99th Annual Meeting of the Pennsylvania Academy of Science

April 12-14, 2024

Program Booklet

Established 1924

Pennsylvania Academy of Science

Hosted on the campus of

MESSIAH UNIVERSITY

Sponsored by

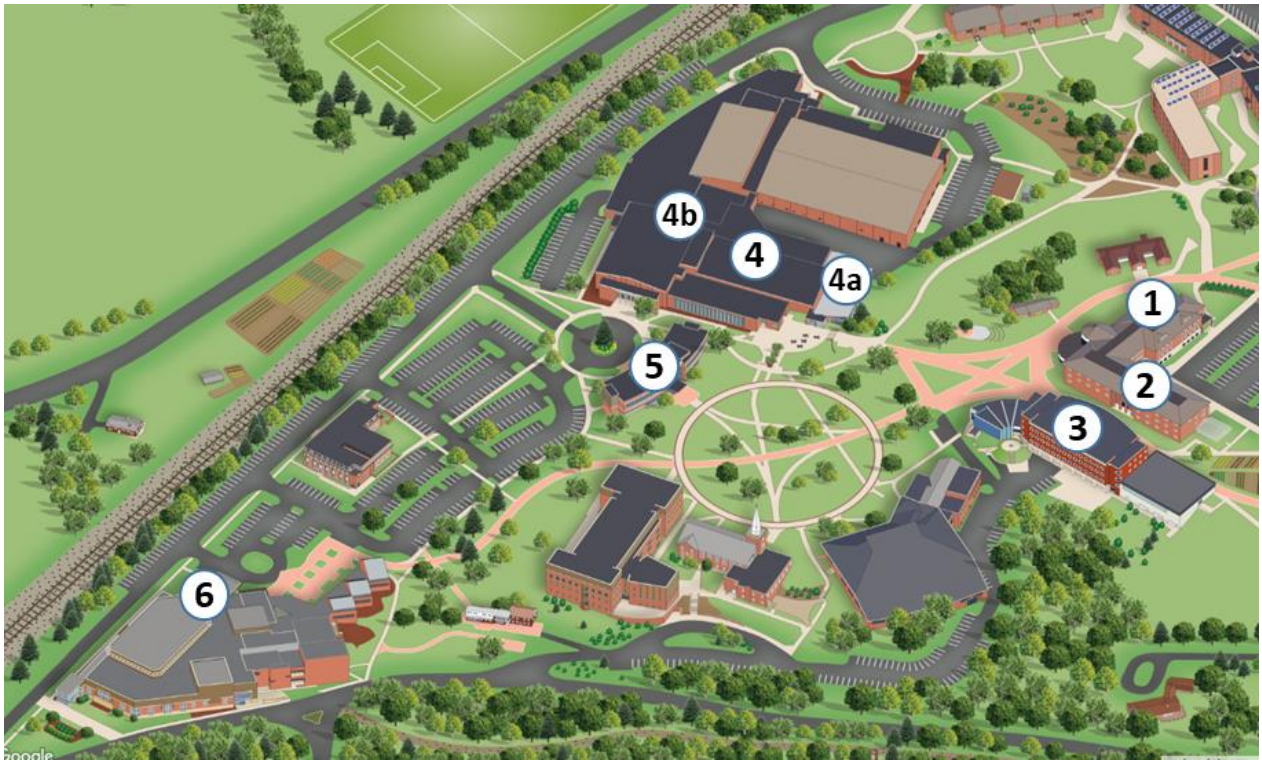
MERCK

Welcome to Messiah University

Messiah University is a top-ranked private university of the liberal and applied arts and sciences in the northeastern U.S. Messiah University is a private Christian university with a student body of 3,320 undergraduate and graduate students. With a reputation for successfully integrating rigorous academics and Christian faith into all of our academic programs, we offer 150+ undergraduate and pre-professional degree options and 20+ graduate degree and certificate programs.

Our scenic 375-acre suburban undergraduate campus is located in central Pennsylvania, just 12 miles from the state capital of Harrisburg. The University was founded in 1909 by the Brethren in Christ Church. Today, the University's faith base is broadly evangelical and includes students and employees from a variety of denominations and Christian faith traditions.

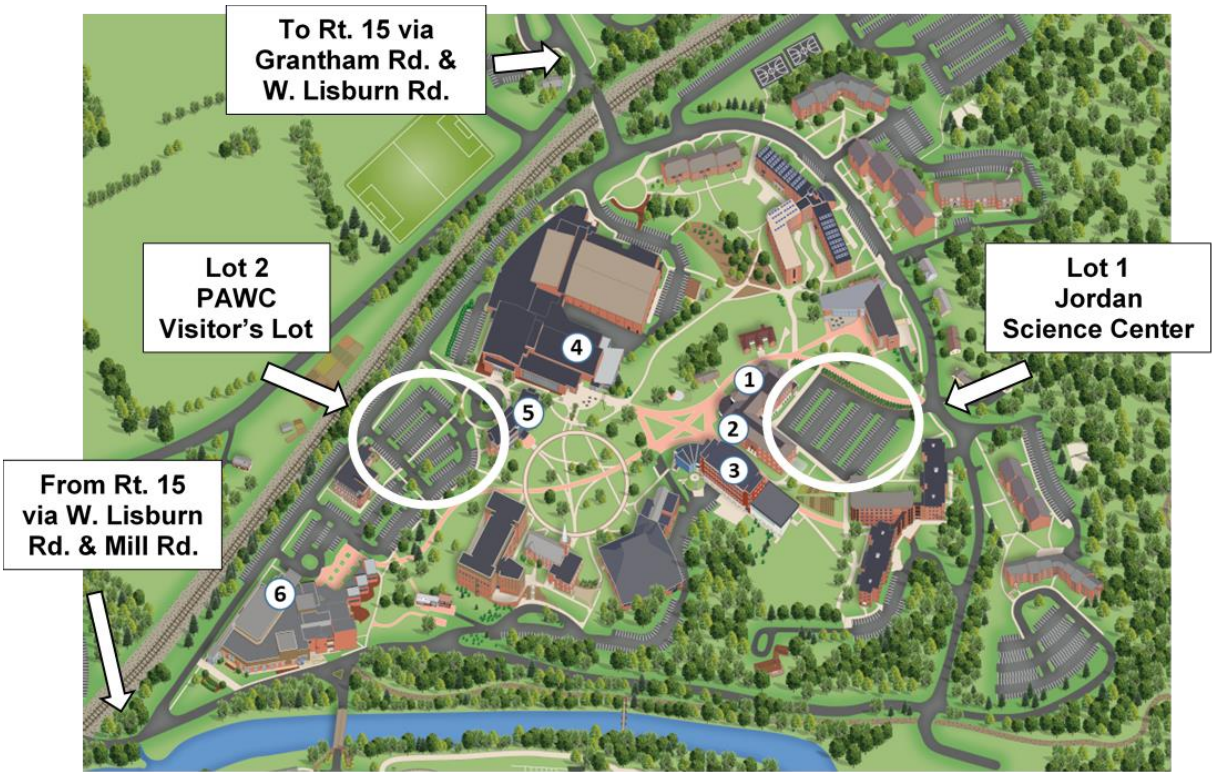
Messiah University Map
(Undergraduate Campus)



