.

Bebber, Michelle
Biomedical Sciences

A recurring question in temper related studies is whether or not pottery additives were selected for production-based benefits gained during the initial vessel formation phase versus performance-based benefits associated with post-firing vessel daily use. It has been widely surmised that temper was added to clay to assist in vessel formation and many studies have focused on the post firing mechanical properties offered by various tempers. This current study is designed to determine in which phase of vessel life was temper of primary importance—during initial formation—or during daily use. In order to assess whether or not temper's primary role relates to the formation phase or the post firing use life, an archaeological experiment was designed. This experimental analysis will address whether or not it is possible to determine if temper was selected primarily for its role in vessel formation and firing, or if it was selected for the improvement in mechanical properties that have been studied in several experimental projects.

Brahler, Emily
Anthropology

The hormone vitamin D is essential to health and overall well-being. It facilitates calcium absorption making it not only integral for growth and maintenance of the skeleton, but also significant within the immune and cardiovascular systems. It is synthesized when the skin is exposed to sunlight, or in more recent decades, through supplementation. Therefore, populations living in nonequatorial areas with limited sunlight, and limited access to appropriate supplementation, are particularly at risk for prolonged deficiency and associated conditions such as osteomalacia in adults. Osteomalacia leaves distinctive traces, called pseudofractures, on bone that can be seen upon gross examination, particularly in postcranial skeletal elements. This study serves to explore connections between these characteristic skeletal manifestations of prolonged hypovitaminosis D and recorded mortality among adult individuals in the Hamann-Todd Human (HTH) Osteological Collection housed at the Cleveland Museum of Natural History. This study serves to build upon previous data collected by Dr. Robert Mensforth in an attempt to illuminate the nature of this condition, in terms of demographic distribution and recorded cause of death, within this historical Cleveland population that lived when necessary means of supplementation were not readily available.

Carnessali, Michael
Architecture

The Leadership in Energy and Environmental Design (LEED) is the leading credential system for sustainability in the United State today. The Green Building Certification Institute (GBCI) has certified over 6,000 Platinum, 15,000 Gold, 18,000 Silver, and 15,000 Bronze (certified)

buildings using the LEED certification standard; with 40% of the built environment sustainable design has become a growing field of importance within the discipline of architecture. By using LEED certification, the assumption can be made that these standards push and develop sustainable design as the leading authority in accreditation. The purpose of this paper is to analyze the sustainable qualities from which LEED roots its credit-based, tiered, system and synthesize a more efficient way to rate sustainability in the built environment. By using quantitative data in which similar cooperatives have collected, such as Breeam, PassivHaus, and The Living Building Challenge, will be used as a comparison to similar LEED buildings. It is through this research which will uncover some of the fallacies from which the LEED system falls short and bring about a more effective system that focuses on the performance of the building as a whole rather than the individual components that make up the system.

Carrick, Ryan, *et al.*

Architecture

This research will demonstrate how micro-climates within a climate zone alter the overall energy performance of a building. This research will be performed by placing an identical building in four micro-climates within the city of Chicago. Each micro-climate will emphasize diversity in the density of the urban fabric, creating changes in the overall documented conditions of the climate zone. As it is currently defined, the Urban Heat Island (UHI) effect is the general rise in temperature of a man made area. Although, this definition does not take into account the smaller micro-climates and localized conditions within that area. The localized conditions which occur in these micro-climates, change the overall energy requirements of a building in that area. Each micro-climate will be tested through energy simulation, accounting for the specific conditions, then compared to the baseline energy performance for the city as a whole. Through these simulations, the outcome will be to identify large enough variations in the energy data for each micro-climate, to support a revision to the Environmental Protection Agency's definition of the UHI Effect. This revision would highlight the climatic variations in the urban fabric density, and the impacts it has on the heat gain of that area.

Chaney, Morgan, *et al.*

Biomedical Sciences

Cytochrome P450 enzymes are encoded by a diverse superfamily of genes, some of which detoxify so-called xenobiotic compounds from an animal's diet (e.g., alkaloids, terpenoids). Our study examines the *CYP2C* subfamily of genes, which are all present in a similar syntenic pattern among well-annotated primate genomes. We aligned genomic DNA and mRNA sequences for all syntenic protein-coding *CYP2C* genes available for human, chimpanzee, bonobo, gorilla, orangutan, gibbon, and long-tailed macaque in public databases. An intron shared by 26 out of 30 protein-coding *CYP2C* genes (range: 3-9 genes per species) was analyzed by maximum likelihood (ML); this analysis revealed close phylogenetic cohesion of these genes within four gene-clusters. Additional ML analyses of the translated protein-coding sequences (28 of 30 genes) implied putative cohesion of function among these genes as well. Overall, our data support a scenario of differential retention of the *CYP2C19* gene, which was duplicated from *CYP2C9* during primate evolution, as well as independent deletions of the

CYP2C18 gene in the chimpanzee-bonobo lineage and that of the gibbon. Because CYP2C enzymes interact with exogenous compounds present in the diet, our results provide insights for further inferences of the early ecology or physiology of the apes.

Chicoski, Allyson

Nursing

Employers of new nursing graduates notice a practice-education gap with employment. In order to close the gap, educators advocate the initiation of experiential teaching strategies at the undergraduate level, to establish multiple ways of thinking. Clinical imagination involves the integration of technical mastery, clinical judgment, and ethical comportment. Scientific knowledge is necessary in the development of clinical imagination. Additionally, intuition, or the ability to recognize and anticipate changes, is required, along with flexibility, to quickly respond to these changes. Clinical imagination considers the context of the patient and encourages the nurse to “imaginatively empathize” while providing patient care. It, also, assists with problem solving, decision-making, and the organization of clinical situations and patient care. To foster clinical imagination, educators utilize experiential teaching strategies to provide a hands-on approach by engaging students directly into practice. Educators design experiences by placing students in active roles, connecting ethical theories, past experiences, and scientific knowledge. Teaching strategies, such as problem-based learning, role modeling, reflection, and simulation, cultivate clinical imagination while effectively assimilating different classroom settings. Fostering necessary clinical imagination in nursing education helps to close the practice-education gap, and with the institution of experiential-teaching strategies, educators produce a practice-ready nursing workforce.

Daily, Bryan

Architecture

Daylighting impacts the health and achievement of educational facility inhabitants. A report found that student test scores were 9% to 15% higher in classrooms with the largest window area (Heschong Mehone Group 1999). Another study observed the quality of light had an effect on student health (Hathaway 1992). An analysis of Ohio’s green schools observed that LEED schools with 1 credit of EQc8.1 daylighting credits had a worse Performance Index than their LEED 2 & 3 credit and non-LEED counterparts. This analysis is an endeavor to determine why the LEED EQc8.1 1 credit schools performed worse than both the non-LEED and LEED 2 & 3 credit schools. Determining the daylight quality in the LEED 1 credit classrooms will be executed by: taking photometric readings of classrooms within a gridded system, student and teacher population surveys about their perception of the quality of daylighting provided in their school’s classrooms, and interviews with the students and teachers to determine their personal interaction with the daylighting of the classrooms. The results from these methods of research will provide evidence to determine whether the daylight quality of these LEED EQc8.1 1 credit classrooms impact the Performance Index of these schools.

Davis, Ashley, *et al.*

Biomedical Sciences

Obesity rates are increasing despite the many diet and exercise programs available today. Weight loss was investigated using a contrasting rat model of obesity and leanness: obesity-prone rats (low capacity runners, LCR) and more physically active lean rats (high capacity runners, HCR). Obesity-prone rats are subject to cardiovascular disease, cancer, and diabetes. Our past studies found that during 50% caloric restriction, lean rats lost more fat than obesity-prone rats. An alternative diet strategy was investigated where 16 male rats (n=8/group) underwent 7 weeks of intermittent fasting (IF), chow removed every-other-day, and an ad libitum diet provided on non-fasting days. Body composition was measured weekly, and body weight and food intake were measured daily. It was hypothesized that IF would induce loss of fat and lean mass in both rat types with obesity-prone rats losing more weight. Consistent with our prediction, obesity-prone rats lost twice as much fat and weight compared to lean rats. Results were consistent with previous female rat data but contrasted with previous findings when weight loss was induced using 50% calorie restriction. IF conserved lean mass while enhancing fat loss. These results suggest that IF may be a potential therapy for reducing weight and the risk of obesity-related disease.

DeLullo, Thomas
Architecture

This paper traces the prevalence of masonry and modularity in Rafael Moneo's work in the theories of his predecessors, Spanish tradition in brick, and his training as an Architect. Rafael Moneo's Roman Art Museum in Mérida, Spain exemplifies the Spanish mastery of masonry construction through the use of roman brick as a building material. Moneo's Kursaal Congress Center in San Sebastián also demonstrates a masonry-like organization with defined joints and modularity even without the use of brick as a building material. / Previous research into Spanish Modernism has argued that masonry in modern Spanish architecture is a result of tradition and a reluctance to embrace new building materials. This paper argues that Moneo's use of modularity originates more from his international training as an Architect, where he learned to consider the technical details of construction and from his belief in a composition of flexible parts. / The method of research includes a critical study both of the museum's previously mentioned as well as Moneo's larger body of built works through interviews, articles, and drawings by Moneo. Research into Moneo's training and early career will come mainly from historiographical accounts such as De Canales and Ray's published biography.

DeLullo, Thomas
Architecture

This paper investigates the adjustable, reusable mold technique in freeform concrete construction and its feasibility for increased construction efficiency. Advancements in digital design processes have increased architects' abilities to rationalize and convey complex designs to builders. However, technology in the construction industry has not been able to keep up with the increased efficiency of the design field. Curvilinear building forms that require unique concrete surfaces often require a unique piece of formwork for each segment. This results in a large amount of waste material leaving the construction site, increase embodied energy, and extra man hours. Alternatively, previous research has shown that an adaptable curvilinear formwork responds to this issue by using a flexible membrane that can be adjusted to match

control points to those of a digital surface, which allows for precise, efficient fabrication of unique segments and reusability of the formwork. The goal of the research is to construct a theoretical system for transferring digital geometry to a physical product through fabrication and testing for precision. This will attempt to verify previous results and add to the small body of published work investigating this technique as a viable possibility for increasing construction efficiency for unique building projects.

Deraway, Stacy Leigh

Anthropology

Language evolution, from a cognitive perspective, is central to understanding how humans differ from nonhuman primates. Among all primate species, language is unique to humans and the basis of many defining aspects of humanity, most notably cumulative culture. The brain has many areas that are crucial for language production and comprehension, and the traditional model of language focuses heavily on Broca's and Wernicke's areas; however, this research will focus the thalamus. Previous studies have shown that the thalamus is related to motoric speech and prosody, semantic processing, and verbal memory. The two nuclei that will be the focus of this study are the ventral anterior and ventral lateral nuclei. The level of dopamine in these two nuclei will be compared across four species: humans, chimpanzees, baboons, and macaques, as dopamine has been shown to be involved in the learning process. The goal of this research is to elucidate the relationship between dopamine in these particular thalamic nuclei and the production of language from an evolutionary perspective.

Dodge, Brandi

Architecture

Lifestyle centers are creating a sense of community by providing public spaces for people to gather and engage in social interaction – a community in which to live, work, play and shop. As of January 2017, it is estimated that 491 lifestyle centers exist in the United States. With the construction of lifestyle centers on the rise, more opportunities for an increased sense of a community culture can be created. Americans hold an emotional desire to rebuild their community and lifestyle centers are a way to tap into that desire. The lifestyle center aims to create and bring back the feel of the old-fashioned “Main Street” culture. The objective of this research is to measure the quantity of people engaging in social interaction as a sense of community at Crocker Park in Westlake, Ohio. Research will include past studies investigating how social interaction has seen an increase through the design of community spaces and seating selection. Qualitative research will include observations of the social interaction occurring among people within the community spaces. As urban retail continues to grow, there will be more opportunities available for social interaction within the community.

Dorsch, Eric, *et al.*

Health Sciences

Traditional resistance exercise may increase the risk for a cardiovascular event, while low-intensity resistance exercise with blood flow restriction (BFR) may not. PURPOSE: To evaluate autonomic modulation in response to resistance exercise with and without BFR. METHODS: Sixteen young, healthy resistance-trained men volunteered for the study. Autonomic modulation

was assessed at rest, 15 (Rec1), and 25 (Rec2) minutes after low-intensity resistance exercise with BFR (LI-pBFR), traditional high-intensity resistance exercise (HI) without BFR, and a quiet control (CON). Autonomic modulation assessments were expressed as natural logarithm (Ln) including total power (LnTP), vagal modulation (high-frequency power (LnHF)), sympathetic modulation (low-frequency power (LnLF)), and sympathovagal balance (LnLF/LnHF ratio). RESULTS: There was a significant ($p<0.05$) interaction for LnTP such that it was reduced at Rec1 and Rec2 after LI-pBFR and HI compared to Rest and CON. There were significant ($p<0.05$) interactions for LnHF and LnLF which decreased at Rec1 and Rec2 after LI-pBFR and HI compared to Rest and CON. There was a significant ($p<0.05$) effect of time for LnLF/LnHF ratio such that it was increased at Rec1 and Rec2 compared to Rest. CONCLUSION: Both low-intensity resistance exercise with BFR and traditional resistance exercise alter autonomic modulation after an acute bout of resistance exercise.

Douglas, Colleen

Lifespan Development & Educational Sciences

In early intervention, it is essential for professionals to support families in learning strategies that promote their child's meaningful participation and engagement in daily routines. A primary reason children receive Early Intervention services is due to communication difficulties and these communication challenges often effect parent-child interactions. Consequently, it is important to provide effective communication strategies to the parents in order to support these parent-child interactions and functional communication. This single subject research study will look at the effects of coaching a parent on the use of naturalistic language strategies that are likely to increase child communication during play. The Enhanced Milieu Teaching (EMT) strategies that will be implemented by the parent during this study will include time delay, environmental arrangement and matched turns. Parental fidelity of implementation of the EMT strategies, frequency of use, and satisfaction with the strategies will be measured. This study will also examine the effects of parental use of these strategies on child communication. The child's communication will be measures by the frequency of vocalizations, gestures and signs. The study results along with future implications will be discussed during the poster session.

Drungil, Ashley

Lifespan Development & Educational Sciences

The field of early intervention provides supports for infants and toddlers with developmental delays or disabilities. Supports are made to address the needs and priorities of the family to build upon their skills and create a positive impact on the early experiences of young children. Children learn best when they are with familiar people in familiar environments during their everyday routines, otherwise known as natural environments. In early intervention, we coach families in their natural environments to foster the development of children. In this study, I will be working to empower the parent to use evidence based strategies during their daily routines and play. The specific goal of the study is to examine the effects of parent-implemented milieu teaching strategies on the language outcomes of children with disabilities in the context of play. The study will be a single-subject design with baseline and intervention conditions. Coaching will be used as the primary tool for transferring evidence-based knowledge to the parent in their home. The parent will learn how to embed milieu teaching strategies into everyday play

activities with their children and what quality indicators of play look like. Child communication will be measured based on vocalizations, gestures, words, and phrases.

Dudhade, Tejas Dnyaneshwar

Applied Engineering, Sustainability, & Technology

In a solid oxide fuel cell (SOFC) system operated at relatively high-temperature, its thermal management is a key issue due to the following twofold reasons; one is based on appropriate/safe operation and maintenance of the system, while the other relates to efficient use of thermal energy which is necessary for high-performance distributed power generation. In this paper, the thermal management of the SOFC system is discussed basically and systematically. First, the mass and energy balances of the SOFC system are analyzed on the basis of a simplified model. Next, according to the quantitative knowledge obtained by the above analysis, all the components included in the system are discussed. That is, various heat exchangers for fuel, water/ steam vapor, air and exhaust gas, cells/stacks and insulation of the entire system are addressed.

Earp, Paul

Library & Information Science

A comparison of university policies dealing with students that have disabilities covered by the Americans with Disabilities Act. Areas reviewed are similarities of policies between qualifying size universities within the same state, and similarities between all qualifying size universities within the U.S. How recent are revisions and/or reviews of those policies, and what trends are arising in policies that have been recently reviewed.

Eberly, Rebecca

Lifespan Development & Educational Sciences

Reading is a fundamental way of learning as we go through life. Shared book reading is an activity that many parents do with their children and is one of the first steps in learning to communicate. Dialogic book reading is an evidence-based intervention known to promote language and communication between caregivers and children. This intervention strategy can be implemented with families whom English is not their primary while ensuring the cultural responsiveness of early intervention. The purpose of this single subject research study is to investigate parent-implemented Dialogic book reading and its effects on parent-child communication when English is not the primary language. Dialogic book reading is a shared reading activity in which the same book is read with the child in a way that allows the child to explore and expand upon the pictures. Dialogic book reading also involves the parent repeating and expanding on the child's comments or labels during the shared book time. During this study, the effects of coaching on parental frequency and fidelity of strategy use for wait time, repeating, or expanding words during book reading will be measured. Change in the child's frequency of utterances and gestures will also be assessed.

Eisa, Alaa, *et al.*

Biomedical Sciences

Gametogenesis requires complex regulation of proteins that control meiosis to produce, in the case of females, the mature egg that can be fertilized to produce an embryo. In female mammals, meiosis, the production of the haploid gamete, is arrested at several points. The resumption of meiosis in the oocyte to produce the mature egg, the process of oocyte maturation, involves both the regulation of meiosis and cytoplasmic changes to produce a fertilizable egg. Oocyte maturation and meiosis are dependent on intricate and reversible interactions to control proteins in which protein kinases phosphorylate proteins and protein phosphatases remove phosphates from proteins. Regulation by members of the Protein Phosphatase 1 (PP1) family have been implicated in regulating meiosis. PPI phosphatases are encoded by three genes to produce isoforms PP1 α , PP1 β and PP1 γ . In addition, alternative splicing of transcripts from the single gene *Ppp1cc* produces, in some cells, two isoforms PP1 γ 1 and PP1 γ 2. PP1 γ 2 is highly expressed in testes where it serves an essential role in spermatogenesis and regulation of sperm function. The role of PP1 γ 1 and PP1 γ 2 in the ovary and in oocytes and eggs not entirely known. Transcripts of PP1 γ 1 and PP1 γ 2 were previously found in mouse oocytes and eggs, but proteins were not detected. We have confirmed the presence of mRNA for PP1 γ 1 and PP1 γ 2 in oocytes and eggs and, for the first time, we show the presence of both PP1 γ 1 and PP1 γ 2 proteins in mouse ovary, oocytes and eggs. Therefore, it will be necessary to examine PP1 γ 1 and PP1 γ 2 phosphatases in the oocyte maturation. We are currently examining the PP1 protein phosphatases in oocyte maturation using gene knockout models for the PP1 γ gene *Ppp1cc*, and other methods to reveal the roles of PP1 γ 1 and PP1 γ 2, together with the other phosphatases that are thought to regulate meiosis, including PP1 α and PP2A, as well as the PPI interacting proteins.

Ellis, Elizabeth

Architecture

Toledo is a proud mid-western city that holds true to its industrial upbringing. Since the time of its birth, Toledo has had notions of utopia. There has been an underlying theme within this underrated rustbelt city that new industry and technology will inevitably bring Toledo into the newest century presented. There are three major eras that this project intends to dissect within the city of Toledo. The Glass Era, the WPA Era, and the ProMedica Era. All three of these eras employ within themselves the future sense of revitalization each will have within a sector of Toledo's industry. All three have in turn monumentalized themselves within Toledo's memories and history. The goal then becomes a question of how to unpack these three eras and begin to explore what happened that these over-sweeping solutions never seemed to stick. By designing an actual monument for the "Toledo of the Future" Toledoans and others can begin to explore these analogous pasts that can begin to show what the future may hold for the city. With the creation of images that show the idealized utopias this project also intends to allow a monumentalization of Toledo's past and questions what that means for Toledo's future.

Faul, Sarah

Lifespan Development & Educational Sciences

Within the field of Early Intervention, professional engagement with caregivers should emphasize the intentional parent-child interaction within the natural environment of everyday routines. Families and professionals should partner to identify family priorities for learning and routines in which intervention will occur. This AB single-subject research study will focus on the parent and their 22-month-old child with receptive and expressive communication delays. The caregiver(s) will be coached on aspects of Enhanced Milieu Teaching (EMT) in order to implement these strategies within the family's daily-routine. The EMT strategies that will be used as the intervention include time delay and responsive interaction (independent variables). This study includes two levels of dependent variables, parent and child levels, to determine the effects on intervention. First, the study will measure the effects of coaching interaction of the fidelity of parental use of EMT strategies; and second, measure the effects of parental use of EMT strategies on the child's use of intentional gestures and vocalization and/or word approximation during play (dependent variables). Results, implications, and future directions from the study will be shared.

