

19-20 AWARD RECIPIENTS

Undergraduate Fellowships:

Meredith Bomers, HC
Carmen Chamberlain, HC
Erik Eikey, MSU
Sawyer Hall, OU
Mouhamad Hammami, OU
Sophie Hourihane, UM
Geoffrey Jenkins, UM
JustOne Crosby, WMU
Alyssa Lalko, OU
Kelsey LeMay, MTU
Eric Leu, HC
Letty Loeza, UM
Rachel Merz, EMU
Erika Miciuda, MSU
Serenity Monroe, UM
Brian Seper, CU
Brooke Shepard, OU
Anna Tarach, GVSU
Armandine Uwimana, HC
Charlie Wingate, OU

NASA Interns:

Eytan Adler, UM
Langley Research
Kitty Ascrizzi, UM
Jet Propulsion Lab
Trent Bekker, UM Dearborn
Stennis Space Center
Lauren Bowling, MTU
Langley Research
Gabrielle Feber, MTU
Goddard Space Center
Amber George, UM
Kennedy Space Center
Sheyenne Harris, UM
Goddard Space Center
Alex Medema, HC
Goddard Space Center

Public Outreach:

Karen Gipson, GVSU
Deanna Van Dijk, CU

Graduate Fellowships:

Krystal Acosta, UM
Osama Alian, MSU
Jeremy Bigalke, MTU
Daniel Brandt, UM
Carly Brouwers, GVSU
Cory Burkwald, MTU
Benjamin Cockfield, MTU
Erin Eberhard, MTU
Nosakhare Edoimioya, UM
Tyler Gardner, UM
Cassidy Gilmore, GVSU
Frederick Glassen, GVSU
Francesca Golus, GVSU
Joshua Gonzalez, MTU
Tyler Harman, GVSU
Camilla Harris, UM
Emily Hunawill, OU
Ryan Kibler, MTU
Kaitlin Lowran, OU
Jasmine Mancusco, GVSU
Larissa Markwardt, UM
Jake Miller, WSU
Jared Mitchell, UM
Ian Nichols, MTU
Nicholas Potter, MTU
Eduardo Rodriguez-feo, MTU
Benjamin Setterholm, UM
Alexander Shane, UM
Katherine Skocelas, GVSU
Brian Swiger, UM
Daniel Trepal, MTU
Brian Wade, MSU
Joshua White, WMU
Kevin Whitley, UM

Teacher Training:

Joan Chadde, MTU
Emily Gochis, Copper County
James Sheerin, EMU

Research Seed Grant:

Clement Burns, WMU
Illias Cholias, OU
Sarah Hamsher, GVSU
Brian Krug, GVSU
Wing Yue Louie, OU
Adam Matthews, WMU
Nasim Nezamoddini, OU
Darren Propppe, CU
Phillip Rivera, HC
Luis Villa-Diaz, OU
Ziming Yang, OU

PreCollege Program:

Feryal Alayont, GVSU
Kathy Dickens, Elkton Pigeon
Bay Port Laker Schools
Steve Elmer, MTU
Anouck Girard, UM
Sarah Maas, GVSU
Kris Pachla, GVSU
Sue Ruffner, Engineering
Society of Detroit

HONES Groups:

CLAWS - Compact Localized
Augmented Work
Station Team, UM
GVSU Pulsars, GVSU
Mapleseed Project, UM
MRover - Michigan Mars
Rover Team, UM
REST - Robotic Exploration of
Space Team, UM

Multiple Programs:

Susan Ipri Brown, HC
Charles Gipson, Michigan
Science Center
Chris Kobus, OU
Eric Mann, HC
Maria Webb, Detroit Area Pre
College Education
Program



FRONTIERS NEWSLETTER

WINTER 2020



MESSAGE FROM THE DIRECTOR

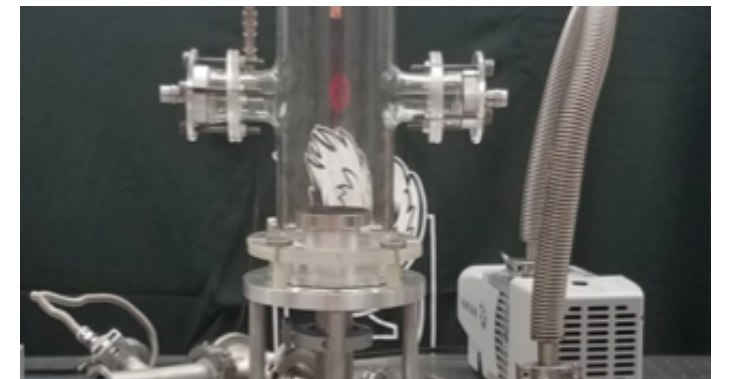
NASA MSGC will have a number of “firsts” in 2020. Our Fall Conference will be held outside of Ann Arbor for the first time at the Calvin University Prince Conference Center in Grand Rapids on October 17th, 2020; we will welcome the Michigan Science Center in Detroit as our first formal non-academic “Partner” to join MSGC’s 11-academic institution Affiliates; and we will fund our first NASA MSGC-Industry Internship with R2 Space this summer. This year we are also supporting our largest cohort of Michigan students in NASA internships. Please participate in and follow our activities through social media, as NASA looks back at the Apollo 50th anniversaries through 2022 and we look forward to new exciting science missions and STEM education and research opportunities in Michigan.