1. Jordan Science Center
2. Kline Hall of Science
3. Frey Hall
4. Eisenhower Campus Center (ECC)
   - 4a Martin Commons (Poster Sessions)
   - 4b Brubaker Auditorium (Banquet & Keynote)
5. Kim S. Phipps Admissions and Welcome Center (PAWC)
6. Parmer Hall, Calvin and Janet High Center for Worship and Performing Arts

https://tour.messiah.edu/campus-map/

Two **parking** areas are available for use by PAS attendees:
Lot 1) Jordan Science Center lot
Lot 2) Guest parking lot between ECC, PAWC and Old Main.



1. Jordan Science Center
2. Kline Hall of Science
3. Frey Hall
4. Eisenhower Campus Center (ECC)
5. Kim S. Phipps Admissions and Welcome Center (PAWC)
6. Parmer Hall, in the Calvin and Janet High Center for Worship and Performing Arts

Welcome Reception

Friday, April 12, 7:00–9:00 PM

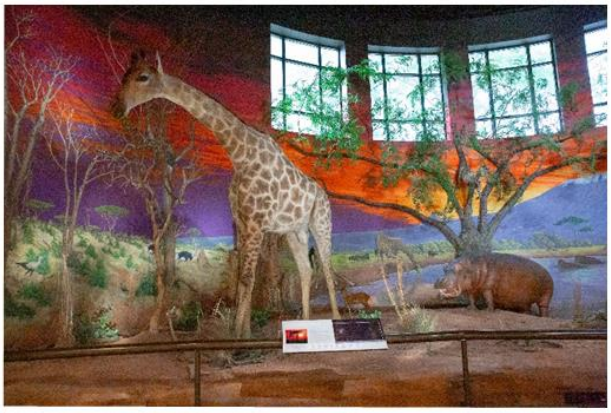
Jordan Science Center Lobby

and

Oakes Museum of Natural History
Hors d'oeuvres served

The Oakes Museum of Natural History is a unique museum experience for the family, classroom, or group featuring more than 40,000 specimens. Located within the Jordan Science center, the 10,000-square foot museum is home to a collection of African and North American mammals, birds, eggs, fish, seashells, minerals, insects, and fossils.

The Oakes Museum of Natural History offers a variety of programs that support the institution, surrounding school districts, home school programs and the public: Curator Clubs; hosting of Field Trips; Homeschool Science and Lab Classes; Scout Programs; Museum Tours; Summer Day Camps. Come to the Jordan Lobby to check-in for the meeting, and then enjoy conversations and hors d'oeuvres while exploring the wealth of specimens and educational displays in the Oakes Museum of Natural History! (*Please park in the Jordan Science Center lot on Friday evening*.)



Welcome Message from Dr. André Walther
President, Pennsylvania Academy of Science

On behalf of the Pennsylvania Academy of Science, it is my pleasure to welcome you to the 99th annual meeting. The Academy is excited to return to the central part of Pennsylvania with our meeting hosted by Messiah University. This meeting has a breadth of oral and poster presentations with presenters from across the state, and we encourage you to attend at least one talk or visit one poster that is in a field outside of your discipline. Be sure to join us for the keynote presentation, *Twists and turns in drug discovery: An antimalarial drug discovery case study that deciphers unique biology and identifies a potent development drug candidate* by Dr. David B. Olsen held following the Saturday evening banquet. In addition to attending the wonderful oral and poster sessions, we encourage our student participants to attend one of the offered career panel discussions on either industry, healthcare, or organismal/field biology during lunch on Saturday. Good luck to all the students participating in the Anne Spychala Competition and the Women in Science Competition, and a tremendous thank you to all of the volunteer judges for the event – we could not have this awards opportunity without your assistance.

As the Pennsylvania Academy of Science approaches its 100th year, we have been actively working to increase the reach and impact of the society on scientists and non-scientists within the Commonwealth. I would like to encourage faculty and staff participants at the meeting to increase their involvement in the society by joining the PAS Board of Directors for our business meeting held during the Saturday lunch. We are always looking for more members to take leadership roles in the society. I would like to extend a special word of thanks to the faculty and staff at Messiah University, led by Lawrence Mylin, for their roles in organizing the meeting this year, and to the program co-Chairs Rachael Zhu and Jenny Hayden for organizing the scientific sessions. Please enjoy the meeting and I look forward to seeing you at next year's 100th Annual meeting hosted by Harrisburg University of Science and Technology, in Harrisburg, PA.

Meeting Wireless Access

Wireless Network: Messiah Guest

Please see the information sheets at registration for directions on

how to access and use of the Messiah University Guest WiFi.

Visit the PAS website for Conference information

Pennsci.org

2024 Keynote Address

David B. Olsen, Ph.D.

Scientific Associate Vice President
Merck Research Laboratories
Neglected Tropical Diseases Discovery Lead

Saturday April 13, 2024 6:30-7:30 PM
Location: Brubaker Auditorium (Eisenhower Campus Center, Lower Level)

Twists and turns in drug discovery: An antimalarial drug discovery case study that deciphers unique biology and identifies a potent development drug candidate.

Malaria is a devastating disease that directly affects over half a million people each year with the most devastating and debilitating effects on young children. Antimalarial drug discovery by and large is focused on the identification of novel drugs to treat and prevent the disease due to the emergence and spread of *Plasmodium* strains resistant to existing medicines. In particular, artemisinin resistance which has now spread from SE Asia and is firmly established in Africa (as reported at ASTMH in Seattle Oct 2022).

