Ohio Space Grant Consortium
Ohio Aerospace Institute
Dr. Gary L. Slater, Director
(513) 556-3223
http://www.osgc.org/

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. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The Ohio Space Grant Consortium is a **Designated** Program Grant Consortium funded at a level of **$785,000** for Fiscal Year 2009.

PROGRAM GOALS

The Ohio Space Grant Consortium has four major goals for FY2009-2010 as part of the 5-year Strategic Plan[1] developed to support NASA in pursuit of their three major education goals and also mirror the OSGC Vision: *"To lead in the creation of an environment in the State of Ohio that will encourage significant educational and research contributions in Science, Technology, Engineering, and Mathematics while stimulating an understanding and appreciation for aeronautics and space."* The four primary goals are as follows:

1. The Ohio Space Grant Consortium Program will increase diversity levels through student awards and develop qualified undergraduate and graduate students who are prepared for employment in various NASA-related STEM careers;
2. The Ohio Space Grant Consortium Program will implement university hands-on programs to inspire and motivate students to pursue careers in Science, Technology, Engineering and Mathematics (STEM) and faculty to enhance their STEM pedagogy;
3. The Ohio Space Grant Consortium Program will develop research project opportunities with OSGC's university base—especially at OSGC's Minority Serving Institutions (MSIs) in collaboration with the Ohio Aerospace Institute (OAI) (OSGC's lead institution), and industry;

[1]OSGC had plans to modify its current Strategic Plan, Vision, Mission, Goals, and SMART Objectives in Summer, 2009, to align with the objectives of the National Space Grant College and Fellowship Program and NASA Office of Education. Due to the untimely passing of the Director, this did not occur until a new Director was in place and a special meeting of the OSGC Executive Committee was convened. With input from the OSGC membership, and after final editing, the new OSGC Strategic Plan, Vision, Mission, Goals, and SMART Objectives were approved and implemented in January, 2010, and submitted to NASA Headquarters with OSGC's FY2010-2014 Proposal.

4. The Ohio Space Grant Consortium will increase collaborations with mutually beneficial research/education partnerships to promote the development of NASA workforce and STEM education throughout Ohio.

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

Outcome 1 - Contribute to the development of the science, technology, engineering, and mathematics (STEM) workforce in disciplines needed to achieve NASA's strategic goals (Employ and Educate) OSGC FY2009 goals were met.

Fellowships and Scholarships

•OSGC awarded a total of 90 scholarships and fellowships [79 undergraduate scholarships and 11 graduate fellowships (including two special minority fellowship awards)]. Of the 90 awards, 28 were made to underrepresented minority students (31.11%), and 40 to female students (44.44%). OSGC scholarship/fellowship awards to underrepresented minorities continue to exceed targets based on the State of Ohio percentage of 16.6% (Source: Table 212) and have increased from FY2008 (24.29%) For female awards, OSGC is under the 50% target, but have increased from FY2008 (40.00%).

•OSGC had 25 additional student awards in Higher Education (17) and Research Infrastructure (8). The awards were made to 9 females and 16 males, 5 underrepresented minorities. The total for Fellowships and Scholarships and Higher Education and Research Infrastructure student awards is 115 with the following demographics: 49 awards to females (42.6%); 33 awards to underrepresented minorities (28.70%). Total OSGC statistics for underrepresented minorities continue to exceed Ohio percentages of 16.6%, but OSGC still remains under the 50% target for females.

•Aimee L. Bogner was the recipient of an Ohio Space Grant Consortium undergraduate Junior Scholarship in FY2008 and was renewed as a Senior scholarship recipient in FY2009. Aimee received her B. S. in Electrical Engineering from Cleveland State University in May, 2010, and is currently a NASA Civil Servant at the Glenn Research Center. Aimee is a Test Electrical Engineer in the Aviation Environments Test Engineering Branch where she performs research using the combustor test cell on jet engines for GE, Rolls-Royce, and Pratt & Whitney.

"I am grateful to NASA and the Ohio Space Grant Consortium for giving me not only the scholarship, but also the opportunity to perform research as part of the scholarship requirement which ultimately helped me attain my current career position at the Glenn Research Center."

•Matthew D. Rippl, Senior OSGC Scholar, Mechanical Engineering, Wright State University, was so challenged by the research he performed while an intern at the Air Force Research Laboratory at Wright-Patterson Air Force Base, made the decision to attend graduate school at the Air Force Institute of Technology. Matthew continues in this research while working on his Master's Degree.

