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**Penn State Behrend - Sigma Xi**

**Twenty-Fifth Annual**

**Undergraduate Student Research and**

**Creative Accomplishment Conference**

**Oral Presentations**

Session I [Biology I - Microbiology](#i)

Session II [Biology II - Cell and Molecular Biology: Genetics](#II)

Session III [Biology III - Organismal Biology and Behavior](#III)

Session IV [Chemistry and Mathematics](#IV)

Session V [Computer Science and Engineering](#V)

Session VI [Economics I](#VI)

Session VII [Economics II - Sport Economics](#VII)

Session VIII [Engineering](#VIII)

Session IX [Psychology and History/Political Science](#IX)

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| **ORAL PRESENTATIONS****SESSION I****BIOLOGY I - Microbiology****169 Nick** |
| 8:55 a.m. | **Welcome** |
| 9:00 a.m. | **A Second Heme Detoxification System in the Insect Pathogen *Bacillus thuringiensis***Casey Latario and Rachel Schmidt (Devin Stauff), Grove City College  |
| 9:15 a.m. | **The Effects of Nano Zinc and Nano Silver as Antiseptics and Safety for Human Skin** Jui-En Hung (Kelly Miller), Penn State Behrend  |
| 9:30 a.m. | **Antimicrobial Activity of Essential Oils from Spices on Foodborne Pathogens**Usman Ahmad (Om Singh), University of Pittsburgh-Bradford  |
| 9:45 a.m. | **Break** |
| 10:30 a.m. | ***Musca domestica* Transmission of Chronic Limb Ulcer *Haemophilus ducreyi***Jordan Gaston (Tricia Humphreys and Bradley Hersh), Allegheny College  |
| 10:45 a.m. | **Use of the Software Program Mothur to Analyze Bacterial and Fungal Diversity on Potato Tubers Treated with 1,4-dimethylnaphthalene (DMN)** René Díaz and Ravi Patel (Michael Campbell), Penn State Behrend  |
| 11:00 a.m. | **A Long-Term Study Examining the Antibacterial Effectiveness of Agion Silver Zeolite Technology on Door Handles within a College Campus**Colleen Miller and Melissa Tarquinio (Beth Potter), Penn State Behrend  |
| 11:15 a.m. | **End of Presentations** |
| Noon | **Awards Luncheon in Erie Hall** |

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| **ORAL PRESENTATIONS****SESSION II****BIOLOGY II – Cell & Molecular Biology/Genetics****167 Nick** |
| 8:40 a.m. | **Welcome** |
| 8:45 a.m. | **Constructing Genetically Modified Human Serum Albumin Reconstituted With Heme as a Potential Nitrite Reductase**Mohammed Al Shibar (Mary Grace Galinato and Michael Campbell), Penn State Behrend |
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| 9:00 a.m. | **A Genomic Survey for *innexin 5* and *6* in Basal Dipteran Species**David Klodowski (Bradley Hersh), Allegheny College  |
| 9:15 a.m. | **Using Brainbow Imaging to Trace Individual Cells throughout Zebrafish Development** Emily Mitchell and Drew Cobert (James Warren), Penn State Behrend  |
| 9:30 a.m. | **Treatment of Potatoes with 1,4-dimethylnapthalene Results in Transcriptional Changes**Olivia D’Annibale (Michael Campbell), Penn State Behrend  |
| 9:45 a.m. | **Break** |
| 10:30 a.m. | **Patterns of *AN11* Expression and thoughts on its Regulation in Gametophytes of the Fern *Ceratopteris richardii***Randy Toth, Julia Girouard, Kara Norman, and Shivali Singh (Mike Ganger and Sarah Ewing), Gannon University |
| 10:45 a.m. | **Who’s Eating Who?**Jared Wilczynski and Brian Fuller (Greg Andraso and Kelly Grant), Gannon University |
| 11:00 a.m. | **Relative Gene Expression in Postnatal Day 25 IRBP-deficient Mice**Ananya Yerramreddy and Matthew Tilley (Christy Donmoyer), Allegheny College  |
| 11:15 a.m. | **Gene Expression of Structural and Functional Proteins in the LRAT-/- Mouse Model, a Model of Vitamin A Deficiency** Karishma Reddy (Christy Donmoyer), Allegheny College  |
| 11:30 a.m. | **End of Presentations** |
| Noon | **Awards Luncheon in Erie Hall** |