Merck, a large pharmaceutical company, paired up with an academic collaborator, Professor Alan Cowman and his colleagues to do some malaria parasite drug hunting. The resulting collaboration identified robust targeted aspartyl protease screening hits that required some creative biochemical target identification to nail down the exact mechanism of the molecules. With some expert medicinal chemistry and detailed biological deciphering the team ended up with dual targeting molecules that are functionally active during the liver, blood and mosquito stage of the parasite's replication cycle.

Dr. Olsen will provide insights during one of the Saturday lunchtime career panels. As a 30+-year veteran of drug discovery in a large pharma company, he is always active in recruiting/interviewing/hiring new scientific talent for the organization. If you are interested in enhancing your chances of landing a scientific job in industry – drop in and see how you can differentiate yourself from the crowd of job applicants with some simple suggestions to your CV (resume) and interview performance. The interactive session will last approximately one hour. Please bring your Qs for Dr. O.! The session is offered for bachelors and graduate level students seeking industry employment, but Dr. Olsen can also provide insights on the role of graduate education in your preparation for employment.

Dr. Olsen graduated with a major in Chemistry from Messiah College in 1983. He completed graduate studies at the University of Maryland and Post-doctoral studies at Max Planck Institute for Experimental Medicine before joining Merck Research Laboratories in 1991 as a Research Scientist.

Student Lunch (Career) Panels
Saturday, April 13 12:00-1:30PM

(A free boxed lunch will be provided for each student registered to attend)

Panel I: *Careers in Industry*
Location: Frey Hall, Room 150

Dr. David B. Olsen ('83)
As a 30+-year veteran of drug discovery in a large pharma company, he is always active in recruiting/interviewing/hiring new scientific talent for the organization. If you are interested in enhancing your chances of landing a scientific job in industry – drop in and see how you can differentiate yourself from the crowd of job applicants with some simple suggestions to your CV (resume) and interview performance. The interactive session will last approximately one hour. Please bring your Qs for Dr. O.! The session is offered for bachelors and graduate level students seeking industry employment, but Dr. Olsen can also provide insights on the role of graduate education in your preparation for employment.

Panel II: *Careers in Healthcare*
Location: Frey Hall, Room 110 (Alexander Auditorium)

Messiah College/University alumni practicing medicine in several areas will describe their professional pathways and respond to questions from the audience.

Andrew Nevin ('18) MD, M.Ed.
Internal Medicine / Pediatrics Resident
Penn State Health

Rebekah Nevin ('19)
Clinical Research Specialist
Medtronic

Daniel Wingert ('14) MD
Assistant Professor, Department of Anesthesiology and Perioperative Medicine, Penn State Health

Daniel Kreider ('12) MD
Emergency Medicine & Ultrasound
Director, WellSpan York Hospital

Kristin (Kreider) Wallace ('11) PA
Medical Oncology, Hospital of the University of Pennsylvania

Panel III: *Careers in Organismal and Field Biology*
Location: Kline Hall of Science, Room 120

Messiah College/University alumni involved in careers related to organismal and/or field biology will describe their career preparation and employment experiences and respond to questions from the audience.

Leo "Rick" Donovall ('03) MS
National Operations Manager for the Citrus Health Response Program and Japanese Beetle Program, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine

Kristin Coury ('14) MS
Senior Aquarist, National Aquarium, Baltimore MD

David Jackson ('99)
Principal and Ecological Services Practice Lead, Civil & Environmental Consultants, Inc., Athens PA

Ben Hepler ('12) MS
Environmental Consultant, Skelly and Loy, Inc.

Erik Lindquist Ph.D.
Distinguished Professor of Biology and Environmental Science
Chair, Department of Biological Sciences
Messiah University

Presentations at the 99th Annual Meeting of the PAS

School/Organization	Number of Presentations
Messiah University	17
DeSales University	11
Cedar Crest College	9
Mercyhurst University	9
York College of Pennsylvania	9
Immaculata University	6
Muhlenberg College	6
Susquehanna University	6
Wilson College	5
Harrisburg University of Science and Technology	4
Lafayette College	3
Misericordia University	3
University of Pittsburgh at Greensburg	3
University of Southern California	3
West Chester University	3
Allegheny College	2
Bucknell University	2
East Stroudsburg University	2
Gannon University	2
King's College	2
La Salle University	2
Albright College	1
Arizona State University	1
Cabrini University	1
Commonwealth Charter Academy	1
Elizabethtown College	1
Lebanon Valley College	1
Northwest Pennsylvania Collegiate Academy	1
Penn State University	1
Penn State University-Harrisburg	1
Tower Health School of Health Sciences	1
University of Iowa Hospital and Clinics	1
Widner University	1
Wilkes University	1

Presentations sponsored by 34 Pennsylvania colleges and universities, and additional institutions.

99th Annual Meeting of the Pennsylvania Academy of Science

All events held on the Messiah University campus

SCHEDULE OF ACTIVITIES AT A GLANCE

Friday, April 12		
5:00–6:45 PM	**PAS Board Meeting and Dinner**	**Eisenhower Campus Center ECC152**
7:00–8:00 PM	**Meeting Check-In**	**Jordan Science Center Lobby**
7:00–9:00 PM	**Hors d' oeuvres reception** **Self-guided museum exploration & conversations**	**Jordan Science Center Lobby & The Oakes Museum of Natural History**
Saturday Morning Sessions, April 13		
8:00–9:00 AM	**Meeting Check-In**	**Jordan Lobby**
8:00–9:00 AM	***Continental Breakfast Bar & Coffee***	**Jordan Lobby**
8:50–9:15 AM	**Opening Remarks** **(NO FOOD or DRINK are permitted in Parmer Hall)** **Dr. Alison Noble**, Interim Provost Messiah University **Dr. Andre Walther**, President PAS **Dr. Lawrence Mylin**, Messiah University	**Parmer Hall, High Center**
9:30/10:00–11:00 AM	***Coffee Breaks in both Jordan Lobby & Martin Commons***	**Jordan Lobby & Martin Commons**
10:30–11:45 AM	**Oral Presentations I:** Cell Biology	**Kline 120**
10:30–11:45 AM	**Oral Presentation II:** Microbiology I	**Frey 110**
9:45–11:45 AM	**Poster Session I (Poster set-up 9:15-9:45 AM):** Molecular Biology, Genetics, Neuroscience, and Other	**Martin Commons (ECC)**
Saturday Lunch Sessions, April 13 (11:45 AM, pick up box lunches in Jordan Lobby)		
12:00–1:30 PM	**PAS Business Meeting/Lunch (Open to all members)**	**PAWC 310**
12:00–1:30 PM	**Student Lunch Panel:** *Career Panel: Organismal & Field Biology*	**Kline 120**
12:00–1:30 PM	**Student Lunch Panel:** *Career Panel: Industry*	**Frey 150**
12:00–1:30 PM	**Student Lunch Panel:** *Career Panel: Healthcare*	**Frey 110**