•Ashlie B. McVetta, former OSGC Bridge, Junior, and Senior scholarship and internship recipient, Mechanical Engineering, The University of Toledo, fulfilled her dream of working for NASA and became a civil servant. Ashlie is currently employed as a Mechanical Research Engineer in Turbomachinery and Heat Transfer at NASA Glenn Research Center. Ashlie believes in giving back and working toward becoming a NASA mentor to assist students participating in the internship program.

•Continue to support the annual Kenneth J. De Witt Scholarship Award (tribute to OSGC's late Director) at The University of Toledo to a deserving sophomore Chemical Engineering Student. The second scholarship was awarded to Curtis C. Sinewe, Sophomore, Chemical Engineering.
•Created a new annual scholarship at The University of Akron in memory of Paul C. K. Lam, OSGC's Director who passed away unexpectedly in May, 2009. The scholarship will be awarded to an underrepresented, undergraduate student majoring in Mechanical Engineering. The first award was made to Michael E. Croston, Sophomore, Mechanical Engineering. Michael was also selected as an OSGC Junior Scholarship recipient for FY2010.
•Provided support for the William A. Hiscock Space Grant Scholarship at Montana State University in memory of the late Montana Space Grant Director.

Higher Education
•Provided support for a University of Akron underrepresented female student that was part of a Space Grant team (i.e., Ohio, New York, and Washington Space Grants) to participate in NASA's Microgravity Flight Program through the MUST (Motivating Undergraduates in Science and Technology). Tanya Miracle stated *"Participation in the microgravity flight program was a wonderful experience that I gained valuable skills from. By being involved with a team that was from all around the country, I learned how to overcome challenges that are faced by using pictures, technical documentation, and communication skills. Organization and planning also played important roles in order to finish the project by the deadline so that we were ready for flight week. Since every team member was from a different state, we utilized technology to complete reports and documents so that it remained a team effort and no single person was stuck doing a majority of the work. I now know how to overcome challenges faced on a project that is being worked on by a number of people in different places. This is a skill I feel would be beneficial to an agency such as NASA, since they have projects and centers across the country."*
•Continue to support proposals from affiliate members for Diversity Initiatives which include: The University of Akron was awarded funding to support diversity programs (i.e., Student Bridge Internship Program. The University of Cincinnati and The Ohio State University were awarded funding for two Special Minority Doctoral Fellowships (one at each university—one female and one male). One NASA Glenn Bridge scholarship was awarded to Cleveland State University.
•Collaborated with Air Force Institute of Technology to place a summer intern (OSGC scholarship recipient from Wright State) at the Air Force Research Laboratory in 2009 with a continued commitment for the future.
•Collaborated with ZIN Technologies (ESMD) to place a summer intern in 2009 with a continued commitment for the future. Student exceeded their expectations and was recalled during 2009 Holiday Break and offered part-time employment while pursuing undergraduate degree.
•Supported an OSGC Senior Scholar from the University of Cincinnati in the 2009 NASA Glenn Academy. OSGC also supported the Academy's summer project entitled "Project Blast'EM", Building Launch Assisted Satellite Technology with ElectroMagnetism, which is an exploratory analysis of the application of Electromagnetic

Launch-Assisted Systems (ELAS) as a means of reducing the amount of propellant necessary to place satellites in lunar orbit from a moon establishment.
•Supported three students with summer internships at NASA Johnson, Kennedy (ESMD), and Marshall (one underrepresented and female).
•Supported three Ohio students with travel funding ($2,000 each) to NASA Johnson, Kennedy, and Marshall in support of their summer internships.
•Supported a student research project in collaboration with Ohio Northern University and Teton Aircraft in Summer, 2009 entitled "Design and Analysis for a New Aircraft".
•OSGC continued the NASA Glenn Bridge Program by supporting one underrepresented student from Cleveland State University for a summer internship. In addition to the summer stipend, the student also receives a $750 OSGC scholarship presented during the Fall and Spring terms following the internship.
•Continue to support student-led balloon satellite/rocketry programs at: Cedarville University, Central State University (MSI), The University of Akron, University of Cincinnati, and Wright State University
•Co-hosted the annual HBCU Conference held at the Ohio Aerospace Institute in July, 2009, whose goals were: 1) Increase awareness of capabilities and opportunities: Minority Serving Institution (MSI) capabilities relevant to aerospace sector; NASA Glenn and Air Force Research laboratory opportunities, Funded research programs; Collaborations, Educational training programs; 2) Nurture existing government/academia, multiple academic institution partnerships as well as new opportunities; 3) Provide recruitment opportunities for future scientists and engineers for government laboratories and Ohio industry.
•Supported an Ohio University team of students and faculty advisor to the Waste Environment Research Consortium (WERC) Environmental Design Competition held on the campus of New Mexico State University in Las Cruces.
•Award seed grants to for innovative STEM Higher Education programs at Ohio universities. Some representative titles include: Students for Exploration and Development of Space (SEDS)" at the University of Cincinnati; "Correlation of 1-g Aerospace Materials Flammability Data with Data in Reduced and Microgravity Environments" at The Ohio State University; NASA student team project entitled "Microwave Synthesis of ZnO Nanowire Under Microgravity Conditions" at The University of Akron.
•Provided support for an Ohio State faculty member to attend the NASA University Student Launch Initiative Rocket Workshop at Kent State University.
•Supported "Engineering Week" at Case Western Reserve University.
•Five OSGC scholars and fellows attended the Great Midwest Space Grant Regional Consortia meeting held in Cleveland, Ohio and also presented posters of their research. (September, 2009) garnering one of the highest attendance records. Tanya Miracle, Junior, The University of Akron, won a prize for having the best undergraduate poster.

