Michigan Space Grant Consortium
University of Michigan
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PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The Michigan Space Grant Consortium is a Designated Program Consortium funded at a level of $575,000 for fiscal year 2011.

PROGRAM GOALS

Outcome 1: *Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals. (Employ and Educate)* Higher Education: MSGC Fellowship, Internship, and Seed Grant Programs.

The MSGC Fellowship Program

Goal: Increase the number of proposals that the MSGC Fellowship Program receives.

Goal: Improve the longitudinal tracking of the MSGC Fellowship award recipients.

Goal: Competitively award graduate and undergraduate fellowships with demographics as specified by NASA of 16.8% underrepresented minority (Department of Education). U. S. citizenship required.

The MSGC Research Seed Grant Program

Goal: Improve participation in the MSGC Research Seed Grant Program across the Consortium.

Goal: Increase the diversity (underrepresented minorities and women) in the MSGC Research Seed Grant Program.

Outcome 2: *Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty. (Educate and Engage)* Elementary/Secondary Education: MSGC Higher Education, K-12 Educator Incentive, Pre-College, and Augmentation Programs.

The MSGC Precollege Education, Higher Education, K-12 Educator Incentive and Augmentation Programs

Goal: Increase the number of applications coming from outside of the Consortium for the MSGC Precollege Education and K-12 Educator Incentive Programs with augmentation funds available to programs that target underrepresented minorities and women.

Goal: Award quality programs that target underrepresented minorities and women.

Outcome 3: *Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission. (Engage and Inspire)* Informal Education: MSGC Informal Education and Augmentation Programs.

The MSGC Informal Education Program

Goal: Increase the number of applications coming from outside of the Consortium for the MSGC Public Outreach Program with augmentation funds available to programs that target underrepresented minorities, women, and persons with disabilities.

Goal: Award quality programs that target underrepresented minorities and women.

Goal: Award quality programs that encourage Science, Technology, Engineering, and Mathematics education in informal settings (e.g., museums science centers, boy and girl scouts, etc.)

PROGRAM/PROJECT BENEFIT TO OUTCOME (1, 2, OR 3)

Outcome 1: *Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals. (Employ and Educate)* Higher Education: MSGC Fellowship, Summer Internship, and Seed Grant Programs. Highlights are provided below:

"The MSGC funded portions of my research as an undergraduate," says **Judith Racusin**, graduate of the University of Michigan. "I went on to get my Ph.D. in Astronomy and Astrophysics, and am now a NASA scientist at Goddard Space Flight Center. I am involved in NASA's Swift and Fermi missions."

"I decided to go on to graduate school after the MSGC funded my SROP internship," says **James Lankford**. "I am currently pursuing a Master's degree in Aerospace Engineering with a concentration in Rotorcraft at the University of Maryland – College Park."

"Space Grant helped me to get where I am today by funding me through the MSGC Fellowship and Internship Program so that I could participate in hands-on engineering," says **Theresa Biehle**, University of Michigan graduate, now doing Systems Engineer at Orbital Sciences. "That experience on my resume helped me to get this job right after graduation, and gave me a leg-up once I started working because I had already had experience on multiple, successful engineering projects within a team."

Calvin College **Professor Larry Molnar**, a Harvard-educated astrophysicist who has recently moved into the field of solar system studies, was awarded an MSGC Research Seed Grant for his proposal, *Asteroid Collisional Families in the Koronis Zone: A Rigorous Test for Collision Models*. A thorough understanding of asteroid collisions is a key to NASA's Strategic Goal 2.3: ascertain the content, origin, and evolution of the solar system. The collisions are the ultimate source of the near-Earth objects now being cataloged by NASA. And the observed distribution of asteroids retains a record of the early phase of planet formation, a record that can only be read clearly once subsequent collisions have been accounted for. "The grant was used for preliminary development of the project and establishment of a collaboration with numerical collision modelers, resulting in the writing of an NSF grant," says Professor Molnar. "If approved, the grant will not only fund further development of the science, but also inspire and train undergraduates to pursue this area." Two graduates of Calvin's program are currently graduate students in the University of Arizona Planetary Science Program.

