



## Poster Session Assignments

### Poster Session A

#### **2. Learning Surface Terrain Classifications from Ground Penetrating Radar**

*Anja Sheppard, PhD Candidate, Robotics, University of Michigan. Jason Brown, Undergraduate, Aerospace/Robotics, University of Michigan. Nilton Renno, Professor, Climate and Space Sciences, University of Michigan. Katherine A. Skinner, Assistant Professor, Robotics, University of Michigan*

#### **4. Influence of Surface Roughness on Mechanochemical Competition of Wear vs Growth for Metal Oxide Nanoparticle Antiwear Films**

*Benjamin Jackson, B.S. in Chemical Engineering with a minor in Math and B.A. in Chemistry, Undergraduate Researcher, Department of Chemistry, Hope College. Meagan Elinski, Ph. D. , Assistant Professor, Department of Chemistry, Hope College*

#### **6. Recent Carbon Accumulation Rates of Michigan Peat Bogs**

*Ben Pikaart, Undergraduate Student, Department of Geological and Environmental Sciences. Michael Philben, PhD, Assistant Professor, Departments of Chemistry and Geological and Environmental Sciences*

#### **8. In-Orbit Space Structure Inspection Trajectory Generation**

*Brandon Apodaca, M.S., PhD Candidate, University of Michigan, Robotics. Leia Stirling, PhD, Associate Professor, University of Michigan, Industrial and Operations Engineering, Robotics. Ella Atkins, PhD, Fred D. Durham Chair in Engineering and Department Head, Virginia Polytechnic Institute and State University, Kevin T Crofton Aerospace and Ocean Engineering*

#### **10. Investigating the Impact of Atg10's Activity Level on Autophagosomes.**

*Cameron Brewer, High School Student at Bishop Foley Catholic High School, Department of Chemistry, Eastern Michigan University; Olivia Clarino, Graduate Assistant, Department of Chemistry, Eastern Michigan University; Steven Backues, PhD, Professor, Department of Chemistry, Eastern Michigan University.*

#### **12. In-Situ Resource Utilization for Lunar Tools and Exploration**

*Divya Sovani, High school intern, NASA SEES; Jatin Aggrawal, High school intern, NASA SEES; Pia Agrawal, High school intern, NASA SEES; Molly Gerding, High school intern, NASA SEES; Thomas Gershanik, High school intern, NASA SEES; Serena Huang, High school intern, NASA SEES;*

#### **14. What Happens to the Debris of Giant Impacts**

*Emily Elizondo; BS, Physics, Wayne State University; Graduate Student; Department of Physics and Astronomy, Michigan State University. Dr. Seth A. Jacobson; BS, Applied and Engineering Physics, Cornell University/MS, Astrophysical and Planetary Sciences, University of Colorado at Boulder/PhD, Astrophysical and Planetary Sciences, University of Colorado at Boulder; Assistant Professor, Department of Earth and Environmental Sciences, Michigan State University*

#### **16. Characterization of individual sea spray aerosol particles produced from sea ice cracks in the rapidly changing Arctic**

*Hailey Kempf, Department of Chemistry, Department of Earth and Environmental Science, University of Michigan, Ann Arbor, Michigan. Jessica A. Mirrielees, Department of Chemistry, University of Michigan, Ann Arbor, Michigan. Tiantian Zhu, Department of Earth and Environmental Science, University of Michigan, Ann Arbor, Michigan. Jessie M. Creamean, Department of Atmospheric Science, Colorado State University, Fort Collins, Colorado. Rachel M. Kirpes, Department of Chemistry, University of Michigan, Ann Arbor, Michigan. Nora Bergner, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland \*Now at Department of Chemistry and Fermentation Sciences, Appalachian State University. Benjamin Heutte, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland \*Now at Department of Chemistry and Fermentation Sciences, Appalachian State University. Julia Schmale, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland \*Now at Department of Chemistry and Fermentation Sciences, Appalachian State University. Andrew P. Ault, 1Department of Chemistry, University of Michigan, Ann Arbor, Michigan. Kerri A. Pratt, Department of Chemistry, Department of Earth and Environmental Science, University of Michigan, Ann Arbor, Michigan*