Senior Design Courses
•Provided support for the following Senior Design courses: "Develop Web-Based Lessons with Graphics and Animations to Teach Statistical Concepts" at Wright State University – Dr. Yan Liu; "Electrical Power Systems for Space Missions II" at The Ohio

State University – Dr. Paul Penko; "Electrochemical Energy Storage Systems and Principle" at Wright State University – Dr. Hong Huang.

Research Infrastructure

•Award seed grants to for innovative STEM Research Infrastructure programs at Ohio universities. Some representative titles include: "Analysis of Acoustic Suppression Strategies for Cavity Flows using 3-D Proper Orthogonal Decomposition" at the University of Cincinnati (Dr. Kelly Cohen); "NanoGraphene Platelets as Anode for High Power-Density Li-ion Batteries" at Wright State University (Dr. Hong Huang); "Changes in Complexity of Physiological Signals Due to Flight and Flight Simulation" at University of Dayton; "Use Information Visualization Techniques to Gain Insights into Mental Workload Classification Data" at Wright State University (Dr. Kimberly E. Bigelow). The following statement is from Dr. Bigelow: *"Personally, this work has the potential to impact my line of research, by broadening my field of study to include aeronautics and aerospace. I believe my work in physiological evaluation, and in particular use of fractal analysis for biosignals, could benefit the aero-fields. The OSGC grant has allowed me to interface with personnel at NASA Glenn Research Center and the Wright-Patterson Air Force Base Laboratory to begian forming connections as the Human Effectiveness Directorate takes its place in Dayton."*

•Collaborated with the Texas Space Grant Consortium to jointly fund "Self-Powered NanoFiber Surface Acoustic Wave Sensors for Aerospace Structure Health Monitoring" with Dr. Jiang Zhe at The University of Akron and Dr. Yin J. Lin at the University of Texas at Tyler, Departments of Mechanical Engineering. Note that the Texas Space Grant Consortium supported Dr. Lin with a $5,000 grant award. Dr. Zhe also worked with Andrew Gyekenyesi, Senior Researcher, Ohio Aerospace Institute (OAI), through collaboration and data analysis. As a result of the OSGC grant, Dr. Zhe received two National Science Foundation grants: 1) A High Throughput Microfluidic Sensor for Real Time Health Monitoring of Rotating Machinery - $270,000, 9/1/2010 – 8/31/2013; 2) MRI: Acquisition of an AFM/Raman Integrated System for Bio/Nano Functional Materials and Devices Research and Education - $252,166, 9/1/2009 – 8/31/2011. Dr. Zhe also showed the electrospun nanofibers and introduced the applications in health monitoring for aerospace structures to more than 30 middle school girls in Summer, 2009, via The University of Akron's Women in Engineering Program.

•Provided additional support to Nuclear Power for Space Colonization Research and Technology Development, Phase I (Ralph Steckler Project) at The Ohio State University and Wilberforce University (Minority Serving Institution).

Outcome 2 - Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty (Educate and Engage). OSGC FY2009 goals were met.

Precollege Programs

•OSGC offered a pre-service teacher workshop in collaboration with NASA Glenn Research Center and NASA CORE (Central Operation of Resources for Educators) for OSGC education scholars and classroom teachers. Participants received NASA education materials, professional development opportunities, curriculum modules for classroom

use, and local resources for enhancing classroom teaching and student experiences in the classroom. Students also had an opportunity to interact with a NASA researcher and participate in hands-on educational activities that can be replicated into a future lesson plan with under the guidance of a NASA Aerospace Education Specialist. OSGC also provided students with gift cards to purchase educational materials from NASA CORE for their future classroom.