Outcome 2: *Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty. (Educate and Engage)*
Elementary/Secondary Education: MSGC Higher Education, K-12 Educator Incentive, Pre-College, and Augmentation Programs. Highlights are provided below:

The University of Michigan's (UM) K-12 Outreach Program is designed to supplement classroom activities with lessons we have developed on aerospace and space science along with hands-on activities. "We find that K-12 students bond with our staff of UM undergraduate and graduate students who are not much older than they are," says MSGC Director, **Professor Alec Gallimore**. "This combination has been successful for over 20 years, giving us the tools to spark the interest of students that have not connected to science and math in the past, and to foster those who have." Events range from activities held within an afternoon class to multi-day, all-day events working with the same group of students or different groups of students. A sampling of the activities provided are: model rocket building and launching, balsa wood glider design, air surface controls, tower building, down-on-the-moon, and lectures, such as, *Why is the Sky Blue?* and undergraduate and graduate students describing their path to the university STEM field that they are currently studying to earn a bachelors or graduate degree. Note: Augmentation funding was used to bring underrepresented and underserved students to the Michigan campus.

Michigan Technological University (MTU), along with the Square One Education Network, recruited 46 teachers (6 minority) comprising nineteen teams to participate in the Underwater Remotely-Operated Vehicles (ROV) in classroom workshops held in the Detroit area and Southwestern Michigan," reports **Doug Oppliger**. "Of the 19 schools represented, seven are primarily serving minority students, and twelve are Title I schools." (Note: Title I indicates a

significant population of low-income families). The workshops were conducted for middle and high school science and math teachers at Oak Park High School near Detroit and at Portage High School near Grand Rapids. During the workshops, each teacher team designed and built an ROV, learned how to operate the ROV, and planned how they would integrate the program into their physical science, earth science, engineering, math, and/or environmental science curricula. Post workshop surveys show the teachers felt the workshops were extremely valuable. Ninety-Five percent of the participant teachers reported they would be *Very Likely* (40%) or would *Definitely* (55%) use this activity in their classrooms during the following school year. Likewise, 100% reported the presenters were prepared, interesting and knowledgeable and that the workshop was good or excellent.

Outcome 3: *Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission. (Engage and Inspire)* Informal Education: MSGC Informal Education and Augmentation Programs. Highlights are provided below:

The Michigan Technological University's Mind Trekkers program brings science, technology engineering, and mathematics (STEM) to life in the hands of participants, young and old. The Mind Trekkers team is made up of undergraduate and graduate students at Michigan Tech. Students create activities, oversee those engaging in these hands-on activities, and also serve as mentors and role models for the K – 12 students that participate in the events. The activities are designed to be completed in 30 seconds to 3 minutes, focusing on the WOW! of STEM, allowing students to explore many different areas of STEM and discover which fits them best. The MSGC supported the execution of a Mind Trekkers Science and Engineering at the 2011 Houghton County Fair. The event had 3 main components: over 90 hands-on STEM activities to participate in, businesses hosting tables with activities staffed by STEM professionals in their organization, and local college and university admissions representatives. This four-hour event took place during the fair under a large circus tent just off the Midway. Over 3,000 students and their families, largely from surrounding rural communities, took part in this music-filled, high-energy event. Surveys were given to the student's engaging in the event to gauge the impact on their views of STEM with the following results: 85% stated they were more interested in attending college; 80% stated they were more interested in technology 73% stated they were more interested in engineering; 67% stated they were more interested in mathematics; 93% stated they were more interested in science. "Feedback from the community, local educators, our Mind Trekkers team, and the Houghton County Fair Board was extremely positive," says **Steve Patchin**. "Mind Trekkers will be hosting the event again at the 2012 Houghton County Fair. The Fair has agreed to solicit funds to support the event, commenting that they would rather support this type of program with their funding rather than juggling acts or dogs catching Frisbee type of entertainment."