#### **18. Sheep Carbon: Composition Dynamics of Soil Carbon in Response to Grazing**

*Tara Kneeshaw, Ph.D. in Geology, Professor, Department of Geology, Grand Valley State University. Katelyn Smith, undergraduate student, Department of Geology, Grand Valley State University. Julia Shreve, undergraduate student, Department of Geology, Grand Valley State University. Lauren Burns, Owner, Tending Tilth LLC*

#### **20. Anomalous Vertical Velocities and the Testing of the NEBP Ventilation System**

*Jacob Morgan, Mechanical Engineering, Mr., Eastern Michigan University. David Pawlowski, Ph. D. Space Physics, Dr., Physics and Astronomy Department, Eastern Michigan University. Thomas Kovacs, Ph.D. Meteorology, Dr., Environmental Science and Society, Eastern Michigan University.*

#### **22. Quantifying Greenhouse Gas Emissions along a Latitudinal Gradient of Lake Michigan Drowned River Mouths Using DIY Samplers and Remote Sensing**

*Jillian Greene, Graduate Student, Annis Water Resources Institute - Grand Valley State University. Ashtyn Gluck, Undergraduate Student, Annis Water Resources Institute - Grand Valley State University. Dr. Michael Philben, Department of Geology - Hope College. Dr. Bopaiah Biddanda, Annis Water Resources Institute - Grand Valley State University. Dr. Sean A. Woznicki, Annis Water Resources Institute - Grand Valley State University*

#### **24. Investigation of Tc change due to 600 keV proton irradiation in TBCCO superconductors**

*Mr. Joseph Fogt, undergraduate student, Hope College Physics Department. Mr. Trevor Harrison, undergraduate student, Hope College Physics Department. Ms. Hope Weeda, undergraduate student, Hope College Physics Department. Mr. Nolan Weeda, undergraduate student, Hope College Physics Department. Dr. Kyuil Cho, PhD Clark University, Hope College Physics Department*

#### **26. Evaluating convolutional neural networks for reconstructing Compton scatter tomography images**

*Jeffery Martin, PhD, Assistant Professor of Mathematics Instruction, Department of Mathematics and Statistics, Hope College. Dominic Cugliari, Student, Research Assistant, Department of Mathematics, Hope College. Sydney Olander, Student, Research Assistant, Department of Engineering, Hope College. Karsten Wiegerink, Student, Research Assistant, Department of Engineering, Hope College*

#### **28. Longitudinal evolution of Escherichia coli in microgravity**

*Kristen Henein, Researcher, Department of Bioengineering and Biological Sciences, Oakland University. Kayla Whitney, Researcher, Department of Bioengineering and Biological Sciences, Oakland University. Dalton Raymond, Researcher, Department of Bioengineering and Biological Sciences, Oakland University. Caleb Kienbaum, Researcher, Department of Bioengineering and Biological Sciences, Oakland University. Fabia Battistuzzi, Associate Professor, Department of Biological Sciences, Oakland University. Shailesh Lal, Professor and Chair of Bioengineering, Department of Bioengineering, Oakland University. Madhan Tirumalai, Research Assistant Professor, Department of Biology and Biochemistry, University of Houston. Madhan Tirumalai, Research Assistant Professor, Department of Biology and Biochemistry, University of Houston. George E. Fox, Emeritus Professor and Research Professor Department of Biology and Biochemistry, University of Houston. Quyen Tran, Research Assistant Professor, Department of Biology and Biochemistry, University of Houston*

#### **30. Stability Considerations in Contact Binary Star Evolution**

*Dr. Lawrence Molnar, Professor, Department of Physics & Astronomy, Calvin University; Levi Carr, Department of Physics & Astronomy, Calvin University*

#### **32. Substitution and Evaluation of Serine-26 Substituted with Alanine in a Regulatory Fragment of Amyloid- $\beta$**

*Maahik Trivedi, High School Student, Department of Chemistry, Eastern Michigan University; Issah Seidu, MD, Graduate Assistant, Department of Chemistry, Eastern Michigan University*

*Michigan University; Deborah Heyl-Clegg, PhD, Professor, Department of Chemistry, Eastern Michigan University.*

