

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 with a \$270,000 augmentation for a total of \$845,000 for fiscal year 2010.

## 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. The MSGC Fellowship and Summer Internship Programs provide authentic, hands-on experiences in science and engineering disciplines for students and increases the interest in STEM careers. The MSGC also enhances the capacity of affiliate institutions to support innovative research infrastructure activities to enable early career faculty to focus their research toward NASA priorities. Examples of both are shown below.

“The MSGC provided me with an avenue to continue exploring space,” says Manish Mehta. “I have just been offered a position at NASA Marshall Space Flight Center!”

“The Space Grant program allowed me the flexibility to complete the research that led to the most important parts of my doctoral dissertation,” says Eric Gustafson. “I am currently

employed at NASA Jet Propulsion Laboratory where I am responsible for the navigation of the Mars Science Lab.”

“I not only gained research experience through my summer internship in the Student Space Systems Fabrication Laboratory at the University of Michigan supported by the MSGC, but I expanded my network of people who work within the same field,” says Jeffery Leath. “I also put the technical theories that I learned about into practice, in practical, real-world situations. This program helped to put my education into perspective in order to get a better understanding of how to shape my career. I went on to participate in a summer internship at Sikorsky Innovations, and then returned to the University of Michigan to pursue a Masters Degree in Aerospace Engineering.”

“Participation in the Space Grant program developed my skills and experiences while pursuing my undergraduate degree,” says Britney Richard. “I appreciate that I could continue my service learning project to the manufacturing stage. My team has had numerous publications and conference presentations to be proud of since I was awarded an MSGC Fellowship.”

“The experience that I gained through my summer internship at the University of Michigan helped to make me a better engineer,” says LaDantè Riley. “I have applied what I learned while participating in other engineering teams.”

“The MSGC has always been very supportive of my career in space science,” says Shaneen Braswell. “The program was truly instrumental in providing me the means to reach my first milestone in becoming an astrobiologist by funding my travel to the *Exploration of Mars* summer school. Attending the summer school was a major turning point in my professional development in terms of directing my restless spirit and eagerness to learn into pursuing a more focused doctoral study in the field of astrobiology. The professional contacts that I made were invaluable. I plan to pursue a Ph.D. in the fall to develop life detection instrumentation.”

“The MSGC supported my internship at the NASA Robotics Academy,” says Lisa Perez. “The Academy taught me to persevere and to keep my mind open to out-of-the-box ideas because you never know where those ideas will lead you. My team came up with a completely new solution to the task of universal gripping in space and, because of this idea, we were able to file for a patent with NASA.”

“My MSGC Fellowship award inspired me to continue go on to graduate school,” says Chandra Romel. “I now work for a small start-up company that designs, builds, and tests superconducting particle accelerators for the Departments of Energy and Defense labs.”

In 2007, we reported that Professor Mitchell Walker was selected for an Air Force Office of Scientific Research (AFOSR) Young Investigator Research Program award. We are proud to announce that Professor Walker has recently been granted tenure at Georgia Tech. Walker was a recipient of a 2004 MSGC Fellowship award.

Assistant Professor, Jason Carter, has begun his career at Michigan Technological University and was awarded from the MSGC Research Seed Grant Program for his proposal, *Influence of*

***Mental Stress on Sympathetic Baroreflex Function: Implications for Post-Spaceflight Orthostatic Intolerance (OI).*** Post-spaceflight OI has been identified as Risk #6 in the Bioastronautics Critical Path Roadmap, a framework initiated by the Johnson Space Center's Space and Life Science Directorate to help guide research priorities for NASA. "The data obtained from this proposal will be used to submit a proposal to the National Institutes of Health," says Professor Carter. "This future proposal will include graduate funding for Ph.D. students and will focus on the mechanisms responsible for OI. Understanding the mechanisms responsible for OI will not only be advantageous to astronauts, but will also benefit other populations susceptible to OI."

**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. Proposals awarded through the MSGC Higher Education, K-12 Educator Incentive, Precollege Education, and Augmentation Programs engage middle school teachers in hands-on curriculum enhancement capabilities through exposure to NASA scientific and technical expertise as shown below.

Joan Chadde of Michigan Technological University (MTU) recruited 26 teachers comprising nine teams to participate in the first ***Underwater Remotely-Operated Vehicles (ROV) in the Classroom*** workshop held in the Upper Peninsula of Michigan. The workshop was conducted at MTU for middle and high school science and math teachers. James Fitzgerald, NASA Aerospace Education Specialist, provided an overview of NASA Missions from under the ocean research to the robotic spacecraft exploring the solar system and beyond. Participants utilized NASA Educational resources to enhance their existing curriculum while incorporating the Underwater ROV into the STEM and related aquatic disciplines. The teachers designed and built an ROV during the two-day workshop, 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. The teachers are eager to engage their students in this exciting STEM activity. "I have talked to my principal about incorporating the ROV as a nine-week exploratory class," reported an Ironwood high school teacher. "We want to engage our students in relevant experiential learning, enhancing their ability to think creatively and critically, building communication, teamwork and life skills to better prepare them for higher education and careers. I see the ROV Exploratory as a viable means to engage and promote interest in STEM fields."