Fischer, Stephen, *et al.*

Health Sciences

To determine the extent to which metabolic and cardiovascular variables and also blood glucose and blood lactate vary between resistance workouts comprised of solely eccentric, concentric or traditional muscle contractions. N=12 men and women completed a traditional (TRAD), concentric (CONC), and eccentric (ECC) full-body resistance workout at 65% of a measured 1 repetition max (1RM) with each condition matched for mechanical work. During each condition, the subject was fitted to a metabolic cart where metabolic variables such as oxygen consumption (VO₂) and percentage energy derived from carbohydrate (%CHO) and cardiovascular variables including heart rate (HR) and mean arterial pressure (MAP) variables were recorded through indirect calorimetry and heart rate monitor. Blood glucose and blood lactate were taken at five different time points. The TRAD (9.26 ± 1.83 ml/kg/min) and CONC (10.03 ± 1.63 ml/kg/min) conditions resulted in significantly (both $p < 0.001$) greater VO₂ values compared to the ECC condition (6.67 ± 1.25 ml/kg/min.) Accumulation of lactate Post Ex. was also significantly (both $p < 0.001$) greater in the TRAD and CONC compared to the ECC. Results indicate much greater metabolic demand from concentric and traditional contractions compared to eccentric contractions on a whole body level.

Fitzgibbon, Andrea, *et al.*

Biological Sciences

Photosynthetic biofilms in streams can influence element cycles through changes in physicochemical conditions over diel time scales. Through diffusion and advection, the products of algal metabolism may modify chemical speciation and ecosystem function in sediments. We quantified the magnitude of change in physicochemical gradients over diel periods in sediments underlying photosynthetic biofilms. Hourly micron-scale physicochemical depth profiles from the water column into sediment were collected using oxygen microelectrodes. The sediment oxic layer was shallowest (~3 mm) at nighttime just before dawn and deepest (>10 mm) between

13:00–19:00. Deepest oxic layer was concurrent with the time that sediment oxygen concentration was highest (~140% saturation). Maximum sediment oxygen concentration was stable for an additional 4 hours following maximum water column concentration. Water column oxygen concentrations indicated that the stream was slightly autotrophic (NEP = 0.28 g O₂/d/m²). Increased depth in the sediment oxic layer over diel periods suggests that algal biofilms can drive sediment physicochemistry and coupled elemental cycles at fine temporal scales. Time lag in oxygen concentrations within sediments suggests that biogeochemical reactions favored under oxic conditions would be sustained at depth beyond the period of peak primary production.

Fleischaker, Rachael

Music

In June of 2014, the National Coalition for Core Arts Standards in collaboration with the National Association for Music Education released the National Core Music Standards. These standards offer a framework for school music programs by outlining three artistic processes – Creating, Performing, and Responding – and providing a framework for engaging students in these processes. While the adoption of these standards is voluntary, many states and local school districts will look to this model for guidance when revising their own standards. The purpose of this paper was to explore the Core Music Standards through the lens of an elementary general music teacher who primarily uses the Kodály method of instruction. The paper explored the definition of musical literacy in the context of the Core Music Standards compared to the context of the Kodály method. Then the paper examined the prospect of using the Kodály method within the framework of the Core Music Standards. The paper compared the language, sequencing, and essential questions used in the Core Music Standards with the educational philosophies and pedagogical practices of the Kodály method.

Followay, Brittany, *et al.*

Health Sciences

To determine the effects of adding different levels of inspiratory resistance to submaximal and maximal exercise performance in normobaric hypoxia on blood lactate (Lac) and hemoglobin (Hb) values. METHODS: Nine apparently healthy, male adults (mean ± SD; age = 25 ± 2 yr, height = 1.81 ± 0.06 m, mass = 92.5 ± 21.6 kg, BMI = 28.0 ± 5.3 kg·m², VO₂ = 46.32 ± 9.01 ml/kg/min²) were analyzed. The participants visited the laboratory on four separate visits in a counterbalanced design. The four conditions consisted of a normoxic (21% O₂) condition with zero added inspiratory resistance (Normox0) and 3 hypoxic (17% O₂) conditions with 3 levels of added resistance (Hypox0, Hypox1.5, and Hypox7.5 cm H₂O) attached to a two-way non re-breathing face-mask. The exercise protocol consisted of data collection at baseline and after 30 min rest in the hypoxia chamber. Three submaximal stages followed on the cycle ergometer with increasing levels of intensity (50, 100, and 150 W) which were then immediately followed by a VO₂max test. After completion of the VO₂max test the participants recovered in the hypoxia chamber for an additional 30 min. Lac and Hb data were collected by a finger prick and analyzed. A 2 factor repeated measures ANOVA was used to evaluate condition (Normox0, Hypox0, Hypox1.5 and Hypox7.5) by time (baseline, 30 min of rest in hypoxia chamber, immediately after the VO₂max test, and during 30 min recovery period) on Lac and Hb. Paired-

samples t-test were performed as the post-hoc test ($p < 0.05$) level of significance set a priori. RESULTS: A significant interaction was found between condition and time for Lac ($p = 0.014$) and was attenuated during Hypox7.5 condition at recovery compared to the other conditions (Normox0: 6.3 ± 3 mmol; Hypox0: 6.5 ± 3.2 mmol; Hypox1.5: 6.3 ± 3.4 mmol; Hypox7.5: 4.5 ± 3 mmol). Also, a main effect of time for Hb ($p < 0.001$) such that there was 6.7% increase in Hb at max compared to base and rest, and 5.6% higher Hb at recovery compared to base and rest. CONCLUSION: Individuals who wear respirator masks with 7.5 cmH₂O in a hypoxic condition may clear Lac faster (turnover) which might improve recovery time. Future research may focus on Lac, Hb and other hemodynamic variables and the mechanism underlying lactate clearance in varying hypoxic conditions.

Forchione, Christopher

Architecture

This paper analyzes the impacts of architectural design studio typologies on secondary education students. The current studio environment induces prolonged sedentary behavior, described as any activity performed slightly above the resting metabolic rate (1-1.5 METS), such as sitting and most passive recreation. Physical inactivity is the fourth leading health concern for global mortality as it increases the probability an individual will develop both physical and mental complications such as: cardiovascular disease, diabetes, cancer, lower self-esteem, and depression. This paper will compare alternative desk and seating typologies which impact sedentary behavior on students required to spend long hours in the studio. A scope of analysis is provided through analyzing studies conducted in primary education, and the common office environment. This provides a contextual background for secondary education to align with, propelling an explanatory sequential mixed method study of sedentary behavior in the architectural studio. Within this study, quantitative surveys will be distributed to students, evaluating their current awareness of sedentary behavior implications. Followed by a qualitative open-ended interviewing with these students to gather desires, needs, and interest in various alternative arrangements. Finally, the paper concludes with an evaluation of the traditional configuration compared with a narrowed view of alternative arrangements.

Gavazzi, Daniel, *et al.*

Physics

Although the three domains of α -spectrin (R15, R16, and R17) are highly homologous, experiments reveal striking differences in their folding mechanism and kinetics. In particular, the R15 domain's folding rate is measured to be three orders of magnitude greater than the other two domains, with R17 being the slowest. Higher folding barriers as well as increased internal friction due to landscape ruggedness are proposed to be responsible for the diversity of folding rates. In this work, we show that a simple analytic model is able to capture subtleties in the folding mechanism of α -spectrin domains despite their structural similarities. Using a simple model for internal friction based on variance in native contact energies, the model also gives folding kinetics that qualitatively agree with experimental rates. The model predicts that R16 and R17 have higher folding barriers and increased internal friction within the transition state ensemble compared to R15. While the model captures the correct range of folding rates for the

domains of α -spectrin, the degree that internal friction influences folding kinetics of each domain may be sensitive to molecular detail beyond the level of approximation in this simple model.

Given, EmmaLeigh, *et al.*

Biological Sciences

Throughout central and south America, endemic species in cloud-forests are experiencing an alteration in their habitat from forested to agricultural landscapes. The objective of this study is to determine how the availability of agricultural plant leaves, as a resource for aquatic invertebrates, compared to native forest tree leaves, impacts the community of invertebrates within cloud-forest streams. Leaf bags were deployed into six streams within the Alberto Manuel Brenes Biological Reserva in Costa Rica and litter decomposition rates and invertebrate colonization were measured for three months. Bags were filled with either agricultural leaves (genus *Dracaena*), or leaves from the two most common riparian tree species, *G. glabara* and *S. hoffmannii*. Leaves from *G. glabara* decomposed most quickly, with *Dracaena* and *S. hoffmannii* following behind respectfully. MANCOVA analyses revealed a significant difference across leaf type for macroinvertebrate diversity, $F(2, 87) = 4.36, p = .016$. Specifically, the invertebrate diversity on the *S. hoffmannii* presented the largest diversity ($M = 6.12$) followed by *G. glabara* ($M = 4.53$) and the *Dracaena* ($M = 4.40$). NMDS ordination (stress=0.07) using Bray-Curtis distances revealed that *S. hoffmannii*'s showed lowest variability in colonization. However, results thus far do not suggest that specific macroinvertebrate colonization varies by leaf type.

Gleason, Justin, *et al.*

Architecture

This paper aims to assess the feasibility of vegetation as sound absorbing acoustical walls. The acoustical qualities of interior spaces are generally overlooked in the design process. In addition, the materials and methods of design used in constructing acoustic panels are not the most sustainable or natural. Vegetation has already been integrated into interior design as green wall systems. These systems are used to make spaces healthier and aesthetically pleasing, however they do not address the acoustics of a space. Studies have shown that vegetation is capable of lowering the amount of sound caused by mobile vehicles such as cars, in the exterior environment. An initial literature review has shown that there has been very little research conducted on the acoustical properties of vegetation in interior spaces. Researching this concept will allow for the enhanced design of green walls, and the acoustical qualities of interior spaces. The tactics and methods of this research will review current case studies, standards of acoustical paneling, current knowledge of vegetation's acoustical abilities, and further research the acoustical properties of plants in an interior space through lab experiments. From this research the paper will conclude with the potential qualifications of vegetation as an acoustical property.

Gundlach, Morgan

Architecture

Time is valuable. Attention is valuable, especially when used to create memories which consequently make time feel longer. If every driving commute could be less forgettable because the brain was actively engaged, each day could -in theory- feel more productive. So why not be productive? Enter the Autonomous Vehicle. “Autonomous” in reference to vehicles, means it needs no human input. The onboard technology is enough for the car to function under any driving condition. What was once just an idea, dreamt up for science fiction novels and futuristic action movies, is now a reality. Actually, the technology has been around for a while. The impending changes to the urban environment due to AVs will be radical; affecting the ‘city’ more than the first introduction of the automobile and altering lifestyle choices more than the smartphone.

Hamilla, Rachel

Anthropology

Zoo-housing of great apes is beneficial to conservation efforts, and captivity provides valuable research opportunities. However, captive life is inherently different than wild, as specifically seen in dietary content and general behavior. The present study aims to explore this by examining the effects of diet on the health and behavior of captive Bornean orangutans. A high-starch/low-fiber commercial biscuit largely supplements the diet of zoo-housed orangutans, creating a wide discrepancy between the fiber content of captive and wild diets. This discrepancy may play a role in the weight problems and cardiovascular issues common of captive apes. Subsequently, these health issues may be linked to behavioral abnormalities. This study will implement a diet change that eliminates the biscuit, increases fiber, and incorporates foraging tasks. Data collection will include: blood samples to monitor physiological markers of potential cardiovascular problems, observations recorded using an ethogram to monitor undesirable behaviors and overall time spent active, and weigh-ins throughout the course of study to monitor any weight change that may occur. This study hopes to find that the diet manipulation and increased opportunities to forage will lead to decreased undesirable behaviors, increased time spent active, and a lower risk of cardiovascular disease.

Hammer, Aimee, *et al.*

Psychological Sciences

Risk factors, such as low socioeconomic status and lack of knowledge about parenting, place adolescent mothers at risk for insensitive and affectively dysregulated parenting, and their children are more likely to experience poor developmental outcomes. The current study tests direct and interactive effects of maternal behaviors and child gender and temperamental characteristics on dyadic synchrony, a parent-child interaction style characterized by harmonious exchanges, with the goal of informing intervention efforts for Latina adolescent mothers and their children. Research has yet to examine predictors of dyadic synchrony among Latina adolescent mothers. Thus, the current study used data from 170 Latina adolescent mothers and their 18-month old toddlers. Results indicated that maternal sensitivity was significantly positively associated with dyadic synchrony after controlling for maternal depressive symptoms and child gender. Child gender also interacted with both child temperament composites. Specifically, positive engagement was associated to dyadic synchrony for mother-daughter dyads only and once probed, negative reactivity was not significantly associated with

dyadic synchrony for either gender. These results reveal two positive characteristics, maternal sensitivity and child positive engagement, as predictors of dyadic synchrony that could be considered as targets in future interventions for Latina adolescent mothers.

Hasson, Sean

Architecture

Carbon dioxide emissions are contributing to a negative phenomenon referred to as The Greenhouse Effect. Conventional methods of producing energy by way of fossil fuels is having a detrimental effect on the surrounding environment. This paper aims to detail alternate approaches for creating energy through renewable resources that will in return reduce the overall carbon footprint. Renewable sources include but are not limited to: sunlight, wind, rain, waves and geothermal heat. Additionally, waste from industrial, agricultural and domestic systems will look to be converted into clean, usable energy. Cleveland, Ohio is the targeted geographic location to be examined. An in-depth analysis of case studies of similar techniques implemented throughout other countries will provide insight to possible solutions. Tangible data derived will construct a framework for future design in regard to carbon footprint reduction. Long term environmental effects of reduced carbon dioxide emissions will be juxtaposed to projected outcomes of an environment progressing by today's standards. The final dissertation looks to deliver solutions to a problematic happening while producing comparable data that reveals consequences of an enlarged carbon footprint.

Haupt, Rachel, *et al.*

Lifespan Development & Educational Sciences

Autism continues to be increasingly prevalent among students today, thus further emphasizing the need for evidence-based interventions to meet the needs of this diverse group of children in schools. Antecedent-based interventions are an established intervention for students with autism. This poster discusses the use of choice as an antecedent-based intervention for teachers to implement in the classroom and provides an overview of the different ways choice interventions may be used to reduce problem behavior and increase positive performance in students with autism.

Humphries, Zach

Communication

Football, or soccer as we know it in the United States, is a fixture within the culture in London, England. The purpose of this qualitative analysis is to discover how fans of the Tottenham Spurs perform their sport fandom online and offline. Through qualitative face-to-face interviews on the ground in London, and tracking what fans post online, each person's story is told through their experiences. By grounding this study in Performative Sport Fandom theory, this analysis will provide additional insight into which roles people take on as a fan, and how societal structures reinforce or deny fan performances.

Huston, Amber, *et al.*

Geology

Though it had been thought that the Holocene has had a relatively stable climate, it is now clear from the geologic record that widespread droughts have been common. Developing tools to understand these changes and reconstruct natural climate variations over this period is essential to provide a context for recent changes linked to anthropogenic disturbances. In this study, diffuse spectral reflectance (DSR) of sediment cores collected from Birch Lake and Lost Lake in the interior of Alaska are analyzed to reconstruct environmental changes through time. The derivative of the DSR values are calculated, a method called visible derivative spectroscopy (VDS). VDS has not been widely used for analyzing lacustrine sediments to study paleoclimate, but recently it has been shown to be an effective tool that compliments traditional multi-proxy geochemical analyses. Varimax-rotated principal component analysis (VPCA) is then used to identify the components contributing to the color of the sediment, such as phytoplankton composition and mineralogy, by comparing the values to previously published pigments or known mineral standards. Temporal variations in the VDS values indicate environmental change, which is crucial for both understanding how our climate has changed in the past and how it will continue to in the future.

Ibrahem, Marwa

Architecture

The project is to redesign and rebuild the Old Brooklyn campus OBC; it is one of the MetroHealth system facilities in Cleveland, Ohio. The new Hospital is called HONRs (Hospital of Orthopedics, Neurosciences, Rheumatology & Rehabilitation). The facility's design is influenced by credible evidence; most of the design decisions are based on the information gathered from research made before the design stage. This approach called Evidence-based design or EBD, using EBD help to create a healing environment to improve patient and staff well-being, patient healing, stress reduction and safety. The thesis includes 4 components: Literature review, case studies of similar facilities, survey study conducted in the existing facility and the new design part.

Jean, Elizabeth, *et al.*

Psychological Sciences

Sisters United Now (S.U.N.) is a culturally relevant musical cognitive restructuring intervention whose primary focus is to teach adolescent African American females how to manage their stress and anxiety. As part of the S.U.N. program participants take their favorite popular song and replace some of the lyrics with personally meaningful words. Songs written by participants in the intervention were coded for statements reflecting self-affirmations, cognitive processing and discovery of meaning. Previous literature has found these self-processes may play a critical role in buffering stress, coping and adjustment. The purpose of the present study was to assess if mindset is associated with the usage of these processes. It was hypothesized that participants with a growth mindset would write songs that included more self-affirmations, cognitive processing and discovery of meaning.

Jones, Danielle

Anthropology

Research on the genetic basis of aggressive behavior has focused on the MAOA gene, which codes for monoamine oxidase-A, an enzyme that catalyzes the degradation of various neurotransmitters. In humans and several macaque species, a high-activity allele (MAOA-H) and a low-activity allele (MAOA-L) of this gene have been observed. Additionally, past studies have found the low-activity allele to be associated with elevated levels of aggression. Macaques represent an ideal model for investigating the role of MAOA polymorphism in aggressive behavior, as they are highly social, genetically similar to humans, and widely dispersed demographically. The goals of this literature review and method proposal are: 1.) to present behavioral and molecular research methods that will be employed to study the role of MAOA polymorphism in differential aggressive behavior in rhesus and Japanese macaques, 2.) to discuss how the results of this study will expand our understanding of how genes contribute to species-specific levels of aggression, and 3.) shed light on antisocial behavior in humans from an evolutionary standpoint.

Khan, Preoyati, *et al.*

Computer Sciences

ImageJ is a java based open source desktop application which is widely used in the image processing community. It is a combination of various user authored plugins. The developer API can be used to implement new plugins for specific image processing tasks or analysis. However, ImageJ wasn't designed to work on a distributed system. Currently, single machine takes several hours to process large medical images. In this thesis, we make several important and widely used ImageJ plugins to work within a clustered architecture. For easy communication among distributed nodes of the cluster we used a shared drive cluster architecture. Main challenge of running these plugins on a cluster is to generate combined results with high accuracy from outputs generated by the original existing processing plugin running on different nodes. We implement several ImageJ plugins to distribute tasks and generate combined results. We consider the 3D object counter plugin for testing the developed cluster based system. Experimental results on test images shows high accuracy and similarity with single machine based results. However, for extra overhead for task distribution and gathering results we obtain improved performance of our system only for large size images in terms of execution time.

Killen, Taylor, *et al.*

Architecture

This paper researches the logistical reasoning behind a tract house and how it holds up against today's standards of sustainability and efficiency. The research will provide insight on how and why tract homes still are being produced and perhaps give us ideas on how to further their place in modern day suburbia. Tract houses were designed to be quickly and cheaply build after World War II in order to house returning veterans. Since then not much has changed in terms of how sustainable or efficient they are. Redevelopment could include changes in layout, design, construction, materials, site orientation, utilities, etc. In order to understand their sustainability or efficiency, different floor plans of tract houses will be studied through computer simulation software. An understanding on the background of the style of house will give insight on their logistics and how they evolved over time. The expected outcome of this study is

understanding the logistics and efficiency. The paper will conclude with the results of the research and what should be redeveloped, if anything, about the tract house.

Kirmani, Ammar, *et al.*

Physics

We consider the problem of p-wave superfluid pairing in an atomic Fermi gas across Feshbach resonance for imbalanced populations in presence of harmonic trap. For our trapping potential, we employ Local Density Approximation (LDA) through chemical potential. In two-channel mean field approximation pairing model, we show that depending on the distance from the trap's center, the p-wave superfluid state will have the lowest energy. We present phase diagrams and density profiles in one- and two-channel model for our singlet p-wave pairing and show that the center of trap is occupied by p-wave superfluid. (The work of A. K. and M. D. was financially supported by the National Science Foundation Grant No. DMR-1506547)

Konieczny, Kara

Architecture

A static shading device cannot respond to the path of the sun throughout the day along a south façade for optimal visual comfort control. A kinetic, bending active, wood veneer, south facade shading device, in Ohio, can increase visual comfort control, from an internal source. This project will demonstrate how an organic material in a bending active structure works as an optimal kinetic shading device. Studies have been done of exterior kinetic shading devices and their effects on interior spaces, this project would expand that research into the interior field. A mixed methods approach, a quantitative study of the adjustments in light levels formulated by specific density patterning of wood veneer strips. Then, through qualitative analysis of light control, the experience of the space will be understood. The kinetic aspect of the shading device is controlled through a Servo motor working with an Arduino and light sensor, responding to the internal conditions of the environment. The expected outcome is to increase the light quality of the space with responsive, internal shading devices. The significance can be found in the ability to free the external façade from limitations based on light control, and allows, instead, for an internal point of control.