### **34. Micromagnetism of $\text{CeZr-FeSi}_2$ Nanoislands**

*Matthew D. Sisson, PhD Candidate, Graduate Student, Materials Science & Engineering, Michigan Technological University. Liwei D. Geng, PhD, Graduate of Materials Science & Engineering, Michigan Technological University. Yongmei M. Jin, PhD, Professor, Materials Science & Engineering, Michigan Technological University*

### **36. “Bitter Water”: Identifying Residues of Cacao Ritual Beverages in Mesoamerican Ceramics**

*Ruth Ann Armitage, Ph.D., Professor of Analytical Chemistry, Department of Chemistry at Eastern Michigan University. Tara Fairchild, Graduate researcher, Department of Chemistry at Eastern Michigan University. Hailey McCloskey, Undergrad Researcher, Department of Chemistry at Eastern Michigan University*

### **38. Luminescence Characterization During Operation of a Porous Emitter Ionic Liquid Electrospray**

*Nathaniel Allwine, BS Aerospace Engineering, Ph.D. Student, Mechanical and Aerospace Engineering Department, Western Michigan University. Thomas Kerber, MS Aerospace Engineering, Ph.D. Candidate, Mechanical and Aerospace Engineering Department, Western Michigan University. Nicholas Taylor, Ph.D., Senior Research Associate, Mechanical and Aerospace Engineering Department, Western Michigan University. Kristina Lemmer, Ph.D., Professor, Mechanical and Aerospace Engineering Department, Western Michigan University*

### **40. Public outreach and interdisciplinary collaboration through art workshops**

*Orion Wakeman, BfA, Preserve Fellow, Calvin Ecosystem Preserve and Native Gardens, Calvin University*

### **42. Batch manufacturing of polyelectrolyte biomaterial capsules with tailored internal micro-environments through use of electrospray technologies.**

*Rafael Ramos, MS, MD-PhD Candidate, Wayne State University Department of Biomedical Engineering, Wayne State University / Wayne State University School of Medicine. Howard Matthew, PhD, Professor, Department of Chemical Engineering and Materials Science, Wayne State University*

### **44. Exploring Habitability and Life Detection: Insights from Microbial Biofilms in Serpentinizing Mars Analog Environments**

*Sarah Gonzalez-Henao, B.Sc Biology(ICESI University)/MsC Biotechnology (ICESI University),/current PhD Student (Michigan State University), Department of Earth and Environmental Sciences,Department of Microbiology and Molecular Immunology Michigan State University. Matthew O. Schrenk, B.Sc. Geology & Geophysics (University of Wisconsin)/Ph.D in Oceanography (University of Washington)/Associate Professor at Michigan State University, Department of Earth and Environmental*

Sciences, Department of Microbiology and Molecular Immunology Michigan State University.

#### **46. Precipitation Imaging Package (PIP): A Potential Instrument for Measuring Raindrops**

*Sloane Poppei, Department of Climate and Space Sciences and Engineering, University of Michigan, Ann Arbor, MI, USA. Ali Tokay, Mesoscale Atmospheric Processes Laboratory, NASA, Goddard Space Flight Center, Greenbelt, MD, US, Goddard Earth Sciences Technology and Research II, University of Maryland Baltimore County, Baltimore, MD, USA. Charles Helms, Mesoscale Atmospheric Processes Laboratory, NASA, Goddard Space Flight Center, Greenbelt, MD, USA, Earth System Science Interdisciplinary Center, University of Maryland, College Park, College Park, MD, USA.*

#### **48. Viewpoint Planning for Semi-Autonomous Human-Supervised External Visual Inspection of Space Stations**

*Thor Helgeson, Undergraduate Student, University of Michigan, Robotics. Leia Stirling, PhD, Associate Professor, University of Michigan, Industrial and Operations Engineering, Robotics. Brandon Apodaca, M.S., PhD Candidate, University of Michigan, Robotics*

#### **50. Calibration of Fluence of High-Energy Particles using a RBS Method**

*Mr. Trevor Harrison, Undergraduate Student, Physics Department, Hope College; Mr. Nolan Miles, Undergraduate Student, Physics Department, Hope College; Mr. Joseph Fogt, Undergraduate Student, Physics Department, Hope College; Ms. Hope Weeda, Undergraduate Student, Physics Department, Hope College; Dr. Kyuil Cho, PhD Clark University, Physics Department, Hope College.*