The purpose of the ***Teaching Algebra Concept through Technology (TACT2)*** study was to provide Algebra I teachers with the pedagogical and technological resources necessary to increase the student achievement of all students, including the at-risk, English language-learning, and special education students. This study explored the link between teachers' pedagogical content knowledge and conceptual understanding of Algebra I functions to student achievement as teachers were immersed in hands-on, multi-faceted pedagogy via (a) *HeyMath* – an interactive virtual manipulative e-learning program from Singapore and (b) through supplemental function family activities (linear, quadratic, polynomial, and exponential) designed by Hope College. Preliminary results revealed that the 36 teachers averaged an increase of 43% in function family pedagogical content knowledge; a 66% improvement in their ability to identify common

misconception present in students' work; and a 33% improvement in creating suitable interventions for those misconceptions. Teachers began correcting misconceptions, not errors. One teacher commented, "A minor tweak resulted in a major revelation." Dr. Vicki Holmes reports that the assessment of TACT2's goals and objectives were three-fold: results from (a) teacher implementation of lesson and feedback, (b) teacher CHASM scores, and (c) teachers' responses of student achievement.

**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 awards proposals that provide research and activities to better understand the Earth's environments as shown below.

"A scientist walks into a bar ... *really!*" says Meg Gower. This is not the opening line of a joke but rather the description of what happens monthly in Jackson, Michigan. Science Cafés have taken off across the country as a way to introduce lay audiences to current hot topics in science research. In Jackson, the informal presentations are held at Hudson's Grill, a casual, family-style grill. Typically, 50 - 70 members of the greater Jackson area meet for dinner and lively discussion. Topics for the past year included Giant Galaxies in the Universe, Nuclear Physics, Global Climate Change, and the Future of Green Energy. Presenters came from both the University of Michigan and Michigan State University. What makes a Science Café unique is the diversity of audience members. This café typically has attendees who range in age from 12 to 80 with varying backgrounds in science; from passing interest to professional. Jackson Community College is a strong supporter of the Café and sends Science majors to act as *table hosts* who facilitate interaction among strangers sitting together. New topics will be coming soon thanks to renewed funding from the Michigan Space Grant Consortium.

## 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 and Internship Programs**

**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 Fellowship Program received 63 proposals in 2010 as compared to 60 in 2009.

**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 and Internship Program was 77 as compared to 62 from 2009. During the 2010 program year the following was reported: 20 students are pursuing advanced degrees in STEM disciplines, 2 students accepted STEM positions at NASA contractors, 1 student accepted a position at NASA, 1 student accepted a STEM position in K-12 academia, and 2 students went on to positions in non-STEM disciplines.

**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. During the summer of 2010, the MSGC dedicated fellowship funds to 8 SROP students in order for them to participate in internships at the University of Michigan. The MSGC continues to offer a fellowship program targeted to underrepresented minority students. The program offers \$2,000 from the MSGC and requires a \$2,000 match from the proposal institution for the mentor's salary. Funding in the amount of \$2,500 is awarded for each underrepresented minority student with a \$500 incentive to mentors of underrepresented students to be used for supplies and materials.

**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 2010 we exceeded our goal; 22% of the fellowship and internship award recipients were underrepresented minority students, the amount of underrepresented minority students that we reached in 2009 was 23%. 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 in the

program, we will more aggressively target women than ever before, especially for summer internships.

### **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 2010 funding interval, we received proposals to the MSGC Research Seed Grant Program from 8 of out of 10 affiliate universities as compared to 7 out of 10 affiliate universities in 2009. We funded proposals from 8 universities in 2010 as compared to 4 universities in 2009.

**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 2010 funding interval, we received proposals from 5 women, 1 underrepresented minority (Hispanic), and 1 disabled person as compared to the proposals we received in 2009 from 2 women and 1 underrepresented minority (African-American male). All proposals from underrepresented scientists (women, minority, and disabled) were of high quality and were funded. The 2010 – 2011 funding interval was the first time we had received a proposal from a person with disabilities. The scientist is Professor Brent Bolen who mentors disabled student, Scott Bleier. Scott was awarded a 2010 Fellowship award.

**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 2010 funding interval, we received 16 proposals from outside of the MSGC as compared to the 8 proposals we received during the 2009 funding interval. Ten teachers were awarded from the MSGC K-12 Educator Incentive Program as compared to the same number, 10, in 2009 and all were from outside the MSGC.