Mark Moldwin



6 MSGC 2019 Fall Conference

This years conference was held in Ann Arbor at Palmer Commons at the U of M with over 150 in attendance.



2 Developing a Future in Plasma Physics

Creating an idea, building it into existence, testing it and then using that to solve a problem is exactly what EMU student,

Jared Powell set out to do in his research. Powell is now headed towards a career in Plasma Physics at Auburn University.



3 Gaining Lessons in Investigating Groundwater Springs



7 A Few Changes at MSGC

New faces have joined the MSGC team as we say good-bye and thank you to others.

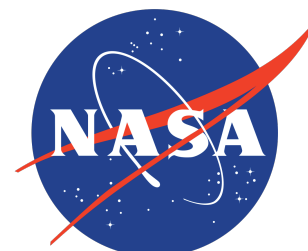


4 Galaxy Girls Summer Camp


A week long summer camp geared towards engineering and discovering a future.

Michigan Space Grant Consortium
www.mispacegrant.org


Prof. Mark Moldwin
1418 Climate and Space Research Bldg.
2455 Hayward St.
Ann Arbor, MI 48109-2143
Tel: (734) 647-3370
mmoldwin@umich.edu
mispacegrant@umich.edu




AFFILIATES




Calvin University
Prof. Jason Smolinski




Grand Valley State University
Prof. Bopi Biddanda




Michigan State University
Prof. Michael Velbel



Eastern Michigan University
Prof. Roxanne Katus



Hope College
Prof. Peter Gonthier



Michigan Technological University
Prof. Lorelle Meadows

Based on Nature's Inspiration

This Mapleseed project being conducted at the University of Michigan definitely brings back a childhood nostalgia. With a device patterned off of maple seeds falling from the trees, who can't help but think back to trying to catch nature's helicopter wings coming from the sky. This project is being led by Professor Xiaogan Liang along with 19 students ranging from undergrad to graduate. Students have developed extremely small wireless circuit boards as well as 3D printed airframes that share a resemblance to maple seed flyers.

Through the project the team demonstrates wireless environmental sensing as well as localization and wind tracking capabilities of a small cluster of free falling mapleseed flyers in Earth's lower atmosphere. The project has been represented at a design expo, MSGC's Fall Conference as well as the Michigan Space Forum.

Mapleseed: Sensor Network Laboratory

The Mapleseed project aims to develop a passive (i.e., free-falling) wireless in-situ sensor platform for use in detailed sensing of various properties of Earth's atmosphere. Students are developing miniature wireless circuit boards (using TI cc1310 radio) along with 3D printed airframes.

Our Team Has
21 - 35 students



Sub-Teams

- Electronics: PCB Design and RF
- Electronics: Communications
- Electronics: Power
- Electronics: Physics
- Software: Lead
- Software: Robotics
- Deployment: Mechanical
- Science
- Apprentice Researcher

Likely Majors

- EE, CE
- PHYS
- CE, CSE/CS-LSA
- PHYS, MATH
- A&D
- Any



2020 CALENDAR

May 9th
New Grant Cycle Begins

September 1st
2021-2022 Applications Open

October 17th
MSGC 2020 Fall Conference
at Calvin University
in Grand Rapids

November 11th
2021-2022 Applications Due

2019 Funding

\$246,900
for Educational Programs




\$188,218
for Fellowships

\$65,000
for Research Seed Grants

MEDIA UPDATES

We not only have a new and updated website but are now on social media. Come find us and stay updated with MSGC.

