



**PennState**  
Behrend

## **Penn State Behrend – Sigma Xi**

Twenty-Seventh Annual  
Undergraduate Student Research and  
Creative Accomplishment Conference

### **Oral Presentations**

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Session I	<a href="#"><u>Biology I</u></a>
Session II	<a href="#"><u>Biology II</u></a>
Session III	<a href="#"><u>Chemistry, Mathematics &amp; Physics</u></a>
Session IV	<a href="#"><u>Computer Science &amp; Engineering I</u></a>
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# ORAL PRESENTATIONS

## SESSION I

## BIOLOGY I

### NICK 165

Time	#	Session
8:40 am		Welcome
8:45 am	1	Antimicrobial properties of compounds isolated from honey <u>Karman Masown</u> , Jillian Wright (Sarah E. Ruffell), University of Pittsburgh at Bradford - Microbiology
9:00 am	2	Identification of antibacterial components within five plants used within traditional medicine <u>Courtney N Shade</u> , Kisun Peters-Diaz (Sarah E. Ruffell), University of Pittsburgh at Bradford - Microbiology
9:15 am	3	Evaluation of Organic Solvents and Thiazolidine-2-thiones for Bacterial Growth and Biofilm Inhibition <u>Sidney Wallin</u> (Todd Eckroat), Penn State Behrend – Microbiology
9:30 a.m.	4	Complementary Genetic Screens Reveal Inactivating and Constitutively Activating Mutations in Two-Component Systems of <i>Bacillus anthracis</i> <u>Michelle Chu</u> , Ellen Upton (Devin Stauff), Grove City College - Microbiology
9:45 a.m.		Break
10:30 a.m.	5	Speciation-related toxicity of palladium complexes to the soil bacterium <i>Pseudomonas aeruginosa</i> <u>Rachel Pell</u> , <u>Daniel Muccio</u> , <u>Carson Williamson</u> (Deborah Aruguete & Kelly Miller), Penn State Behrend, Wesley College - Microbiology
10:45 a.m.	6	Characterization of UBX Binding in <i>Drosophila melanogaster</i> <u>Jessica Yohe</u> (Bradley Hersh), Allegheny College - Biochemistry
11:00 a.m.	7	Identification of Genes Affecting the Synthesis of Cuticular Hydrocarbons (CHCs) in <i>Drosophila melanogaster</i> <u>Emily Watto</u> (Bradley Hersh), Allegheny College - Biochemistry
11:15 a.m.		End of Presentations
Noon		Awards Luncheon in Erie Hall

# ORAL PRESENTATIONS

## SESSION II

## BIOLOGY II

*NICK 166*

Time	#	Session
8:40 a.m.		<b>Welcome</b>
8:45 a.m.	8	Effects of Forced Limb-Use and Exercise on Motor Recovery of a Rat Model of Parkinson's <u>Katelynn Morrell</u> (Deanne Buffalari), Westminster College - Neuroscience
9:00 a.m.	9	Developing an Ethical and Cost-Effective Murine Model for Type 1 Diabetes Mellitus-Induced Cataract via Single Dose of Streptozotocin <u>Samuel Thomas</u> (Christy Donmoyer), Allegheny College - Physiology
9:15 a.m.	10	You Can't Judge a Horse by its Color: Examining the Relationship between Horse Coat Color and Personality <u>Callie Garlick</u> (Ronald Mumme & Bradley Hersh), Allegheny College - Genetics
9:30 a.m.	11	DNA Barcoding of Important Pest Scale Insects from Southeast Asia <u>Haley Flick</u> , <u>Devin Hill</u> (Matthew Gruwell), Penn State Behrend - Genetics
9:45 a.m.		<b>Break</b>
10:30 a.m.	12	Estimating Growth Rates of Yellow Perch ( <i>Perca flavescens</i> ) from Lake Erie Using a Cost-Effective Method of Processing Otoliths <u>Nolan Pyle</u> , <u>Ileana Calderon-Martell</u> (Greg Andraso), Gannon University - Organismal Biology
10:45 a.m.	13	Influence of Diurnal Temperature Variation on the Amphibian Fungal Pathogen, <i>Batrachochytrium dendrobatidis</i> <u>Carissa Lange</u> (Matthew Venesky & Beth Choate), Allegheny College - Ecology
11:00 a.m.	14	Effects of disease pathology on nutrient cycling in aquatic systems <u>Michelle Woods</u> (Matthew Venesky & Scott Wissinger), Allegheny College - Ecology
11:15 a.m.	15	A Census of the Bat Population of Gannon University, Erie, PA <u>Lauren Reilly</u> (Steve Ropski), Gannon University - Zoology
11:30 a.m.		<b>End of Presentations</b>
Noon		<b>Awards Luncheon in Erie Hall</b>

