Welcome to the Annual Fall Conference of the Michigan Space Grant Consortium
Saturday, October 18, 2014

Aerospace Engineering • Home to the MSGC
Celebrating 100 Years • 1914 to 2014

9:00 a.m.  Welcome!
Dr. Alec Gallimore – MSGC Director

9:15 a.m.  Introductions by Mr. Michael Madison – Ann Arbor Public Schools

9:15 a.m.  Conductivity-Based Health Monitoring in Glass-Fiber Laminates with Carbon Black Filler (page 4)
Mr. Tyler N. Tallman – University of Michigan
Dr. Kon-Well Wang – University of Michigan

9:30 a.m.  Emplacement of Igneous Bodies on Mars: Evidence from Major-phase Modal Abundances in the Nakhlite Group of Mars Meteorites (page 5)
Dr. Michael Velbel – Michigan State University

9:45 a.m.  Patterned Thin Film Sensor Circuits for Structural Damage Detection (page 6)
Mr. Andrew Burton – University of Michigan

10:00 a.m.  Modern Portfolio Theory: A Model for Superior Risk-Adjusted Returns (page 7)
Ms. Rebecca Young – Saginaw Valley State College

10:15 a.m. to 10:45 a.m.
MSGC Conference Poster Presentations

10:45 a.m.  Introductions by Dr. Larry Molnar – Calvin College

10:45 a.m.  Saginaw Valley State University Summer Mathematics Opportunity Camp (page 8)
Dr. Amy Hlavacek – Saginaw Valley State University
Dr. Joseph Ofori-Dankwa – Saginaw Valley State University
Dr. Christopher Nakamura – Saginaw Valley State University
Ms. Charnay Gloss – Michigan State University
Mr. Daniel Kobina Ofori-Dankwa – Michigan State University
Ms. Mia Rankine – Saginaw Valley State University

11:00 a.m. **Exploring iBooks Using Technology to Enhance Mathematics Instruction** (page 9)
Dr. Vicki-Lynn Holmes – Hope College
Ms. Brooke Dykstra – Hope College

11:15 a.m. **Engaging Undergraduate Students in Science with the First-Year Research in Earth Sciences Project** (page 10)
Ms. Natasha Strydhorst – Calvin College
Ms. Audrey Hughey – Calvin College

11:30 a.m. **Hope College Engineering the Future Academies** (page 11)
Dr. Eric Mann – Hope College
Ms. Sherah Head – Hope College

11:45 a.m. **Lunch and Poster Displays**
(A buffet lunch will be served in the room next to the lecture hall, Room 1133. Seating is available in the classrooms across the atrium and in the McDivitt Conference Room).

1:00 p.m. to 2:00 p.m.

Dr. James Cutler – MSGC Conference Keynote Speaker
**CubeSats: Enabling Bold Flight to the Extremes** (page 2)

2:00 p.m. **Introductions by Dr. Michael Velbel – Michigan State University**

2:00 p.m. **An Abrupt Period Change in the Contact Binary Star System V859 Cyg** (page 12)
Mr. Chris Spedden – Calvin College

2:15 p.m. **Luminous Red Novae** (page 13)
Mr. Daniel Van Noord – Calvin College

2:30 p.m. **Modeling Pure Component Phase Equilibrium from Cubic Equations of State Throughout the Decades** (page 14)
Dr. Michael Misovich – Hope College
2:45 p.m.  An Examination of Flux Dropouts in Earth’s Radiation Belts with the Van Allen Probes (page 15)
            Ms. Lois Keller Sarno-Smith – University of Michigan

3:00 to 3:30 p.m.  MSGC Conference Poster Presentations

3:30 p.m.  Introductions by Dr. James Sheerin – Eastern Michigan University

3:30 p.m.  Venus High Temperature Atmospheric Dropsonde and Extreme Environment Seismometer (HADES) (page 16)
            Mr. Nathan Boll – University of Michigan

3:45 p.m.  CubeSat Star Imaging and Visual Attitude Propagation (page 17)
            Dr. Samir Rawashdeh – University of Michigan - Dearborn

4:00 p.m.  Measuring the Metric Hardware on the Tiltrotor Test Rig (page 18)
            Ms. Elaine Apaza – University of Michigan

4:15 p.m.  Adjourn – Safe Travels!
Poster Presentations:

57 Cygni: A Spectroscopic Binary Star (page 20)
Ms. Lindsay Ciastko – Albion College

Asteroid Collisional Families By Color (page 21)
Mr. Nathan McReynolds and Dr. Lawrence Molnar – Calvin College

Nest Selection and Neonate Survival of Eastern Box Turtle (Terrapene carolina carolina) in Northern Michigan (page 22)
Mr. Joseph Altobelli – Grand Valley State University

Science Technology & Engineering Preview Summer (STEPS) Camp for Girls (page 23)
Ms. Sara Maas – Grand Valley State University