*** Business Meeting Election slate found at https://pennsci.org/schedule2024/**

Saturday Afternoon Sessions, April 13		
2:00–4:00 PM	***Coffee Break***	**Jordan Lobby**
2:00–3:15 PM	**Oral Presentations III:** Behavior	**Kline 120**
2:15–3:00 PM	**Oral Presentations IV:** Microbiology II	**Frey 150**
3:15–4:30 PM	**Oral Presentations V:** Ecology	**Frey 110**
4:30–5:30 PM	**Planning Meeting for the 100th Annual Meeting**	**Jordan 159**

Saturday Evening Sessions, April 13		
5:30–6:30 PM	**Dinner (Buffet Banquet)**	
6:30–7:30 PM	**Keynote Speaker:** *Twists and turns in drug discovery: An antimalarial drug discovery case study that deciphers unique biology and identifies a potent development drug candidate.* *Dr. David B. Olsen, Scientific Associate Vice President Merck Research Laboratories*	**Brubaker Auditorium, Eisenhower Campus Center**
Sunday, April 14		
7:30–8:30 AM	**Meeting Check-In**	**Jordan Lobby**
7:30–8:30 AM	***Continental Breakfast Bar & Coffee***	**Jordan Lobby**
8:00–9:15 AM	**PAS Board Meeting**	**ECC Board Room**
9:30–11:30 AM	***Coffee Break***	**Jordan Lobby & Martin Commons**
9:45–11:00 AM	**Oral Presentations VI:** Plant Biology and Environmental Science	**Kline 120**
9:30–11:00 AM	**Poster Session II (Poster set-up 8:00-9:00 AM):** Microbiology and Ecology	**Martin Commons (ECC)**
11:45–12:00	**Pick up box lunches for Awards Ceremony**	**Frey Lobby**
12:15–1:30 PM	**Awards Ceremony**	**Frey 110**

Scan here to access the Schedule, Abstracts, and Business Meeting information at https://pennsci.org/schedule2024/

99th Annual Meeting of the Pennsylvania Academy of Science

GENERAL PROGRAM SESSIONS

ALL Abstracts are available in the Abstract Booklet located at

https://pennsci.org/schedule2024/

Program Co-Chairs: Jenny Hayden and Rachael Zhu

Saturday, April 13 MORNING SESSIONS

ORAL SESSION I: Cell Biology

Saturday April 13 10:30 – 11:45 AM Location: **Kline 120**
Session Chair: **Dr. Andrea Nagy**

10:30-10:45 **1.** *Evaluation of a cell-based vaccine against pancreatic cancer*.- **Soerens, Evangeline*, and Lawerence Mylin** Messiah University.

10:45-11:00 **2.** *Effect of proglumide on expression of type I collagen chains in pancreatic cancer*.- **Azar, Michael*, and John Harms** Messiah University.

11:00-11:15 **3.** *Using an ethosomal solution to study transdermal Vitamin D3 delivery on dorsal porcine ears*.- **Conner, Rebecca*, Erica Ward, and Andrea Nagy** Harrisburg University of Science and Technology.

11:15-11:30 **4.** *Lipopolysaccharide alters cell viability and location of NF-κB and TNF-α in cAMP-stimulated RT4-D6P2T Schwannoma*.- **Wilcox, Mackenzie*, Caitlyn Henry, and Angela Asirvatham** Misericordia University.

11:30-11:45 **5.** *Analyzing the effect of aldosterone on symptoms of vestibular dysfunction in mice*.- **Bowers, Connor*, Jeffrey Bardwell, and Brad Engle** Wilson College.

ORAL SESSION II: Microbiology I

Saturday April 13 10:30 – 11:45 AM Location: **Frey 110**
Session Chair: **Dr. Manuel Ospina-Giraldo**

10:30-10:45 **6.** *Assessing changes in pond fungal communities after chemical treatment*.- **Glenn, Madeline*, Gabrielle Seagreaves*, and Lara Goudsouzian** DeSales University.

10:45-11:00 **7.** *Gene expression analysis of Phytophthora infestans auxiliary activity 17 (AA17) family genes PITG_04949 and PITG_13520*.- **Hofmann, Olivia*, and Manuel Ospina-Giraldo** Lafayette College.

11:00-11:15 **8.** *Filamentation of novel bacterial and yeast species*.- **Foriska, Isabella*, and Rajinikanth Mohan** Mercyhurst University.

11:15-11:30 **10.** *Developing a serum-limited growth media for HUVECs*.- **Azar, Sydney*, and Brian Gray** York College of Pennsylvania.

POSTER SESSION I: Molecular Biology, Genetics, Neuroscience, and Other

Saturday April 13 9:45 - 11:45 AM Location: **Martin Commons**

Session Chair: **Dr. Leocadia Pauliulis**

11. *Extraction and analysis of the antioxidant resveratrol from various dried fruit*.- **Katzenmoyer, Jonathan P.*, and Francis Mayville** DeSales University.

12. *Synthesis of ionic liquids and their application for electrophilic aromatic substitution reactions*.- **Donovan, Angelena*, and Francis Mayville** DeSales University.

13. *Review on diabetes and obesity treatments*.- **Liashenko, Varvara*, Molly Sawyer*, Emily Misko, Praveer Singh, Dominic Pearson, Gabrielle Hollenbeck, He Liu, and Prasad Dalvi** Gannon University.

14. *Gold- based therapy: Investigating the side effects at the organismal level*.- **Snavely, Tyler*, Ashley Darrow*, Stella Phillips*, Laicie Terry*, and Valbona Hoxha** Lebanon Valley College.

15. *Regulation of CBF1 and SVALKA during acute cold stress in Arabidopsis thaliana*.- **Washco, Lauren*, and Amy Hark** Muhlenberg College.

16. *Insight into how Jazf-1 regulates gene expression in the eye nervous system*.- **Stonbraker, Madison*, and Matthew Johnson** University of Pittsburgh at Greensburg.

17. *The effects of Jazf-1 on the nervous system of Drosophila melanogaster*.- **Bajich, Mariana*, Stephanie Bodner*, Naomi Custer*, and M. Logan Johnson** University of Pittsburgh at Greensburg.