# ORAL PRESENTATIONS

## SESSION III

### CHEMISTRY, MATH & PHYSICS

*NICK 167*

Time	#	Session
8:10 a.m.		<b>Welcome</b>
8:15 a.m.	16	Constructing Imidazole Complexes of Human Serum Albumin Reconstituted with Heme and Testing for Nitrite Reductase Activity <u>Alexandra Alfonso Castro</u> (Mary Grace Galinato), Penn State Behrend - Biochemistry
8:30 a.m.	17	Detection of Narcotics in Beverages Using Colorimetric Methods <u>Justin Keck</u> , <u>Jake Urbano</u> (Luciana Aronne), Penn State Behrend - Chemistry
8:45 a.m.	18	Electrochemical comparison of dicyanoferritoporphyrin - modified carbon and Pt microelectrodes for selective H <sub>2</sub> S detection <u>Hannibal Pharathikoune</u> (Jason Bennett), Penn State Behrend - Chemistry
9:00 a.m.	19	Combined Quantum Mechanical/Molecular Mechanical Investigation of Quorum Sensing Inhibitors <u>Nathan Gasparovic</u> (Ronald Brown), Mercyhurst University - Chemistry
9:15 a.m.	20	Bridge Tournament Scheduling <u>Hong Xin</u> (Paul Olson), Penn State Behrend - Mathematics
9:30 a.m.	21	Collatz Conjecture: A Problem Mathematics May Not Be Ready For <u>Caleb Cairns</u> (Michelle Previte), Penn State Behrend - Mathematics
9:45 a.m.		<b>Break</b>
10:30 a.m.	22	Optimal forcing location in arrays of Coupled Oscillators <u>Ziyuan Han</u> (Joseph Previte), Penn State Behrend - Mathematics
10:45 a.m.	23	Computer simulation of molecules and solids <u>Zhengxi Yan</u> (Blair Tuttle), Penn State Behrend - Physics
11:00 a.m.	24	Theory of Band Gaps in Amorphous Nano-porous SiC <u>Tyler Summers</u> <sup>1</sup> , <u>Andrew O'Hara</u> <sup>2</sup> , <u>Sokrates Pantelides</u> <sup>2</sup> (Blair Tuttle <sup>1</sup> ), Penn State Behrend <sup>1</sup> & Vanderbilt University <sup>2</sup> - Physics
11:15 a.m.	25	Optimizing the Power Output of Luminescent Solar Concentrators that Use White Diffusive Backgrounds <u>Jonathon Schrecengost</u> (Bruce Wittmershaus), Penn State Behrend - Physics
11:30 a.m.		<b>End of Presentations</b>
Noon		<b>Awards Luncheon in Erie Hall</b>