Using Bioinformatics to Identify the Potential Modifications on Light-Response BTB (LRB) Proteins (page 24)
Mr. Nicholas Reitz – Grand Valley State University

Diode-laser Based Measurement of Molecular Parameters Relevant to Atmospheric Studies (page 25)
Ms. Catlin Schalk – Grand Valley State University

Quantifying the Effect of Climate Change on Upper Mesophotic Coral: Montastraea cavernosa (page 26)
Mr. John Skutnik – Grand Valley State University

Designing Improved Light Responsive Actuators Through Mechanical Testing and Materials Development (page 27)
Mr. Ryan Backman – Hope College

Improving Mechanical Behavior of Light Responsive Materials Through Mechanical Design (page 28)
Mr. John Baranski – Hope College

Thermally Reversible Gels for Fabricating Self-Oscillating Structures (page 29)
Mr. Skylar Heidema – Hope College

Compton Scattering Cross Sections in Strong Magnetic Fields: Advances for Neutron Star Applications (page 30)
Mr. Jesse Ickes and Dr. Peter Gonthier – Hope College

Making Sense of Plant Speciation in East Asia and North America with Plastid Genome Analysis (page 31)
Mr. Mark Stukel and Dr. Jianhua Li – Hope College
A New Approach to Vapor-Liquid Equilibrium Property Prediction from Cubic Equations of State (page 32)
Mr. Danny Vessells and Dr. Michael Misovich – Hope College

Robotic Echolocation Testbed (page 33)
Mr. Xavier Wu – Hope College

Lithospheric Processes on Mars and Venus: A Geochemical Study of Analogous Terrestrial Structures in the Galema Range, Central Ethiopia (page 34)
Mr. Brandon Chiasera – Michigan State University

Microscopic Analysis of Sediment Grains in Mars’ Regolith and Terrestrial Analogs: Habitability at the Phoenix Landing Site, Revisited (page 35)
Dr. Michael Velbel, Ms. Asia Grant, Mr. Jason Kim, Mr. James VanderRoest, Mr. Brian Wade, Mr. Isaiah Walker, Mr. Joseph Backlas, Mr. Adam Fine, Mr. Ethan Lee, Ms. Anya Niehaus, and Ms. Andromeda Veach – Michigan State University

Biocompatibility of Metallic Zinc for Bioabsorbable Stents (page 36)
Mr. Roger Guillory – Michigan Technological University

Wound Site Fibrosis Reduces the Lymphatic Capacity To Prevent Chronic Lymphedema in Murine Tissues (page 37)
Ms. Laura Lynch – Michigan Technological University

Revealing the Performance Barrier: First Principles Prediction of the Physical-Chemical Properties of New Co-Crystals for Rocket Propulsion (page 38)
Mr. Matthew Pirkola – Michigan Technological University

A Semantic Approach for Traceability Link Recovery in Aerospace Requirements Management System (page 39)
Dr. Kahlid Mahmood - Oakland University
Mr. Mazen Alobaidi – Oakland University

RF Link Analysis and Ion Thruster Plasma Plume Modeling (page 40)
Mr. Michael Culver – Oakland University

A Numerical Investigation of Local Heat Transfer Coefficients on the Underside of an Oil-Jet Cooled Piston (page 41)
Mr. Stephen Powell and Mr. Zachary Waldrup – Oakland University

Integrating Facial Expression Analysis into Facial Recognition Systems (page 42)
Mr. Cody Brown, Mr. Khandaker Rahman, and Mr. Dustyn Tubbs – Saginaw Valley State University
Observations of Atmospheric and Snowpack Chemistry in the Summer on the Juneau Icefield (page 43)
Ms. Jennifer Berry – University of Michigan

Investigation of Ship-Emitted Aerosol Particles (page 44)
Ms. Rebecca Craig – University of Michigan

Students for the Exploration and Development of Space (SEDS): Expansion of Outreach Program (page 45)
Ms. Andrea Day – University of Michigan

Reduced Order Modeling of Compressible Flows with Large Unsteady Normal Shock Motion (page 46)
Mr. Christopher Marley – University of Michigan

Robotic Exploration of Space Team (REST) Robotic Mining Competition (page 47)
Mr. Ben Woolsey – University of Michigan

Magnetic Field Mapping of RF Micro Ion Thruster on a CubeSat (page 48)
Mr. Andrew Hine and Dr. Kristina Lemmer – Western Michigan University

A Modular Printed Circuit Board For Realizing Discrete-Time Chaotic Systems: Experimental Results (page 49)
Dr. Damon Miller – Western Michigan University
Dr. Giuseppe Grassi – University of Salento, Department of Engineering for Innovation

Technology Demonstration of Proximity Operations with Multi-Rotor using Low-Cost Hardware (page 50)
Mr. Spencer Watza and Dr. Christopher Proctor – Western Michigan University

Michigan Space Program (page 51)
Mr. Brian Byars – DeWitt High School

Summer Galaxy Academy (page 52)
Ms. Michelle Reaves – Detroit Area Pre-College Engineering Program