PROGRAM ACCOMPLISHMENTS

Outcome 1: *Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals. (Employ and Educate).* Higher Education: MSGC Fellowship, Internship, and Seed Grant Programs.

The MSGC Fellowship Program

Goal: Increase the number of proposals that the MSGC Fellowship Program receives.

Metrics: Compare the number of proposals received from year-to-year.

Approach: Provide brochures to all MSGC campus representatives to supplement the other ways (newsletter, website, postings, and e-mails) in which we announce the MSGC Fellowship and Internship opportunities.

Accomplishment: The MSGC flagship Fellowship Program received 53 proposals in 2011 as compared to 63 in 2010. In 2011, we had a dramatic decrease in undergraduate proposals, from 33 in 2010 to just 19 in 2011, due to other funding opportunities available during that academic year at several of the affiliate campuses. In 2012, the number of undergraduate proposals that we received went back up with 34 undergraduate students applying to the MSGC Fellowship Program.

Goal: Improve the longitudinal tracking of the MSGC Fellowship and Internship award recipients.

Metrics: Track the next steps that students take after they are awarded fellowship funding from the MSGC.

Approach: Mark Fischer, Executive Director of the National Space Grant Foundation, provides us with results from the surveys that he routinely sends to our Fellowship and Internship award recipients with the contact information provided by Bonnie Bryant, MSGC Program Coordinator. Bonnie also contacts the mentors of Fellowship and Internship award recipients for input.

Accomplishment: The number of students that received funding from the MSGC Fellowship Program was 37 as compared to 47 in 2010. Once augmentation funds are disbursed, this number will increase. During the 2011 program year, the following was reported: 15 students are pursuing advanced degrees in STEM disciplines, 3 students accepted STEM positions as NASA contractors, 34 accepted STEM positions in industry, 1 student accepted a position at NASA, 5 students accepted STEM positions in K-12 academia, and 5 students went on to positions in non-STEM disciplines. The remaining students have not yet received the degree that they were pursuing when they were awarded by the MSGC.

Goal: Competitively award graduate and undergraduate fellowships and internships with demographics as specified by NASA of 16.8% underrepresented minority (National Center of Education Statistics Digest). U. S. citizenship required.

Metrics: Compare the number of proposals received each year by gender and ethnicity.

Approach: The Summer Research Opportunity Program (SROP) is a long-standing minority student recruitment program for graduate school that focuses on exposing rising sophomores, juniors, and seniors to on-campus research activities. SROP is supported by the Council of Graduate Schools, a *Big Ten Plus* consortium of graduate schools that routinely brings dozens of high-achieving underrepresented minority undergraduates to its campuses each summer. At UM and MSU, SROP runs through the graduate school. The MSGC will dedicate funds to 8 SROP students with the recently awarded augmentation funds in order for them to participate in internships at the University of Michigan. Reporting on augmentation funding will occur at a later date. In addition to supporting SROP students, the MSGC continues to offer a fellowship program targeted to undergraduate, underrepresented minority students. The program offers $2,000 for the mentor's salary. Funding in the amount of $2,500 is awarded for each undergraduate, underrepresented minority student. A $500 incentive is offered to mentors of underrepresented students not eligible for this program, for example, underrepresented graduate students.

Accomplishment: Our goal is to award a minimum of 16.8% underrepresented minority students in our fellowship program. The goal is derived from the underrepresented minority student enrollment percentage for the state of Michigan as per the National Center of Education Statistics Digest. Our commensurate minimum for women is 40%. During funding interval 2011, 19% of the fellowship award recipients were underrepresented minority students, the amount of underrepresented minority students that we reached in 2010 was 22%. A preliminary review shows that the number of underrepresented minority students reached will increase to 27% once we report on the disbursement of augmentation funding for 2011.