**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 2010 funding interval, we received 14 proposals that directly targeted underrepresented minorities and/or women. During the 2009 funding interval, we received 9 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 2010 funding interval, we received 11 proposals from outside of the MSGC as compared to 4 proposals that we received during the 2009 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 2010 funding interval we received 6 proposals that directly targeted underrepresented minorities and/or women as compared to the 2 proposals that were received during the 2009 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 2010 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 2009 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: 77; Fellowship/Scholarship: 37; and Higher Education/Research Infrastructure: 30. Of the students who were supported from FY10 funds, 20 are pursuing advanced degrees in STEM disciplines, 2 accepted STEM positions as NASA contractors, 1 accepted a position at NASA, 1 accepted a STEM position in K-12 academia, and 2 went on to positions in non-STEM disciplines. All students are funded through the Fellowship Program where we are not charged indirect costs so that we can provide more dollars to students.
- For all students significantly supported in the period spanning FY06 - FY10, 43 are pursuing advanced degrees in STEM disciplines, 8 accepted STEM positions at NASA contractors, 3 accepted positions as NASA, 11 accepted STEM positions in industry, 1 accepted a STEM position in K-12 academia, 10 accepted STEM positions in academia, and 2 went on to positions in non-STEM disciplines. The remaining students have not yet received the degree that they were pursuing when they received their MSGC Fellowship award.
- Course Development: Professor James Sheerin from Eastern Michigan University developed a new entry-level interdisciplinary course for pre-service teachers designed to meet state K-12 science education and teacher certification requirements using NASA resources integrated

into each lesson module. The course number is AST105E. *Our Magnetic Universe* is taught at Eastern Michigan University.

- Course Development: Professor Brent Krueger from Hope College was provided MSGC funding for course developed for high school teachers: *Development, Implementation, and Ongoing Support for Computationally-Based Investigative Course Modules in High School Classrooms*. There are two versions of the course, depending on whether the teacher wants chemistry credit or education credit; just one course with one name but offered in two departments: CHEM 795 or EDUC 795. *Computational Chemistry and Inquiry* taught at Hope College.
- Matching Funds: A match of at least one-to-one is required of all programs with the exception of fellowships. Historically, the MSGC augmented NASA funding by a ratio of nearly 2-to-1 overall as reported in CMIS (2003 – 2007).
- 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.

#### IMPROVEMENTS MADE IN THE PAST YEAR

At last year's winter meeting, we introduced Professor Kristina to the MSGC Board and asked the Board to consider adding Central Michigan University (CMU) as an affiliate campus (CMU administration had requested MSGC membership) in 2011. "I met Kristina while she was in high school visiting the University of Michigan campus," reports MSGC director, Professor Alec Gallimore. "She and her mother visited the department, and I was assigned to give her the sales pitch to enroll her into Michigan's Aerospace Engineering program. After coming to Michigan, she became an MSGC K-12 Outreach instructor, was awarded an MSGC Fellowship, worked in my lab an undergraduate, and then became my graduate student. In 2006, she attended the National Council of Space Grant Directors with us in Washington, D.C. and realized a dream when she met former NASA astronaut, Senator John Glenn. She is now an Assistant Professor of Mechanical Engineering at Central Michigan University and, I am proud to say, an MSGC Board member." Professor Lemmer was also awarded the Susan Lipschultz Fund for Women Graduate Students and the Amelia Earhart Fellowship award while she attended the University of Michigan.

MSGC Director, Professor, and Associate Dean, Alec Gallimore, has been named the director of the Michigan/Air Force Research Laboratory (AFRL) Center of Excellence in Electric Propulsion (MACEEP). The MACEEP is the first USAF Center of Excellence dedicated to advanced spacecraft propulsion. A \$5M grant and nearly \$1M of cost-sharing, contributed by MACEEP partner institutions over a five-year period, has been awarded.

Sponsored by the Great Midwestern Space Grant Region, *The Integration of Design and Hands-On Learning into Early Stages of Engineering Curriculum* Workshop took place from June 17 - 19, 2010 at the Missouri University of Science and Technology in Rolla. The MSGC provided support for Professor Brooks Byam (Saginaw Valley State University), Professor Kristina Lemmer (Central Michigan University), and graduate student, Christopher Morgan (Michigan Technological University) to attend. Educators from all over the region and from a variety of different types of educational institutions attended the workshop. The level of diversity allowed for meaningful discussions of how to apply the knowledge gained at the workshop to each participant's specific situation. In addition, there was a wealth of hands-on activities meant to introduce the educators to the project (the building of a model airplane) and to show how the Missouri University of Science and Technology introduces design early in the students' education.

- “This was my first venture into Space Grant activities,” said Professor Byam. “I was impressed by the organization and content of the workshop. The hands-on parts were outstanding and left me wanting more. I really enjoyed the informal contact and discussion with my colleagues. Since the experience, I am excited about participating in Space Grant activities and will spread the word.”
- “The instructors were knowledgeable, helpful and friendly,” said Christopher Morgan. “I liked the hands-on aspects of the experience.” Overall, all agreed that the experience was worthwhile and helped to demonstrate the importance of introducing the design aspects of engineering to students early in their education.

#### 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.

##### 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.

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 an Associate Dean in UM's Rackham Graduate School. Professor Gallimore is an expert in advanced spacecraft propulsion systems and an avid supporter of diversity initiatives in higher education. Professor Gallimore plays a key role in the NSF-funded *Louis Stokes Alliance for Minority Participation* (LSAMP) and the NSF-funded *Alliances for Graduate Education and the Professorate* (AGEP).

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

Frank Severance is Professor Emeritus of Electrical Engineering and the author of textbooks on controls and robotics.

Respectfully submitted on April 5, 2011.

Alec D. Gallimore, Director  
Michigan Space Grant Consortium