•Cedarville University hosted a pre-service teacher workshop for all Education and Science majors. Highlight of the program was a presentation by Bill Richey, Science Teacher at Xenia High School and Ohio Teacher of the Year along with other national teaching awards. Mr. Richey is also an adjunct professor at Miami University.

•OSGC continued the High School Bridge Internship Program at The University of Akron in Summer, 2009, which offers summer research opportunities to high school junior and senior students on the Akron campus.

•Supported "Enhancing Physics Education with Open-Ended Engineering Design Projects" teacher workshop at The University of Toledo.

•Provided support for three Cleveland Municipal Schools to attend STS-119 Crew Visit at NASA Glenn Research Center (One of the participating schools was a NASA Explorer School, Luis Muñoz Marín).

•Award mini-grants to Ohio K-12 teachers for innovative STEM programs. Some representative titles include: "Voyage to Mars", Akron Public Schools; "FIRST Robotics", Benjamin Logan Schools; "Return to the Moon", St. Pius X School; "In the 'Wright' Nook", Fredericktown Schools; "Lunar Innovation Vehicle Design", Convergence Education Foundation; Technology, Teamwork, and Learning", Prince of Peace Catholic School; "Project Lead the Way - Gateway to Technology", Tallmadge Middle School; "Aerospace to Cyberspace – Teaching Aviation through Podcasting", Western Brown School District; "21st Century Robotics", Jackson Junior High School; "Creating, Solving, and Contributing to a Global Society through Robotics", Benjamin Logan Middle School.

•Hosted The University of Akron IDEAS student/faculty group visit to OAI and tour of NASA Glenn Research Center

•Sponsorship of the FIRST Buckeye Regional Robotics Competition – 59 high school teams compete where 59 student teams (Ohio has 42 teams) from across the country competed in a robotics competition that combines sports with engineering and technology (February 26-28, 2009). The competition was named "Lunacy" in recognition of the 40th anniversary of the first moon landing (URL: http://www.grc.nasa.gov/WWW/OEP/first/regional/teams.htm. [OSGC receives favorable publicity as a sponsor to this event (i.e., websites, signage, banners, and ads in Ohio newspapers.)]

•Supported the Women in Engineering Camp at the University of Dayton – a week-long, residential summer program that introduces high school females to career opportunities in engineering through classroom activities, hands-on experiments, industry visits, and exposure to engineers.

•Supported two iSPACE programs for educational outreach: 1) "OnSite Insight into STEM"; 2) Embrace Space with iSPACE. OSGC received these words from Director Linda A. Neenan: *"OSGC has been wonderful to iSPACE. Your support of our efforts has enabled our programs to provide space science curricula to over 12,000 students,*

educators and families. Our programs keep growing and getting excellent reviews so I know what we are making an impact here in Greater Cincinnati and stimulating interest in STEM and also to promote STEM careers."

•Provided support for the Cincinnati Observatory Center's "40 Galileos: Starry Messenger Project". As a result of OSGC funding, Cincinnati Observatory received a grant from NASA to continue the program. Constantine Regas stated, *"As a result of funding from the Ohio Space Grant, we were able to receive additional program support and win a grant from NASA on the success of 40 Galileos, the Cincinnati Observatory won a grant from NASA to continue the program for three additional years."*

•Collaborated with Space Explorers Aerospace Outreach offering professional development to 14 Ohio teachers in Canton, Cincinnati, Milford, and Willoughby, Ohio, schools to train teachers using hands-on lessons and activities with a vision to connect students with space exploration in mission simulations and activities that expand their knowledge of space, earth, physical, and life science. Willoughby Middle School Teacher Tony Marinelli's testimonial: "*I am amazed at the quality of the Mars Explorer simulation. This activity allowed my students to use their knowledge of basic geology concepts on Earth and apply them to the other planets in the Solar System, especially Mars. The students are amazed that Mars has similar features as Earth, such as mountains, volcanoes, valleys, polar ice caps, and dust storms."* Willoughby Middle School students are featured "Exploring the Geology of Mars" on Space Explorers' website at the following link:
http://www.space-explorers.com/internal/common/announce/willoughby1.html

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). OSGC FY2009 goals were met.

Informal Education

•Sponsorship of "Science is Fun!" family days at Case Western Reserve University impacting over 700 indirect participants.

•Cleveland Museum of African American History – permanent home of the "African Americans in Space Science Exhibit."

•Drake Science Center in Cincinnati – conducts structured visits for teachers, students, and parents (over 20K students annually) in astronomy topics.