The number of women that we funded dipped from 35% in 2009 to 31% in 2010. In order to turn around the decrease in the number of female students awarded, we aggressively recruited. women. In 2011, 38% of the students that participated in the MSGC Fellowship and Internship Program were women. A preliminary review shows that the number of women that will participate in the program will increase to 49% once we report on the disbursement of augmentation funding for 2011.

The MSGC Research Seed Grant Program

Goal: Improve participation in the Research Seed Grant Program across the MSGC.

Metrics: Compare the distribution of awards across the institutions within the MSGC.

Approach: Keep a record of the proposals we received overall as well as the distribution across the Consortium.

Accomplishment: During the 2011 funding interval, we received proposals to the MSGC Research Seed Grant Program from 7 out of 12 affiliate universities as compared to 8 out of 10 affiliated universities in 2010. We funded proposals from 7 universities in 2011 as compared to 8 universities in 2010.

Goal: Increase the diversity (underrepresented minorities and women) in the MSGC Research Seed Grant Program.

Metrics: Record the number of applicants each year by gender, ethnicity, and persons with disabilities.

Approach: Target announcements to college and university groups using e-mail, group meetings, and invitations from the director and campus representatives.

Accomplishment: During the 2011 funding interval, we received more proposals from women than we ever have. Six women proposed to the MSGC Research Seed Grant Program versus 5 received last year. Five proposals from women were funded. The woman (Stephanie Brouet) that was not funded received feedback from the MSGC Executive Board, proposed in 2012, was ranked number one, and was awarded a Research Seed Grant. Despite our best efforts (as described in this report), we did not receive any proposals from underrepresented minorities in 2011.

Outcome 2: *Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty. (Educate and Engage)*
Elementary/Secondary Education: MSGC Higher Education, K-12 Educator Incentive, Pre-College, and Augmentation Programs.

The MSGC Precollege Education, Higher Education, and K-12 Educator Incentive Programs

Goal: Increase the number of applications coming from outside of the Consortium for the Precollege Education, K-12 Educator Incentive, and Augmentation Programs (all K-12 Educator Incentive Program proposals come from outside of the MSGC).

Metrics: Record the number of applications that the MSGC receives from outside of the Consortium.

Approach: Some 8,000 brochures are sent to public and intermediate school districts, including high, middle, elementary, charter along with the Boy and Girls Scouts, museums and after-school clubs.

Accomplishment: During the 2011 funding interval, we received 15 proposals from outside of the MSGC as compared to the 16 proposals we received during the 2010 funding interval. Nine teachers were awarded from the MSGC K-12 Educator Incentive Program as compared to 10 teachers in 2010.

Goal: Encourage quality programs that target underrepresented minorities and women.

Metrics: Record the number of programs targeted to underrepresented minorities and women.

Approach: Announce that augmented support will be available to those programs that target underrepresented minorities and women. Within the announcement add that to be considered for augmented support, an additional page describing in detail why added funds are necessary to assure the success of program targeting underrepresented minorities and/or women.

Accomplishment: During the 2011 funding interval, we received 11 proposals that directly targeted underrepresented minorities and/or women. During the 2010 funding interval, we received 14 proposals that directly targeted underrepresented minorities.

Outcome 3: *Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission. (Engage and Inspire)* Informal Education: MSGC Informal Education and Augmentation Programs.

The MSGC Informal Education Program

Goal: Increase the number of applications coming from outside of the Consortium.

Metrics: Record the number of applications that the MSGC receives from outside of the Consortium.

Approach: Some 8,000 brochures are sent to public and intermediate school districts, including high, middle, elementary, charter along with the Boy and Girls Scouts, museums and after-school clubs.

Accomplishment: During the 2011 funding interval, we received 7 proposals from outside of the MSGC as compared to 11 proposals that we received during the 2010 funding interval.