18. *widerborst and well-rounded: an example to illustrate the relationship of orthologs and paralogs in Drosophila species*.- **Ali, Anam*, and Amy Hark** Muhlenberg College.

19. *Assessing the efficacy of anti-fibrotic treatment on pancreatic cancer metastases*.- **Ramsey, Ruby*, and John Harms** Messiah University.

20. *Measuring the effect of corticosteroids on epithelial integrity of the human corneal epithelial monolayer in the presence and knockdown of the glucocorticoid receptor*.- **Thompson, Sydney*, and Mahita Kadmiel** Allegheny College.

21. *Analysis of glycoprotein secretion from OKF6/TERT-2 (oral epithelial) cells after E-liquid treatments*.- **Pecorelli, Sara*, and Giancarlo Cuadra** Muhlenberg College.

22. *Distribution of prophages in the Streptococcus bacteria genus and their role in increasing host pathogenicity*.- **Mathur, Vinayak*** Cabrini University.

23. *Rilpivirine treatment alters growth patterns and delays the onset of senescence in primary human fibroblasts*.- **Madera, Jack*, Liam Rivard, David Rothblat, and Jaimy Joy** La Salle University.

24. *Is Iso-Q the missing clue? Evaluating the anti-inflammatory effects of isoquercitrin*.- **Perneta, Nicholas*, Victoria Kenney, and Olivia Montvydas*** DeSales University.

25. *Assessing the correlation between pain tolerance and ACTN3 genotype*.- **Ferguson-Richards, Adore*, Zahra Imrani*, and Lara Goudsouzian** DeSales University.

26. *Testing the effect of phosphoglycerate kinase 1 activation with terazosin in a Drosophila model of amyotrophic lateral sclerosis*.- **Grove, Austin*, and Daniela Zarnescu** Messiah University.

27. *The Effect of LPS on Phosphorylation of AKT Signaling in Schwann Cells*.- **Wilde, Nicholas*, Mackenzie Wilcox, and Angela Asirvatham** Misericordia University.

28. *Understanding how RPA phosphorylation affects the telomere synthesis pathway*.- **Wolfinger, Madison*, and Andre Walther** Cedar Crest College.

29. *Applying quantitative PCR with high-resolution melt analysis for rapid genotyping of brewery yeasts*.- **O'Donnell, Reagan*, Lauren Heiland, and André Walther** Cedar Crest College.

31. *Examining Replication Protein A and its interactions with proteins Ddc2p, Mec1p, and Tel1p using the budding yeast Saccharomyces cerevisiae*.- **Bonser, Hannah*, Alison Edwards, and Andre Walther** Cedar Crest College.

32. *Examining the bridging interactions of cancer associated protein Ddc2p with Replication Protein A and Mec1p using the budding yeast Saccharomyces cerevisiae*.- **Edwards, Alison*, Hannah Bonser, and Andre Walther** Cedar Crest College.

33. *Annotation and comparative analysis of the sticks-and-stones homologs in the Drosophila melanogaster subgroup: implications for studying human congenital nephrotic syndrome*.- **Eichner, Miranda*, Dhruv Kayastha*, and Nik Tsotakos** Penn State University-Harrisburg.

34. *Expression pattern of Canavan Disease-associated ASPA gene during development of zebrafish (Danio rerio)*.- **Kuzmiak, Faith*, and Wendy Boehmler** York College of Pennsylvania.

35. *Effect of Glucocorticoids on Zonula Occludens 1 (ZO-1) expression in human retinal pigmented epithelial cells*.- **Yendluri, Saiananya*, Marissa Hooks, Taylor Besch, and Mahita Kadmiel** Allegheny College.

36. *Analyzing the effect of RPA phosphorylation on interactions with DNA repair proteins in Saccharomyces cerevisiae*.- **Franzone, Katherine*, and Andre Walther** Cedar Crest College.

37. *The effect of alkylation on mutation frequency and type in yeast*.- **Cruz, Siera*, and Daniel Ginsburg** Immaculata University.

38. *Developing a more specific histone deacetylase inhibitor*.- **Faia, Louis*, James K. Murray Jr., and Daniel Ginsburg** Immaculata University.

39. *Tenofovir disoproxil fumarate induces premature senescence in primary human fibroblasts*.- **Gallagher, Casey, David Rothblat, and Jaimy Joy*** La Salle University.

40. *Evaluating fibrosis inhibition in a new murine model of pancreatic cancer*.- **Ambrosino, Marian*, and John Harms** Messiah University.

41. *The difference in the course of infection across genetic lines of the confused flour beetle, Tribolium confusum, with the rat tapeworm, Hymenolepis diminuta*.- **Abdulrahman, Lieth*, and Ann Yezerski** King's College.

42. *How ciprofloxacin antibiotic may induce prolonged anxiety-like behavior and gastrointestinal dysfunction in rats*.- **Ganzorig, Maral*, and Cecilia Bove** York College of Pennsylvania.

43. *The effects of vitamins, supplements, and other naturopathic therapies on the outcomes of Duchenne muscular dystrophy patients*.- **Antalek, Chloe*, Brad Engle, and Marit Delghandi** Wilson College.

44. *Super giant basal cell carcinoma: A comprehensive systematic review*.- **Kang, Genelia*** Northwest Pennsylvania Collegiate Academy.

45. *MDH and metabolic regulation: insights from phosphomimic mutants*.- **Sontheimer, Danielle*, and Amy Parente** Mercyhurst University.

46. *Navigating overexpression challenges: mutant MDH production in E. coli*.- **Flores, Maria*, Torianne Morrow*, and Amy Parente** Mercyhurst University.

47. *Comparison of living and dying dividing cricket spermatocytes*.- **Aryal, Sweta*, Maria Ruccolo, and Leocadia Paliulis** Bucknell University.

48. *Analysis of chromosome movements in cell division in the milkweed bug Oncopeltus fasciatus*.- **Davoudi Kianersi, Hedyeh*, and Leocadia Paliulis** Bucknell University.

49. *Minimal genetic variation in DNA sequences of spotted lanternflies, Lycorma delicatula*.- **Neto, Isabella*, Kelly Reid, Kimeal Parham, and Richard Kliman** Cedar Crest College.