# ORAL PRESENTATIONS

## SESSION IV

### COMPUTER SCIENCE & ENGINEERING I

#### NICK 168

Time	#	Session
8:25 a.m.		<b>Welcome</b>
8:30 a.m.	26	<b>Development of Information System for Engineering Research Labs at Penn State Behrend</b> <u>Andres Santana</u> , (Jalaa Hoblos, Faisal Aqlan), Penn State Behrend - Computer Science/Software Engineering
8:45 a.m.	27	<b>Making Database Management Systems Manageable: User-friendly Automatic Report Generation</b> <u>Karen Postupac</u> , (Lory Al Moakar), Grove City College - Computer Science/Software Engineering
9:00 a.m.	28	<b>Integration and Administration of Macs in the Westminster College Unix Lab</b> <u>Eric Adams</u> , (David Shaffer), Westminster College - Computer Science/Software Engineering
9:15 a.m.	29	<b>Development of a Cross-Platform Logbook Application for Athletic Departmental Use</b> <u>Mitch Stahara</u> , (David Shaffer), Westminster College - Computer Science/Software Engineering
9:30 a.m.	30	<b>Blockchain Technology: An Initial Step Towards a Coherent Tech Society</b> <u>Alex Marcinkiewicz</u> , (Adrienne Foos), Mercyhurst University - Computer Science/Software Engineering
9:45 a.m.		<b>Break</b>
10:30 a.m.	31	<b>Hash Functions in Intrusion Detection Systems</b> <u>Nicholas Caiazza</u> , (David Shaffer), Westminster College - Computer Science/Software Engineering
10:45 a.m.	32	<b>Faculty Hiring Decision Support System</b> <u>Benjamin Reuscher</u> , <u>Shawn Weaver</u> , (Omar Ashour), Penn State Behrend - Engineering
11:00 a.m.	33	<b>Simulation Study to Improve Scheduling at a Cardiology Outpatient Clinic</b> <u>Nicholas Bowers</u> , (Omar Ashour), Penn State Behrend – Industrial Engineering
11:15 a.m.	34	<b>Improving Industrial and Mechanical Engineering Student Satisfaction, Motivation, and Performance through Development and Implementation of the "I-C-D-M" Undergraduate Teaching Methodology</b> <u>Gina Demeo</u> , (Shraddha Sangelkar, Paul Lynch), Penn State Behrend – Engineering Education
11:30 a.m.		<b>End of Presentations</b>
Noon		<b>Awards Luncheon in Erie Hall</b>

# ORAL PRESENTATIONS

## SESSION V

### ENGINEERING II

*NICK 169*

Time	#	Session
8:40 a.m.		<b>Welcome</b>
8:45 a.m.	35	<b>Analysis of Curved Shelving Units in Retail Stores: A Digital Human Modeling Approach</b> <u>Jessica Wyckoff</u> , (Faisal Aqlan), Penn State Behrend - Engineering
9:00 a.m.	36	<b>Feasibility Study of Interacting side-by-side Piezoelectric Harvesters in low-intensity grid-generated Turbulence</b> <u>Kevin Ferko</u> , (Amir Danesh), Penn State Behrend - Engineering
9:15 a.m.	37	<b>Java Based, Web Deployed GUI for the Human Cardiovascular System</b> <u>Ben Murphy</u> , (Elisa Wu), Penn State Behrend - Engineering
9:30 a.m.	38	<b>Ergonomic Assessment of Automotive Service Centers: A Case Study</b> <u>Faris Alzahrani</u> , <u>Ahmed Mushaikh</u> , (Faisal Aqlan), Penn State Behrend - Engineering
9:45 a.m.		<b>Break</b>
10:30 a.m.	39	<b>Wavy Toolpath Development in Single Point Incremental Forming</b> <u>Tyler Grimm</u> (Ihab Ragai, John Roth), Penn State Behrend - Engineering
10:45 a.m.	40	<b>AC System Design for Control of Thermal Environment using Solar Power Application</b> <u>Emmanuel Fale</u> , Evan Mangan, Daniel Schell, (David Gee), Gannon University - Engineering
11:00 a.m.	41	<b>Interaction of Side-by-Side Fluidic Harvesters in Fractal Grid-Generated Turbulence</b> <u>Nicholas Chiappazzi</u> , (Amir Danesh), Penn State Behrend - Engineering
11:15 a.m.	42	<b>Evaluation of Patient Handling Techniques Using Digital Human Modeling</b> <u>Christopher Lashway</u> , (Faisal Aqlan), Penn State Behrend - Engineering
11:30 a.m.		<b>End of Presentations</b>
Noon		<b>Awards Luncheon in Erie Hall</b>