#### **52. Ground-To-Satellite Quantum Clock Synchronization**

*Ethan Grant, Bachelors, Student, Electrical and Computer Engineering at Michigan State University. Virginia Ayres, PhD, Professor, Electrical and Computer Engineering at Michigan State University. Harry Shaw, PhD, Director, Quantum Communications at NASA Goddard Space Flight Center. Haleh Safavi, PhD, Director, LCOT at NASA Goddard Space Flight Center. Alejandro Rodriguez-Perez, Principal Researcher, QCS IRAD at NASA Goddard Space Flight Center*

### **Poster Session B**

#### **1. ARC-LIGHT: Algorithm for Robust Characterization of Lunar surface Imaging for Ground Hazards and Trajectory**

*Alexander T. Cushen, Graduate Student, Department of Climate and Space Science and Engineering, University of Michigan. Samuel Carrico, Undergraduate, Department of Aerospace Engineering, University of Michigan. Ariana Bueno, Graduate Student, Department of Climate and Space Science and Engineering, University of Michigan. Mirko Gamba, Associate Professor, Department of Aerospace Engineering, University of Michigan. Chris Ruf, Frederick Bartman Collegiate Professor of Climate and Space Science, Department of Climate and Space Science and Engineering, University of*

Michigan. Corrydon Wettstein, Undergraduate, Computer Science and Engineering Division, University of Michigan. Jaykumar Ishvarbhai Adalja, Graduate Student, Department of Climate and Space Science and Engineering, University of Michigan. Mengxiang Shi, Undergraduate, Computer Science and Engineering Division, University of Michigan. Naila Garcia, Undergraduate, Department of Mechanical Engineering, University of Michigan. Yuliana Garcia, Undergraduate, Department of Mechanical Engineering, University of Michigan

### **3. Optimizing portability of bioluminescent cortisol sensors stress hormone monitoring**

Anthony Rentzel, Undergraduate research assistant, Central Michigan University  
Eric Petersen, PhD, Assistant Professor of Neuroscience, College of Medicine  
Neuroscience Graduate Program, College of Science and Engineering  
Biochemistry, Cellular and Molecular Biology Graduate Program, College of Science and Engineering Central Michigan University

### **5. Extracting Aluminum Through Chemical Processing of Lunar Anorthosite**

Benjamin Thiel, undergraduate student. Megan Harvey, undergraduate student. Dr. Sarah Dean, assistant professor. All authors: Geological and Environmental Sciences Department, Hope College

### **7. Life in Space: The 2024 "Roger That!" Symposium**

Bradley Ambrose, GVSU Professor of Physics. Amy Coon, GRPM Public Programs Coordinator. Jack Daleske, GRPM Planetarium Manager. Karen Gipson, GVSU Professor of Physics. Samhita Rhodes, GVSU Professor of Engineering. Rob Schuitema, GRPM Director of Public Programs. Glen Swanson, Chaffee Scholarship Fund. Deana Weibel, GVSU Professor of Anthropology

### **9. The Hunt for New Number Sequences in the Union of Path and Cycle Graphs**

Bridget Rozema, currently finishing my BS in Mathematics, N/A, Mathematics Grand Valley State University

### **11. Analysis of soil carbohydrates across a longitudinal transect of Michigan peatlands**

Christopher Klaver (Undergraduate Researcher, Departments of Geology and Environmental Science and Chemistry, Hope College), Parker Diaz (B.S. Biochemistry and Molecular Biology, Department of Chemistry, Hope College), Dr. Michael Philben (PhD in Marine Science from University of South Carolina, Assistant Professor in Geology, Departments of Geology and Environmental Science and Chemistry, Hope College)

### **13. Protein Based Lanthanide Capture from Coal Fly Ash**

Elliot Furr, B.S., Graduate Student (PhD), Department of Chemistry, Wayne State University. Valerie Akrawi, Undergraduate Student Researcher, Department of Chemistry, Wayne State University. Sayak Gupta, PhD, Former Graduate Student, Department of Chemistry, Wayne State University. Sai Praneeth, PhD, Post-Doctoral

*Researcher, Department of Civil and Environmental Engineering, Wayne State University. Matthew J. Allen, PhD, Department Chair, Department of Chemistry, Wayne State University. Timothy M. Dittrich, PhD, Associate Professor, Department of Civil and Environmental Engineering, Wayne State University. Jeremy J. Kodanko, PhD, Associate Department Chair, Department of Chemistry, Wayne State University*