Krouse, Franklin

Architecture

The goal of acoustics in critique spaces is to provide the audience with the clarity of what is being said. My hypothesis states that Kent State's new College of Architecture and Environmental Design's third floor critique box has high reverberations of sound throughout the space, thus resulting in poor acoustical performance during student critiques. These high reverberations may be due to the lack of acoustical treatments, absorptive materials, and diffusion of sound throughout the space. Utilizing mixed research methods, I will analyze the rooms existing acoustical conditions under varying frequencies, test various acoustical treatments in a small-scale model of the room, and perform surveys from individual students to

understand their audio perceptions of the third-floor critique box. Upon the completion of my research, my results will inform my suggestions for acoustical improvements of the space. These audio enhancements may include the addition of deployable acoustic panels to aid in the absorption of the reflected sound, bass traps to absorb lower frequencies, and diffusive panels to scatter any remaining frequencies. Deployable structures may also aid in the dynamic tuning of the room. These suggested improvements will increase the clarity of conversation between students and faculty during presentations.

LaBuda, Jessica, *et al.*

Psychological Sciences

Accuracy and bias in perceptions of a partner's approach and avoidance motives were examined using 1,228 reports of 614 activities, where partners reported their own and their partner's experiences within their shared activities. We looked at both the partner's self-reported emotions as mediators and actor's perceptions of their partner's emotions as mediators in these models. Higher partner approach motives predicted higher actor perceptions of partner approach motives showing some degree of accuracy in actors' perceptions of their partner's approach motives. Higher actor approach motives also predicted higher actor perceptions of partner approach motives, also showing bias. Partner's own emotions did not mediate any of the motive perceptions; however, the actor's perception of their partner's positive emotions predicted higher actor perceptions of partner approach motives and lower actor perceptions of partner avoidance motives. Furthermore, the actor's perception of their partner's negative emotions predicted higher actor perceptions of partner avoidance motives. Results showed that people are both accurate and bias in their judgments of partner's motives, and that they do not use partner's emotions as cues, rather they use their own perceptions of their partner's emotions.

Levin, Kylie

Lifespan Development & Educational Sciences

The field of Early Intervention relies on developmental milestones in early childhood to determine whether or not a child is developmentally delayed and/or eligible for services. Many families seek Early Intervention services due to concerns pertaining to their child's ability to communicate wants and needs. Before children can have conversations, they must first acquire prelinguistic skills, non-verbal means of communication, such as using gestures or word approximations. This single subject multiple baseline research study will examine the effects of Prelinguistic Milieu Teaching (PMT) strategies on interactions between a parent and her 28-month old child within their natural environment. This study will determine if, through coaching interactions, the parent can implement PMT strategies with fidelity; and if parental use of PMT strategies will increase the frequency of the child's engagement during play. The PMT strategies that will be used in this study include following the child's lead and getting on the child's level, repeating and expanding on the child's communication attempts, and using wait time. Results of parent's use of PMT strategies and change in frequency of engagement with a caregiver will be shared. Future directions and implications will be discussed.

Linscott, Megan

Biological Sciences

Wilson C.J. Chung The co-existence of two histone modifications on the promoter region of a genes are key developmental regulatory components, which maintain genes in an active or inactive state. These two modifications, H3k27me3, (a repressive marker) and H3k4me3 (an activating marker), regulate the chromatin state of the gene and are thought to respond to developmental cues. Here we present evidence that Fibroblast growth factor 8 (FGF8), a key developmental regulatory gene, is significantly impacted by epigenetic factors. To this end, we used the mouse olfactory placode (OP) as a model of bivalent gene regulation in the context of Fgf8-induced GnRH neuron fate specification, a critical process which controls the hypothalamus-pituitary-gonadal (HPG) axis, and therefore reproductive success. Here, Fgf8 is activated during a narrow time period (~E9.5-E13.5), and harbors both H3k27me3 and K3k4me3. Consistently, the E9.5 olfactory placode is enriched with 5hmC at CpG islands, which decreases with age at E13.5. Concomitantly, robust increases in all three known Ten-eleven Translocation (TET) enzymes increase and DNMT3b, an enzyme responsible for de novo DNA methylation, is downregulated in the OP. Further studies will analyze how these factors and other transcription factors interact to coordinate histone modifications on the Fgf8 gene.

Mandal, Shankar, *et al.*

Chemistry & Biochemistry

Sensitivity of biosensors is set by the dissociation constant (Kd) between analytes and probes. Although potent amplification steps can be accommodated between analyte recognition and signal transduction in a sensor to improve the sensitivity 4–6 orders of magnitude below Kd, they compromise temporal resolution. Here, we demonstrated mechanochemical sensing that broke the Kd limit by 9 orders of magnitude for Hg detection without amplifications. Analogous to trawl fishing, we introduced multiple Hg binding units (thymine (T)–T pairs) in a molecular trawl made of two poly-T strands. Inspired by dipsticks to gauge content levels, mechanical information (force/extension) of a DNA hairpin dipstick was used to measure the single or few Hg²⁺ ions bound to the molecular trawl, which was levitated by two optically trapped particles. The multivalent binding and single-molecule sensitivity allowed us to detect unprecedented 1 fM Hg ions in 20 min in field samples treated by simple filtrations.

Manthey, Jennifer

Lifespan Development & Educational Sciences

Research studies have shown that pre-linguistic communication skills are predictive of later language development. Studies have also demonstrated a correlation between verbal responsiveness in parents and pre-linguistic language development in children. Therefore, interventions should target enhancing parent and child interactions to promote language acquisition in young children who are demonstrating early language delays. This single subject research study will examine the effects of coaching on parent use of Pre-Linguistic Milieu Teaching (PMT) strategies and the effects of parent use on parent-child communication. PMT strategies will be taught using an instruct, model, coach, and reflect technique. Data will be taken at baseline and then at weekly sessions. Sessions will be coded for parental use of the PMT strategies and taught in the sequence of: following the child's lead, mapping and

expanding communication, and prompting communication with the use of environmental arrangements. Sessions will also be coded for the child's use of the intentional communication techniques of responding, initiating, and imitating. It is predicted, based on previous research that the child's intentional communication will increase in relation to the parental use of PMT strategies. Findings from the study will be shared during the poster session.

Markowski, Kelly

Sociology

Much research within identity theory focuses on identities that reproduce normative, accepted, and expected relations (e.g., being a parent or being married). By contrast, this project assesses whether the relationships among structural identity theory concepts hold in a case example of a counter-normative identity that seeks individual, social, and structural change: the vegan identity. Using structural equation modeling techniques on survey data from a national sample of self-identified vegans, results show support for the structural identity model where participation in vegan groups leads to more identity-consistent behavior through planning behaviors. The study adds to the literature in two ways: first, this research details the context in which structural concepts enhance and strengthen counter-normative behaviors and social change; and second, this research provides new measurements that contextualize and expand structural identity theory concepts. As findings expand our understanding of the contextual nature of identities, future directions for identity theory are discussed.

Marshall, Erica, *et al.*

Health Sciences

To determine sex-specific differences after an acute bout of free-weight resistance exercise on pulse wave reflection and arterial stiffness in resistance-trained individuals. **METHODS:** Resistance-trained men (n=14) and women (n=12) volunteered for the study. Pulse wave reflection and arterial stiffness were assessed at rest and 10 minutes after an acute bout of free-weight exercise using 3 sets of 10 repetitions at 75% 1-repetition maximum on the squat, bench press, and deadlift. Two minutes of rest was given between sets and exercises. An ANOVA was used to analyze the effects of sex across condition and time. **RESULTS:** The sexes had similar values at rest and after the acute resistance exercise such that there were no significant 3-way interactions. There were significant interactions for heart rate (p=0.0001), augmentation index (AIX; p=0.003), Alx at 75bpm (p=0.0001), augmentation pressure (p=0.004), and pulse wave velocity (p=0.02) such that they significantly increased after the acute resistance exercise. There were also significant interactions for time of the reflected wave (p=0.02) and the subendocardial variability ratio (p=0.0001) such that they were reduced after the acute resistance exercise. **CONCLUSION:** An acute bout of resistance exercise may alter pulse wave reflection and arterial stiffness similarly between the sexes.

Martinez, Andy

Anthropology

In 1833, Frankie Silver was hanged for the murder and dismemberment of her husband, Charlie. The story would become a legend in the mountains of North Carolina, immortalized in

song, but this is where the consensus ends. Many questions still linger about the night Charlie Silver died. Was Frankie really guilty? Did she kill him out of jealous spite or self-defense? Was she even the one to wield the axe? While there is little chance after 185 years that these questions will ever be answered with any certainty, there is a great deal about the case that can help shed light on what may have happened. Here I will examine the historical context of the murder and trial – including issues of law, religion, and geography – and the many stories of Frankie Silver’s life and execution. In doing so, I will seek to explore the reasons so many questions remain and how justice may or may not have been served in this case.

Matar, Mona, *et al.*

Mathematics

We discuss a method to identify the most important nodes of a directed network, based on the nodes we specify as targets. The use of matrix exponential function is widely used for undirected network. In case of directed graphs, researchers have derived a bipartite undirected graph from the original network, with double the number of nodes, then used a symmetric adjacency matrix associated with the new graph to rank the nodes according to their hub and authority role for the whole network. In this poster, we show that we can apply the matrix exponential function to a nonsymmetric adjacency matrix and get a more successful ranking of nodes in their roles as hub and authority, and in their contribution to the access of target nodes.

Mekala, Sai Srinath

Applied Engineering, Sustainability, & Technology

The dose and energy of a 200 keV electron accelerator were measured under different conditions using radiochromic dye films (B3 films) and CTA films (Fuji). The dose at different electron beam settings and platform speeds was determined using B3 films and the dose uniformity along the sample platform was obtained using CTA films at different distances from the accelerator window. The area processing coefficient k was determined for several electron energies. Using a stack of B3 films (18 μm thick) the energy of the electrons at 10 mm from the accelerator window was obtained for a 200 keV and 150 keV irradiation. Table of results along with the graphs of dose uniformity, variation of dose as a function of beam current and platform speed will be presented as part of this poster.

Miro Ojeda, Annette

Architecture

After Spain lost all its colonies the Spanish struggled to find their architectural identity in the modern world. The colonies left behind were heavily influenced by the Spanish culture. However, some of these newly freed colonies started to develop an architectural identity of their own. Cuba was one of the last Spanish colonies freed. There are examples of Cuban architecture which are reflections of the Spanish influences. These influences impacted the groundwork for Cuba to also develop its own modern architectural identity. This paper will argue how the Catalan-Modernisme influences from Antonio Gaudi’s Park Guell are present on the design of Masía L’Ampurdà by architects Mario Rotllant, and Ignacio de la Vega by doing a visual stylistic comparison between the two architectural projects. Even after Cuba stopped being a Spanish colony the adaptation of Spanish versions of modern architecture were being

developed in the island during the beginning of the 20th Century. Several sources can be cited to support this research such as original photographs, and documents as primary sources. Also original architectural and restorations drawings of Masía L'Ampurdà will be provided by "La Oficina del Historiador de La Ciudad de La Habana" located in Havana, Cuba.

Mitchell, Megan

Urban design has adopted concerns in more recent decades for healthy and clean, sustainable environments. We have all the tools to create a "green" city. Where though, is the concern for mental health and happiness in urban life? What does a happy city look like? What are its key components and major concerns? A focus on physical health and well-being alone is only looking at one aspect of the human experience in space; we can't have healthy environments if we do not include mental health in the mix too. Truly sustainable environments are important to the successful future of our cities and sustaining the mental well-being of the people is one small but important aspect. Urban populations are expected to increase by 61% by 2050. This staggering number means higher population density, which could lead to higher numbers of anxiety and other psychoses. Accommodating positive mental well-being into urban design is necessary for a bright future.

Naik, Hemant

Applied Engineering, Sustainability, & Technology

Fuel cell is a device that converts chemical energy from a fuel into electricity. Fuel cell have various advantages compared to conventional power sources. There are several different types of fuel cells which are generally classified according to the nature of the electrolyte. Solid Oxide Fuel Cell (SOFC) is one of them which has more advantages over other fuel cells, such as high electric conversion efficiency, high environmental performance, fuel flexibility and size and siting flexibility. / SOFC has three different kinds of geometric designs: planar, tubular, and monolithic. The main focus of my research is on spiral solid oxide fuel cell (S-SOFC) which comes under tubular design. S-SOFC uses the inner space of the cylindrical design by providing more surface area for the electrochemical reaction to take place. In addition, due to the interconnected pathways, the fuel and the oxygen have two surfaces of interaction throughout their spiral pathway. Therefore, S-SOFC offers an attractive alternative to the conventional SOFCs. S-SOFC has compact architecture and high volumetric power density compared to any other tubular design. The purpose of my research is to design a spiral fuel cell and manifolds, then manufacture the functional cells using additive manufacturing (3D printing) technique.

Niemczura, Alexandra, *et al.*

Biomedical Sciences

Adult mice emit four main categories of vocalizations (USV, LFH, MFV, and Noisy) in varying proportions across behavioral contexts. Their meaning to the listener is currently unknown. Our goal is to determine whether these categories have differential effects on the listener by assessing locomotive behavior, antiphonic calling, fecal bolus quantity, and hormone levels. Subjects were 24 adult CBA/CaJ mice (12m, 12f). Each animal underwent six 30-minute trials in an open field arena (habituation, no-sound control, 4 counterbalanced stimulus trials). Locomotive and vocal behavior of the listener were recorded. During the latter 20 minutes of

stimulus trials, three exemplars of a single vocalization category were presented (80 dB-SPL, 0.25-Hz repetition rate, pseudo-random order). Blood was collected after each trial to assess plasma corticosterone levels. Greater CORT levels were seen in females during Noisy trials, $p < 0.05$. Males avoided the speaker during LFH trials $p < 0.05$. Calling rate of females reduced during LFH and Noisy trials, $p < 0.05$. Animals "flinched" more during LFH, MFV, and Noisy trials, $p < 0.0001$. Preliminary analysis of these data suggests that the four vocalization categories have differential effects on the listener.

Nylocks, Karin Maria, *et al.*

Psychological Sciences

People differ in their ability to regulate their emotions, and recover from emotion-eliciting events (e.g. stress, trauma). Without effective emotional recovery emotional arousal might be maintained, a state known to be associated with emotion-related psychopathology. It is not clear how people choose to regulate their emotions or how individual differences (e.g. distress, rumination) may impact recovery. Therefore, we explored spontaneous emotion regulation and recovery in a novel in-lab paradigm. In this ongoing investigation, participants view two sets of four emotionally evocative videos (alternating between positive and negative valence). Each video is followed by a one-minute recovery period, and during the entire task autonomic responses and emotion-facial behavior is collected. Additionally, participants rate their emotions following each video and recovery period. During the second set of videos, participants are asked to notice if/how they alter their emotions after each clip (emotion regulatory strategies). Preliminary data (N=44), mean age 19.9(SD=1.6), 84.8% female, show a positive correlation between higher negative affect after recovery, following positive stimuli, and higher distress ($r=.37$, $p < .05$) and greater trait anxiety ($r=.59$, $p < .01$). These data indicate potentially important individual differences in emotional recovery in response to emotionally evocative stimuli.

Penvose, Jonathan

Architecture

Due to plastics inability to decompose chemically through natural processes, a continual burden is placed on the environment. The contributing factors as to why plastic is quickly disposed of lies in the temporary nature of the materials plastic is being used to package. This research project will challenge the temporary use and disposability of plastic products in attempts to expand the materials useful life. To begin testing solutions for alternative long-term uses for waste plastics, building bricks will be constructed using the recycled material from the low density polyethylene (LDPE) found in water bottles and shopping bags. These plastic products will be melted down and formed within a standard size brick mold. The formed bricks will then be tested for their residential construction capability of holding their own systems weight, in addition to the roofing materials as dictated by the ASTM of composites. The tests being conducted include both the compression and shear strength of the modules. The results of testing will conclude whether alternative ways in dealing with waste plastic can be achieved by the means of repurposing into more permanent building applications.

Perrone, Nicole

Anthropology

Allocare, infant care by group members other than the mother, is a behavioral phenomenon observed in many lemur species, although the extent of these behaviors varies among species. Allocare benefits new mothers by expanding their energy supply through increased time spent resting or feeding. This study will investigate the Trivers-Willard Hypothesis of the parent-offspring conflict in 3 critically endangered lemur taxa; specifically, that a potential relationship between parental investment strategies (e.g., frequencies of allocare) and physiologic stress (e.g., cortisol levels) exists. To measure this, we will analyze fecal samples from all adult, juvenile, and infant group members of *Lemur catta*, *Eulemur mongoz*, and *Varecia rubra* at the Lemur Conservation Foundation in Myakka City, FL. We will subsequently compare the extracted cortisol levels to corresponding behavioral samples. An enzyme immunoassay (EIA) test will be used to detect the presence of cortisol in the fecal samples. Fecal samples were used in this study as a noninvasive and reliable technique to extract cortisol and measure stress levels. Statistical analyses will be performed to: compare mean fecal cortisol values between groups, determine whether behavioral frequencies differed across time, and determine if there is a relationship between behavioral variables and cortisol levels.

Petruso, Alex

Architecture

Studies in the past have shown that humans can gain personal health benefits as result of keeping dogs as pets. Unfortunately, urban residents of Northeast Ohio cities are do not or cannot own dogs because the region's urban architecture and public space which neglect to sustain domestic dogs' lifestyles. Many urban dwellers who do own dogs despite this challenge are forced to adapt their own lifestyles in order to support their pet dogs, using whatever (often undesirable) spaces are available. The outcome of this research is to promote the design of better accommodating spaces for domestic dogs in Northeast Ohio cities, thus resulting in healthier lives for domestic dogs and their owners. By conducting interviews of dog owners (either past, current, or aspiring), veterinarians and animal shelter employees, along with an analysis of current "dog-friendly" spaces, architects and planners can make better informed design decisions in the design of space for domestic dogs.

Poe, Casey

Architecture

The street and the public park have the capacity to be the great equalizers--the facilitators of social life and meaningful inclusive connection. The reality has fallen far short: inadequate public space, social disconnect and inequality. Efforts to design meaningful public space too often fall short of the "public means all" idealism. They limit public life and even exclude certain groups from participation in the public realm altogether. The excluded often include impoverished and minority groups, whose neighborhoods rarely receive meaningful attention or resources towards the provision of community space. The impotency of formal public space to reflect the diversity of urban life raises questions about how we approach the design of public space. How can we apply meaningful urban strategies to the diverse, transient nature of public life in a way that strengthens social cohesion and brings connection and meaning to the public

realm? Instead of purely designing the physical, we must become designers and facilitators of public life, re-imagining how we can connect and find meaning in the city.

Puleo, Catherine

Architecture

This research will examine to what extent place attachment influences community involvement in historic downtown revitalization, specifically in the case of Canton, Ohio. Place attachment, defined as the bond between person and place, can be incredibly insightful as to the community desires, especially when dealing with deeply rooted historic sites. Commonly believed to be composed of three major elements - person, place, and process - this breakdown will provide three separate lenses for which to analyze place attachment. The first perspective will look at the socio-cultural influences (person), examining views presented by Sharon Zukin and Jane Jacobs. The second perspective, or lens, is the architectural or built component of the downtown (place), implementing theories of Kevin Lynch and Aldo Rossi. The final perspective is the role of political-economic impacts (process), looking at theories presented by David Harvey and Richard Florida. These perspectives will be used to measure the levels of influence and effect the various aspects play in revitalization. The interviews, focused on investigating the bond of place attachment and community involvement, will be viewed in three unique ways to assess their importance and influence on historic revitalization.

Rana, Priyanka, *et al.*

Biological Sciences

While discussing cell volume regulation, an assumption is often made that a cell can be characterized by its “natural” volume determined by some intrinsic set point. Although this may be true for stable and differentiated tissues, it is obviously wrong for actively dividing cell populations, where the volume doubles between divisions. In this case, it seems more natural to talk about a set point for protein concentration C , rather than for volume V . For example, the majority of data on regulatory volume increase or decrease have been collected within a brief period following the osmolarity change, presumably to avoid complications resulting from cell growth. By using the intensive property of protein/water concentration, rather than the extensive property of volume, this complication can be avoided. Another example comes from apoptosis. Apoptotic shrinkage can be caused by dehydration or by fragmentation. To distinguish between these two processes, one has to know both V and C . Thus, we have developed two simple methods based on light transmission microscopy, to measure these parameters. This approach gives a new insight into cell adaptation to anisotonic environment and into apoptotic shrinkage.

Randall, Duncan

Architecture

Outdoor public spaces in cold climates are underutilized during cold months and in cold weather. The purpose of this study is to understand the impact that vegetation has on the usability of public spaces during cold conditions, the extent of that impact, and how such impact can be used to improve the level of comfort for the purpose of extending the usability of public spaces. This study will be on the Kent State Student Center and Library Commons, and will focus on February and March of 2017. Field measurements will be taken; including temperature, humidity, and wind speed readings. Simulations will be conducted based on different vegetational configurations to determine the changes in measurable conditions. These will be analyzed in conjunction with occupant surveys to determine their effects on habitability. A literature review will be conducted regarding cold-climate design in landscape architecture and urban planning, as well as a study on the life-cycle of vegetation that is typical of these climates. The goal of this research is to provide and evaluate potential strategies for the use of vegetation to extend public space usage during cold weather months.