•Supported "Exploring the Solar System: Planetary Science Lecture Series" at Ohio University.

•Provided support to Wright Brothers Family Home, Hawthorn Hill through The Dayton Foundation

PROGRAM ACCOMPLISHMENTS

•OSGC showcases its scholarship and fellowship recipients at the annual OSGC Student Research Symposium held every April at OAI in Cleveland, Ohio. The all-day event is comprised of oral presentations by Senior scholarship winners, Master's and Ph.D. Fellowship awardees. Each of these students gives a 15-minute presentation on their research project (requirement of award). The Junior Scholarship winners and the Community College Scholarship winners participate in a poster session where they

entertain questions and comments from attendees. Additionally, pre-service teacher scholarship awardees present posters of an educational activity or future lesson plan in their respective majors using NASA materials. Bridge scholarship awardees also present a poster of their research from their summer experiences while at GRC. A NASA speaker is the keynote speaker who gives a presentation on a current NASA project. After the Symposium, a Symposium Proceedings book is published which includes summation reports from each student, and is widely distributed. Students also have the opportunity to interact and receive feedback from NASA scientists and researchers who act as evaluators. A NASA guest speaker is also part of the day's activities. All OSGC affiliates attend this event. Plans for next year are to invite corporate partners to attend

The OSGC has begun making progress in securing corporate support:
•Received funding from ArcelorMittal for the 2009 Summer Student Bridge Program at The University of Akron (similar program was replicated at Ohio Northern University).
•Received funding from ZIN Technologies and Teton Aircraft for a 2009 summer internship with continued future collaborative plans.

Other highlights include:
•Co-hosted the Great Midwest Space Grant Regional Consortia meeting along with the Illinois Space Grant Consortium and the Ohio Aerospace Institute in Cleveland, Ohio (September, 2009) garnering one of the highest attendance records. Highlights of the program included a student poster session (5 Ohio students participated—2 female, 3 underrepresented; Tanya Miracle, Junior, The University of Akron, won a prize for the best undergraduate poster), tour of NASA Glenn Research Center, and special presentation by Amanda Wright Lane (descendant of Orville and Wilbur Wright).
•Collaborated with Air Force Institute of Technology to place a summer intern at the Air Force Research Laboratory in 2009 with continued future collaborative plans.
•Supported a student from the University of Cincinnati in the NASA Glenn Academy.
•Supported three Ohio students with travel funding ($2,000 each) to NASA Johnson, Kennedy, and Marshall in support of their 2009 summer internships.
•Supported a student research project in collaboration with Ohio Northern University and Teton Aircraft in Summer, 2009 entitled "Design and Analysis for a New Aircraft".
•Co-hosted the annual HBCU Conference held at OAI in July, 2009.
•Collaborated with the Texas Space Grant Consortium to jointly fund "Self-Powered NanoFiber Surface Acoustic Wave Sensors for Aerospace Structure Health Monitoring" with Dr Jiang Zhe at The University of Akron and Dr. Yin J. Lin at the University of Texas at Tyler, Departments of Mechanical Engineering
•Continue to support NASA Explorer Schools and work with NASA GRC's Education Programs Office.
•Continue to support innovative seed grant and mini-grant awards.
•Collaborated with NASA Glenn Educational Programs Office and NASA CORE to host another successful pre-service teacher workshop for OSGC education scholars and Ohio K-12 teachers.
•Continue working with the GRC University Affairs Officer to explore opportunities to collaborate with NASA researchers.

PROGRAM CONTRIBUTIONS TO PART MEASURES

- Longitudinal Tracking:

•Total Fellowship and Scholarship awards = 90. Of the 90 awards, 28 of the awards represent underrepresented minority (31.11%). Forty (40) awards were to female students (44.44%). OSGC scholarship/fellowship awards to underrepresented minorities continue to exceed targets based on the State of Ohio percentage of 16.6% (Source: Table 212) and have increased from FY2008 (24.29%) For female awards, OSGC is under the 50% target, but have increased from FY2008 (40.00%).

•OSGC had 25 additional student awards in Higher Education (17) and Research Infrastructure (8). The awards were made to 9 females and 16 males, 5 underrepresented minorities. The total for Fellowships and Scholarships and Higher Education and Research Infrastructure student awards is 115 with the following demographics: 49 awards to females (42.6%); 33 awards to underrepresented minorities (28.70%). Total OSGC statistics for underrepresented minorities continue to exceed Ohio percentages of 16.6%, but OSGC still remains under the 50% target for females.