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| **ORAL PRESENTATIONS****SESSION III** **BIOLOGY III – Organismal Biology and Behavior****170 Nick** |
| 8:55 a.m. | **Welcome** |
| 9:00 a.m. | **Tick Talk: Prevalence of Zoonotic Pathogens in Pennsylvania**Ryan Braumann, Colin Fort, Amanda Hutzelmann, and Amy Lind (Tracy Farone), Grove City College |
| 9:15 a.m. | **A Census of the Bat Population on Gannon University’s Campus**Nick Bengel and Erin Debelak (Steve Ropski), Gannon University  |
| 9:30 a.m. | **The Relationship between Blood Lead Concentration and Raptors Involved in Vehicular Collisions**Abby Hileman (Anne Jacobs), Allegheny College |
| 9:45 a.m. | **Break** |
| 10:30 a.m. | **Heat-Shock Response in *Strongyloides Stercoralis* Infective Larvae**Laura Johnston (Wayne Forbes), Slippery Rock University  |
| 10:45 a.m. | **Pharyngeal Morphology of Field-Caught and Lab-Reared Bluegills (*Lepomis Macrochirus*), Pumpkinseeds (*Lepomis Gibbosus*), and their Hybrids**Andrea Landgraf (Greg Andraso and Kelly Grant), Gannon University |
| 11:00 a.m. | **Indirect Community Repercussions of Gun Violence: A Case-Control Study to Determine the Effect of Mass Shootings in The United States on the Birth Weight of Newborns**Garrett Devenney (Becky Smullin Dawson), Allegheny College |
| 11:15 a.m. | **End of Presentations** |
| Noon | **Awards Luncheon in Erie Hall** |

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| **ORAL PRESENTATIONS****SESSION IV****CHEMISTRY AND MATHEMATICS****168 Nick**  |
| 8:55 a.m. | **Welcome** |
| 9:00 a.m. | **Developing the Discrete Schrödinger Form via Discrete Orthogonal Polynomial Sequences**Derek Shaffer and Lauren Minner (Daniel Galiffa and Jennifer Ulrich), Penn State Behrend  |
| 9:15 a.m. | **Ideals and Extensions in Non-Commutative Rings** Marco Nunez (Papiya Bhattacharjee), Penn State Behrend |
| 9:30 a.m. | **Elucidating the Nitrite Reductase Activity of Myoglobin by Altering its Hydrogen-Bonding Network: Method Optimization, Kinetics, and Spectroscopic Characterization**Jaclyn Gowen and Anthony Rodland (Mary Grace Galinato), Penn State Behrend |
| 9:45 a.m. | **Break** |
| 10:30 a.m. | **The Discrete Sheffer Sequences as Solutions to the Discrete Schrödinger**Lauren Minner and Derek Shaffer (Daniel Galiffa and Jennifer Ulrich), Penn State Behrend  |
| 10:45 a.m. | **Assessing Electrochemically Reduced Graphene Oxide as a Support for Cyanide-Coordinated Ferriprotoporphyrin to Selectively Detect H2S**Susanne Simkovitch (Jason Bennett), Penn State Behrend  |
| 11:00 a.m. | **Do Vertex Replacement Rules Generate Post Critically Finite Self-Similar Sets?**Thomas Tuberson (Michelle Previte), Penn State Behrend  |
| 11:15 a.m. | **End of Presentations** |
| Noon | **Awards Luncheon in Erie Hall** |