Goal: Encourage programs that target underrepresented minorities and women.

Metrics: Record the number of programs targeted to underrepresented minorities and women.

Approach: Announce that augmented support will be available to those programs that target underrepresented minorities and women. Within the announcement we added that to be considered for augmented support, an additional page describing in detail why additional funds are necessary to assure the success of program targeting underrepresented minorities and/or women.

Accomplishments: During the 2011 funding interval we received 6 proposals that directly targeted underrepresented minorities and/or women which is the same number that we received during the 2010 funding interval.

Goal: Encourage programs that include Science, Technology, Engineering, and Mathematics in informal settings (e.g., museums, science centers, boys and girl club, etc.).

Metrics: Record the number of applications that come from libraries, museums, planetariums, and others that offer STEM education in informal settings.

Approach: Some 8,000 brochures are sent to public and intermediate school districts, including high, middle, elementary, charter along with the Boy and Girls Scouts, museums and after-school clubs. We also encourage MSGC campus representatives to reach out to these establishments in their communities.

Accomplishment: During the 2011 funding interval, all of the programs awarded offered STEM education in informal settings with highly trained staff that provided supplemental materials; the same was true of the 2010 funding interval. Informal settings included libraries, symposiums, mobile planetariums. Museums, and science centers like the Cranbrook Institute of Science.

PROGRAM CONTRIBUTIONS TO NASA EDUCATION PART MEASURES

- **Student Data and Longitudinal Tracking:** Total Awards = 37; Fellowship = 37 (this number will increase once augmentation funds are disbursed and will be accounted for in a future progress report). Seven of the total awards represent underrepresented minority Fellowship funding and 14 of the total awards represent female Fellowship funding. Again, these numbers will increase once augmentation funding is disbursed. During the 2011 program year, the following was reported: 15 students are pursuing advanced degrees in STEM disciplines, 3 students accepted STEM positions as NASA contractors, 34 accepted STEM positions in industry, 1 student accepted a position at NASA, 5 students accepted STEM positions in K-12 academia, and 5 students went on to positions in non-STEM disciplines. The remaining students have not yet received the degree that they were pursuing when they were awarded by the MSGC.

- For all students significantly supported in the period spanning FY06 - FY11, 58 are pursuing advanced degrees in STEM disciplines, 11 accepted STEM positions at NASA contractors, 4 accepted positions as NASA, 45 accepted STEM positions in industry, 1 accepted a STEM position in K-12 academia, 15 accepted STEM positions in academia, and 7 went on to positions in non-STEM disciplines. The remaining students have not yet received the degree that they were pursing when they received their award.

- **Diversity:** Women, underrepresented minorities, and people with disabilities are strongly encouraged to apply to all MSGC Programs. This is noted in our funding opportunity announcements, on our website, in our brochures, and in broadcast e-mails and building monitors. As mentioned previously, in addition to our flagship Undergraduate and Graduate Fellowship Programs, we offer an Undergraduate – Underrepresented Minority Fellowship Program (U-UMFP) and offer an incentive to mentors of underrepresented students that are not eligible for the U-UMFP. MSGC Executive Board members seek out faculty at their institutions that are underrepresented and/or women to inform the about the MSGC Research Seed Grant Program and to encourage them to apply.

Minority-Serving Institutions: The underrepresented minority enrollment Wayne State University and Eastern Michigan University is 36% and 20%, respectively, as compared to 4% - 13% at other MSGC-affiliated universities and colleges. The only historically black college that we have in the state of Michigan is Lewis College, a non-accredited business college in Detroit. Bay Mills Community College and Keweenaw Bay Ojibwa Community College are the two tribal colleges located in Michigan but at this time, no science programs are offered on either campus. Our focus remains to recruit minority students and junior faculty members from MSGC institutions and through the SROP Program.