www.mispacegrant.org

-  MichiganSpaceGrant
-  mispacegrant
-  mispacegrant

A Few Changes at MSGC

We've had a few new faces and changes this year at the Michigan Space Grant Consortium. A Marketing Communications Specialist joined the team as well as two new board members. Katie Klink joined the team in late August. She has years of hands-on marketing and over 15 years of event experience. Katie brings with her an eye for detail and a mission for broadening the reach of the MSGC as the Marketing Communications Specialist. Assistant Professor of Mathematics, Roxanne Katus has taken over the affiliate position for Eastern Michigan University. Professor of Physics & Astronomy, Ed Cackett from Wayne State University has joined us as a new board member as well. We are excited to welcome these three to the MSGC team. Professor James Sheerin, the former EMU board member, has taken over the Higher Education role replacing Professor Cinda Sue Davis of the University of Michigan who has retired this year. Professor Jeff Potoff from Wayne State University and Brenda Vyletel, the Program Manager from the University of Michigan, have stepped down from their positions. We thank Cinda Sue, Jeff and Brenda for their significant contributions. We wish them the best of luck in their next adventures.

2019 MSGC FALL CONFERENCE



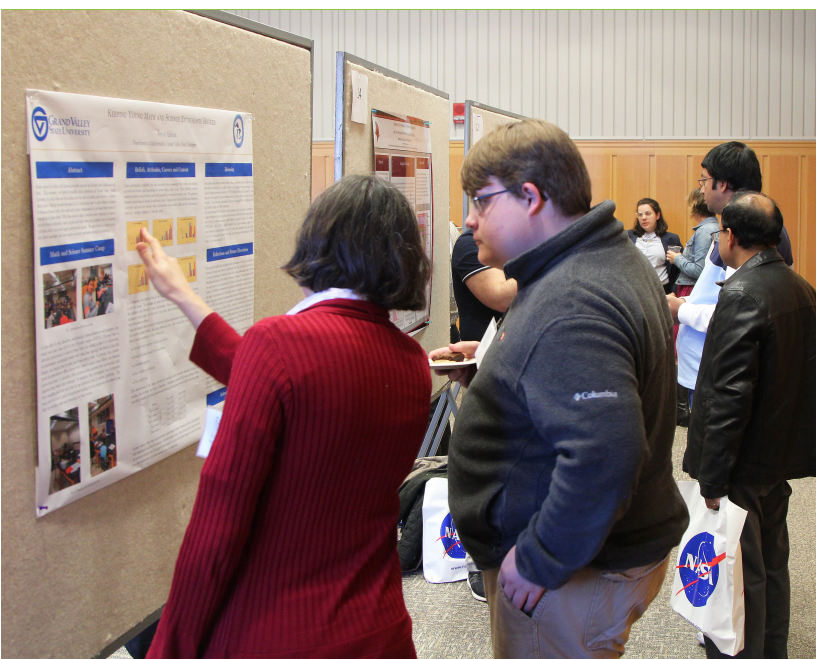
This year's Fall conference was held in Ann Arbor at Palmer Commons on University of Michigan's campus on October 12th, 2019. This annual event is an opportunity for the MSGC award recipients to gather, network and share their research, projects and excitement.

Keynote speaker and Apollo Astronaut Dr. Tony England, Dean of the College of Engineering and Computer Science at the University of Michigan - Dearborn captivated the audience with his lessons on mission success from the Apollo and space shuttle programs.

We were delighted to have Gavin Brown, Executive Director from Michigan Aerospace Manufacturers Association (MAMA) give us insight into the future of the space industry coming to Michigan and the possibilities that will be available. Along with Randy Whitmire, President of the Michigan Air Force Association discussing our ongoing collaboration creating opportunities for students with industry leaders.

The rest of the day was filled with rounds of poster sessions, where individuals had opportunities to discuss and answer questions about their projects and several oral presentation sessions that gave grant recipients an opportunity to describe their work and answer questions in a timely manner. Presenters represented students and faculty from every affiliated college and university in the consortium, as well as several of our non-profit educational partners.

The conference brought people together from all over the state to share similar goals and passions. We look forward to seeing everyone at next year's conference being held at Calvin University on October 17th, 2020.



Gaining Lessons in Investigating Groundwater Springs

Not only did Grand Valley State University undergraduate student, Eleanore Larson devote her time and research to investigating groundwater springs, but she learned some eye-opening and transformative lessons along the way. Larson's research focused on Hemlock Crossing Park in Ottaway County, Michigan and whether small valleys were formed by spring sapping. Focusing on learning the speed of erosion as well as the flow of the springs, Larson's objective was to gain understanding of the groundwater systems, the ability to predict how and where they influence water quality, ecology and geomorphology of a watershed. She gained skills such as patience, excitement and overcame fears along the way.