# ORAL PRESENTATIONS

## SESSION VI

### ENGINEERING III

*NICK 170*

Time	#	Session
8:25 a.m.		<b>Welcome</b>
8:30 a.m.	43	Experimental Investigation of Tube Flaring with a Rotating Tool <u>Elizabeth Mamros</u> , (Chetan Nikhare), Penn State Behrend - Mechanical Engineering
8:45 a.m.	44	Analysis of Electrically Conductive Polymer Composites as Bipolar Plates <u>Meredith Sander</u> , James Pritts, (Adam Hollinger), Penn State Behrend - Engineering
9:00 a.m.	45	Experimental and Numerical Analysis on Bilayer Tube Flaring <u>John Olevnik</u> , (Chetan Nikhare), Penn State Behrend - Mechanical Engineering
9:15 a.m.	46	Resizing Armored Gloves <u>Morgan Wehler</u> , (Charlotte deVries), Penn State Behrend - Mechanical Engineering
9:30 a.m.	47	Springback Analysis of 5083 Aluminum Alloy <u>Brent McFarland</u> , (Chetan Nikhare), Penn State Behrend - Mechanical Engineering
9:45 a.m.		<b>Break</b>
10:30 a.m.	48	Burst Testing of Biomaterials for Medical Applications <u>Kelly Miller</u> , (Adam Hollinger), Penn State Behrend - Mechanical Engineering
10:45 a.m.	49	Experimental & Numerical Investigation of Bend-Unbend Mechanics in the Tube Flaring Process <u>Bradley Pier</u> , (Chetan Nikhare), Penn State Behrend - Mechanical Engineering
11:00 a.m.	50	Study of the Elastic Recovery and Residual Hoop Stress in Steel-Aluminum Rings <u>Jacob Alexander</u> , (Chetan Nikhare), Penn State Behrend - Mechanical Engineering
11:15 a.m.	51	Investigation on Square Tube Forming using a Reuleaux Triangle <u>Ryan Horstman</u> , (Chetan Nikhare), Penn State Behrend - Mechanical Engineering
11:30 a.m.		<b>End of Presentations</b>
Noon		<b>Awards Luncheon in Erie Hall</b>