NASA Education Priorities are noted throughout this progress report: **Racusin** – page 2, **Lankford** – page 3, **Biehle** – page 3, **Molnar** – page 3, **Gallimore** – page 3, **Oppliger** – page 3, and **Patchin** – page 4.

IMPROVEMENTS MADE IN THE PAST YEAR

We were happy to add Calvin College as an MSGC affiliate institution in 2011. The MSGC Representative on the Calvin campus is Professor Deborah Haarsma, Chair of the Department of Physics and Astronomy. Professor Haarsma earned her Ph.D. at the Massachusetts Institute of Technology. Her thesis was in the field of radio astronomy under Professor Bernard F. Burke entitled "Gravitational Lens 0957+561: A Study at Radio Wavelengths."

The MSGC Conference Keynote Speaker on November 12, 2011, was Professor Tony England. Professor England is currently a professor of Electrical Engineering and Atmospheric, Oceanic, and Space Sciences at the University of Michigan. He served as a NASA Scientist Astronaut in the Apollo Program from 1967 -1972, and again during the early Shuttle Program from 1979 – 1988. Professor England has been the recipient of many awards including the *President's Medal of Freedom* for his contributions to the safe recovery of Apollo 13, and the *NASA Outstanding Scientific Achievement Medal.* Conference surveys revealed that our guests thoroughly enjoyed the anecdotes and visuals during the early days of the space program that only a former astronaut could provide.

We were sorry to lose long-time MSGC Executive Board member, Professor Emeritus, Frank Severance from Western Michigan University. Frank is now in demand as a lecturer and travels throughout the world. As mentioned in previous reports, Frank is the author of textbooks on controls and robotics. Frank passed the baton to Massood Atashbar, Professor of Electrical and Computer Engineering.

Even though we had what we considered an excellent online proposal and review process, we spent a significant amount of time tweaking the funding opportunity announcements, ruberics, and having general discussions on how the process could be improved upon at the May 2011 Executive Board Retreat. Our new (this year and last) MSGC Executive Board members were able to give us excellent feedback given that they were reviewing the process for the first time. Our server for the process was running on fumes and our webmaster, Dr. Robert Lobbia, graduated with his Ph.D. and entered the workforce so we are now working with the National Space Grant Foundation's Mark Fischer and Eric Day. Bonnie Bryant works with Mark regarding the proposal and review system and with Eric on all MSGC website matters.

MSGC Director, Professor Alec Gallimore, has been named Associate Dean for Research and Graduate Education (ADRGE) for the University of Michigan's College of Engineering. He started this position on September 1, 2011 after having served six years as an Associate Dean in the Horace H. Rackham School of Graduate Studies at Michigan. As the ADRGE, Professor Gallimore's responsibilities include the College of Engineering's ~$190M/year research enterprise, and the College's 3200 master's and Ph.D. students.

The Great Midwestern Space Grant Regional Conference was held at the University of Illinois in Urbana-Champaign. Three University of Michigan students participated in the poster competition, where competition was extremely strong among 30 students. Iverson Bell (received an "Honorable Mention"), Nathan Hamet, and Shang Sun. The student posters were entitled, *Investigating the Potential of Electrodynamic Tethers to Enhance Capabilities of Ultra Small Spacecrafts*, *High Altitude Solutions*, and *Probabilistic Modeling of Microstructure Evolution using Finite Element Representation of Probability Density Functions*, respectively.

- "I was surprised by the sheer diversity of subjects presented," says Iverson Bell. "Multiple disciplines were represented, including research on unmanned aerial vehicles (UAVs), biological cell growth, and remote sensing."
- Thank you for supporting my travel to the Great Midwestern Space Grant Regional Conference." Says Nathan Hamet. I enjoyed the experience and the network connections that I made were invaluable."
- "After taking a tour around some awesome engineering laboratories, we went to the poster competition stage," says Shang Sun. "The competition was well organized with students enthusiastic to introduce the research that they are doing at their universities."

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

The MSGC Board is comprised of 43% women and 29% underrepresented minorities, including the director, Professor Alec Gallimore.