•Two students are employed at NASA Glenn Research Center (Aimee L. Bogner, Cleveland State University; Justin Niehaus, University of Cincinnati), one PhD student graduated and is employed at General Dynamics Advanced Information Systems (STEM aerospace contractor) as a Principal Scientist – Research (Mike Orra, Ph D, The University of Toledo); six students are employed in STEM (non-Aerospace positions): Renée Petty, The University of Akron is a Chemical Engineer with BP; Antonio Samuel (underrepresented male), The University of Akron, is an engineer with Timken, Robert Hansen, University of Cincinnati, is a chemical engineer with Lubrizol; Emily Roth, The University of Toledo, is a proposal engineer at ABB, Inc., Katrina Altman, Master's, The Ohio State University, is an engineer with Corning, and Matthew Ourednik, Cuyahoga Community College, is a respiratory therapist at Rainbow Babies & Children's Hospital; four Ohio Northern University College of Education 2010 graduates entered the workforce and are K-12 STEM teachers (Kyle Meyer, Mallory Myers, John Matthew Rader, and Kimberly Vogtsberger).

•In Higher Education and Research Infrastructure, one student is employed as an Engineer at Rolls Royce and another is at NASA Glenn Research Center.

- Course Development:

Currently, there are four course developments underway at Ohio universities as follows:
1) "Web-Based Course of Statistical Concepts" was developed at Wright State University by Dr. Yan Liu. All introductory statistics courses, including ISE 301 - Statistical Method for Testing, Development and Manufacturing I and IHE 602 - Probability for Engineers, use the web lessons as supplementary teaching materials Students who are enrolled in ISE 301 and IHE 602 use the web lessons, but anybody can access the lessons with a web browser; URL: http://www.cs.wright.edu/~webstats/
2) ME 428/628 "Fuel Cell" was developed by Dr. Hong Huang at Wright State University and offered Fall Quarter, 2009.

3) ME 780 “Advanced Energy Materials” was developed by Dr. Hong Huang at Wright State University and offered Winter Quarter, 2010.
4) AAE 755: Electrical Power Systems for Space Missions II is a new Aerospace Engineering elective course by Dr. Paul F. Penko in the Aerospace Engineering Department at The Ohio State University, Winter Quarter, 2009, and is a follow up to AAE 754: Electrical Power Systems for Space Missions I. In the follow-up course, student teams will extend the initial designs and modify them as required, to produce prototypes for proof-of-concept and testing. Actual fuel-cells could be produced or purchased depending on availability of lab resources. This will be a 3-credit hour course. In addition to expertise from the faculty within the Aerospace Engineering Department at Ohio State, the aforementioned courses and design projects will be conducted in consultation with personnel from NASA Centers (i.e., Johnson Space Center and Glenn Research Center, Advanced Electrical Systems Branch – Tony Baez and Ray Beach), and senior researchers from the Ohio Aerospace Institute (OSGC’s lead institution).

- Matching Funds:

OSGC’s FY2009-2010 budget of $785,000 shows a match of $1,530,648, reflecting a match of 1.9498:1. In addition, the Ohio Aerospace Institute (OSGC’s lead institution) provides $105,000 (cash) annually for scholarships and fellowships and additional in-kind support (i.e., website administration and updates, facilities space for events, etc.) Academic affiliates provide $500 for each Junior and Senior award. For Fellowships, academic affiliates provide a cash match of $5,000 each for Doctoral awards and $3,000 for Master’s 1 and $1,500 for Master’s 2 awards plus tuition waivers. Community Colleges and Colleges of Education provide a $250 cost share for each scholarship award. In FY2009, OSGC’s total cost share for Fellowships was $449,676.

- Minority-Serving Institutions:

The OSGC currently has two universities designated as Minority Serving Institutions (MSIs): Central State University (CSU) and Wilberforce University (WU). The campus representative from CSU serves as the Associate Director for OSGC. Both of these institutions are federally recognized as Historically Black Colleges and Universities (HBCUs). Both CSU and WU are charter affiliate members of the OSGC. Five OSGC scholarships are awarded to STEM students at each of the two universities. Neither of the two universities has a graduate-degree program; however, students who attend graduate school at other affiliates are strongly encouraged to apply for OSGC fellowships.

Personnel from Central State University and Wilberforce University participated in the HBCU conference held at OAI.

Both universities have students and faculty involved in BalloonSat activities. Faculty members at the MSIs have received seed grants to support their research development activities. Other CSU faculty have participated in Summer Faculty Research activities at NASA Glenn Research Center and have received NASA research grants in Low Gravity Studies and other areas.