Rankin, Jonathan
Architecture

This study investigates the relationship between spaces, materials, and acoustics. Through the use of auditory equipment such as decibel meters and frequency producing devices the research seeks to find out the successful and unsuccessful spaces in the architecture building based solely on the parameter of acoustics. Through this investigation the study will find out which spacial ratios and materials produce the best environment for hearing and learning. From research and case studies this research will be able to determine what is a suitable space in terms of acoustics and create a spectrum on which to rate the spaces as to which are the most successful acoustically. The end product of the study will be a graphic representation of the data results in the form of a map. This map of the building will show the results with a gradient in terms of best and worst acoustics through different criteria.

Ratnayake, Kalpani, *et al.*
Geology

Lake Erie is critical in understanding regional paleoclimate and hydrology, because it is the shallowest and volumetrically the smallest of the Great Lakes. Therefore, it is very sensitive and vulnerable to environmental and hydrologic changes, including perturbations by humans. This study is a basic approach to evaluate past climatic history of the lake using two deep sediment cores, STN 84-A (1010 cm deep) and LECB1 (842.5 cm deep) from eastern basin of the Lake Erie. Particle size analysis (Malvern UM 2000) and reflectance measurements (handheld Minolta CM-2600d) were carried out using homogenized sediments at 10 cm sampling resolution. Climatic signals were extracted using Diffuse Spectral Reflectance (DSR) and varimax rotated principal component analysis (VPCA). Illite, iron oxides/oxy-hydroxide, calcite, pigments (algal/plant), clay and silt are the major components of the lake sediment which represent paleoproductivity, paleoenvironmental and paleohydrological conditions. Data from two sediment cores revealed that five major climate shifts in sediment properties at depths ~250, ~350, ~560, ~760 and ~950 cm by increasing paleoproductivity, silt percentage and terrestrial inflow. a^* (red-green contrast), b^* (blue-yellow contrast), and L^* (brightness) values obtained from color reflectance data clearly indicate the sediment color variations for dominant

climatic shifts in both sediment cores. These multiproxy approach may also indicates major hydrological changes in Lake Erie during the early Holocene. Age modeling is necessary to infer abrupt climate changes and dominant climatic episodes, which will be the next step of the study. Wavelet analysis indicate that the principal components are oscillating at ~32, ~64, and ~256 year climatic cycles. Additional work will focus on age model construction, and chemical proxies identification in order to determine regional climate variations and hydrology changes.

Reilly, Olivia, *et al.*

Public Health

Police reports from Kent State University (KSU) and City of Kent reveal that more sexual offenses occurred on KSU's campus than anywhere else in Kent during 2013 and 2014. Resources, such as blue light security phones, need to be easily accessible and visible on campus. KSU's campus currently holds 43 blue light phones. A printed map of campus was divided into four quadrants and sectioned off into 200 ft. by 200 ft. grids. Numbers of grids were randomly selected from each section so that all four quadrants had 40% representation. A total of 33 sidewalk intersections were selected to be evaluated for visibility and accessibility of blue light phones. At least one blue light phone could be observed from selected sidewalk intersections in 43% of the grids. A total of 21 lights were visible from the intersections selected. Of those, 8 had an obstruction that could potentially affect visibility from the selected intersection. The average number of steps from a selected point to a visible light was 125 steps. Resources need to be identified to increase the availability of blue light phones in areas that do not have a light that is visible or accessible.

Ruiz, Cody

Anthropology

Previous research has uncovered a unique case of primate Y chromosome introgression - the unidirectional transfer of genetic material from one population to another. Specifically, the rhesus macaque Y chromosome has been detected 200+ km into the range of a neighboring species, the long-tailed macaque. This phenomenon - hybrid macaque males carrying the rhesus Y chromosome then spreading it into a neighboring range - violates the traditional view of hybridization, i.e. Haldane's Rule, where hybrid males typically suffer from reduced fertility. Thus, we hypothesize that a selective advantage of the rhesus Y chromosome is driving its introgression. Reproduction-related Y genes have been sequenced and analyzed from rhesus and long-tailed individuals throughout southeast Asia and subsequently tested against a hypothesis of male mating competition.

Rygel, Krystina

Lifespan Development & Educational Sciences

Research has shown that early interactions between family members, especially adult and child, are pivotal for language acquisition in infants and toddlers. Enhanced Milieu Teaching (EMT) is an evidence-based strategy used in early intervention to elicit language through child interests and initiations in their natural environments. EMT strategies are implemented easily within the family's daily routines which provides an abundance of opportunities for learning communication. This single-subject research study will measure the effects of coaching

caregivers on parent-implemented EMT interventions to determine the fidelity of parent strategy use and impact on child communication. Strategies such as making choices and time delay have been proven to enhance communication skills in young children with language delays. Therefore, choice making and time delay will be the caregiver dependent variables, and fidelity and frequency of use will be assessed. The child dependent variable of communication will be measured by the frequency of child vocalizations, word approximations, and words. Data will be evaluated to determine the effects of interventions when delivered by the caregivers within their daily routines and activities. Based on the findings, future directions and implications will be presented.

Sas, Jacob

Architecture

This study investigates how users are affected by the form of architecture. Through qualitative analysis, subject's responses are examined to determine specifically what aspects of architectural form are causing specific effects on the subjects. The study identifies patterns of effect that can be developed into a system of analysis that can be applied to any piece of architecture to predict its effects on users. Identifiable affecters are first isolated to establish effect – affecter relationships. These relationships are used to identify how a series of architectural decisions – whether aesthetic/program driven or code/law based – affect users. The distinction between aesthetic/program driven and code/law based decisions are crucial in revealing architects' or the law's power to alter users' states of consciousness. The findings in this research produce a language for identifying, examining, and discussing architectural decisions and their effects on users.

Scabora, Stephen

Architecture

This paper will investigate how humans perceive and navigate through the built environment, specifically the new Kent State College of Architecture and Environmental Design building. A myriad of factors affect how easily one can read the circulation of a building. These will be carefully studied to better understand way-finding in architecture and to elucidate new patterns therein. The almost-overwhelming openness of the CAED building undoubtedly has significant effects on the user experience, one of which seems to be increasing the legibility of the circulation intentions and possibilities. Interviews and observations will fuel the research. Participants that are both familiar and new to the building will be studied to widen the spectrum of results. A building that is less transparent with less open space will also be studied to reveal any unseen correlations. Although way-finding in architecture has been studied before, the new CAED building provides a fresh case study that has yet to be observed through this lens.

Scarborough, Charles

Architecture

In healthcare design there are inherent conflicts between the goals of cost management, patient satisfaction, and medical outcomes. In inpatient facilities designers prefer the use of single patient rooms, over multi-patient, for palpable medical benefits relating to a plethora of factors, primarily infection and disease communication reduction. Scholarship in healthcare design

emphasizes the utility of quantifiable medical outcomes over qualifiable conclusions related to patient satisfaction, which also effects healthcare outcomes. Patient's with a variety of diseases and disorders will react variously to the presence of another patient in their room; the characteristics of discrete disorders will dictate the wisdom of cohabitating patients. This study will use data gathered from Post-Occupancy Evaluations and social media keyword analysis to assess inpatient satisfaction and happiness as it correlates to the presence of a roommate. Qualitative results from questionnaires and interviews will be used to more finely parse patient scenarios by illness types. It is expected that roommate satisfaction levels will correlate with certain types of medical conditions. The anticipated conclusion is that multi-person rooms can be employed in discerning ways to achieve higher levels of occupant satisfaction in situations where the presence of a roommate is medically neutral and socially desirable.

Schmidt, Bethany, *et al.*

Biological Sciences

Nitrogen fixation is a biological process that converts atmospheric dinitrogen gas to ammonium. In lakes, certain cyanobacteria possess the ability to fix nitrogen, allowing them to continue growth when other reactive forms of nitrogen are diminished. Nitrogen fixation requires an enzyme (nitrogenase), co-factors, and an anaerobic region within the organism. Micronutrients including iron (Fe), boron (B), and molybdenum (Mo) serve as co-factors in the nitrogenase pathway or help maintain the anaerobic conditions necessary for the enzyme to function. Nitrogen fixation and cyanobacterial growth could be limited by phosphorus (P), but pollution has often created situations where phosphorus is in excess. This leads to the question of whether micronutrients could limit nitrogen fixation in northern Ohio lakes when P is abundant. To test this theory, an experiment was set up with treatments that included a control, and additions of P, P + Fe, P + B, and P + Mo. The acetylene reduction assay was used to determine nitrogen fixation rates. In 5 of the 9 lakes, nitrogen fixation increased significantly when additions of phosphorus were applied. However, the micronutrient additions did not significantly increase nitrogen fixation compared to the phosphorus-only treatment.

Scott, Alexander

Architecture

Graffiti, in most social circles, is seen as a heinous and illegal act. An act which is intensely undesirable and shunned by society. Considered an act of vandalism, or destruction of property, those caught participating in the act often face harsh and unnecessary sentences. This has led the artists to adopt personas and disguise themselves in order to avoid arrest or prosecution. However, those perpetuating the act see it as an art form. A way to express what they are feeling and think for the world to see without retribution. To them, this is the only way that they can truly have their voice heard. This project seeks to develop a model of design which can provoke, engage, harness, and display this important medium of free speech and expression. Through a development of a vocabulary, similar to the skate parks in the 1980's, a series of nodes appear throughout the neighborhoods of Cleveland. Once built, the vocabulary items begin collecting the voice of the populace. A curator will then collect the pieces for the purpose of archival and display at a central, primary node. This will enable to city hear the voice of the people in one, common location.

Scoville, Caitlyn
Architecture

Toxicity is all around us, whether we realize it or not; we stand on it or in it, drink it, and breathe it in. The problem stems from the cyclical nature between purification and pollution. In order to purify one place, we have to be willing to sacrifice another. It never really leaves. Land grounds it, water allows it to flow to someone else, and air is ubiquitous. Increased exposure to these conditions has been linked to numerous health affects, ultimately affecting those in communities that need the industry. This proposal juxtaposes the realistic and the idealistic in order to illustrate what a twenty-first century solution looks like. Realistically, a solution to toxicity in the environment doesn't come from a simple one line answer, but rather involves a series of micro interventions that create a complex system across multiple scales. Idealistically, the proposal looks to what could happen in the long-term, and how an asset divided by infrastructure and toxicity could thread together again. The research will use a combination of case studies and literature review in order to generate theories. Ultimately, drawing from fifteen case studies to understand the affects toxicity has on health and well-being for people and the environment.

Selvam, Sangeetha, *et al.*
Chemistry & Biochemistry

The formation of DNA tetraplex structures such as G-quadruplex and i-motif are highly influenced by the chemical (ions and pH) and mechanical (superhelicity and molecular crowding) factors. In this work, we quantified the influence of these aforementioned factors on the population of G-quadruplex and i-motif structures from Insulin linked Polymorphic Region at the single-molecule level. Using custom-built magneto-optical tweezers, we mechanically unfold these tetraplex structures which is sandwiched between long duplex DNA in torsionally constrained conditions. Based on our previous study, we recognized that negative supercoiling leads to increase the folding of G-quadruplex by decreasing the stability of the duplex DNA. We observed similar trend in the formation of i-motif on negative supercoiling of the duplex DNA construct. Another mechanical factor, molecular crowding also showed comparable increase in the population of tetraplex structures whereas their influence is much lesser as to supercoiling. The chemical factors (ions and pH) plays the major role on the folding of the DNA tetraplexes with G-quadruplex being dependent on K⁺ ions and the i-motif is favored at acidic pH. Inside cells, both the chemical factors (ions and pH) and molecular-crowding are well-regulated whereas the supercoiling of dsDNA are more dynamic, providing the opportunity for tetraplex structures to serve as regulators.

Shamailov, Maya
Nursing

Adequate pain management during hospitalization has many benefits. It enhances earlier mobility and allows for overall earlier recovery for the hospitalized patient. Additional benefits include a reduction in post-surgical complications and sleep deprivation, as well as decreases in length of stay and readmission rates (Glowacki, 2015). Pain management has been identified as an area needing improvement within a 30 bed inpatient unit of a large academic medical center. The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS)

benchmark of 76.10-77.90% is frequently not met. Chart audits and discussions with nursing staff revealed that a gap exists with both the documentation of pain assessments and the communication with patients about pain management. An educational intervention including an interactive session to discuss ways to communicate and set expectations with the patient was carried out with the main goal of improving the assessment and reassessment of pain. Post intervention chart audits revealed an improvement in the documentation of pain assessment and reassessment, but not in assessment of comfort level. Further recommendations include development of a pain management resource nurse role, further education of the staff on pain management and patient education on what is expected for their pain management while in hospital.

Shrestha, Samata, *et al.*

Architecture

Studies showed that heat stress has profound effects on the human physiology over a prolonged period. Human responses vary from heat exhaustion, headaches, to severe heart strokes and even death. Exacerbating these responses is the impact of Urban Heat Island effect (UHI) which increases the ambient temperatures of the city. The literature attributes UHI to the presence of large areas covered with concrete and asphalt roads that absorb solar radiation and retain it. However, this research will consider the effect of surrounding building heights on levels of UHI. The outcome is a likelihood of occurrence of heat stress profile alongside a transect that includes the city center, suburban neighborhoods, and the surrounding rural area.

Environmental simulation software will be used to determine the outdoor conditions and thermal stress. We will validate data obtained through simulation by comparing them with conditions measured at local weather stations. The authors will use a Universal Thermal Climate Index (UTCI) to assess the degree of stress to which individuals be exposed. Data will provide researchers with insight on an urban transect that combines urban environmental conditions that determine heat stress with coincidental socio-economic conditions.

Sidick, David

Architecture

A group of software developers published the Manifesto for Agile Software Development in 2001. The document proclaimed the importance of the user and was an answer to the ephemerality of the industry. Within an Agile design framework, users provide input during every stage, shaping the software as it is written. Centered on this iterative, recursive process, Agile design delivers a product to the client faster than traditional approaches, resulting in more responsive, up-to-date programs that are not viewed as end products. Software developers remain in a feedback loop with the client for the life of the program. As architectural paradigms such as Alexander's A Pattern Language have been applied to the field of computer science, Agile software development strategies can be adopted by the field of architecture. These methodologies have shaped the industry to value consumer participation and devalue the designer's initial preconceptions. These fast, iterative approaches could allow innovative architectural solutions to be tested before full-scale materialization, and could de-emphasize the building as object. This research studies how the traditional architectural design process can benefit from an ideology of a far more transitory practice.

Singer, Tyler, *et al.*

Health Sciences

Acute resistance exercise (ARE) may have a negative effect on vascular function. **PURPOSE:** To evaluate the effects of ARE on forearm blood flow (FBF) and vasodilatory capacity between sexes. **METHODS:** Twenty-three resistance-trained men ($n=12$, 23 ± 3 yrs) and women ($n=11$, 22 ± 3 yrs) volunteered. One-repetition maximums (1RM) were assessed on the squat, bench press and deadlift. FBF and vasodilatory capacity were assessed using venous occlusion plethysmography. Measures of FBF, mean arterial pressure (MAP), forearm vascular conductance (FVC) and vasodilatory capacity were assessed before and 20 minutes after ARE consisting of 3 sets of 10 repetitions at 75% 1RM on the three exercises or a control. Area under the curve (AUC) was utilized to determine differences in blood flow. **RESULTS:** There were no significant sex differences at rest for any of the variables. There were significant ($p=0.0001$) increases in FBF and FVC after ARE, but not the Control. A significant interaction was noted for MAP ($p=0.003$) such that it was reduced after ARE. While there was no increase in vasodilatory capacity, there was a significant increase in AUC ($p=0.0001$). **CONCLUSION:** These data demonstrate that microvascular function is increased after ARE in resistance-trained men and women.

Singh, Rashmi

Teaching, Learning, & Curriculum

Recent initiatives (NCTM, 2000; CCSSM, 2010) encourage the inclusion of technology in instruction for better understanding of mathematical concepts among students. Incorporation of these technological tools fulfills the voids caused by traditional teaching practices. Many researchers suggested that using dynamic geometry software (DGS) in secondary schools are better alternative of traditional methods of teaching proof. GeoGebra is an open source DGS which can be easily implemented by schools. The dragging property and automated deduction tools of GeoGebra provide a first-hand experience to explore the truth of a theorem by freely experimenting the diagrams before writing conjectures and proofs. Additionally, using GeoGebra in teaching proof can save significant amount of classroom time on drawing diagrams. Studies also mentioned that DGS can be very useful in scaffolding the solution processes of students and help them to advance from “argumentation to logical deduction. Therefore, the purpose of this poster is to propose that the conjectures or informal proofs using GeoGebra in secondary school is better instructional alternative than using antiquated two-column proof.

Snyder, Lydia

Music

Scholars within each discipline of music- historians, theorists, semiologists, therapists, etc., have all debated the difference between music and noise. Many believe sounds become musical when they are organized in some fashion. For others, such as theorist Thomas Clifton, music is that which creates an experiential phenomenon; it is something that changes our emotions. While, semiologist Jean-Jacques Nattiez and ethnomusicologist Bruno Nettl, believe the concept of music is culturally formed. To address the debate between music and noise, I

honed in on these three arguments. My research focuses on a specific cultural group- undergraduate students at Kent State University. I created a survey for students to analyze their understandings of music and how they draw conclusions on what is human and non-human music. Each student listened to multiple sound clips and rated each on a Likert scale- from “Highly Musical” to “Not Musical at all.” Sounds clips ranged from organized sounds to unorganized sounds, including a symphony of musical instruments, birdsong, and running water. Each clip was also rated on a scale for preference from “Strongly Like” to “Strongly Dislike.” This poster presentation will discuss the results of this survey and the implications it has for the field of music.

Socha, Daniel, *et al.*

Communication

In recent years, development programs from entities such as the United Nations (UN) have espoused a need for all countries to protect the rights of Lesbian, Gay, Bisexual, Transgender, and Queer (LGBTQ) individuals. The topic has risen to the forefront of international development actions and discourses, especially in counties where same-sex relations are criminalized or strongly discriminated against. One such country, Ghana, has received a great deal of international attention for its discriminatory policies and practices against LGBTQ individuals, and is pressured by the UN to change its policies through development initiatives and doctrines. However, extant research reveals that discourses and policies of development are often implemented in a top-down fashion that privileges neoliberal agendas, and thus are resisted in local contexts. This study employs postcolonial queer theory to examine how LGBTQ rights initiatives are perceived among everyday Ghanaian citizens. To this end, this project will use in-depth interviews with Ghanaians, along with a qualitative analysis of a UN doctrine that advocates for LGBTQ rights in developing nations. This research anticipates making theoretical contributions by bringing together queer and postcolonial theory to better understand how tensions arise from multiple, competing discourses of sexuality and what constitutes human rights. Finding from this study will offer practical guidance for more effective LGBTQ rights discourses and policies in the future.

Stavres, Jon, *et al.*

Health Sciences

Post exercise hypotension (PEH) is defined as a decrease in blood pressure following exercise, though its mechanisms are not clear. PURPOSE: The purpose of this study was to determine how metabolic activity, independent of force generation, influences PEH. METHODS: Twelve healthy participants (6 male, 6 female) completed a concentric (CON), eccentric (ECC), and traditional (TE) exercise session, each matched for total work. Participants performed 3 sets of 10 repetitions in TE and 3 sets of 20 repetitions in the CON and ECC sessions, all at 65% of a predetermined 1 repetition max. Blood pressure was collected at baseline and every 15 minutes after exercise for 120 minutes. Brachial blood flow, vascular conductance, and upper limb pulse wave velocity (PWV) were also assessed at baseline, immediately after exercise, and at 30, 60, 90, and 120 minutes after exercise. RESULTS: VO₂ was significantly lower during ECC compared to CON and TE ($p < 0.05$). Results indicated a significant time by condition interaction for MAP ($F_{2,22} = 3.38$, $p < 0.001$), whereby CON augmented the PEH response

through 75 minutes of recovery and ECC elicited a post-exercise hypertensive response through 120 minutes of recovery (all $p < 0.05$). Results also indicated a significant time by condition interaction for brachial blood flow ($F_{2,22} = 9.13$, $p < 0.001$) and vascular conductance ($F_{10,110} = 3.59$, $p < 0.001$), whereby CON and TE elicited significantly greater increases in blood flow post exercise than ECC and brachial conductance significantly increased immediately post exercise in all conditions and then decreased throughout recovery in CON (all $p < 0.05$). CONCLUSIONS: Results from this study indicate that metabolic activity does influence post exercise hypotension independently from factors related to force production. Furthermore, these data suggest that eccentric exercise may elicit a sustained post exercise hypertensive response.

Tan, Yong Seng 'Jonathan'

Teaching, Learning, & Curriculum

Weaving using palm or coconut leaves is a common activity especially for Polynesians, Hawaiians, and Pacific Islanders due to the abundant tropical natural resources available on the islands. The project incorporated Dr. M. David Merrill's First Principles of Instruction model (Merrill, 2012) to teach people how to acquire skills or knowledge better by developing a healthy relationship between activities and as well as to build a positive experience on learning—"First Principles of Instruction." Dr. Merrill's First Principles of Instruction model can easily fit into most learning environments effectively by applying the four suggested problem-based learning phases: activation of prior experience or knowledge, demonstration of skills or knowledge, application of skills or knowledge, and integration of skills or knowledge to the real world. The weaving project based on the First Principles of Instruction includes video, PowerPoint slides, and quizzes to help learners to master the skills and retain the knowledge quickly. Ultimately, the project proves that problem-based learning using the First Principles of Instruction actually will increase learner's relevance to the knowledge or skills demonstrated in any learning environments.