It's projects like Larson's that help us better understand and learn more about the environment that we live in. She was able to present her research for the first time to a professional scientific audience at the 2019 Geologic Society of America's annual meeting in Indianapolis, Indiana. The opportunity that MSGC provided for Larson helped her grow not only in knowledge and understanding, but in confidence in her plans for her future goals.



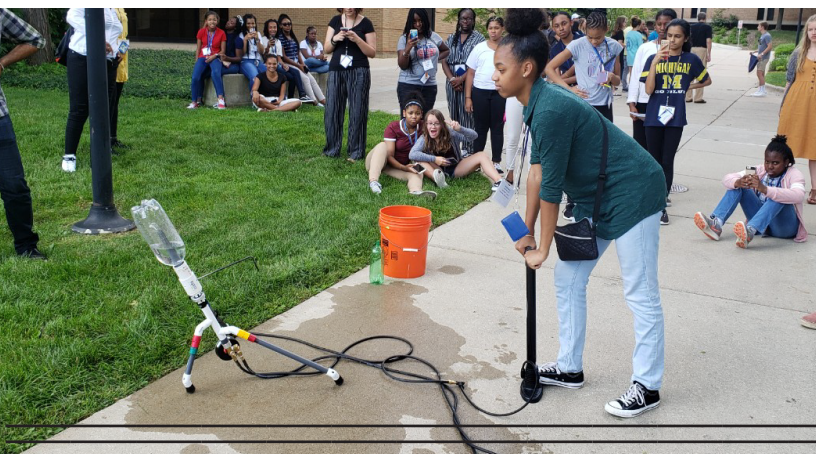


Galaxy Girls Summer Camp

The Detroit Area Pre-College Engineering Program (DAPCEP) put together quite a summer camp where 22 young girls got the opportunity to stay on campus at the University of Michigan and attended classes with an engineering perspective. Not only does this program give them a taste for college life, it teaches them skills, forces them to think outside the box and challenges them to question and grow in how to relate these skills into real life experiences.

At the end of the week, the students confidently present their projects and presentations to parents and a panel of college students, faculty and staff. The goal of this yearly MSGC supported program is to let these ladies know that they have something to offer society and encourage them to consider pursuing a career in engineering should that be their dream.

www.dapcep.org

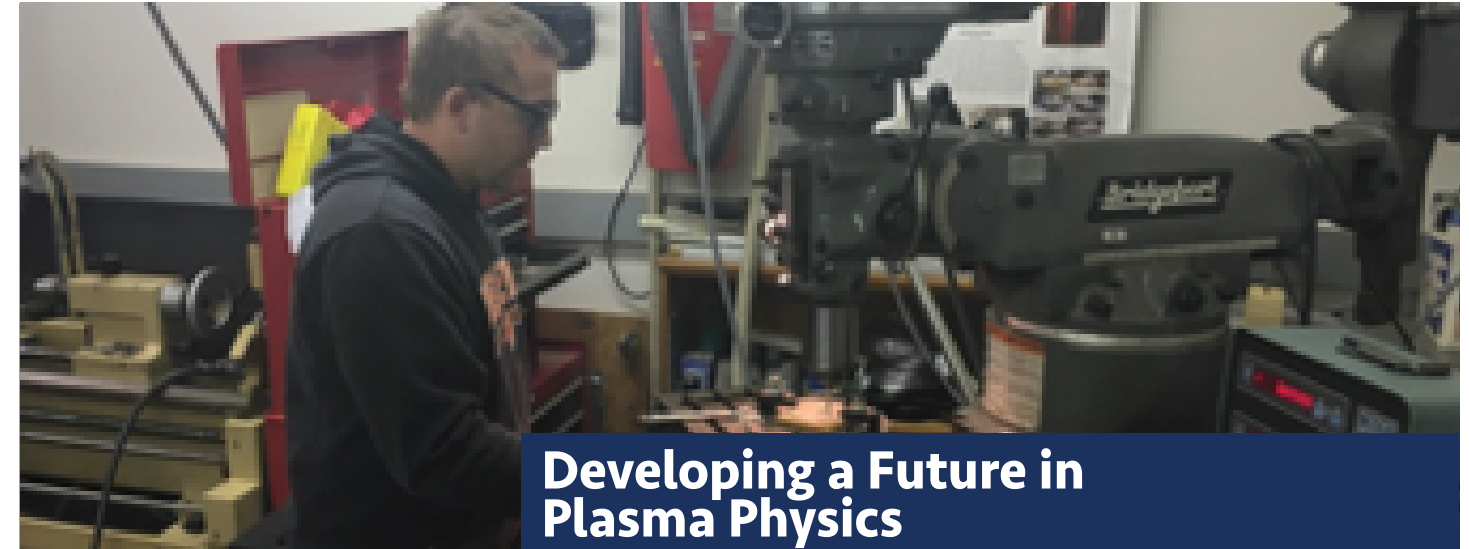


KUDOS

Michigan Technological University student, Josh Gonzalez was chosen and supported by the NASA National Space Grant Program Office to attend the Southern Regional Educational Board's Institute on Teaching and Mentoring conference this year. The conference was held in Atlanta, Georgia on October 24th-27th, 2019.