Saturday, April 13 AFTERNOON SESSIONS

ORAL SESSION III: Behavior

Saturday April 13 2:00 - 3:15 PM Location: **Kline 120**

Session Chair: **Dr. Valbona Hoxha**

2:00-2:15 **50.** *Environmental and seasonal variations of postmortem necrophagous insect communities on Rattus norvegicus*.- **Jones, Bryan*, and David Foster** Messiah University.

2:15-2:30 **51.** *Quantifying the initiation and spread of fashion trends on TikTok*.- **Pilaitis, Julia*, and Daniel Strömbom** Lafayette College.

2:30-2:45 **30.** *Developmental profile of locomotor response to novelty and anxiety-like behavior in male and female mice*.- **Conard, Payton*, Erin Kirschmann, and Eric Sweet** Immaculata University.

2:45-3:00 **53.** *Social group size and habitat density influence the development of Rocio octofasciata (Jack Dempsey) cichlid fish behavior*.- **Spagnola, Lily*, Laura Blanco, Jessica Maamari, and Audrey Ettinger** Cedar Crest College.

3:00-3:15 **54.** *Effects of human habituation on eastern gray squirrel predator response behaviors*.- **Brill, Charles*, and Thomas LaDuke** East Stroudsburg University.

ORAL SESSION IV: Microbiology II

Saturday April 13 2:15 - 3:00 PM Location: **Frey 150**

Session Chair: **Dr. Deborah Austin**

2:15-2:30 **56.** *Caseinase production in bacteria specimens, the search for novel sources*.- **Murray, Mackenzie*, and Rajinikanth Mohan** Mercyhurst University.

2:30-2:45 **57.** *Diisononyl phthalate exposure induces a unique phenotype for multiple Bacillus isolates*.- **Hill, Kara*, and Rajinikanth Mohan** Mercyhurst University.

2:45-3:00 **58.** *The effectiveness of sulfur-containing compounds on the inhibition of growth of Streptococcus pyogenes*.- **Story, Lydia*, Deborah Austin, and Jeffrey Bardwell** Wilson College.

ORAL SESSION V: Ecology

Saturday April 13 3:15 - 4:30 PM Location: **Frey 110**

Session Chair: **Dr. David Foster**

3:15-3:30 **64.** *Migwéch: Science, language, and relationship in the ethnobotany of the Forest County Potawatomi*.- **Jahraus, Tyler*, Richard Gouge*, and David K. Foster** Messiah University.

3:30-3:45 **59.** *Uropygial gland size increases isometrically with body size in 35 North American bird species*.- **Dotta, Austin*, and Alex Huynh** DeSales University.

3:45-4:00 **60.** *Effects of a low-intensity fire on an oak forest in Central Pennsylvania two years post-burn*.- **Smith, Caleb*, and David Foster** Messiah University.

4:00-4:15 **61.** *Dietary analysis of Plethodon wehrlei : a cryptic species of lungless salamander in Pennsylvania*.- **Michael, Mary*, Randy Cassell, and Erik Lindquist** Messiah University.

4:15-4:30 **62.** *Improving analysis of a Pennsylvanian hardwood forest fire using ArcGIS Pro in 3D*.- **Richert, Caleb*, and David Foster** Messiah University.

Sunday, April 14 MORNING SESSIONS

ORAL SESSION VI: Plant Biology and Environmental Science
Sunday April 14 9:45 - 11:00 AM Location: **Kline 120**
Session Chair: **Dr. Rachel Fogle**

9:45-10:00 **65.** *Impact of agro-wastes: Cocos nucifera (coconut coir), Carya illinoinensis (pecan shells), and Oryza sativa (rice husks) on growth timelines, fruition production, and average diameter of Pleurotus ostreatus (oyster mushrooms)*.- **Fake, Kyle*, Steven Urban, and Rachel Fogle** Harrisburg University of Science and Technology.

10:00-10:15 **66.** *Comparative growth of Brassica rapa var. chinensis (Pak choi) and Lactuca sativa var. crispa (red salad leaf lettuce) in a hydroponic nutrient solutions with and without addition of aquaponic stimulant solution and fulvic acid in a Nutrient Film Technology (NFT) hydroponics system*.- **Thurber, Caleb*, and David Foster** Messiah University.

10:15-10:30 **67.** *Evaluation of the growth and agronomic performance of flax varieties (Linum usitatissimum) in South Central Pennsylvania*.- **Condon, Sarah*, and Glafera Janet Matanguihan** Messiah University.

10:30-10:45 **52.** *Optimal resource allocation to combat spotted lanternfly infestations*.- **Hu, Jinrong*, Daniel Strömbom, Swati Pandey, and Elizabeth Batchelar** Lafayette College.

10:45-11:00 **55.** *Predation by green algae – regulated by a quest for nutrients?*- **Charvet, Sophie*** Susquehanna University.

Poster Session II: Microbiology and Ecology
Sunday March 19 9:30-11:00 AM Location: **Martin Commons**
Session Chair: **Dr. Dia Beachboard**

68. *Analyzing the effect of E-liquids on oral commensal bacteria*.- **Christian, Nicole*, Alexander Emam*, Daniel Burden, and Giancarlo Cuadra** Muhlenberg College.

69. *The effects of E-liquids on THP-1 macrophage differentiation and gene expression*.- **Tomov, Sophie*, Sabeen Safi*, and Giancarlo Cuadra** Muhlenberg College.

70. *Berberine: extraction, analysis, and evaluation of antibacterial effectiveness*.- **Casey, Abigail*, David Foster, Richard Schaeffer, and Lawrence Mylin** Messiah University.

71. *Investigating a stenothricin-like pathway: uncovering the antibiotic potential of the soil bacteria Paenarthrobacter nicotinovorans using CRISPR Cas9 gene editing*.- **Rossiter, Taylor*, and Meda Higa** York College of Pennsylvania.

72. *Determining the role of FODMAPs molecules in the production of short-chain fatty acids in the human gut microbiome*.- **Salo, Shannon*, and Brian Gray** York College of Pennsylvania.

73. *Evaluation of bacteriophage T4-neutralizing antibodies secreted by murine hybridoma clones*.- **Foster, Ava*, Wei-Jin Lin, and Lawrence Mylin** Messiah University.

74. *Non-Biting Midges (Chironomidae) as bioindicators of specific pollutants*.- **Saxe, Nathaniel*, and Jeff Erikson** Messiah University.

75. *The mycobiome of four distinct bog environments*.- **Lippitt, Kade*, Madeline Glenn*, and Lara Goudsouzian** DeSales University.

76. *Mouthwash and the oral microbiome*.- **Micklus, Morgan*, Anthony Teo*, and Lara Goudsouzian** DeSales University.