Tokosh, Joe

Geography

The city of Pittsburgh, Pa felt the impacts of deindustrialization through the second half of the 1900s. The city's revitalization efforts included economic and retail development in the form of shopping malls and centers. As early as the 1960s shopping malls started to appear in the city's metro area (Eastland Mall, South Hills Village), this development continued throughout the turn of the century and as recently as 2005 shopping malls were still being constructed (Pittsburgh Mills). Such intense temporal development creates an oversaturation of shopping malls in the Pittsburgh Metropolitan Area. Using shopping center data from the Directory of Major Malls (2016) and quantitative testing 13 regional shopping malls in the Pittsburgh area are be typified based on their unique endogenous (number of stores, gross leasable area, customer visits, etc.) and exogenous (market area population and income) characteristics.

Travers, Kimberly

Lifespan Development & Educational Sciences

The Individuals with Disabilities Education Act (IDEA) ensures that Early Intervention services are provided to young children (0-3) with disabilities and driven by expected outcomes. As a component of this process, the Early Intervention team develops an Individualized Family Service Plan (IFSP) to determine the achievement of outcomes. Research findings confirm that teams are not writing outcome statements in a manner that is measurable or meaningful, therefore effecting quality. Building upon this research team's previous work on the reliability and validity of the Individual Family Service Plan (IFSP) Outcome Assessment Tool (OAT), the current project examined the reliability, validity, and utility of the IFSP-OAT in a community based-sample. The present study recruited supervisor-professional dyads from five counties across Ohio and delivered training to supervisors on the implementation of the IFSP-OAT as a professional development and supervisory tool. Prior to training, professional who participated in the study provided a de-identified IFSP outcome statement as a baseline measure. Once supervisors were trained, they completed the IFSP-OAT instrument using consented providers' IFSP statements at defined intervals (1-, 2-, 3- and 6-months), coinciding with monthly individual supervision meetings. The results of supervisor ratings, perception of feasibility, and rater reliability will be discussed.

Vaughan, Jeremiah, *et al.*

Health Sciences

To determine the effects of added inspiratory resistance on cycling in normobaric hypoxia on cognitive function. Nine healthy adult males (mean \pm SD: age = 25 ± 2 yr, height = 1.81 ± 0.06 m, mass = 92.5 ± 21.6 kg, BMI = 28.0 ± 5.3 kg. m⁻², VO₂ = 46.32 ± 9.01 ml.kg.min⁻¹) data were analyzed. The protocol consisted of a counterbalanced design involving four visits involving a normoxic (21% O₂) condition with zero added inspiratory resistance (NORM0) and three hypoxic (17% O₂) conditions with 3 levels of added inspiratory resistance (HYPOX0, HYPOX1.5 and HYPOX4.5 cmH₂O) attached to a two-way valve facemask. Data were collected at baseline and during 30 min seated rest in the hypoxia chamber with resistor added. This was followed by three submaximal stages on the cycle ergometer (50, 100, and 150 W) which was then immediately followed by a VO₂max test. After completion of the VO₂max test the participants recovered in the hypoxia chamber for an additional 30 min. Cognitive function was assessed via a computerized cognitive test battery with the participants performing the running memory continuous performance task (RMCPT) and Stroop Color Word Test (SCWT). A 2 factor repeated measures ANOVA were used to evaluate condition (NORM0, HYPOX0, HYPOX1.5, HYPOX4.5) by time (baseline in normoxia, 30 min of rest, after VO₂max test, and after 30 min recovery in hypoxia) were performed on RMCPT and SCWT with post-hoc significance ($p < 0.05$). RESULTS: A main effect of condition ($p = 0.001$: NORM0 = 126 ± 20 ; HYPOX0 = 126 ± 19 ; HYPOX1.5 = 116 ± 23 ; HYPOX4.5 = 115 ± 19) and a main effect of time ($p = 0.031$: base = 117 ± 21 ; rest = 120 ± 19 ; max = 123 ± 16 ; recovery = 124 ± 18) existed on throughput of RMCPT. A main effect of time ($p = 0.001$: base = 62 ± 11 ; rest = 67 ± 11 ; max = 69 ± 9 ; recovery = 70 ± 11) existed on word-color association for SWCT. No significant interactions between time or condition was demonstrated on cognitive function with added inspiratory resistance in hypoxia after cycling performance. It appears from these data that the respirators

do not impair cognitive function during work at the selected levels of resistance in normobaric hypoxia. Further research may be performed on this device to elucidate other markers of cognitive function in more extreme environmental conditions.

Visgaitis, Jonathan

Architecture

The College of Architecture and Environmental Design is making an effort to connect with students through different visual media. This includes posters and digital screens conveying important information, events, and announcements. This study aims to find if the current location of this media is making an impact on students and their movement through the Center for Architecture and Environmental Design. The study will observe the path students take when entering the building and time spent observing different media, and will compare the movement of students to pedestrian patterns found in exterior conditions. Any overlapping patterns will help to better understand the interior condition of the building and will provide important insight for the College of Architecture and Environmental Design to determine the best locations to display important media.

Wachholz, Haley

Geography

There are multiple hazards associated with a severe thunderstorm including wind, hail, lightning, and flooding. In particular, the wind hazard is often perceived through the formation of circular winds that can form tornadoes. However, straight-line winds can reach up to 100 miles per hour and cause significant damage and even loss of life. A proposed survey will illustrate the perceived wind hazard of both straight-line winds and circular winds as expressed by participants. By observing this hazard perception, mitigation efforts can better account for the people at risk and how they respond to these hazards.

Weiss, Elizabeth

Architecture

There is constantly new technology being introduced that gains a foothold and inevitably changes the way a society functions. Most recently augmented and virtual reality have noticeably changed how public spaces are used and how a society uses a city. The people these spaces are being designed for are changing how they use public spaces through new technologies. Our designs of spaces need to adapt in a similar manner to how technologies adapt to allow for people to experience these spaces properly through all mediums. / With these new technologies new forms of networks are being developed to support them. In the context of urban development, these networks are important for development of cities, neighborhoods, and relationships. At the center of these networks is the user. Users have the ability to raise concerns, compliments, and other desires for their neighborhoods. These smart cities are slowly starting to power up. What will these smart cities look like? And what will it mean for neighborhoods?

Welch, Cara

Architecture

An architectural design jury is an idealized academic practice that allows students to verbally and graphically explain and defend their projects. In reality, this is not the perception students have of the jury process, due to repeated miscommunication of the jury's objective. The method of juries practiced at KSU is the same process that has remained unvaried since the 1960's. This research identifies how the juries practiced today attempt to accomplish too many goals simultaneously, and how defining a specific intention for the jury positively affects the participating students' perceptions of it. A student and professor survey is used to question the perspective of those involved, and the goals they have for a design jury. Feedback is analyzed to understand the benefit of juries for professors and students, and propose what are considered viable alterations and alternatives. The survey results are anticipated to indicate a modified jury process, and distinct intentions for juries. The study's results imply there is no solitary best organization for an architecture jury, and provide a way to obtain feedback about juries from students at KSU with respect to their individual perspectives, and perceptions of the process.

Wharrey, Justin, *et al.*

Architecture

This paper examines material dredged from the Toledo Harbor to be fabricated into brick for a shell structure. The process of dredging from lakes and rivers is a necessity, but the material put into confined disposal facilities (CDF) has a finite amount of space. After air dried in the lab, the dredged material will then be crushed. The material passing a No. 16 sieve is mixed with varying water content to determine the highest strength of brick that can be fabricated with this material. The goal is to produce a high strength brick that is capable of sustaining complex loads that result from shell structure designs. Using the data of the mixture tests, grounded theory will be applied to further define the ideal mixture that results in high strength bricks. The importance of this study is to find the optimal mixture for a dredged material brick that can be used to build a shell structure instead of a using a regular brick. Life cycle analysis will be completed to determine the greenhouse gas emissions from the shell structure construction. This research will tap into a potential use for dredged material as a structural brick in a shell structure.

Willer, Christopher

Geography

Today, there are approximately 3,087 small towns in the United States. Deemed urban clusters by the U.S. Census Bureau, these areas in total equate to 29,331,148 people. While only accounting for approximately 10 percent of the population in the U.S., small towns are still very much urban places. Just as cities are affected by economic, socio-political, and environmental processes, small towns too can experience similar affects. This research questions, broadly, to what degree are small towns sprawling? How do they grow? Where do they grow? With that, this preliminary research utilizes Kent, OH as a case study in order to investigate these

questions. Remote sensing techniques were used to both quantify and map urban land-use change in Kent, OH over the past two decades.

Wilson, Kevin

Music

Ohio has always played a significant role in the birth and cultivation of the arts in the USA. This region has helped produce a significant number of artists that have promoted and carved their path in music such as Art Tatum, The O'Jays, Tadd Dameron, The Black Keys, Twenty-one Pilots, and John Legend. For this presentation, my studies of Northeast Ohio will focus on the contributions of Akron to jazz music, drawing upon the history of Akron and concentrating on the economic and social development that helped shape and enable the city to become a hotbed for this music. The rise and fall of the Howard Street District venues that provided music a home during the 1920s through 1960s as well as the current revival of jazz through the network of venues in Akron will also be discussed in order to understand how and why Akron was able to quickly move between being a center for jazz, falling out of fashion, and back into a national spotlight over the course of less than a century. This research is part of an on-going project that continues to be / developed with plans of submitting it for my thesis.

Wise, Anna, *et al.*

Psychological Sciences

Much of the developmental trauma literature underscores the strong effect of a healthy parental or caregiver relationship for the stress-response system in children, however; parental dysfunction resulting from the traumatic event can negatively influence child outcomes following a trauma. The association between parent and child symptoms is well-established where higher parental PTSS is associated with the development of child PTSS in various trauma samples. Less literature has examined the potential impact of parent gender on the development of child posttraumatic stress symptom development. We recruited children and both of their parents from a local emergency room of a Children's Hospital following emergency medical services transport for an acute, non-illness related injury. We assessed parent acute stress symptoms at two-weeks following the child's injury and child posttraumatic stress and depression symptoms were assessed at 3-months and 6-months post-trauma. We hypothesize that parent male, compared to parent female, acute stress symptoms will differentially predict child 3-month and 6-month symptoms. Results indicate that parent gender should be considered with other risk factors when predicting which children are at higher risk for symptom development following an acute injury.

Ye, Ziyang

Architecture

Cities are constantly growing outwards and vertically along with new population boom nowadays. Many urban planners and theorists see urban density as a chance to embrace advances in the vertical building while providing greater economic opportunities. In addition to the support urban economic, it also raises questions about sustainability, livability, and strains on resources and space. These introspections behind the rapid development of contemporary urbanization also raise the following questions: 1. Are tall buildings a sustainable model given the increased scarcity of resource? 2. And to the extent that dense, mixed-use developments

and vibrant streetscapes are becoming the preferred model, a skyscraper good urbanism in perspective of better efficiency, public health, and more humanized? Like New York City and Hongkong, which have geographical, economic and political constraints that can only grow upwards to accommodate their dense population. Thus, tall buildings become the only strategy to accommodate densely populated cities, creating spaces for culturally, socially, architecturally diversified urban patterns. However, available lands are taken over by the increasing demand for land to develop more housing and many other types of architecture for commercial and real estate purposes. Quality public spaces in community scale such as urban parks and recreational fields in the dense urban environment are becoming insufficient to meet the need of urban habitants in both qualitative and quantitative aspects, which, on the other hand, lead to an “unsustainable urbanism” that shows less concerns in neither environmental nor social aspects. In order to avoid the “canyon effect” and create a prototype of a more livable vertical city, he suggested that design of the vertical building or complex must perform better ground level design that engages street more, efficient internal building mobility and excellent connection to urban infrastructure. By rethinking tall buildings, a city will be able to use its vertical density to bring in new ideas and energy not only to keep megacities vital but also creatively accommodate the need of sustainable living in a high-density urban area. The concept of sustainable urban life gained attention in the 1960s. Afterward, this concept became one of the most essential issues in developing successful design projects of both architectural and urban aspects. This project will be implemented based on the concept with an emphasis on the social and humanity side. The sustainability of social aggregation and the humanity that exists in the vertical urban growth are essential as well as energy consumption that involves people’s daily life. Most of the current architectural forms of high-rise usually commit the crime of segregating vertically from communicating each other. Moreover, high rises have been accused of causing many unpleasant outcomes: dissatisfaction, stress, behavior problems, suicide, poor social relations, and many other psychological issues. In addition to a more livable vertical city, many planners and new urbanists are interested in the street-level experience and can be suspicious of skyscrapers since usually, most of the designs of skyscraper fail to meet the street in an effective way. They believed that many contemporary or modern skyscrapers are part and parcel of the same bad strategies that emptied out downtowns and created bad pedestrian environments. According to Jon Gehl, a city is best viewed at eye-level. High-rise buildings usually create a “canyon effect”, which not only isolate occupants and residents but also minimize connections with street-life. In order to avoid the “canyon effect” and create a prototype of a more livable vertical city, designs of the vertical building or complex must perform better at the ground level. Also, an efficient internal building mobility and excellent connection to urban infrastructure that will be necessary to draw people in without neither overshadow nor isolate them. By putting efforts on such rethinking of tall buildings, people live in these cities will be able to use the vertical density to bring in new ideas and energy not only to keep megacities vital but also creatively accommodate the need of both environmental and socially sustainable living style in the high-density urban area.

Draper, Shane, *et al.*
Exercise Physiology

When exercise is confined to a small muscle mass, greater blood flow to that muscle allows for greater muscle specific intensity compared to whole body exercise. The greater muscle specific intensity results in greater glucose oxidation for any given VO_2 which may optimize exogenous blood glucose uptake following the exercise. Thus, the purpose of this study was to determine the influence of reduced muscle mass exercise (single leg cycling) on post exercise blood glucose control. Seven healthy college age students completed the study in which they arrived fasted and were administered an oral glucose tolerance test (OGTT) following 4 conditions: no exercise, following 30 minutes of single leg cycling, following 30 minutes of double leg cycling matched for VO_2 , and following 30 minutes of double leg cycling matched for power. VO_2 , RER, carbohydrate oxidation were recording throughout the exercise. Despite the fact that carbohydrate oxidation was much greater during the single leg cycling, there was no difference in blood glucose kinetics during the subsequent OGTT test. We conclude that the greater glucose utilization during single leg cycling had no effect on blood glucose uptake following an OGTT.

Yen, Ke-Jui

Lifespan Development & Educational Sciences

The field of Early intervention emphasizes the importance of interactions between parents and children that promote learning when they occur throughout daily activities. Families, who have a child diagnosed with Autism Spectrum Disorder, may find having meaningful interactions with their child difficult. This study will evaluate the effectiveness of coaching a caregiver to use parent responsive teaching strategies that enhance joint attention and engagement. This single subject single baseline research design with a parent-child dyad will assess the effects of coaching on the frequency of parent's use of wait time and turn taking with the child during play. Since communication is a reciprocal event, it is important to measure the child's response to parent strategies. Therefore, the child's frequency of joint attention and responding to or initiating a request will be measured. The uniqueness of the present study is that all interactions between the professional and caregiver will occur through an online live format, called tele-intervention. This study will assess the effectiveness of using tele-intervention to deliver evidence-based intervention strategies that can have a positive effect on parent-child interactions and learning. Results for the study will be presented and future directions based upon these findings will be shared.

Interdisciplinary Poster Sessions by Research Institute

Health Communities

Alboslemy, Talib, *et al.*

Biomedical Sciences

Biofilm-associated infection has shown to serve as a major risk factor for the development of non-healing chronic wounds. One critical mechanism that biofilm infection leads to persistent wound infection lies in the capacity of biofilm to evade macrophage-mediated innate immune response. However, the molecular mechanism by which biofilm-associated environment skew macrophage polarization to favor biofilm persistency remains to be elucidated. In this study, we demonstrate that *Staphylococcus Aureus* (*S. aureus*) biofilm environment significantly attenuates the capacity of macrophage phagocytosis by suppressing the expression of iNOS and IL-1 β , whose expression is critical for anti-bacterial activity. More importantly, our data demonstrates a significantly increased expression of Kruppel-like factor 2 (KLF2) in macrophages exposed to *S. aureus* biofilm, compared with those exposed to planktonic culture of *S. aureus*. This was associated with attenuated expression of NF-kB and limited invasion into the *S. aureus* biofilm. Finally, the silencing of KLF2 with siRNA in macrophage could tip the balance in favor of a pro-inflammatory M1-like phenotype, which resulted in enhanced bactericidal activity against *S. aureus* biofilm. Our study validates that an immunotherapy to precisely reprogram macrophage activation via targeted manipulation of KLF2 will provide therapeutic advantages for treating.

Alshahrani, Waleed

Health Sciences

Background: The purpose of this review of literature is to examine the problem of stigma and discrimination in the provision of mental healthcare. The author will review the literature available from research and assessments in relation to this topic as well as the problems faced in research and proposed solutions to this phenomenon. Topics requiring further research into bettering the situation of both the patient and the health care service provider will be highlighted. / **Objective:** To inventory and organize the peer-reviewed literature related to attitudes of health professionals towards the mentally ill and to identify shifts in research focus from risk evaluation to intervention and reduction. To consider research directions with clear applications for improved care and care outcomes. / **Methods:** A comprehensive review of the peer-reviewed literature was conducted to retrieve empirical studies that addressed attitudes of health professionals towards the mentally ill. The review was created to determine the capacity, quality, and characteristics of 47 research studies conducted between 1996 and 2014, all pertaining to attitudes of health professionals towards patients with mental illness. / **Results:** A synthesis of these empirical studies revealed an emerging literature related to attitudes of healthcare professionals towards the mentally ill and the consequences of limited information focusing on patients' perspectives. / **Conclusions:** Amid growing trends in numerous countries of healthcare professionals' negative attitudes towards the mentally ill, the need for further

research is clear. Researchers must fill gaps in literature concerning appropriate strategies and techniques to minimize negative attitudes among healthcare providers.

Anaba , Ezinne , *et al.*

Public Health

Disabilities resulting from a decrease in activities of daily living (ADL) are prevalent in older adults after hospitalization for Myocardial Infarction (MI). For continued recovery, half of these patients use post-acute care services (PAC) including inpatient rehabilitation facilities (IRF), skilled nursing facilities (SNF) and home health care (HHC), to assist with cardiac rehabilitation (CR) after their hospital stay. Starting CR soon after discharge may help to reduce disability and speed up recovery, however, research has not examined when patients actually begin CR. Therefore, this research evaluates time to CR, comparing the patients who utilized PAC and those who did not use PAC. This retrospective cohort study used data from Medicare on 63,127 older adult patients. The Cox proportional hazards regression evaluated time to CR as: date of entry into PAC. Recommended median time to CR from hospital discharge is four weeks; but findings from this study reveal that time into PAC was 5.7, 3.3 and 3.1 weeks for IRF, SNF, and HHC respectively. Overall, only 9% of PAC users attended CR, which is consistent with previous studies that revealed a 10% use of CR. This study is a step towards identifying how to improve the continuum of cardiac care.

Andrei, Spencer, *et al.*

Biomedical Sciences

An emerging theme in the pathobiology of diabetic cardiomyopathy is an increased generation of superoxide anion (O_2^-) which can rapidly react with nitric oxide (NO), reducing the bioavailability of NO in diabetic tissues; however, the effects of diabetes or propofol on NO bioavailability in isolated adult mouse ventricular cardiomyocytes (CMs) has not been extensively explored. Our objectives were to investigate the effects of diabetes and propofol on NO bioavailability in CMs and the potential roles for superoxide and eNOS in this process. Our results indicate that NO levels are decreased in diabetic CMs due to its reaction with elevated superoxide levels, producing excessive amounts of peroxynitrite. Our results also demonstrate that a decrease in the phosphorylation-dependent activation of eNOS is concomitant with an increase in Akt phosphorylation which may be due to, in part, reduced HSP-90 levels. Furthermore, clinically relevant concentrations of propofol increase NO bioavailability and promote eNOS/Akt/HSP-90 interactions in diabetic CMs. This increase in NO is, in part, mediated by the propofol-induced decrease in superoxide in diabetic CMs.

Aurora, Pallavi, *et al.*

Psychological Sciences

Limited research has looked at the underlying mechanisms of social avoidance within social anxiety disorder, specifically the relationship of personality dimensions and affect using experience sampling methods. Results suggest the relationship between extraversion and

social avoidance is moderated by negative momentary affect, with current avoidance predicting future avoidance.

Bhatta, Sabana, *et al.*

Public Health

Background: Staphylococcus aureus is a Gram-positive bacterium which commonly colonizes the nose and throat of one-third of the US population. Drug-resistant and methicillin-resistant Staphylococcus aureus (MRSA) are emerging which can be difficult to treat. The purpose of the study was to look at the genetic and environmental factors of S. aureus colonization that exist among identical twins.