Congratulations to the Micro-g NExT teams from Grand Valley State University and Western Michigan University. They were selected to have their Artemis devices tested in the Neutral Buoyancy Lab in Houston this spring. We can't wait to see their designs.

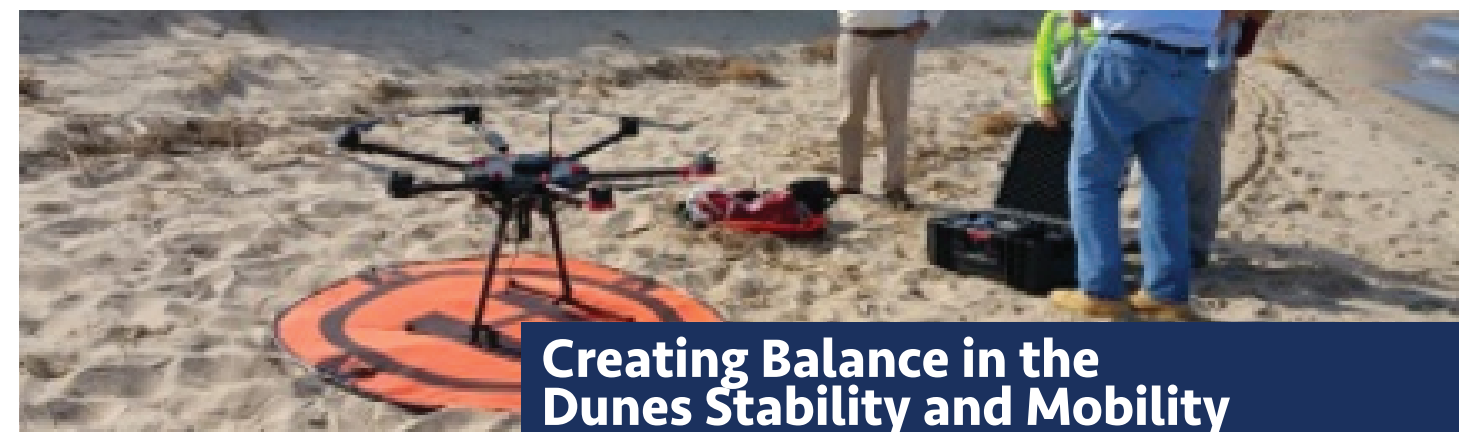
One of our Michigan State University graduate fellowship recipients, Osama Alian had his research used in a recent NY Times article. His group's original journal article is titled "Experimental evidence that symbiotic bacteria produce chemical cues in a songbird" and the New York Times article is "The Bacterial Surprise in This Bird's Smell."



Developing a Future in Plasma Physics

Coming up with an idea, building it into existence, testing it and then using that to solve a problem is exactly what Eastern Michigan University graduate student, Jared Powell set out to do in his research. Powell built a plasma chamber in EMU's machine shop and it is now operational and resides in EMU's newly renovated plasma lab in Strong Hall. Although, it's plasma quite yet. Powell is learning how to fix and seal his device. In the meantime, he has written an operation manual detailing each component of the chamber, their

function and how it operates. Eventually the chamber will help EMU researchers investigate communication between objects reentering the Earth's atmosphere and ground stations to understand why they often lose signal. This MSGC funded project has helped Powell focus on continuing down a path of plasma physics where he hopes to pursue a career. Until then Powell is continuing his education at Auburn University this year for a Ph.D. in plasma physics.



Creating Balance in the Dunes Stability and Mobility

A project under an MSGC Research Seed award to Dr. Paul Pearson in 2017, Hope College's undergraduate student Jacob Stid has taken a refined approach to the study of the stability and mobility of the coastal dune systems. Using drone flights, Stid was able to capture images creating a topographic map to evaluate the dune mobility. These maps in turn were tested along with data about drift potential collected from the local weather station. Stid was able to create a model that can be used for testing

observations of the dune's mobility over the next several years. Not only has Stid's team given several presentations about their project, but they have continued refining and testing their methods. With the help of their Professor they have added two students to continue working on the project throughout the summer funded through Hope College. Stid's goal is to create a manuscript for publication this year documenting his findings.