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| **ORAL PRESENTATIONS****SESSION V****COMPUTER SCIENCE AND ENGINEERING****155 Nick** |
| 8:25 a.m. | **Welcome** |
| 8:30 a.m. | **An Intelligent Analysis Application that Helps Telling Student’s Academic Preference to Others**Xiaoyu Zhou (Meng Su), Penn State Behrend |
| 8:45 a.m. | **Implementation of a NAS System**Blake Dulick (Terri Lenox), Westminster College |
| 9:00 a.m. | **Leveraging Web Technologies for PLC Interfacing**Ryan Kelley (E. George Walters), Penn State Behrend |
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| 9:15 a.m. | **Analyzing Various Intelligent Agent Designs in a New Game Environment**Mark Patton (John Bonomo), Westminster College  |
| 9:30 a.m. | **Using Aquatic Adventure to Enhance the Learning of Mathematics in Preschool Children**Aaron Shifflett (Terri Lenox), Westminster College |
| 9:45 a.m. | **Break** |
| 10:30 a.m. | **Developing a Tersoff Potential Molecular Dynamics Framework to Simulate** **Amorphous Materials**Yehya Awad (Blair Tuttle), Penn State Behrend |
| 10:45 a.m. | **Learning to Learn: Using Artificial Neural Networks to Assist in the Short-Term Learning of Brain-Computer Interfaces**Zachary Dernar (C. David Shaffer), Westminster College  |
| 11:00 a.m. | **Application of the Internet of Things in Education**Yehya Awad (Naseem Ibrahim), Penn State Behrend |
| 11:15 a.m. | **Library Call Number Sorting Application**Christopher Andrejewski (David Loker), Penn State Behrend  |
| 11:30 a.m. | **End of Presentations**  |
| Noon | **Awards Luncheon in Erie Hall** |

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| **ORAL PRESENTATIONS****SESSION VI****ECONOMICS I****171 Nick** |
| 8:40 a.m. | **Welcome** |
| 8:45 a.m. | **Does a College’s Admission Selectivity Affect its Student Loan Default Rate?**Annie McGowan (Stephanie Martin), Allegheny College |
| 9:00 a.m. | **The Effects of the Samaritans Dilemma on the Outcome in Natural Disasters**Taylor Samuel (Stephanie Martin), Allegheny College  |
| 9:15 a.m. | **The Determinants of Renting versus Owning a Home**Edward Tiemann (Stephanie Martin), Allegheny College  |
| 9:30 a.m. | **The Essential Correctional College Education**Mark Egan (Stephanie Martin), Allegheny College  |
| 9:45 a.m. | **Break** |
| 10:30 a.m. | **Case Study on the Determinants of the Euro versus the United States Dollar Since 1999**Emily Neuherz (Stephanie Martin), Allegheny College  |
| 10:45 a.m. | **Gas Prices in Erie, Pennsylvania** Natalie Szalajko (Kenneth Louie), Penn State Behrend  |
| 11:00 a.m. | **Examining Minority Business Ownership**Marissa Baker (Kenneth Louie), Penn State Behrend  |
| 11:15 a.m. | **End of Presentations** |
| Noon | **Awards Luncheon in Erie Hall** |

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| **ORAL PRESENTATIONS****SESSION VII****ECONOMICS II – Sports Economics****156 Nick** |
| 8:55 a.m. | **Welcome** |
| 9:00 a.m. | **Performance, Wage and Nationality Discrimination in the Competitive Labor Market of Major League Soccer**Steven Ramsdell (Stephanie Martin), Allegheny College  |
| 9:15 a.m. | **Does Age in the NFL Matter in Order to Succeed Relative to the Salaries of the Highest Paid Players per Team?**Zach Harvey (Stephanie Martin), Allegheny College  |
| 9:30 a.m. | **NFL Player Trade and Acquisition Effects on Jersey Sales**Cody Stolar (Stephanie Martin), Allegheny College  |
| 9:45 a.m. | **Break** |
| 10:30 a.m. | **Economic Impact of Professional Sports Teams on their Cities**Nick Deichler (Stephanie Martin), Allegheny College |
| 10:45 a.m. | **Does the Presence of Sports Affect Alcohol Sales and Crime Rates?**Zachary Hudac (Stephanie Martin), Allegheny College  |
| 11:00 a.m. | **Do Sports Venues Act as a Catalyst for Gentrification in Low Income Areas?**Ian Richards (Kenneth Louie), Penn State Behrend |
| 11:15 a.m. | **End of Presentations** |
| Noon | **Awards Luncheon in Erie Hall** |