Methods: We collected nose swabs, throat swabs, and hand samples from 294 identical twins at the Twins Day Festival held at Twinsburg, OH, USA in August 2016. Samples were tested for S. aureus, antimicrobial susceptibility testing, multi-locus sequence typing, PVL and spa typing.

Results: Of 294 participants, 79 (27%) of nose, 88 (30%) of throat, and 13 (5%) of hand samples were positive for S. aureus. Only one pair of twins was positive for S. aureus in their nose, throat, and hand. One percent of these samples were positive for MRSA. All isolates were resistant to benzylpenicillin. Further analyses are still ongoing.

Conclusion: Our result indicated that nose and throat are at more risk for S. aureus colonization than hands. We are working to investigate the microbiome of hands, noses, and throats in relation to S. aureus carriage in the identical twin population.

Boonkaewwan, Ampaiwan, *et al.*

Nursing

This sequential exploratory mixed methods study used participatory action research (qualitative arm) in phase I and a repeated-measures experimental design (quantitative arm) in phase II to develop and phase III to test a Facebook HIV transmission prevention program (HTPP) among adolescents with HIV (AWH) in Thailand. Outcomes include AWH's HIV transmission prevention attitude, subjective norm, perceived behavioral control, and knowledge. IRB approval was secured in Thailand. In phase I, literature review and concept analysis were performed to generate initial HTPP for Thai AWH. Subsequently, principal investigator (PI) attended AWH group sessions led by a social worker at a public hospital in Thailand and purposively selected 10 AWH as leaders and worked collaboratively with them on the refinement of HTPP, on how to lead 70 other AWH as participants, and on how to deliver HTPP successfully. Focus group, group discussion, video clips from a TV series were used in this process based on mutual agreement between the leaders and PI, expecting sustainable outcomes. Phase III is on-going using the refined Facebook HTPP, theory of planned behavior, and experimental repeated measures. Participants' HIV transmission prevention attitude behavioral intention and perceived effectiveness of HIV/AIDS preventive behavior will be measured at three time points.

Chiyaka, Edward, *et al.*

Public Health

Introduction: Marijuana is the most commonly used illicit drug in the United States with adverse effects including risk of addiction, increased risk of anxiety and depression, and cognitive impairment. The current study seeks to determine the effect of parenting style on Marijuana

initiation. / Methods: A sample of 6,746 participants from the National Longitudinal Survey of Youth 97 Longitudinal project of the U.S. Bureau of Labor and Statistics that followed representative national sample of American youth born during the period 1980-84 was used. Cox proportional hazards model was used in the analyses. / Results: During the period 1997-2011, about 51% of the participants initiated on the use of Marijuana. Adolescents with uninvolved parents (OR 1.3 95% CI 1.1-1.5) and permissive parents (OR 1.2 95% CI 1.1-1.2) were more likely to initiate in marijuana smoking than adolescents with authoritative parents after adjusting for all other covariates. The crude hazard rate for marijuana initiation was 1.92 (95% CI 1.78 2.06) but went down to 1.70 (95% CI 1.57 1.84) after adjusting for other covariates. / Conclusion: Our findings show that parenting style influences adolescents in different ways and adolescents benefit from having parents who are warm, firm, and accepting of their needs for psychological autonomy. /

Garcia , Monica, *et al.*

Psychological Sciences

Prior research has found that childhood maltreatment leads to pain catastrophizing independent of actual chronic pain. Additionally, research has suggested that high pain catastrophizers were found to increase use of opioids after surgery compared those who were not catastrophizers. High catastrophizers have also reported less analgesic effects from opioids. This creates an environment for an individual to be increasingly susceptible to tolerance. It is hypothesized that pain catastrophizing plays a role in perpetuating and increasing drug use. One hundred and fifty participants (65% male) recruited from a drug detox crisis center were supervised as they independently filled out self-report questionnaires. Preliminary analyses suggest that pain catastrophizing moderates the relationship between childhood maltreatment and drug abuse later in life.

Hsu, Yu-Lin

Health Sciences

The capacity to process health information and perform health behaviors is associated with the level of health literacy people possess. Adequate health literacy supports individuals in obtaining and applying health information properly, as well as managing chronic conditions more effectively. Chronic illness is a common health issue among older adults in the United States, and self-management is one of the methods used to manage and control chronic illness. Correct medication use is an essential self-management strategy. However, older adults are at greater risk for limited health literacy than adults of other age groups. The presentation will address the developing issue of inadequate health literacy among older adults in the U.S. via literature review. The issue will be explored by introducing an overview of the connection between limited health literacy and chronic illness, and focus on the impacts of limited health literacy on older adult's chronic illness management, quality of life, and risk factors for having limited health literacy in regards to medication use. Recommendations and strategies to improve limited health literacy with medication use will also be provided.

Junglen, Angela, *et al.*

Psychological Sciences

Several predictors of Substance Use Disorders (SUDs) have been identified in the literature. One predictor that has been recognized in the development of SUDs is childhood emotional abuse. The aim of the study is to evaluate mechanisms behind this relationship between emotional abuse and SUDs. Two separate samples from a detoxification center were analyzed to evaluate the mediating effect of PTSD symptoms and negative urgency. Results were replicated across both samples showing PTSD symptoms and negative urgency mediated the relationship between emotional abuse and substance use behaviors. The indirect effect for PTSD symptoms showed to be a stronger driving force of attenuating this relationship for both samples, suggesting the importance of focusing treatments on trauma and PTSD symptoms at the initial stages of sobriety to mitigate substance use relapse. /

Khurana, Monika, *et al.*

Public Health

Chatfield Peer mentoring has been shown to be an effective strategy to increase physical activity (PA) participation in community-based adults; no prior researchers have synthesized findings from published qualitative research in this subject. The purpose of this presentation is to report findings from content analysis of participant quotes in published research to compare how mentors and mentees describe their experiences of peer mentoring for exercise behaviors. We searched eight databases and initially identified 3108 potentially eligible sources. After eliminating duplicates and articles that did not report findings from qualitative or mixed methods research conducted on peer mentoring interventions with community-dwelling adults, and adding articles identified through reference lists of identified report, our final sample comprised 31 articles. Of these, we identified a subgroup of 22 reports that contained sufficient detail to contribute to this report. Mentees most frequently described specific activities, emotional states related to health, and sources of PA support that acted as either formal or informal mentors. Mentors most frequently spoke about physical health outcomes, program details, and health knowledge. Mentor training programs might be improved by placing greater emphasis on awareness of mentee's emotional as well as physical responses to health behavior change.

Nolan, Rachael, *et al.*

Public Health

Purpose: High utilizers are (HU) disproportionately high users of inpatient care and other high-cost public services. Despite research on these users and their associated healthcare costs, characteristics of HU and their service needs are not well understood. To date, no review has been published healthcare services used by HU, or how HU affect healthcare costs. The purpose of this review was to identify care costs and the role of severe mental illness in HU across the service sectors of healthcare, homelessness, and criminal justice-involvement. Methods: Three searches were conducted for peer-reviewed sources focused on HU diagnosed with schizophrenia, bipolar disorder, or psychosis. A quality index was used to determine the rigor of research methods used in selected studies. Results: The first search yielded 1,210 sources; the second search yielded 1,057 sources; and the third search yielded 784 sources. Sources were reduced based on inclusion criteria and the removal of duplicates (n=21). Limited research was found on criminal justice-involvement and homelessness. Conclusions: Current research fails to accurately quantify the cost of HU across identified service sectors. Mental

health needs of HU are not adequately managed within the current healthcare system and lead to greater healthcare expenditure for complex, unmet healthcare needs. /

Phuangkhem, Wimonthip, *et al.*

Nursing

Background: Intimate partner violence (IPV) is a critical social issue. Evidence shows that IPV can inversely impact the victims' quality of life (QOL). However, a QOL integrative literature review does not exist among WIPV. Purpose: To present a comprehensive and integrative literature on QOL and its relationship with IPV. Method: A literature search was performed on the PubMed, CINAHL, PsycINFO, Academic Search Complete, and Google Scholar databases, delimited to journals in English with the dates ranging from 2010 to 2016, using the keywords "intimate partner violence" and "quality of life," yielding 9 studies. A matrix was used for data extraction. Results: Overall, IPV, including physical, psychological, and sexual violence, had a significant negative correlation with QOL. Of the three types of IPV, psychological violence significantly predicted QOL of WIPV, particularly in the mental health domain. WIPV had a lower level of QOL when compared with those without IPV. Conclusion: IPV is associated with low QOL among female victims. Screening for IPV is thus important. A deeper understanding of QOL in WIPV using qualitative methodology may help nurses and other healthcare professionals to appropriately care for the target population.

Thapa Chhetry, Bishal

Architecture

Hospital Infrastructure is an expensive investment as its needs greater durability, systems, codes and regulations, technological advancement. It must be designed and built flexible for future modifications. Outpatient care or Ambulatory center provides health service to patients without the need of stay in hospital avoiding the loss of time visiting regular hospitals. It doesn't have a long history: it started developing in the 1980s. The initial name used was "medical home", which was discussed in the 1960s. This term was coined in 1967 by the American Academy of Pediatrics. Two early examples of primary care centers were introduced by William Mayo in 1910 and Henry Ford in 1915. By the early 1980s, ambulatory surgery centers (ASCs) had grown to over 100. There were more than 5,300 ambulatory care centers in the United States by 2011 performing 23 million surgeries annually with 3500 types of procedures covered by Medicare. This clearly shows the significance of outpatient care centers in terms of growth and service provided to patient population which can also be beneficial in other part of the world. This project is focused on design of an outpatient healthcare center in Nepal for delivering cost effective, resource saving health service to patients. / According to Human Development Report, Human Development Index (HDI) was 0.540 in 2014, from 0.291 in 1975. The Gross Domestic Product per capita in Nepal is 689.50 US dollars in 2015. Population per doctor in Nepal is about 18,000 which is very low when compared to developed country like U.S with 1 doctor for every 2500 people. In Nepal, there is 1 hospital bed available for every 5000 people. In this case, introduction of outpatient clinic avoids the unwanted visits and stays in the regular hospital reducing the burden and expenses of hospitals and patients. According to report published by World Health Organization in 2014, with total population of 28,514,000, lung and pulmonary diseases are

responsible for more than 20% casualties. Lung disease is the main cause of death with 17,186 (10.84%) deaths followed by 17,107(10.79%) caused by coronary heart disease. Similarly, stroke, influenza and pneumonia are also other leading cause of death in Nepal. / According to Work the World, patients suffering from the pneumonia, Ejection fraction, Chronic Obstructive Pulmonary Disease(COPD) and other respiratory tract infections are the most common outpatient visits in Nepal. Globally, 10%–20% of the population older than 40 years (an estimated 80 million) are COPD sufferers, resulting in more than 3 million deaths each year COPD is projected to be the third leading cause of death by the year 2020. / Annual report published by some of the major hospitals in Nepal show that outpatient population more than 10 times that of inpatient population. This indicates the importance of ambulatory care dedicated to efficient service to patients. The design of the facilities must be focused on patient care in an appropriate location by using demographic research, outpatient facilities can be targeted to serve the desired population. The approach of freestanding outpatient clinic is new practice in Nepal and an idea of developing such health hubs can mitigate overburden hospitals and ultimately act as a boon to the health care sector.

Wetzel, Britain, *et al.*

Doctorate of Podiatric Medicine

The nonunion rate following 1st MTP arthrodesis regardless of fixation has been found to be typically less than 6%. Stronger constructs have been utilized to help decrease the risk of nonunions and has allowed for early weight bearing with many patient benefits. Early weight bearing increases patient compliance, lessens adjacent joint stiffness, and decreases the risk of deep vein thrombosis. / / The purpose of our study was to investigate if there was a significant difference between fusion techniques and the joint integrity that would allow for early weight bearing. The sesamoids serve as a fulcrum for the flexor hallucis brevis muscle, providing a greater force of motion in the push-off phase of the gait cycle. Current arthrodesis techniques do not account for the mechanical advantage provided by the sesamoid apparatus. The addition of a K-wire to fixate the tibial sesamoid could reduce this fulcrum, reducing the force available at the joint and allowing bony consolidation to occur. / / This study demonstrates that there is a correlation between the use of an additional K-wire to fixate the tibial sesamoid and an increased amount of force that the joint could withstand. This could provide a cost effective option for arthrodesis while improving patient outcomes.

Global Understanding

Bair, Angelina

Library & Information Science

By tracing a genre of resistance and cultural identity through African-American children's / / picturebooks we can learn about the importance of how children understand themselves and their / / place within the community. Even during the current "golden age" of publishing, picturebooks / / still continue to lack African-American writers and illustrators. The question of why this is / / happening will be covered throughout this study by investigating statistical and scholarly / / sources. Also, the history of how African-Americans were portrayed in picturebooks through / / racist and stereotypical portrayals will be examined. Even today scholars continue to

debate as to / / whether published works for children continue to contain racist depictions of Blacks. African- / / American children's literature can be used as a tool to discuss how to reimagine racist / / stereotypes and be aware of the racist history within the stories marketed to children. The / / political benefit of teaching African-American picturebooks within community settings has key / / value for children of all races and backgrounds and provides role models that validate the / / importance of the Black experience in literature. Positive portrayals of African-Americans teach / / Black children the importance of diversity and prepare them for adulthood. By highlighting / / African-American children's literature through, before or after school programs and camps, / / children will learn the importance of the Black cultural experience and understand the value of / / sharing and recognizing in the celebration of everyday Black life.

McKinney, Rob

Lifespan Development & Educational Sciences

The subject of religion has been studied for decades by researchers. Yet, individuals who identify as lesbian, gay, bisexual, transgender, or queer (LGBTQ) may discover that their sexual identity may not be accepted by some religious groups or organizations. These individuals' expressed sexual identity and held religious beliefs may be perceived as an existing dichotomy by other individuals. Although many researchers have focused on religious topics of interest and other researchers on various aspects of LGBTQ studies, there is a paucity of research which seeks to examine both of these research areas through the same study simultaneously. Therefore, the purpose of this conceptual proposal is to understand the religious experiences of gay male individuals who identify with Christianity. In order to achieve the purpose of this study, the overarching research question is, "What do the stories of experiences with religion told by gay male individuals reveal about their experience with Christianity?" The methodological approach to this study will be through a narrative analysis, which seeks to look at the way individuals "story" their lives and thus make meaning of their experiences. Implications for this research area for educators and professional counselor will be discussed.

Nolan, Rachael

Public Health

Purpose: Evidence supports the role of community and public sectors as social and environmental supports for the vitality and sustainability of lesbian, gay, bisexual, and transgender (LGBT) populations. However, measurement of perceived social and environmental supports of PRIDE centers' is lacking. This study describes coming out experiences, as well as perceived level of community supports of LGBT persons after the dissolution of the PRIDE Center. Design: Non-experimental, cross-sectional study Methods: Recorded, semi-structured interviews of LGBT participants (N=10) were coded in Dedoose (SaaS) using Glazer and Strauss's (1967) constant comparison method. Measures: A ten-item questionnaire was used to collect data on participants' coming out experiences and perceived level of community supports. Results: The mean age of participants was 41.2 years (σ 15.838), with an average reported coming out experience during high school. Synthesization of code clusters revealed two over-arching themes as Somewhere over the Rainbow and Dreams that We Dare to Dream. Conclusion: Dreams that LGBT persons dare to dream about being

accepted often come with a price tag. Coming out has cost LGBT persons their employment, friends, and family members. Lack of central mobilization and having no established PRIDE center in the community negatively impacts LGBT persons.

Rockland, Suwatana

Theater & Dance

Growing up in Thailand, Thai classical dance and costume are part of who I am. Coming to Kent, I have been provided opportunities to create dance and costume design in order to support the music of the Thai Music Ensemble, housed within the School of Music within the College of the Arts. This group is made up of classically trained musicians who study through the lens of ethnomusicology. Culture and the arts reflect the greatest accomplishments of humankind. Having the opportunity to create dance and costumes for a Thai Music Ensemble in Kent Ohio, made me question and evaluate the very essence of what was as familiar to me as McDonalds is to Americans. In looking closely at Thai dance and music in relation to an American audience, I had to make choices that would support and feature aspects in design appealing to the American aesthetic. After all, design is not a singular experience but rather a way for artists to reach their audience.

Wang, Tongfei

Communication

In this paper, I study how the current rise of terrorism and the increasing coverage of terrorism in the media affect widely appearing nationalistic and extreme ideologies, especially xenophobia, in the United States. The topic is very important considering intensive worldwide terror attacks in recent years. The rise of Islamic State as a prominent terrorist group in the Middle East is one example. I will explore correlations between media exposure to terrorism and anger about terrorists, anger about Muslims, fear of terrorists, fear of Muslims, negative stereotypes against Muslims. Eventually, I want test the connections between media exposure to terrorism, nationalism and xenophobia. By means of a survey of current students and faculty members in Kent State University, media exposure to terrorism will be measured to assess its effect on the two main outcome variables of this study: nationalism and extremism.

Winters, Carrie

Communication

National identity is an important element of self-definition. But what happens when this identity is ill-defined? Or possibly even declining? Such is the case of Britishness. What it means to be British has always been a topic of debate, but in light of the Brexit vote, this national identity may be even more disrupted. This study employs social identity theory to examine how citizens of the UK perceive this event and how they are negotiating the larger group identity in a state of mass division. To this end, this project will use in-depth interviews with citizens of the UK. This research seeks to enhance understanding of the already ill-defined "Britishness" in the wake of a major political event. The findings will provide the community an in depth clarity of how others from the in-group are dealing with the nebulous identity of Britain at this point in history. Findings from this study will teach about the ramifications of very public, controversial events on national identification and possibly international relations.

Wood, Lauren, *et al.*

Psychological Sciences

Children of adolescent mothers, in particular those of Puerto Rican origin, are at high risk for poor outcomes. It is important to understand the strengths of this population by examining culturally-salient facets of the child-rearing environment. This study sought to better understand differences in the childrearing environments of mothers displaying different constellations of parenting behaviors. Participants included 122 adolescent mothers of Puerto Rican origin and their 24-month-old toddlers. Variables utilized for clusters included observations of maternal control, guidance, and positive affect, and maternal reports of cultural orientation. Observed child defiance was coded to examine between-cluster differences in child functioning. Maternal reports of familism, living arrangements, and perceived childcare involvement from the child's grandmother and father were utilized for analyses of between-cluster differences. Clusters were formed using K-means cluster analyses, revealing four distinct clusters, representing patterns of cultural orientations and parenting approaches. Results demonstrated that both control and guidance are associated with lower defiance depending on the cultural context. Further analyses revealed significant differences between clusters on variables of familism, childcare involvement from the child's father and grandmother, and household makeup. These findings help bring further understanding to aspects of culture that may be salient for Latina adolescent mothers parenting.

Environmental Science & Design

Appelbaum, Emily

Architecture

Annually, 1.5 million cubic yards of sediment is dredged from Lake Erie harbors in Ohio, including 225,000 cubic yards landfilled at confined disposal facilities in Cleveland. Utilizing this material, lightweight aggregates have been successfully fabricated in the construction material lab located in the Center for Architecture and Environmental Design. This study intends to discover the feasibility of using the lightweight aggregate in concrete by testing fresh concrete properties including slump, unit weight, air content, and temperature, as well as the strength of the hardened concrete according to ASTM standards. The lightweight concrete will then be used to fabricate an integrated concrete masonry wall. Additionally, a life cycle assessment will be performed to determine the environmental impact of the wall in comparison to one built using traditional concrete aggregates. Ultimately, this study will reveal the sustainability potential of the lightweight concrete.

Appling, Torri, *et al.*

Architecture

Developing new and environmentally conscious construction methods and materials is essential for minimizing the negative effects of architectural practices. This study investigates the effectiveness of phase change materials (PCM) as insulation in built environments. PCM's work by absorbing or releasing heat, triggering a phase change. When integrated into a building panel this PCM can act as a thermal mass, preventing heat transfer during the warm day and

releasing it during the cooler night. Utilizing the natural structure of PCM's would eliminate the need for less environmentally friendly options such as foam, fiberglass, or spray insulations. Current products such as ENRG Blanket suggest that PCM's are cost and energy efficient models; there are a variety of PCM and it is unknown the comparative effectiveness of this method. This investigation will be performed through literature review as well as the deployment of model studies incorporating various PCM materials in a controlled setting. Temperature sensors will be utilized to record the results from these various models. The results of these studies will then be compiled and analyzed to create a comparison of energy efficiency between traditional massing and PCM incorporated massing. Hopefully this study will help further the investigation into bio-based architectural solutions.