Other OSGC MSI initiatives include:

•Wilberforce University is collaborating with The Ohio State University on "Nuclear Power for Space Colonization Research and Technology Development" for the Ralph Steckler Opportunity.
•Central State collaborated with NASA Glenn Research Center on "A Science, Technology, Engineering, and Mathematics Diversification Initiative" for the Minority Serving Institution Partnership Development Competition."

IMPROVEMENTS MADE IN THE PAST YEAR

•The OSGC Executive Committee named a new OSGC Director (Gary L. Slater) due to the untimely and unexpected death of Paul C. K. Lam.
•Under Dr. Slater's leadership, a new OSGC Strategic Plan, Vision, Mission, Goals and SMART Objectives were approved and implemented in January, 2010.
•OSGC increased the undergraduate scholarship awards to remain competitive with other university awards. As a result, OSGC Junior Scholarships were increased from $2,000 to $3,000, and Senior Scholarships were increased from $3,000 to $4,000 in FY2009. The $500 cash match requirement from the universities remained the same.
•Scholarships to community colleges included a new award to Cuyahoga Community College and continued awards to Columbus State Community College (3 awards--two underrepresented students) and Owens Community College. (2 female students).

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

•Ohio Aerospace Institute (OAI) – is the lead institution located in Cleveland and is an active participating OSGC member providing financial and supplementary support as part of the required match. OAI's mission is to build Ohio's aerospace economy through research and technology development, education and training, and collaboration and information exchange. Ms. Ann O. Heyward, Vice President of Research and Educational Programs serves as the OAI liaison to the OSGC.

The OSGC currently has 23 members from Ohio colleges, universities, and community colleges. Fourteen (14) universities (Affiliate Members) comprise the OSGC Executive Committee (12 are from the original Ohio universities with Colleges of Engineering).[2]

Affiliate Members and OSGC Executive Committee Members (14):
•Air Force Institute of Technology (AFIT) - (Federal Institution Ph.D. degree-granting university). AFIT is the Air Force's graduate school of engineering and management as well as its institution for technical professional continuing education. Dr. Jonathan T. Black is an Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, and serves as the OSGC campus representative at AFIT and member of the OSGC Executive Committee.

[2]Two universities were promoted (Cedarville University in FY2007 and Ohio Northern University in FY2008) as a result of a goal to increase OSGC membership and on the strength of their participation in and contributions to OSGC activities (other participating institutions may be considered for promotion to affiliate status based on performance and the availability of funding).

•Case Western Reserve University - (Private Ph.D. degree-granting independent research university). Dr. J. Iwan Alexander is Professor and Department Chair, mechanical and Aerospace Engineering, and serves as the OSGC campus representative at Case and member of the OSGC Executive Committee.
•Cedarville University - (Private four-year degree-granting university). Dr. Robert Chasnov is Professor of Engineering and Assistant to the Chair, and serves as the OSGC campus representative at Cedarville and member of the OSGC Executive Committee.
•Central State University – (Public Historically Black four-year degree-granting university). Dr. Gerald T. Noel, Sr., serves as the Associate Director of the OSGC, the campus representative at Central State and member of the OSGC Executive Committee.
•Cleveland State University – (Public Ph.D. degree-granting research university). Ms. Pamela C. Charity is Manager of Engineering Student Affairs and serves as the campus representative at Cleveland State and member of the OSGC Executive Committee.
•Ohio Northern University – (Private four-year degree-granting comprehensive university). Dr. Jed E. Marquart is Professor of Mechanical Engineering and serves as the campus representative at Ohio Northern and member of the OSGC Executive Committee.
•The Ohio State University – (Public Ph.D. degree-granting research university and is currently the second largest university campus in the United States). Dr. Füsun Özgüner is Professor, Department of Electrical and Computer Engineering, and serves as the campus representative at Ohio State and member of the OSGC Executive Committee. Dr. Özgüner and Ohio State also host OSGC Executive Committee meetings.
•Ohio University – (Public Ph.D. degree-granting university). Dr. James M. Rankin is Associate Dean for Research, Graduate Studies, and Planning and serves as the campus representative at Ohio University and member of the OSGC Executive Committee. Ohio University holds the honor as the oldest university in Ohio and the Northwest Territory.
•The University of Akron – (Public Ph.D. degree-granting research university). After OSGC Director Paul Lam passed away, Dr. Craig C. Menzemer became the campus representative at The University of Akron and member of the OSGC Executive Committee. Dr. Menzemer currently is Interim Assistant Dean, College of Engineering.
•University of Cincinnati – (Public Ph.D. degree-granting research university). Dr. Gary L. Slater became the OSGC Director after Paul Lam passed away. Dr. Slater is Professor, Department of Aerospace Engineering and Engineering Mechanics, serves as the campus representative at the University of Cincinnati and Chair of the OSGC Executive Committee.
•University of Dayton – (Private Ph.D. degree-granting university). Dr. Malcolm W. Daniels is Interim Dean, School of Engineering, and serves as the campus representative at the University of Dayton and member of the OSGC Executive Committee.
•The University of Toledo – (Public Ph.D. degree-granting research university). Dr. D. Ramon Hixon is Associate Professor, Mechanical, Industrial, and Manufacturing Engineering Department, and serves as the campus representative at The University of Toledo and member of the OSGC Executive Committee.
•Wilberforce University – (Private Historically Black four-year degree-granting university). Wilberforce University has the honor of being the first HBCU in the country! Dr. Edward Asikele is Chair, Engineering and Computer Science, and serves as the