77. *Assessing the effect of gravity and coagulant aided thickening methods on the nutrient profile of RAS effluent for potential reuse in hydroponic production*.- **Lopez-Soliz, Maurice*, Joseph Tetreault, and Rachel Fogle** Harrisburg University of Science and Technology.

78. *Unveiling aquifer heterogeneity: ground penetrating radar as a pioneering tool for preferential flow visualization*.- **Morton, Delaney*, and Ahmed Lachhab** Susquehanna University.

79. *Cultivating Lactuca sativa (Bibb lettuce) using various fertilization methods in controlled environment agriculture*.- **Metzger, Bradlee*, Joseph Tetreault, and Rachel Fogle** Harrisburg University of Science and Technology.

80. *Testing the plant vigor hypothesis after wildfire in the New Jersey Pinelands National Reserve*.- **Wolfgang, Jessica R.*, Francesca C. Giardini*, Vaughn Shirey, and Stephen C. Mason, Jr.** Immaculata University.

81. *Optimizing protocols to study prasinophyte bacterivory*.- **Sheppard, Jordan*, and Sophie Charvet** Susquehanna University.

82. *Comparing beetle (Insecta: Coleoptera) biodiversity at different sites on Hog Island, Maine*.- **Doyle, Aidan J.*, Liam H. Semmler, Evan S. Waite, Vaughn Shirey, and Stephen C. Mason, Jr.** Immaculata University.

83. *Impacts of water availability on Plethodon cinereus*.- **Hauk, Tyler*, Natasha Sherinsky, and Tanya Hawley Matlaga** Susquehanna University.

84. *Role-playing medical cases in Human Anatomy and Physiology courses with undergraduate students using principles from Dungeons and Dragons*.- **Leidig, Charles, Drew MacDonald, Justin Kerby II, and Ian Cost*** Albright College.

85. *Better understanding of protein interactions with jazf-1*.- **Greene, Hallee*, and M. Logan Johnson** University of Pittsburgh at Greensburg.

86. *Repeated exposure to ethanol selects for mutants with reduced ethanol sensitivity in Staphylococcus aureus*.- **Weaver, Jackson*, and Sean Buskirk** West Chester University.

87. *Exploring the differences in plant communities across Hog Island, Maine*.- **Semmler, Liam*, Aidan Doyle, Vaughn Shirey, and Stephen Mason** Immaculata University.

88. *Comparing two different methods to estimate turtle abundance in Lake Marburg (Hanover, PA)*.- **Valerio Peralta, Yadeyli*, and Jessica Nolan** York College of Pennsylvania.

89. *The effects of atorvastatin on fish physiology*.- **Wardlaw, Ashley*, Madison Dalton, Morgan Bryant, and Ann Yezerski** King's College.

90. *Lampire lobster hemocyanin is demonstrates no antibacterial activity against ESKAPE relatives*.- **Dotta, Austin*, Taylor DeHaven*, and Dia Beachboard** DeSales University.

91. *Development of mouse hepatitis virus chimeric reporter viruses expressing the 3CLpro Pproteases of human coronaviruses HKU1 and OC43 reveals susceptibility to inactivation by natural inhibitors baicalin and baicalein*.- **Armstrong, Alexis*, and Dia Beachboard** DeSales University.

92. *Polydatin shows no antiviral activity toward the Human Coronavirus 3C-like Proteases of HCoV-OC43 or HCoV-HKU-1*.- **Zilinski, Cora*, Benjamin Ziegler*, and Dia Beachboard** DeSales University.

93. *Screening to identify new amylase enzymes*.- **Settle, Caitlin*, and Rajinikanth Mohan** Mercyhurst University.

94. *Screening for novel antibiotic producing bacteria*.- **Kremer, Alena*, and Rajinikanth Mohan** Mercyhurst University.

95. *Nickel response of irt1 mutants in Arabidopsis thaliana*.- **Undieh, Unimakon*, and Michael Shin** Messiah University.

96. *Quantifying gene expression in feeding prasinophytes*.- **Burrell, Alex*, and Sophie Charvet** Susquehanna University.

97. *Assessment of ranavirus in Eastern box turtle (Terrapene carolina carolina) samples from West Shore Wildlife Center*.- **Jacob, Austin*, and Bridgette Hagerty** York College of Pennsylvania.

98. *Inhibition of Streptococcus equi growth by five types of equine bedding*.- **Reese, Allyson*, Sherri Buerdsell, and Deborah Austin** Wilson College.

99. *Sarcoptic mange susceptibility in juveniles and adult red fox (Vulpes vulpes) by camera trapping*.- **Sentz, Abby*, Sherri Buerdsell, and Brad Engle** Wilson College.

100. *Exploring potential causes of increasingly frequent harmful algal blooms in Lake Louise, Franklin Township, Pennsylvania*.- **Daisey III, Gene*, and Cosima Wiese** Misericordia University.

101. *A recursive matlab model for nitrate in a decoupled aquaponics system*.- **Gibbs, Evan*, Jessica Nolan, and Jason Smith** York College of Pennsylvania.

102. *Investigating the evolution of alcohol tolerance in the ESKAPE pathogens*.- **Durkee, Hannah*, and Sean Buskirk** West Chester University.

103. *Exploring the prevalence and variation of the enzyme laccase within bacteria*.- **Reid, Heidi*, and Rajinikanth Mohan** Mercyhurst University.

104. *Investigating ferroptosis in the model invertebrate species Hydra oligactis and Hydra vulgaris*.- **Witkofsky, Victor*, Sarah Marston*, Callie Asper*, and Diane Bridge** Elizabethtown College.

105. *Effects of lysine acetylation on DNA repair in Mycobacterium smegmatis*.- **O'Connor, Corinne*, and Jenny Hayden** Cedar Crest College.

106. *Uncovering antibiotic-producing bacteria in soil samples*.- **Updegrove, Madelyn*, and Jenny Hayden** Cedar Crest College.

107. *Exploring The Establishment Of AM Symbiosis In Brachypodium distachyon In Response To Spent Coffee Grounds Fertilizer*.- **Paul, Sherin*, and Shiqi Zhang** East Stroudsburg University.

108. *Freshwater snails introduced over small ranges form novel gut bacteria associations reflecting their environment*.- **Minton, Russell*** Gannon University.

109. *Characterization of novel Drosophila Egf receptor signaling targets with roles in eggshell structure and morphology*.- **Bullek, Autumn*, Sara Delgado, and Lisa Kadlec** Wilkes University.