Calvin College

Private four-year liberal arts college

As mentioned above, Professor Deborah Haarsma is the Chair of the Department of Physics and Astronomy. In her research, she pursues questions about galaxies and the universe as a whole.

Central Michigan University

Public PhD. granting university

Kristina Lemmer is a Professor in the Department of Mechanical Engineering. Her interests are plasma propulsion, applied plasma physics, space propulsion systems, plasma applications to environmental concerns, and medical plasma applications.

Dicken Elementary School

Ann Arbor Public School System

Mr. Michael Madison is the principal. Mr. Madison was recently elected President of the Ann Arbor Administrators' Association for a two-year term. He is also Executive Board

member of the Ann Arbor Hands-On Museum, and Vice-President of the Pioneer High School Boosters.

Eastern Michigan University

Public Ph.D.-granting university

James Sheerin is Professor of Physics and Astronomy and is very active in space physics research and in developing science courses for non-majors and pre-service teachers.

Grand Valley State University

Public Master's-granting university

Ms. Mary Ann Sheline is the director of the Regional Math and Science Center. As a former teacher, she is an expert in K-12 matters.

Hope College

Private four-year liberal arts college

Peter Gonthier is an astronomer and Professor of Physics. Professor Gonthier recently won an NSF grant for his proposal, *Radio, X-Ray, and Gamma-Ray Emission from Neutron Stars* and a Fermi Guest Investigator Award for his proposal, *Pulsar Population Synthesis and Contribution to Positron and Diffuse Gamma-Ray Backgrounds.*

Michigan State University

Public Ph.D. granting university

Dr. Aurles Wiggins is director of the Office of Support Services (OSS). In addition to directing the OSS, Dr. Wiggins is a key element in the management team of the NSF-funded *Louis Stokes Alliance for Minority Participation* (LSAMP). This program is engaged in recruiting underrepresented minorities into STEM fields. The MI-LSAMP facilitates the long-term goal of increasing the production of Ph.D.'s in STEM fields with an emphasis on entry into faculty positions.

Michigan Technological University

Public Ph.D. granting university

Ms. Chris Anderson is the Special Assistant to the President and specializes in the recruitment of women and underrepresented minorities into engineering. Ms. Anderson was recently selected to serve as diversity technical advisor for the STARS (Sustainability, Tracking, and Assessment Rating System) and joined the Diversity Committee for the national Women in Engineering Pro-Active Network.

Oakland University

Public Ph.D. granting university

Bhushan Bhatt is Professor of Mechanical Engineering. His research is in Thermal-hydrodynamics of Two-Phase Flows and Electronic Component Cooling.

Saginaw Valley State University

Public Master's-granting University

Garry Johns is Professor of Mathematics at Saginaw Valley State University. Professor Johns also consults with high school mathematics teachers in the Buena Vista School District regarding best teaching practices and curriculum alignment. Buena Vista has a large African-American population.

University of Michigan (lead institution)
Public Ph.D. granting university
Alec Gallimore is the MSGC director, Arthur F. Thurnau Professor of Aerospace Engineering and, as mentioned above, the newly appointed Associate Dean for Research and Graduate Education (ADRGE) for the University of Michigan's College of Engineering.
University of Michigan (lead institution)
Public Ph.D. granting university
Dr. Cinda Davis is the director of the Women in Science and Engineering Program.
Wayne State University
Public Ph.D. granting university
Gerald Thompkins is Associate Dean of Engineering and Associate Professor of Engineering and is very active in minority student recruitment throughout the Detroit metropolitan area.
Western Michigan University
Public Ph.D. granting university
Massood Atashbar is Professor of Electrical and Computer Engineering and the director of Advanced Smart Sensors and Structures and the Sensor Technology Laboratory.

Respectfully submitted on May 7, 2012.

Alec D. Gallimore, Director
Michigan Space Grant Consortium