# ORAL PRESENTATIONS

## SESSION VII

### ENVIRONMENTAL SCIENCE

*NICK 171*

Time	#	Session
8:25 a.m.		<b>Welcome</b>
8:30 a.m.	52	<b>Sustainable Waste Management: Development of a Leachate Collection and Treatment System for The Solomon Islands</b> <u>Courtney Platt</u> , <u>Madeline Schwerinski</u> , <u>Matthew Hackathorn</u> , (Hwidong Kim, Varun Kasaraneni,), Gannon University - Environmental Science
8:45 a.m.	53	<b>Environmentally Sustainable Redesign of Seabreeze Amusement Park Waste Production</b> <u>Briana Freeman</u> , (Rich Bowden, Casey Bradshaw-Wilson), Allegheny College - Environmental Science
9:00 a.m.	54	<b>Assessing the Degradation of Terrestrially Derived Dissolved Organic Matter in three Temperate Lakes</b> <u>Sarah Magyan</u> , (Christopher Dempsey), Gannon University - Environmental Science
9:15 a.m.	55	<b>Historical Change in Impervious Surface Cover of Penn State Behrend</b> <u>Rachel Pell</u> , (Michael Naber, Pam Silver), Penn State Behrend - Environmental Science
9:30 a.m.	56	<b>Shoreline change of Presque Isle State Park from 1937 to 2015</b> <u>Julia Guerrein</u> , (Michael Naber, Pamela Silver), Penn State Behrend - Environmental Science
9:45 a.m.		<b>Break</b>
10:30 a.m.	57	<b>Sustainable Waste Management: Application of yard clippings based Biochar for water treatment</b> <u>Steven Houser</u> , <u>Blake Dantio</u> , <u>William Morris</u> , (Varun Kasaraneni, Hwidong Kim), Gannon University – Environmental Engineering
10:45 a.m.	58	<b>Blood Makes the Flowers Grow: Studying Menstruators Menstrual Hygiene Product Usage and Knowledge of their Environmental Impact on Allegheny College Campus</b> <u>Danielle Higbee</u> , (Richard Bowden), Allegheny College - Environmental Science
11:00 a.m.	59	<b>Toxic effects of “environmentally-friendly” deicing alternatives on <i>C. dilutus</i> larvae using 10-day spiked sediment toxicity tests</b> <u>Megan Solan</u> , (Samuel Nutile), Penn State Behrend - Environmental Science
11:15 a.m.	60	<b>Design of Wastewater Treatment for Erie Water Works Sommerheim Plant</b> <u>Evan Wujcik</u> , <u>Jedariah Bortz</u> , <u>David Bovkun</u> , (Varun Kasaraneni, Hwidong Kim), Gannon University – Environmental Engineering
11:30 a.m.		<b>End of Presentations</b>
Noon		<b>Awards Luncheon in Erie Hall</b>



# ORAL PRESENTATIONS

## SESSION VIII

### HUMANITIES & SOCIAL SCIENCES

#### *HAMMERMILL 144H*

Time	#	Session
8:10 a.m.		<b>Welcome</b>
8:15 a.m.	61	Sustainable Consumption Goals, Automaticity, and the Consumption Context <u>Samuel Woodell</u> , (Richard Vann), Penn State Behrend - Marketing
8:30 a.m.	62	Exceeding Expectations: How the Behrend College Grew Exponentially <u>Michael Steadman</u> , (Joseph Beilein), Penn State Behrend - History
8:45 a.m.	63	Funding and Support of the Apollo Project: The Role of Politics and Public Opinion <u>Dylan Perry</u> , (Glenn Kumhera), Penn State Behrend - History
9:00 a.m.	64	Breaking the Chains: Re-Interpreting the Aztecs <u>Colin Shakespeare</u> , (Patrick Cosby), Penn State Behrend - History
9:15 a.m.	65	Comparative Advantage and Economic Policy Tools based on a Local Economy's Imports and Exports <u>Hannah Carlino</u> , (Travis Yates), Penn State Behrend - Economics
9:30 a.m.	66	Information Literacy and Dual Enrollment Students <u>Julia Lombard</u> , (Emmett Lombard), Gannon University – Information Literacy
9:45 a.m.		<b>Break</b>
10:30 a.m.	67	Society's Perception of School Mathematics as Told through Memes <u>Rachel Hughes</u> , (Courtney Nagle), Penn State Behrend - Education
10:45 a.m.	68	Anti-Fascist and Political Protest in Picasso's Guernica <u>John Jarecki</u> , (Killic Kanat), Penn State Behrend - Political Science/Art History
11:00 a.m.	69	Political Identity of American Volunteers in the Spanish Civil War <u>William Belding</u> , (Glenn Kumhera), Penn State Behrend - History
11:15 a.m.	70	Brief History of the Fuzz Detector <u>Isabelle Odell</u> , (Aaron Mauro), Penn State Behrend – Digital Media, Arts, and Technology
11:30 a.m.		<b>End of Presentations</b>
Noon		<b>Awards Luncheon in Erie Hall</b>