Butler, Zach, *et al.*

Architecture

This research investigates architecture and its identity as a platform to expand North / America and discuss connectedness through video-based social media. Currently, / architecture is disconnected between cultures, places and people. Rem Koolhaas stated / in an interview with Mohsen Mostafavi that "architecture has a serious problem today, / people who are not alike do not communicate." 1 This means that something we spend / 90% of their life in doesn't allow us to connect with other cultures, places, and people / effectively. The theory is that society can use video formatted social media platforms to / engage with and promote visual communication between different places in North / America. To test to see if people will engage with other cultures in a visual way, a / screen will be placed in different areas of northeast Ohio showing different communities / with a multiplicity of different factors on the screen. Multiple ethnicities, social class / types, cultures and locations will act as the viewers to give an unbiased and honest / opinion of the theory and its legitimacy. Testing will include watching time, amount of / people, how many people promote this on social media/share, among other categories. / Finally, the research concludes with some anticipated impacts that this research could / have when planning buildings as well as benefits that can be attributed to closing the / gap of the built environment not helping people communicate with one another. / / 1 Hustwit, Gary. Helvetica ; Objectified ; Urbanized: The Complete Interviews. New York: Gary Hustwit,2015. Print.

Cosgrove, Colleen, *et al.*

Biological Sciences

Tree mortality in forest communities can be the result of a number of factors including herbivory, disease, abiotic factors, and age. We set out to see how tree mortality and growth rates differ within ecosystems compared to within ecotones, and which factors can predict mortality. In 2008, an adult tree survey showed that individuals near ecotones experienced soil habitat outside of their optimal range. In 2016, this survey was repeated to evaluate how the community changed. We aimed to determine how ecosystem and species type affect mortality. Additionally, we compared the rank abundances of species and recruitment of new adult trees into the system. Preliminary results suggest mortality depended more heavily on species than ecosystem. We saw less mortality at ecosystem edges and in ecotones than in ecosystem cores; surprising, as we hypothesized high mortality along ecosystem edges and within ecotones. The lack of mortality for the majority of tree species resulted in little change in species

rank abundance between the two time periods, leading to our conclusion that the forest community has remained relatively unchanged. Since we did not observe increased mortality near ecotones, further analysis and studies are necessary to understand factors maintaining different communities delineated by ecotones.

Dassanayake, Arosha, *et al.*

Chemistry & Biochemistry

Various carbon dioxide capture, storage and utilization (CSU) technologies have been exploited to convert waste carbon dioxide (CO₂) emissions into valuable products and consequently reduce the green-house gas (GHG) effects. Biomass derived solid sorbents, such as cellulose, are widely employed as supports for CO₂ removal due to their high availability, thermal stability and eco-friendliness. Nano crystalline cellulose (NCC) derived by acid hydrolysis of native cellulose are crystalline nanoparticles with excellent renewability, thermal and mechanical stability. Among many functional groups studied, amidoximes; organic compounds with merged amide and oxime functionalities, stands as top candidates for CO₂ adsorption. Herein we report utilization of amidoxime, grafted onto NCC silica composites for selective capture of CO₂. A series of mesoporous NCC-amidoxime composites (NCC-AO) with attached double-amidoxime groups were synthesized and examined for CO₂ sorption. NCC-AO composites showed high CO₂ uptakes at ambient pressure; namely, 3.30 mmol/g at 25 °C and 5.54 mmol/g at 120 °C, which exceeds the values reported so far for other sorbents under similar conditions. Furthermore NCC-AO sorbents exhibited an excellent recyclability and were stable even after ten successive adsorption/desorption cycles with negligible losses of the sorption capacity, therefore NCC-AO composites would serve as effective sorbents for CO₂ sorption at elevated temperatures.

Duroe, Kiersten, *et al.*

Geology

Rapidly changing climate in high-latitude regions is altering biogeochemical cycles and potentially shifting arctic and sub-arctic ecosystems from sinks to sources of atmospheric carbon. Phosphorus (P) is an important nutrient whose availability may limit biological productivity and carbon storage in northern ecosystems. Here, we examine iron (Fe) geochemistry across redox gradients and investigate the potential for phosphate adsorption to iron oxide minerals to limit P bioavailability. We compare Fe and P geochemistry in organic-rich soils collected from relatively depressed and saturated microtopographic positions to elevated and dry microtopographic positions in four sites spanning a latitudinal gradient in northern North America including tundra and boreal ecosystems. To assess P sorption to Fe-oxides, we used phosphate sorption assays to evaluate the capacity for soils to bind phosphate and sequential extractions to quantify Fe phases including poorly-crystalline and crystalline iron oxides. Our results indicate that zones of high phosphate sorption capacity may coincide with Fe-oxide accumulation at oxic-anoxic interfaces in topographic depressions. Consequently, projected temperature increases in arctic and boreal regions may influence P availability due to increased association with Fe-oxide minerals that precipitate as water tables lower in drying peatlands, wetlands, and polygonal landscapes. /

Erdman, Hayden

Architecture

This paper will examine one form of biotechnology, mycofiltration, and its suitability for use in passive media filters. Monitoring programs in the United States show that urban storm water runoff contains pathogen concentrations higher than EPA recreation standards that define if waterbodies can cause illness. Of numerous Best Management Practices outlined by the EPA, media filters have a high potential for effluent bacteria reduction. Paul Stamets' 2012 EPA study has also shown that mycelium could potentially remove 100% of E. Coli from flowing water. With these threads in place, mycelium could prove to be a novel biotech alternative to current storm water BMPs. Evidence that mycelium can act as a media filter will be tested through examination of the need for new filtration methods, procedures for testing mycelium and storm water management products, and an accelerated physical test of baked mycelium's durability when exposed to the elements. This will further determine the plausibility of a renewable filter system made as wholly out of mycelium as possible. The paper will conclude with reports on the methodology and findings of the physical test as well as the anticipated impact of mycelium on storm water filtration methods.

Grigonis, Donna, *et al.*

Architecture

On June 1st. 2016 and during the Sunset Music Festival in Tampa, FL two individuals died, and as many as 57 individuals were hospitalized. An autopsy of the bodies showed evidence of the drug Ecstasy abuse. According to a study conducted By the Department of Psychology, Swansea University (Parrott, 2011), high doses of the drug ecstasy increased the mean body temperature by 12.6° F. The temperature measured in Tampa, FL between 2:15 pm to 4:00p peaked at 95° F and relative humidity of about 44%. This study aims at linking the high number of hospitalized individuals to a heat stress exacerbated by drugs overuse. The research team will recreate the conditions at the site using environmental simulation software. The modeling will take into account the surrounding buildings, vegetation, as well as the structures on the site. It will also consider the ambient temperature caused by the overcrowding conditions. The calculated data will be used to estimate the thermal stress factors affecting a human body amidst the crowds. The outcomes of this study will be used to develop a guide for organizers and city officials to address the environmental conditions and reduce potential life loss in future events.

Hong, Xin, *et al.*

Geography

Livestock production is an important contributor to sustainable livelihood and food security in Northern China. A large body of literature suggested that intensive livestock grazing exacerbates grassland desertification in Northern China (Su, Li, Cui, & Zhao, 2005; Zhang, Borjigin, & Zhang, 2007). Datasets of livestock production and grassland cover collected for Northern China have enabled us to examine the spatio-temporal relationship between livestock production and grassland using geographically weighted regression (GWR) model. This study has confirmed the importance of grassland in shifting livestock production. Furthermore, the spatial associations between them tend to change both across space and over time. Outcome

from our analysis suggests that the volatile changes in spatio-temporal patterns could be explained by additional environmental or socioeconomic variables.

Kelly, Eric
Architecture

Almost ubiquitously, mandatory internships are required by architecture registration boards. Architecture is a unique profession which requires the mastery of many different skills and abilities. Clients must be assured that a person calling themselves an architect has the necessary mastery required. Internships are “both a means and a measure of specialized architectural knowledge,” as stated by Beth Quinn in the Journal of Education. With the recent rebranding of the NCARB internship it is necessary to complete an analysis of the participants’ perceptions to compare with the findings of the 2003 article. Surveys will measure the participants’ perceived preparedness in the same “competency areas” as a paper published by Quinn. The results are then compiled and compared with the 2003 results, graphs and tables will illustrate the difference. The significance of the study will indicate if the NCARB internship method is on the right track in regards to the improvement of the experience and preparedness of the participants. The specific changes in competency areas can indicate the extents of which NCARB is either excelling, maintaining or declining, in its service to the profession and participants.

Kerwood, Ashley, *et al.*
Architecture

Traditionally, the goal of architecture has been to establish a sense of place through the means of a permanent structure. Today the world is changing dramatically through politics, war, climate change, and an overall changing social demographic. These changes have created a new set of problems relating to housing for displaced refugees, emergency shelter, sustainability, mobility, and the response to natural disasters. The framework of permanent architecture is no longer capable of supporting the demands associated with the rapidly changing environment. Due to the current shift, temporary architecture is beginning to be studied as a solution to these issues by many architects and city planners, such as Robert Kronenburg and Mike Lydon. Temporary architecture is becoming a resilient solution to provide the necessary flexibility to adapt to problems in the changing environment in a fresh, new way that is more sustainable than its permanent counterpart. This paper centers on the argument of temporary architecture as a natural response to resilience. To argue this point, a qualitative study will be conducted analyzing a series of pop-up architecture projects to understand the solutions provided by temporary architecture as a means to resolve the issue of resilience currently associated through permanent architecture.

Liu, Qingsong, *et al.*
Geography

The emergence of social media data provides a potential to researchers in transportation study due to the ability to extract the individual movement with space and time context. In our research, we analyzed the movement records in Twitter. An exploratory study in terms of space and time was performed and two models were built to investigate the factors in the county

level's movement. Findings show that the social media data can be a potential new data source to explore the large scale of human movement. Second, the distance between origin and destination place play a variant role in different travel purpose. Third, the rush hour effect is not significant in the morning and afternoon in the county level movement.

Ly, Dorothy

Visual Communication Design

Approximately 55% of the 220 million tons of waste generated each year in the United States end up in one of over 3,500 landfills. Many products going into these landfills are materials, such as paper, organic waste, and solid plastic. Landfills are the second largest source of human-related methane emissions in the USA. What can be accomplished to decrease the amount of trash going into these landfills? The problem has reached a surface level resolution through the creation of online subscription stores that cut out the middle man, also known as convenience stores, that send customers multiple products in one package rather than shipping each item individually. As a result, this significantly cuts down the amount of energy needed for product delivery and shipment. However, one major question remains: what happens to all the packaging materials and containers once the product is delivered and/or finished? Similarly, could an online company use a different type of packaging material to create a greener environment with less pollution? This project will explore an alternative, renewable energy solution to the paper or plastic material currently available worldwide.

Richardson, Bree, *et al.*

Biological Sciences

Excess phosphorus (P) in the Great Lakes stimulates toxic algal blooms that are harmful to the environment and human health. Research has shown that Great Lakes coastal wetlands are able to store a significant amount of P and help mitigate eutrophication. However, an individual wetland can spatially vary causing heterogeneous P storage. Our objective was to determine areas of maximum P storage in the sediments in Old Woman Creek estuary, an unaltered wetland along the coast of Lake Erie. We sampled sediment at 30 locations throughout the wetland at various depths and plant communities. Results from log-normalized data collected in June 2016 show a negative linear relationship between log water depth and log sediment total P ($r^2=-0.67$). This suggests that P storage is higher in shallower areas. Additionally, log sediment total P shows a positive linear relationship with log total iron and log organic matter ($r^2=0.82$ and $r^2=0.73$, respectively) suggesting P is stored in the estuary by binding to iron oxides and in organic matter. Future analysis includes determining the variables that contribute to optimized P storage at shallower depths.

Shaw, Meaghan, *et al.*

Geology

Acid mine drainage (AMD), a prevalent issue throughout the world that contaminates ecosystems and negatively impacts surrounding communities, results when pyrite contained in coal is exposed to weathering through mining activities and oxidizes to release high concentrations of sulfate, metals, and acidity. A limestone channel was installed at HR25, a subwatershed of the Huff Run Watershed in northeastern Ohio, to treat acidic, metal-rich water

draining from an abandoned underground coal mine into a small tributary stream. Here, we investigated the effectiveness of the treatment system by analyzing changes in water chemistry (cations, anions, pH) along the length of the treatment system and tributary. Along the treatment system, pH increased from ~4 to ~8. Concentrations of dissolved metals (Fe, Mn, Al) decreased due to precipitation of oxide minerals. However, water discharging from the watershed outlet downstream of the treatment system was acidic (pH < 3) and metal-rich. These results indicate that, while the treatment system is effective in neutralizing acidity and removing metals (e.g., Fe), the system does not neutralize all of the inputs to the stream. We infer that an additional, unidentified input to the tributary decreases pH and increases metal content of the water that discharges to Huff Run.

Slivka, Janelle

Architecture

Retail design has become an essential part of successful distinctive brands and creative environments. The economic recession in the developed world and competition for consumer goods has led to a re-assessment of the retail industry. In addition, the rapid advance of online shopping has created new challenges for physical stores and the communication of retail brands. The Visual identity and brand of the retailer is fundamentally created through design, which must attract and keep customers, support a brand's image, create an experience and work as a functional impactful environment. As customers tend to perceive these dimensions in a global perspective, the key to effective retail design stands in making these conditions suitable and interconnecting them. Following the contact to the built environment, a series of internal reactions result in cognitive reactions such as the perception of quality, color, wayfinding by establishing categories, environmental branding, emotional and psychological reactions such as feelings or attitudes. In this research approach, I will analyze the manner in which the retail store environment can create and stimulate a company's brand image as well as how retail design can compete with online shopping experience. This design brand theory research will help to fill the gap in the lack of evidence to support how consumers will use the different applications of retail wayfinding, navigation, color theory, visual and emotional cues, pleasant atmospheres and feel a personal connection, such as brand loyalty, to their physical space. It is hypothesized that providing consumers with well designed cues (the aspect of walls, of the ceiling and floor, as well as the materials with which they are covered, the manner in which the store is enlightened, the sound background, branding color elements, interior temperature, possibilities to move inside), can help retail companies to thrive. By creating a significant, refined approach to experiential design, which understands the consumer in an environment relationship to the retail environment, the results of this thesis will create new techniques and guidelines to effectively create visually stimulating design for an environment in which consumers can positively interact and engage within the retail place.

Sweterlitsch, Michael

Architecture

Creating self-sufficient neighborhoods will provide rural and suburban neighborhoods an opportunity to upgrade their energy management infrastructure from the bottom up while waiting for the smart grid to become applicable in rural and suburban areas. This paper will focus on

establishing if more efficient methods of energy production and storage will become available if they are moved in scale from single family homes to the housing development as a whole. / / To do this a housing development in close proximity to Kent State will be selected to enable site visits. Data related to energy usage for the homes in the housing development will be collected. Systems of energy production and storage that offset usage will then be proposed and modeled for the site. Some systems will be applicable at both the individual and the neighborhood scale. However, another set of proposed options that are only possible at the larger, neighborhood scale will also be modeled. All results will be graphed as a function of the cost of a system to total kWh's produced at 1, 5, and 10 years and compared to determine the potential for a housing development that produces and stores its own energy. /

Tolodzieski, Matthew

Architecture

Tiny living is a social movement that can be very intriguing for current or potential home owners. The concept is to downsize the amount of space in which one lives to provide greater financial freedom while having a positive impact on our environment. This study examines the public perception of the tiny movement and the potential value that can be added to a local economy. Many tiny homes are built by the future owner(s) using locally sourced materials. This do-it-yourself construction method is expanding the market of mass customized dwellings which raises the concern of resale value. An additional trait of many tiny homes is their ability to be moved from one location to another. More transient home owners create the potential for communities to draw new residents. The biggest hurdle for tiny home seekers is the zoning restrictions that vary from city to city. The goal of this study is to show the economic value of the tiny living movement to influence communities to be more receptive to this new generation of home owners.

Wolfe, Brendan

Architecture

The aim of this study is to examine the idea that brownfield redevelopment is more beneficial for urban living than that of greenfield development. Brownfield sites, according to the United States Environmental Protection Agency, is "...real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant." By redeveloping brownfield status sites near urban areas, the environment is decontaminated, previously unused land is reclaimed, blights will be removed from the urban fabric, distressed neighborhoods can be revitalized, the health of the public can improve, properties around redeveloped brownfield sites will increase in value, it can cause economic revitalization, and it will provide an opportunity for job creation. Data relating to the above benefits of redeveloped brownfield status sites will be compared to that of what may occur on a greenfield site. By comparing this data gather by this study, the goal is to identify if brownfield redevelopment is more beneficial than greenfield development.

Yarger, Brianne, *et al.*

Geology

Abandoned mine lands often contain piles of mine waste (spoil) that continue to leach acid and heavy metals into groundwater and stream water long after mining ceases. Revegetation is a common reclamation technique used to stabilize the spoil against erosion. In this study, we investigated the potential of forest vegetation developed on pyrite-bearing coal mine waste to mitigate leaching of the metal manganese (Mn) out of the spoil. We hypothesized that vegetation removes Mn from soil solution due to uptake, temporarily stores it in biomass, and then returns it to the soil surface contained in leaf litter where it is immobilized during soil forming processes. Geochemical analyses of tree foliage reported high concentrations of Mn in green leaves (2,383 mg kg⁻¹), indicating substantial uptake of Mn by trees; however, concentrations of dissolved Mn in pore water increased with depth, suggesting leaching of Mn below the rooting zone. Mass balance models were used to determine that vegetation uptakes 3x more Mn than what is leached in pore waters, but uptake only occurs within surface soils where roots access water. Our study provides insight to geochemical evolution of forested mine spoil and biogeochemical cycling of Mn in soil.

Zhao, Huanyang

Geography

This study investigates the spatio-temporal distribution patterns of high ozone days in Northeast Ohio, multiple factors are included in the analyses to provide a comprehensive understanding of the associations between regional demographic characteristics and the frequency of high ozone occurrences. The results prove the viability of GIS based spatial-statistical evaluations of meteorological data.

Advanced Materials

Bhandari, Srijana, *et al.*

Chemistry & Biochemistry

We investigate charge and energy transfer processes through interfaces involving organic semiconducting molecules. Two systems are studied using time-dependent density functional theory (TDDFT) that addresses properly charge transfer states and where the role of the extended electrostatic environment is taken into account. / In the first system spectroscopy of perylene-bisimid dyes (PBI) is studied. The excited states lifetime of PBIs have been indicated to be strongly affected by self aggregation. We study the non-adiabatic transitions involved in ultrashort exciton lifetimes in PBI dimers as determined by the molecular environment. / In the second system spectroscopy of coumarin derivatives in a host molecule is studied.

Encapsulating the molecules is promoted as a means to avoid the dyes aggregation. We first benchmark our protocol for studying the emission and absorption of solvated coumarins, and then investigate the effect of the host molecule on the excited states. /

Feng, Hai

Applied Engineering, Sustainability, & Technology

Fuel Cell is an electrochemical device that converts chemical energy directly into electrical power. Basically, there are several types of Fuel Cells which are classified by the Electrolyte Materials. Solid-Oxide-Fuel-Cell (SOFC) has recently been considered as the most outstanding

Fuel-Cell because: SOFC has higher electric efficiency than other fuel cells; lower emissions and material flexibility. / However, High temperature (e.g. 800C), high current (e.g. 100-300amp) and unregulated DC are barriers of the SOFC system design. / My research is to provide a design that can regulate the SOFC's DC output voltage for practical use. /

Penman, Nicholas, *et al.*

Chemistry & Biochemistry

As a consequence of aerobic respiration mammalian cells generate some reactive oxygen species(ROS). It has been shown that cancer cells tend to produce ROS at an increased rate as a consequence of their altered metabolism. It has also been demonstrated that excessive ROS can kill cells. Copper has been shown to exhibit "Fenton-like" chemistry which supports the concept of catalytic ROS production from a copper surface. By coating gold nanospheres with varying layers of Cu(I)MoS₄ a series of ROS producing drugs can be tested for their ability to kill cancer cells.

Rao, Nilin, *et al.*

Health Sciences

Background: We have developed a prototype of a thermochromic leuco dye coated latex glove designed for the early prevention of frostbite in cold environments. Thermochromic leuco dye was calibrated to detect contact temperature and change color accordingly at temperatures of 8°C and below. PURPOSE: The purpose of this study was to evaluate the reliability and efficacy of the glove as a potential tool for the early detection of frostbite. Methods: Two trials were conducted, in a constant environmental temperature set at 24°C and 6°C using an environmental chamber. Using a water bath, water was cooled to temperatures between 5°C and 15°C in 1°C increments and was placed into the same thermochromic dye coated latex glove five times at each temperature set point, in each trial. Visual findings were recorded and all data was analyzed using paired samples t-tests. Results: Color change was noted in 20/100 individual trials at all internal contact temperatures of 8C and below. Mean internal contact temperature measurements were 8.54 (±) 0.05 C in Trial 1 (24C ambient) and 8.48 (±) 0.04C in Trial 2 (6°C ambient). It was concluded that there was no significant difference (p=0.208) between threshold mean internal water temperature between the two trials at the targeted color change of red. Conclusion: The glove demonstrated a consistent color change at a threshold of 8C and below, with all of the 100 individual trials, at 2 different external environmental temperature set points proving that ambient temperature has minimal influence on contact temperature required to elicit a color change. This demonstrates that the thermochromic dye coated latex glove can be used as a visual, real time diagnostic tool for the prevention of cutaneous frostbite. Future work may therefor focus on developing this material for the military or outdoorsman for the early detection of cold injury in the field.