campus representative at Wilberforce University and member of the OSGC Executive Committee.
•Wright State University – (Public Ph.D. degree-granting comprehensive university). Dr. P. Ruby Mawasha, Assistant Dean of Engineering and Computer Science, and serves as the campus representative at Wright State University and member of the OSGC Executive Committee.

Participating Institutions (3):
•Marietta College – (Private four-year degree-granting university). Dr. Benjamin H. Thomas is Assistant Professor, Department of Petroleum Engineering and Geology, and serves as the campus representative at Marietta College.
•Miami University – (Public Ph.D. degree-granting research university). Dr. Osama M. Ettouney is Chair, Mechanical and Manufacturing Engineering Department, and serves as the campus representative at Miami University.
•Youngstown State University – (Public Ph.D. degree-granting urban university). Dr. Hazel Marie is Assistant Professor, Mechanical and Industrial Engineering, and serves as the campus representative at Youngstown State University. Dr. Marie was a former OSGC fellowship recipient from The University of Akron where she received her Doctoral Degree.

Minority Serving Institutions (MSIs) (2):
Ohio holds the honor of having the nation's oldest private, historically black university named to honor the great 18th century abolitionist, William Wilberforce—hence the founding of Wilberforce University. Central State is Ohio's only public MSI. Central State University and Wilberforce University are Minority Serving Institutions (MSIs).

Community Colleges:
•Columbus State Community College – (Associate degree-granting community college). Mr. Jeffery M. Woodson is Professor, Engineering Technologies Department, and serves as the OSGC campus representative at Columbus State Community College.
•Cuyahoga Community College (Tri-C) – (Associate degree-granting community college). Ms. Sandy Robinson is Interim Dean of Academic Affairs, and serves as the OSGC campus representative at Cuyahoga Community College. Tri-C is the oldest and largest community college in Ohio.
•Lakeland Community College – (Associate degree-granting community college). Dr. Frederick W. Law is Executive Vice President and Provost, and serves as the OSGC campus representative at Lakeland Community College.
•Lorain County Community College – (Associate degree-granting community college). Dr. George Pillainayagam is Engineering Program Director, and serves as the OSGC campus representative at Lorain County Community College.
•Owens Community College – (Associate degree-granting community college). Ms. Tamara Williams is Interim Vice Provost, and serves as the OSGC campus representative at Owens Community College.
•Terra Community College – (Associate degree-granting community college). Dr. James Bighouse is Associate Professor, Physics, and serves as the OSGC campus representative at Terra Community College.

Government affiliates include the NASA Centers (especially Glenn Research Center), NASA CORE (Central Operation of Resources for Educators), the Air Force Research Laboratory, Wright-Patterson Air Force Base Education Outreach, Ohio Board of Regents, State of Ohio Aerospace and Defense. NASA CORE is a new partner who assists the OSGC with teacher workshops and pre-service teacher scholarships (i.e., resources for teachers, students and NASA education materials). All the government affiliate representatives are very involved with the OSGC, attend meetings regularly, and work well with the Director and others.

Industry partnerships include aerospace (ZIN Technologies), manufacturing (ArcelorMittal), and continuing educational partnership with Space Explorers, Inc. For many years, a member of GE Aircraft Engines had also been an industry member who regularly attended OSGC meetings until his retirement. OSGC recognizes the need to improve membership in this area and is working with the lead institution and others to add industry members.

Outreach affiliates include the Cincinnati Observatory Center, Cleveland Museum of Natural History, Drake Science Center, iSPACE, Walter Schuele Planetarium, and informal educational partners throughout Ohio. Many of the outreach affiliates receive OSGC mini-grants for STEM programs.