110. *Effects of e-liquids on tHP-1-derived m1 macrophage phagocytosis*.- **Tabakha, Maya*, and Giancarlo Cuadra** Muhlenberg College.

111. *Creating a predictive model for limestone stream health assessment and monitoring through historical macroinvertebrate and water chemistry data*.- **Gaston, Laurel*, and Jeff Erikson** Messiah University.

112. *Indoor Testing of Low-Cost Volatile Organic Compound Sensor: Sensirion SGP-41*.- **Stevens, Molly*, and Derek Straub** Susquehanna University.

113. *A study of how plant growth regulators impact plant growth in various succulent species over a ten week period*.- **Dannenberg, Kaitlin*, and Jason Smith** York College of Pennsylvania.

114. *The effect of exposure to nitrate on freshwater crayfish (Procambarus clarkii).* **Brown, Megan*, Sherry Poole*, Jenna Waldron*, Dari Goldstein*, Wendi Gavilanes*, Bryce Amstrong*, and Itzick Vatnik** Widener University.

Restaurants Near Messiah University

(Short List. Find other options on Google Maps!)

Fast Food

Arby's
240 Cumberland Pkwy, Mechanicsburg

Chick-fil-A (2 are close)
219 Gettysburg Pike, Mechanicsburg
3525 Gettysburg Rd, Camp Hill

McDonalds
2112 Bumble Bee Hollow Rd.,
Mechanicsburg

Panera Bread
1500 Camp Hill Mall, Camp Hill

Subway
4 Gettysburg Pike, Unit 3,
Mechanicsburg

Casual Dining

China Garden
2151 Fisher Rd #101, Mechanicsburg

Cracker Barrel Old Country Store
395 Cumberland Pkwy, Mechanicsburg

Ferrante's Pizza and Italian Restaurant
4902 Louise Dr., Mechanicsburg

Hellenic Kouzina (Greek)
500 E. Main St, Mechanicsburg

Hoss's Steak and Sea House
61 Gettysburg Pike, Mechanicsburg

JoJo's Pizza & Pasta Upper Allen
2210 Aspen Dr, Mechanicsburg

Isaac's Craft Kitchen & Brewery-
Mechanicsburg
4940 Ritter Rd, Mechanicsburg

Marzoni's Brick Oven & Brewing Co.
4925 Ritter Rd, Mechanicsburg

Road Hawg BBQ
43 S. Baltimore St, Dillsburg

Texas Roadhouse
1101 Lower Allen Dr, Camp Hill

TJ Rockwell's American Grill & Tavern
896 W Grantham Rd, Mechanicsburg

Slightly more upscale

Bonefish Grill
3505 Gettysburg Rd, Camp Hill

Carrabba's Italian Grill
5250 Carlisle Pike, Mechanicsburg

Flinchy's
1833 Hummel Ave, Camp Hill

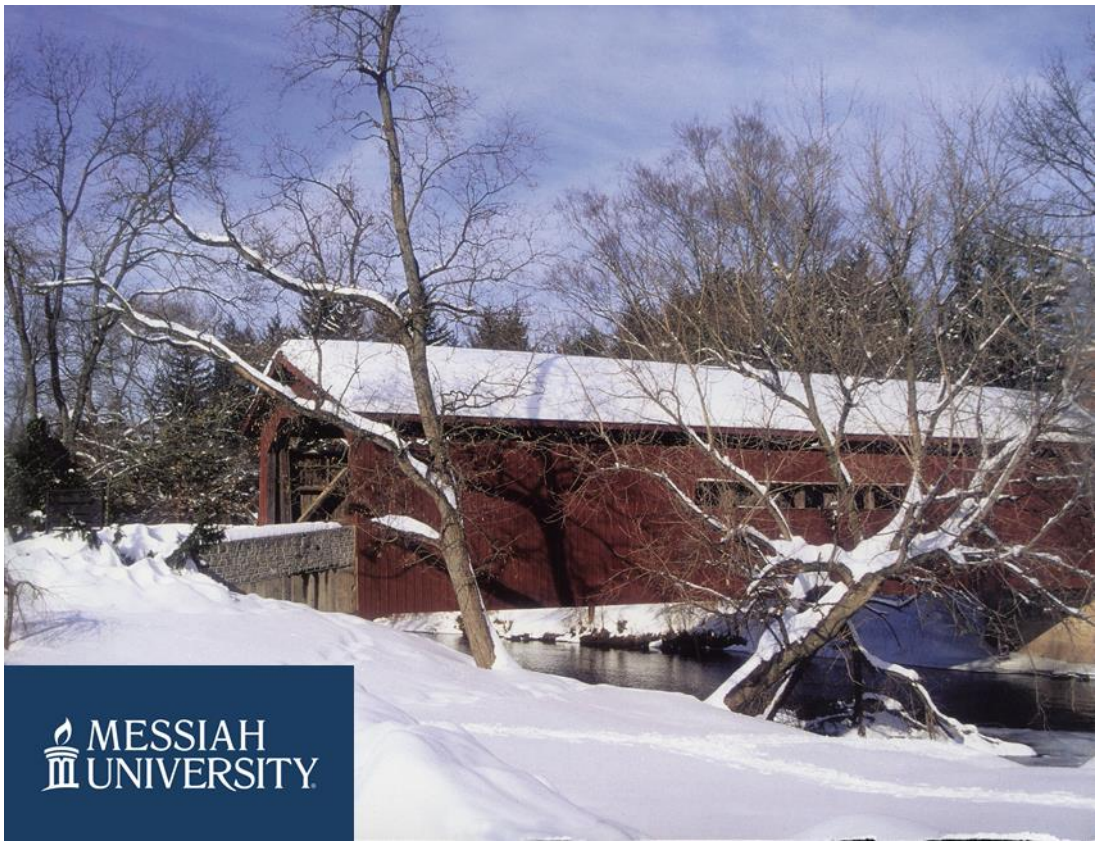
Luna Italian Cuisine
100 Legacy Park Dr., Suite 102
Mechanicsburg

Sophia's at Walden
129 Walden Way, Mechanicsburg

Tatiana's Restaurant
4601 Gettysburg Rd, Mechanicsburg

Theo's Bar & Grille
3315 Hartzdale Dr, Camp Hill

*Many thanks to the **Messiah University** faculty, staff, student volunteers, and administrators who made this event possible, and to the print shop at **Cedar Crest College**!*



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