Jiang, Jinghua

Liquid Crystal Institute

Liquid crystal droplets dispersed in isotropic media are of significant interest for scientific community and great importance for industrials. The confinement can generate many fascinating liquid crystal director configurations and enable important practical applications.

With tangential anchoring condition at the droplet surface, theoretically there are two possible configurations: bipolar and toroidal. Bipolar configuration is usually observed in droplets made from common liquid crystals while the toroidal configuration is rarely observed and its existence is questionable. Their realizations depend on the splay and bend elastic constants. We constructed liquid crystals with abnormally small bend elastic constants, with which droplets with the toroidal configuration were successfully created. By varying the bend elastic constant, we observed the transition from the bipolar configuration to the toroidal configuration.

Brain Health

Bhatta, Sabina

Biomedical Sciences

Luteinizing hormone (LH) and its receptor (LHR) are present in regions critical for learning and memory in the CNS. Previously, we have shown that ovariectomy (OVX) induced loss of LHR signaling in CNS is associated with cognitive deficits and importantly, reactivation of LHR signaling through intracerebroventricular (ICV) delivery of the ligand improves cognitive function in vivo and neuronal plasticity in vitro. In order to develop a fast and simple strategy to utilize knockdown of LHR to examine the effects of its absence in vivo, we explored the CRISPR/Cas9 system to knockdown the LHR in HEK cells overexpressing LHR. The simplicity of CRISPR/Cas9 technique is countered, however, by the inability to predict the specificity and efficiency of a guide RNA (sgRNA). Therefore, we selected two high scoring guides from three published predictive models and assessed the knockout efficiency of these guides in HEK cells overexpressing LHR in vitro by measuring the levels of LHR as well as signaling cascades associated with the activity of the receptor. Here we show that different sgRNAs resulted in differential decreases in protein levels as well as differential activation of signaling cascades.

Blair, Jeffrey, *et al.*

Biomedical Sciences

Ovariectomy and concurrent loss of estrogens impair spatial memory and synaptic plasticity. However, ovariectomy is also followed by a stark increase in peripheral levels of luteinizing hormone (LH), an aspect that is associated with a marked decrease of brain LH levels. Since we recently discovered a correlation between brain LH levels and spatial memory, we hypothesized that restoring LH signaling in the CNS with an analogue, human chorionic gonadotropin (hCG), would ameliorate spatial memory deficits due to ovariectomy. We ovariectomized C57Bl/6J mice at 3 months of age, infused artificial CSF or hCG (3 or 30mIU/day) to the lateral ventricle at 6 months of age and trained mice to perform the Morris water maze task. Our data show that hCG treatment increases ERK phosphorylation and rescues ovariectomy associated deficits in spatial memory on the probe trial of the Morris water maze task. Additionally, we treated primary neuronal cultures with 300mIU hCG, which increased the number of secondary neurites and branch points, an aspect that may be linked to the ability of hCG to increase ERK phosphorylation in vivo. Together, our data suggest that LH signaling is able to restore spatial memory deficits and increase the complexity of the dendritic arbor.

Dowdell, Bryan, *et al.*

Health Sciences

BACKGROUND: Individuals with Parkinson's disease (PD) generally display symptoms of "mask face" in that they have difficulty expressing and recognizing facial expressions especially negative emotions such as fear, anger, sadness, and disgust. / **PURPOSE:** To determine if acute bouts of high-cadence dynamic cycling promotes improvements in the cognitive ability to recognize emotions. / **METHODS:** 18 individuals with mild to moderate PD who passed screening took a computerized Webneuro cognitive test. After the pretest cognitive Webneuro assessment, the individuals completed three days of high-cadence dynamic cycling with one day of rest between. The posttest cognitive Webneuro assessment was taken 72 hours after the last cycling session. / **RESULTS:** Individuals with PD had lower Z-scores than the general population in terms of Emotional Bias recognition. Interestingly, paired sample T-tests indicated that acute dynamic cycling significantly improved overall Emotional Bias recognition Z-scores ($p=0.006$). Specifically, the percent accuracy of identifying "disgust" emotions significantly improved ($p=0.023$). The average correct reaction time for identification of sad and angry emotions also significantly improved ($p=0.001$, $p=0.004$, respectively). / **CONCLUSION:** These data suggests that acute bouts of high-cadence cycling can improve negative emotional recognition and response time in individuals with PD. /

Dyne, Eric, *et al.*

Biomedical Sciences

Alzheimer's disease (AD) is the 6th leading cause of death in the United States. Currently, there is no treatment that stops AD pathogenesis. AD pathogenesis includes the accumulation of amyloid plaques. The apolipoprotein E gene (APOE) $\epsilon 4$ allele is the strongest genetic risk factor for AD and plays a role in amyloid plaque accumulation. An immune receptor, triggering receptor expressed on myeloid cells 2 (TREM2), was recently identified in AD genetic studies. Similar to APOE $\epsilon 4$, TREM2 locus genetic variants are highly significantly associated with AD risk. The influence by TREM2 on immune responses to plaques in AD brain remains unclear. TREM2 has many potential interactions in the brain including with apolipoprotein E (apoE). Interestingly, recent studies implicate apoE as a ligand for TREM2. The aim of this investigation is to demonstrate that both apoE and TREM2 are localized, and present at high levels near amyloid plaques in the human AD brain. By performing immunohistochemistry and western blot for TREM2 and apoE in various post-mortem human brain regions, we can determine if TREM2 clusters around amyloid aggregates in AD. Findings from this investigation will provide important information about the mechanisms underlying TREM2 and inflammation in the AD central nervous system.

Grizzanti, John

Biomedical Sciences

Sara' Patrick Evidence suggests that leptin signaling within the brain is both neurotrophic and neuroprotective and leptin signaling is known to be impaired in AD brains. To address the role of leptin signaling in AD we determined the effects of leptin treatment on tau pathology in SH-SY5Y cells expressing the tau40 mutation. Previous data from in vitro models of AD suggests that leptin treatment is effective in reducing both A β pathology and tau phosphorylation. Our preliminary data indicates that SH-SY5Y cells expressing the tau40 mutation have increased

expression of both STAT3 and tau. Furthermore, acute leptin treatment sufficiently activates the leptin signaling cascade, peaking at 30 minutes and diminishing by 2 hours. Acute leptin treatment, however, was not capable of reducing tau phosphorylation up to two hours. This suggests that acute leptin treatment is capable of activating STAT3 signaling via phosphorylation of STAT3, but may not be a long enough treatment to affect tau phosphorylation. Based on previous studies, it is likely that a longer treatment will modulate tau phosphorylation. As such, these data suggest that the tau-40 mutation has an effect on STAT3 expression and subsequent leptin signaling. Thus, further inquiry into the relationship between tau phosphorylation and leptin signaling is warranted. /

Kershner, Leah, *et al.*
Biological Sciences

Receptor for activated C kinase (RACK1) is a multi-functional ribosomal scaffolding protein that can interact with a number of signaling molecules concurrently. We recently found that RACK1 is localized to growth cones in the developing mammalian nervous system, prompting an investigation into its role during neural development. Here we show for the first time that RACK1 is localized to point contacts within cortical growth cones. Point contacts are adhesion sites that link growth cones to the extracellular matrix, and are necessary for appropriate axon guidance. Thus, we investigated the role of RACK1 at point contacts. We found that RACK1 is necessary for point contact formation and the density of point contacts within growth cones increases following brain-derived neurotrophic factor (BDNF) stimulation in a RACK1 dependent manner. RACK1 shRNA knockdown significantly lowers basal point contact density and eliminates the BDNF-induced increase in point contact density. Overexpression of non-phosphorylatable RACK1 also eliminates the BDNF-induced increase in point contact density. We also examined the role of RACK1 in axon growth, and found that axonal growth requires both RACK1 expression and phosphorylation. Taken together, these data suggest that RACK1 is a critical member of the point contact complex and necessary for appropriate neuronal development.

Kharel, Prakash, *et al.*
Chemistry & Biochemistry

Reactive oxygen species (ROS) are produced intracellularly and can cause oxidative damage to the biomolecules. Under normal physiological conditions ROS are used in cellular homeostasis and cell signaling but during stress condition they are often overproduced. The overproduction of the ROS is associated with age and neurological disorders, such as, Alzheimer's disease, Parkinson's disease and multiple sclerosis. The weakened antioxidant defense mechanism in the brain of the patients with the neurological disorders makes the neurons susceptible to oxidative damage. The ROS can damage every major class of biomolecules including DNA, RNA and proteins. In the past the focus was mainly on studies of DNA and protein damages, while the detrimental effects of RNA damages only began to be highlighted in recent years. 8-Hydroxyguanosine (8-OHG) is the most common oxidative modification found in the RNA. By identifying the modified mRNA molecules during sodium nitroprusside (SNP) induced oxidative

stress in the neuronal cells (SH-SY5Y), we aim to delineate the relationships between specific mRNA oxidation and neurodegeneration. We have isolated the modified mRNA from the stressed SH-SY5Y cells by immunoprecipitation with anti 8-OHG antibody. Using RT-qPCR assay we have shown the differential mRNA expression during the oxidative stress, for example, high expression of superoxide dismutase 1 and carbonyl reductase mRNAs. Additionally, we have identified the class of mRNA molecules that are targeted more during SNP induced stress situation by using iLumina® RNA sequencing platform. This study will shed light on the yet to be understood link between mRNA oxidation and neurodegeneration.

Kulp, Adam, *et al.*

Biomedical Sciences

Stress is an inevitable strain organisms need to regulate to survive. One of the major hormones in stress regulation is glucocorticoids (Cortisol in humans and corticosterone [CORT] in rodents), which is controlled primarily via the hypothalamus-pituitary-adrenal (HPA) axis. When dysregulation occurs, CORT can become over secreted and result in depression-like phenotypes. However, the majority of research today uses superphysiological levels of CORT (10-15 mg/kg CORT) to induce depressive-like behavior in rats. In addition, the CORT administrations were not adequately controlled for the circadian rhythm of rats, which we believe has a critical window for disruption (circadian nadir). The unnatural levels of CORT cause complications when trying to understand the mechanism behind stress-induced depression. To fix this issue, our work questions whether natural levels of CORT administration during the circadian nadir can induce depressive-like behaviors. To answer this question, we first designed a mechanistic study that examined whether the Designer Receptors Exclusively Activated by Designer Drugs (DREADD) technique could be used to activate the major control region for the HPA axis, paraventricular nucleus of the hypothalamus (PVN). To determine whether the DREADDs technique can activate the PVN, rodents were administered with adeno-associated virus carrying the neuronal specific hM3D Gq-coupled DREADD receptors at the PVN. Three weeks following administration of the virus, neurons expressed receptors specifically activated by clozapine-n-oxide (CNO). After subcutaneous injection of CNO (1.0 mg/kg), rodents were reaching significant increase in plasma CORT. Future studies will investigate whether constant stimulation of the HPA axis through DREADDs will result in depressive-like symptoms.

Penko, Amanda, *et al.*

Health Sciences

Parkinson's disease (PD) is a neurodegenerative movement disorder affecting approximately one million Americans. Physical activity has been shown to be beneficial in the management of PD. Therefore, it is important to understand factors that affect physical activity behavior. / Purpose: To assess the relationship between balance confidence and fall frequency, disease severity and physical activity in individuals with PD. / Methods: Ten participants with PD (63.5 ± 11.2 years old, n = 3 females) completed the validated Activities-specific Balance Confidence scale and gave self-report of their fall frequency over the past 12 months. Disease severity was assessed via the UPDRS. Participants were given a physical activity monitor (Movband 3) to measure physical activity behavior over a one-week period. / Results: Pearson's correlation analyses revealed significant negative correlations ($r \geq -0.59$, $p \leq 0.05$) between the ABC scale

score and both the number of falls reported over the previous 12 months and UPDRS scores. However, ABC scores were not ($r = -0.06$, $p = 0.85$) associated with physical activity. / Conclusion: While individuals with Parkinson's disease who had poor balance confidence did have more frequent falls and greater disease severity, their physical activity behavior was not different than those with greater balance confidence.

Raimbekova, Lolagul

Teaching, Learning, & Curriculum

How often we see people are impressed with the idea that young children acquire language(s) quickly and seemingly without effort, whereas adults often struggle with second languages. What can we learn by looking at the specific contexts and processes of language learning in young children? What are the research implications about learning a second language in early years? And why the U.S education system does not support learning a second language in early years? / This poster presentation will share research on why learning a second language is important beginning in the early years. It will raise the awareness on the importance of bilingualism and highlights second language learning strategies for consideration in U.S. schools where teachers strive to support the needs of their young English language learners who are mostly bilingual or trilingual. /

Shelestak, John

Biomedical Sciences

The cuprizone animal model is widely used to study toxic demyelination and subsequent remyelination in the central nervous system. Cuprizone is a copper chelator that affects oligodendrocytes, leading to degeneration and loss of myelin sheathing. Unlike most demyelinating diseases like Multiple Sclerosis, studies suggest the cuprizone model appears to maintain an intact blood-brain barrier throughout the treatment. In the present study, we aim to assess the integrity of the blood brain barrier after 6 week administration of cuprizone, as well as after 2 weeks of remyelination. / Mice were imaged using MRI every two weeks starting on week 0 of administration. Measurements of demyelination and ventricle enlargement were taken with T1, T2, and diffusion weighted protocols. Immunohistochemistry was utilized to stain brain sections after sacrifice. The tissue sections were stained for neurons, myelin, astrocytes, microvessels, oligodendrocytes, immune cells, matrix and tight junction proteins. Cuprizone treatment caused significant weight loss, as well as a measurable change in ventricle size seen after 6 weeks of treatment. There was a significant increase in gliosis, as well as morphological changes indicative of activation. BBB integrity was assessed using computational image analysis techniques and cuprizone treatment was associated with morphological changes that may indicate BBB alteration.

Stewart, Courtney, *et al.*

Biomedical Sciences

Reduced fibroblast growth factor (FGF) 8 signaling delayed anterior brain midline astrocyte maturation. In contrast to perinatal development, this GFAP+ astrocyte population did not exhibit marked deficits in adulthood. Nonetheless, it is possible that reduced FGF8 signaling may have disrupted adult GFAP+ astrocytic function or reactivity. Especially considering *in vitro*

studies reporting that FGF8 increased cortical astrocytic branching complexity. Here, we asked whether FGF8 signaling deficits impaired adult GFAP⁺ astrocyte activation. Adult wildtype (WT) and *Fgf8* hypomorphic (+/neo) mice were given a 0.2% cuprizone (CPZ) diet for two or three weeks. CPZ is used to model murine multiple sclerosis myelin pathogenesis in part by examining reactive astrogliosis. We measured astrocyte reactivity within the corpus callosum, cingulum and cortex. CPZ increased GFAP expression in all regions. Neither corpus callosum nor cortical GFAP expression increased in a genotype dependent fashion. Interestingly, cingulum GFAP expression increased in WT but not *Fgf8*^{+/neo} mice. This suggests reduced FGF8 signaling does not exacerbate CPZ-induced astrocyte activation in the corpus callosum and cortex. However, astrocyte activation in the cingulum was significantly decreased in CPZ-treated *Fgf8*^{+/neo} mice when compared to CPZ-treated WT mice. Our results show that GFAP⁺ astrocyte activation is FGF8 signaling dependent in a regionally specific manner.

Tehrani, Mahtab, *et al.*

Biological Sciences

In zebra finches the song circuit consists of interconnected neural regions that project to the muscular vocal organ (syrinx). Several features of this system are more enhanced in males as compared to females including neuron size and number, nuclear volume, and muscle fiber size. These differences enable only males to sing. Estradiol (E2) contributes to these dimorphisms by partially masculinizing the female brain and feminizing the male syrinx, but the receptor(s) through which it works is unknown. G-protein-coupled estrogen receptor 1 (GPER1) is a possible candidate. To investigate its potential role, G15, a GPER1 antagonist, was intracranially administered to male and female zebra finches for 25 days starting on the day of hatching. G15 decreased cell number in the neural song control region HVC (High Vocal Center) of males. It also decreased fiber size of the two largest muscle groups (ventralis and dorsalis) in the syrinx of males, but increased these measures in females. Together, these data suggest that GPER1 may contribute to masculinization of the brain but since not all dimorphic characteristics were affected, additional factors are likely involved. The bi-directional results in the syrinx imply a more complex function for GPER1 in this organ possibly involving opposing pathways.

Weaver, Alyx, *et al.*

Biomedical Sciences

Multiple sclerosis (MS) is an autoimmune disease of the nervous system driven by pro-inflammatory T-cells. The hallmark of MS is lesioning of myelin, which leads to motor disturbances, pain, fatigue, and aberrant sensations. Tumor necrosis factor alpha (TNF α) is one major pro-inflammatory cytokine released by T-cells that target myelin. Myelin in the brain is produced by oligodendrocytes, a type of glial cell that is lost progressively in MS. In cultured oligodendrocytes, TNF α impairs mitochondrial respiration. When TNF α binds the Tumor Necrosis Factor alpha1 receptor (TNF α r1) it activates the neutral membrane-associated sphingomyelinase 2 (nSMASE2). nSMASE2 degrades the membrane lipid, Sphingomyelin (Sph), to cell signaling lipids known as ceramides. Sph is shown deficient in most MS brains at sites of demyelination, implying altered metabolism of this species. Studies have shown alterations of ceramide ratios can cause apoptosis in oligodendrocytes. We hope to show

TNF α 1 activate nSMASE2 in oligodendrocytes and produces changes in ceramide ratios like at lesion sites. Our lab has grown primary oligodendrocytes and established a TNF α concentration from previous protocols. Our goal is to show that selective inhibition of nSMASE2 in those cells will abolish changes in ceramide levels following TNF α treatment. Demonstration of this has implications for lesion pathology.

Witchey, Shannah, *et al.*

Biological Sciences

The endocannabinoid system (ECS) plays a role in numerous behaviors, including those associated with feeding, reproduction, addiction, and stress. The cannabinoid 1 receptor (CB1R), expressed throughout the central nervous system, mediates a majority of these behavioral effects. CB1R knockout (CB1R $^{-/-}$) mice display anxious- and depressive-like phenotypes, are hypersensitive to stress, and have deficits in reward-seeking behaviors. Interestingly, the ECS has been linked to the oxytocin (Oxt) system, a system important to the neuromodulation of social behavior. To determine the effects of CB1R disruption on the Oxt system, we quantified the Oxt receptor (Oxtr) binding in male and female CB1R $^{-/-}$ and control mice. We hypothesized there would be genotypic differences in Oxtr expression within brain areas important for social behavior, such as amygdala, olfactory bulbs, and hypothalamic regions. In males, no genotypic differences in Oxtr binding in any regions quantified have been observed. In females, a significant genotypic difference in Oxtr binding has been observed in the accessory olfactory nucleus, with CB1R $^{-/-}$ females having increased expression of Oxtr. Given the importance of this region helping provide salience to social cues, these findings are intriguing and we plan to follow up with functional studies.

Yaw, Alexandra, *et al.*

Biomedical Sciences

Cocaine use creates a long term lengthening of circadian period (τ), which could underlie the significant health issues of cocaine addiction, and the rewarding effects of paternal cocaine use are transgenerational. We hypothesize the τ lengthening effect of cocaine may also be transgenerational, causing altered offspring reward response. Male mice were exposed to forced cocaine-water or water and harem-mated with naïve females. F1 drug or sucrose preference and circadian behaviors were analyzed. Nucleus accumbens RNA was isolated from F1 males and HiSeq RNA analysis was run. Long-term lengthening of τ was evident in cocaine sires. General circadian behaviors were not altered in F1's, but cocaine-sired males have altered photic phase shifting. Cocaine preference decreased in cocaine-sired males compared to controls; females had no difference. There were no differences in sucrose or ethanol preference. RNAseq analysis revealed significant correlations between genes upregulated in cocaine-sired males and genes upregulated by CREB and short-term Δ FosB. These data reveal no transmission of a cocaine-lengthened τ phenotype. However, paternal cocaine exposure significantly altered F1 preference for cocaine only, suggesting a selective effect on cocaine reward mechanisms in a sex-dependent fashion. Thus, cocaine addiction can be influenced by paternal sex-specific mode(s) of inheritance that alters gene expression.

Zalar, JP

Lifespan Development & Educational Sciences

Early Intervention emphasizes the need for families to receive services in their natural environment with familiar people and objects. This study's goal is to increase interactions and socialization between parent and child within their daily routines. Enhanced Milieu Teaching (EMT) strategies have been shown to enhance parent-child interactions, and therefore, the strategies of following the child's lead, wait time and turn taking will be used in the current project. This single subject research study aims to answer: what are the effects of coaching EMT strategies on the caregiver's use of intentional interactions; and what are the effects of parent-implemented EMT on the child's engagement? Using the evidence-based coaching method of Teach-Model-Coach-Review, the mother will be coached throughout the systematic introduction EMT strategies. Data will then be collected on how often the mother utilizes these three strategies and the duration of the child's engagement in a preferred activity. Past research suggests that as parental usage of EMT strategies increase, the child's engagement in preferred activities should also increase. Real world implications of this study include that by increasing intentional interactions, the opportunities for learning skills increase through child engagement, impacting behavior, functional play, language development, and daily routines.

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