| **ORAL PRESENTATIONS****SESSION VIII****ENGINEERING****165 Nick** |
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| 8:10 a.m. | **Welcome** |
| 8:15 a.m. | **Experimental Investigation of Bend-Unbend Mechanics in the Tube-Flaring Process**Bradley Pier (Chetan Nikhare), Penn State Behrend  |
| 8:30 a.m. | **Acoustic Noise Emission Analysis for Manufacturing Processes**Travis Roney (David Loker, Cheatan Nikhare, and Ihab Ragai), Penn State Behrend  |
| 8:45 a.m. | **Hole Expansion and Strain Evolution during Biaxial Tension**John Nolan (Chetan Nikhare), Penn State Behrend  |
| 9:00 a.m. | **Assessment of Ergonomic Risks in Engineering Research Labs at Penn State Behrend**Anton Benedikt and Kyle Beckett (Faisal Aqlan), Penn State Behrend |
| 9:15 a.m. | **Reconfiguring the Goat Wrench**Tyler Loughran (Charlotte de Vries), Penn State Behrend |
| 9:30 a.m. | **Mathematical Modeling of Microscale Fuel Cell Electrode Performance**Daniel Doleiden and Naz Argun (Adam Hollinger), Penn State Behrend |
| 9:45 a.m. | **Break** |
| 10:30 a.m. | **Sectional Heat-Treated Tubing during Uniaxial Crash Test**Zachary McCauley (Chetan Nikhare), Penn State Behrend |
| 10:45 a.m. | **Case Study of Multipurpose Product Design Methodology**Johnathan Moody (Shraddha Sangelkar), Penn State Behrend  |
| 11:00 a.m. | **The Effect of Applied Electricity on Springback during Bending and Flattening of Stainless Steel 304 and 316, Titanium ASM-T-9046, and Magnesium AZ31B**Jacklyn Niebauer and Ian Sweeney (Ihab Ragai and John Roth), Penn State Behrend  |
| 11:15 a.m. | **Validation of Anisotropic Strain Data for University-Built Biaxial Tensile Machine**Emmett Vorisek (John Roth and Chetan Nikhare), Penn State Behrend |
| 11:30 a.m. | **End of Presentations** |
| Noon | **Awards Luncheon in Erie Hall** |

| **ORAL PRESENTATIONS****SESSION IX****PSYCHOLOGY AND HISTORY/POLITICAL SCIENCE****166 Nick** |
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| 8:25 a.m. | **Welcome** |
| 8:30 a.m. | **Assessing the Effectiveness of Therapy Dogs for Children with Autism in an** **Educational Setting**Emily Galeza, Julia Gabrys, and Danielle Carioto (Heather Lum and Victoria Kazmerski), Penn State Behrend |
| 8:45 a.m. | **The Influence of Mentoring on Positive Youth Development**Emily Marsden, Anana Tinnhe, Brianna Zaffino, Christina Murzynski, and Taylor Morris (Charisse Nixon and Nicole Rosen), Penn State Behrend |
| 9:00 a.m. | **Parental Attachement and College Student Adjustment**Allison Rupe, Skylar Amorose, Jane Ann Wiggers, and Chelsey Cratty (David Herring), Penn State Behrend |
| 9:15 a.m. | **Parenting Styles, Bullying, and Adjustment to College**Alyssa Pollo, Kyleen Baker, Jessica Mihalic, Melissa Watson, and Raven Porter (David Herring), Penn State Behrend  |
| 9:30 a.m. | **The Effect of Game-Play Difficulty on Auditory Attention: an Event-Related** **Potential Study**Alysha Simmons and Rachel Mooney (Victoria Kazmerski), Penn State Behrend  |
| 9:45 a.m. | **Break** |
| 10:30 a.m. | **“I’m in Lesbians with You”: A Microhistory of Romantic Friendships and Homosexuality Starring Emily Dickinson**Breanna Black (Amy Carney), Penn State Behrend |
| 10:45 a.m. | **Examining the Effectiveness of a Promotional Giveaway Social Norms Campaign**Rebecca Dinsmore and Allison Gage (Melanie Hetzel-Riggin), Penn State Behrend  |
| 11:00 a.m. | **The Role of Life Events on Feelings**Meghan Burgdolt, Julia Luke, Jacob Benedict, and Brianna Zaffino (David Herring), Penn State Behrend  |
| 11:15 a.m. | **The Relationship between Personality and Perceived Support within a Friendship**Kelsey Heinrich, Madison Barone, and Carlye Swanson (David Herring), Penn State Behrend |
| 11:30 a.m. | **End of Presentations** |
| Noon | **Awards Luncheon in Erie Hall** |