### **15. Solar Energy and Partial Harvesting Study by a Solar Cage**

*Gabe Gransden, Senior Undergraduate Student, Undergraduate Fellow of MSGC, Electrical and Computer Engineering, Saginaw Valley State University. Zachary Franzel, Senior Undergraduate Student, Electrical and Computer Engineering, Saginaw Valley State University. Mohammad Khan, PhD, Associate Professor, Electrical and Computer Engineering, Saginaw Valley State University*

### **17. Formalizing Motion Plan Legibility Using Empirical Manual Takeover Data in Autonomous Spacecraft Docking**

*Hannah Larson, M.S. (University of Michigan Department of Mechanical Engineering), Leia Stirling Ph.D. (University of Michigan Department of Industrial & Operations Engineering, Department of Robotics)*

### **19. Measuring the Charge Half-Life of Desert Dust Using an Open-Source CERN Ion Trap: Implications for Climate Modeling**

*Ian Norwood, BS Physics, Graduate Student, Department of Physics at Michigan Technological University*

### **21. Control of Hot Carriers Cooling in Perovskite Solar Cell**

*Jihan Abou Halloun, PhD candidate, Department of Chemical Engineering and Materials Science, Wayne State University, Helen Durand, Associate Professor, Department of Chemical Engineering and Materials Science, Wayne State University.*

### **23. The impacts of iron oxide nanoparticles on the antipredator behaviors of house sparrows**

*John Wenderski, undergraduate researcher, Hope College. Liam Hanlon, undergraduate researcher, Hope College. Shae Johnston, undergraduate researcher, Hope College. Chisom Okogbue, undergraduate researcher, Hope College. Dr. Natalia Gonzalez-Pech, PhD, Principal investigator, Chemistry, Hope College. Dr. Kelly L. Ronald, PhD, Principal Investigator, Biology, Hope College*

### **25. Binary Stars and Big Data**

*Mr. Joshua, undergraduate at Calvin University department of Physics and Astronomy. Mr. Levi Carr, undergraduate at Calvin University department of Physics and Astronomy. Dr. Larry Molnar, PhD Harvard University, Astronomy, Calvin University department of Physics and Astronomy.*

### **27. Long-Term Metabolic Measurements Reveal Seasonal Carbon Cycling Trends in a Great Lakes Estuary**

*Kaylynn Dennis, Zoology B.S., Graduate Research Assistant, Department of Biology, Grand Valley State University, Annis Water Resources Institute. Anthony Weinke, Masters of Biology, Lab Manager, Annis Water Resources Institute. Dr. Bopi Biddanda Ph.D in Ecology, Research Scientist, Biology, Grand Valley State University.*

**29. Human Powered Locomotion on Variable Terrain: Implications for How to Move on Mars**

*Kyle Wehmanen, MS, Department of Kinesiology & Integrative Physiology, Michigan Technological University. Steven Elmer, PhD, Department of Kinesiology & Integrative Physiology, Michigan Technological University*

**31. Temperature sensitivity of nitrogen mineralization in peat from bogs across a Michigan transect**

*London Yoder, undergrad research, Geological and Environmental Sciences, Hope College. Madison Smith, undergrad research, Geological and Environmental Sciences, Hope College. Dr. Michael Philben, Ph.D., marine science, University of South Carolina, 2014, B.A., earth and planetary science, Northwestern University, 2010, mentor, Geological and Environmental Sciences, Hope College.*

**33. FuzzRT: Enhancing Assurance for Robotics Applications**

*Mallory Jacobs, Working towards a B.S. in Computer Science, College of Computing, Grand Valley State University*

**35. Freshwater fish as a bioindicator for Escherichia coli (E. coli) in contaminated river systems in Michigan**

*Mitchell Olszewski, Graduate Student, Biology, GVSU. Dr. Carl R. Ruetz, GVSU Annis Water Resource Institute. Dr. Kevin B. Strychar, GVSU, Annis Water Resource Institute*

**37. Urbanization Effects on Stress and Auditory-Visual Processing in House Sparrows (Passer domesticus)**

*Natalie Leake, Undergraduate Researcher, Biology, Hope College. Emma Yonker, Undergraduate Researcher, Biology, Hope College. Kelly Ronald, PhD, Primary Investigator, Biology, Hope College*

**39. Comparing the Effects 1.7 MeV and 0.6 MeV Proton Irradiation on YBCO Thin-film Superconductors**

*Nolan Miles, Undergraduate Student, Undergraduate Research Student, Department of Physics at Hope College Trevor Harrison, Undergraduate Student, Undergraduate Research Student, Department of Physics at Hope College Joey Fogt, Undergraduate Student, Undergraduate Research Student, Department of Physics at Hope College Hope Weeda, Undergraduate Student, Undergraduate Research Student, Department of Physics at Hope College. Kuil Cho, PhD, Research Advisor, Department of Physics at Hope College.*

**41. Grain Shape Analysis of Fine Sand in a Post-glacial Inland Dune and a Phoenix Mars Lander Site Analog**



*Michael Velbel, Doctorate, Professor Emeritus, Department of Earth & Environmental Sciences, Michigan State University, Brian Wade, Masters, Laboratory Technologist, MSU-DOE Plant Research Laboratory, Michigan State University, Pablo Rizzo Mora, Undergraduate, Research Assistant, Honors College, Michigan State University, Guilherme Eckert Roda, Undergraduate, Research Assistant, Honors College, Michigan State University, and the Sands of Mars of Mars X Seminar students.*

#### **43. Strengthening under-resourced Michigan student engagement in science through astrophysics research**

*Rhianna Taub, Undergraduate physics and astronomy student, Student Research Assistant, WSU physics & astronomy department; Kristen Dage, PhD in astrophysics, Student research Mentor, lecturer at Curtin Institute for Radio Astronomy and co-chair of Rubin Observatory's Stars, Milky Way and Local Volume Collaboration; Edward Cackett, WSU representative, Associate Dean of the College of Liberal Arts & Sciences and Distinguished Service Professor, Dept. of Physics & Astronomy at WSU.*

#### **45. Development of a High-Fidelity Pressure Mapping Glove for Enhanced Grip Analysis and Injury Assessment in EVA Spacesuits.**

*Simin Masihi, Doctor of Philosophy, Assistant Professor, Electrical and Computer Engineering, Western Michigan University. Hakan Dogdu, Master Student, Electrical and Computer Engineering, Western Michigan University. Alimohammad Haji Adineh, PhD Student, Electrical and Computer Engineering, Western Michigan University*

#### **47. Optimizing Antioxidant and Nitrate Balance in Space-Grown Vegetables: The Impact of LED Light Treatments**

*Margaret E. Hitt, Undergraduate Engineering Freshmen & Egleston Scholar, Columbia University, Founder of Dow High Space Farmers, NASA Space Biology Intern; Sophie Cai, Vice President of Dow High Space Farmers, NASA Space Biology AI/ML Trainee, Herbert Henry Dow High School; Sanvi Patel, Chief Science Officer, member of Dow High Space Farmers, Herbert Henry Dow High School; Lisa S. Tsay, NASA GBE and HUNCH Mentor, Saginaw Valley State University*

#### **49. CUDA Parallelization Of DCUHRE**

*Tobias Shaw, High School Diploma, Undergraduate Student, Computer Science, Hope College. Peter Worden, High School Diploma, Undergraduate Student, Computer Science, Hope College. Omofolahunmi Olagbemi, PhD, Assistant Professor, Computer Science, Hope College*

#### **51. Investigation of Mechanical Integrity of GeTe for Radioisotope Thermoelectric Generators**

*Weeam Guetari - Undergraduate Student, Department of Chemical Engineering and Materials Science, Michigan State University. A K M Ashiquzzaman Shawon - PhD candidate, Department of Chemical Engineering and Materials Science, Michigan State University. Alexandra Zevalkink - PhD, Professor, Department of Chemical Engineering and Materials Science, Michigan State University*

**53. The Direct Formation of Contact Binary Planetesimals from Gravitational Collapse**

*Jackson Barnes; M.S. Northwestern University; Ph.D. Candidate; Michigan State University. Seth Jacobson; Ph.D. University of Colorado, Boulder; Assistant Professor; Michigan State University*