

Ohio Space Grant Consortium
Lead Institution: Ohio Aerospace Institute
Director: Jed E. Marquart, Ph.D., P.E.
Telephone Number: (419) 302-8998
Consortium URL: <http://www.osgc.org/>
Grant Number: NNX15AL50H

Lines of Business (LOBs): NASA Internships, Fellowships, and Scholarships;
Stem Engagement; Institutional Engagement; Educator Professional Development

A. 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 Consortium funded at a level of \$760,000 for Fiscal Year 2017.

B. PROGRAM GOALS

OSGC has 5 goals to accomplish their mission and in support of NASA's and the National Space Grant (SG) Program's goals and objectives for FY2015-2018. The Strategic Plan, Vision, Mission, Goals and SMART Objectives were redefined, approved and implemented by the OSGC Executive Committee in February, 2015, and revised in April, 2016, with submission of the Augmentation Proposal. We are happy to report that in FY2017, all goals were exceeded. The specific goals of the program, followed by the SMART objectives are as follows:

Goal 1 – Develop a diverse STEM workforce in Ohio and the Nation.

- NIFS (NASA Internships, Fellowships, and Scholarships)
 - Competitive scholarship and fellowship program at Ohio universities (includes research project + faculty mentors)
 - Internships [with NASA Centers (focus on Glenn Research Center/OAI)] and industry
- 1.1 At least 40 percent of annual student awards [i.e., NIFS (NASA Internships, Fellowships, and Scholarships)] will be made to females to meet NASA's target goal.
- 1.2 Diversity of annual student awards (i.e., NIFS) will meet or exceed 19.55 percent (OSGC's goal as outlined in Table 265, National Center for Education Statistics.)
- 1.3 At least 90 percent of supported students will graduate with a STEM degree from an Ohio university each year.
- 1.4 Annually longitudinally track all students receiving a "Significant" award that identifies the next step. All scholarship, fellowship, and internship awards are classified as "Significant" awards. A minimum of 80 percent of undergraduate students will enter either graduate

school in a STEM discipline or enter the STEM workforce. A minimum of 80 percent of Education scholars will enter the K-12 STEM teaching field. A minimum of 80 percent of Fellowship recipients will enter the STEM workforce or academia. A minimum of 95 percent of students receiving internships will indicate that they are likely to enter the STEM workforce or graduate school as a result of the experience (students and mentors complete evaluation form).

Goal 2 – Engage students and faculty in hands-on STEM research activities.

- Student-Innovative-Creative-Hands-on Project (SICHOP) grants
- Faculty Research/Curriculum grants (aligned to NASA research priorities)
- 2.1 Support a variety of student and faculty hands-on STEM research activities annually (i.e., SICHOP/Research/Curriculum grants, internships (NASA Centers and industry).
- 2.2 Each year, 80 percent of the students receiving a SICHOP grant will report they are more likely to pursue a STEM career or an advanced STEM degree.
- 2.3 Faculty who receive funding will report increased research capacity and competency in their field as a result of the award.

Goal 3 – Support collaborative STEM research for Ohio faculty and students.

- Student-Innovative-Creative-Hands-on Project (SICHOP) grants
- Faculty Research grants (aligned to NASA research priorities)
- Summer research/internship opportunities (2 HBCUs)
- 3.1 Support at least four faculty/student research grants annually.
- 3.2 Faculty who receive funding will report increased research capacity and competency in their field as a result of the award.
- 3.3 Each year, 80 percent of the students receiving a SICHOP grant will report they are more likely to pursue a STEM career or an advanced STEM degree.
- 3.4 Support at least two students (from an Ohio HBCU) to perform research during the summer at an Ohio-research university.

Goal 4 – Increase STEM awareness for Ohio K-12 teachers and students.

- Exposure to NASA Education materials
- Teacher Training Programs and Workshops
- OSGC Mini-grants
- 4.1 At least 90 percent of supported K-12 teachers will report increased knowledge in NASA and STEM content as a result of professional development activity.
- 4.2 At least 90 percent of K-12 teachers receiving a mini-grant will report increased student knowledge in NASA and STEM content as a result of the activity.

Goal 5 – Encourage informal educational activities promoting STEM.

- OSGC Informal Education grants
- 5.1 Fund a minimum of four programs annually to increase and engage public awareness in informal STEM activities and NASA opportunities.
- 5.2 Sponsor STEM programs on Ohio university campuses targeted to women and underrepresented minorities (UM) (minimum of 1 program per year).

C. PROGRAM/PROJECT BENEFITS TO PROGRAM AREAS

1) Collin E. Mikol, fellowship recipient, will graduate May, 2018, M.S., Mechanical Engineering, The Ohio State University, and will work for the Swagelok Company in Solon, Ohio. *“The NASA/Ohio Space Grant Consortium fellowship allowed me to pursue a higher level of education while putting a priority on successfully completing my desired research. This fellowship has opened the doors of possibilities for me in terms of research and business*

connections alike, allowing me to have a broader impact in my area of expertise. The prestige and unique learning experiences I received from this fellowship will help to set me apart as I start to work at my future career in industry.” **Aligns to NIFS, Higher Education, and Research Infrastructure.**

2) Lindsey A. States, Education Scholarship Recipient, Miami University, will graduate May, 2018, and will be certified to teach Mathematics at the Adolescent to Young Adult level. “*The NASA/OSGC scholarship impacted my life in several ways. The most prominent would be the way it exposed me to new and exciting resources available to educators. As a high school math pre-service teacher, finding engaging and relevant materials to use in class is a challenge. Learning more about the resources available to teachers through NASA helped me see all of the real life and interdisciplinary lessons I can teach to my future students. Another way this award/opportunity has impacted my life is the scholarship I was able to receive. School can be increasingly expensive and working during college doesn’t always cover the costs. By being awarded this scholarship I was able to work less on campus and dedicate that time to working on research. Overall, this experience has taught me how important continuing my research will be once I am in the field teaching.*” **Aligns to NIFS, Higher Education, and Precollege.**

3) Nicholas R. Horn, scholarship recipient, received his B.S. in Aeronautical and Astronautical Engineering, from The Ohio State University, in May, 2017. Nicholas is currently an Aeronautical Engineer at Lockheed Martin in Fort Worth, Texas. “*The Ohio Space Grant Consortium Scholarship proved to be extremely valuable to me. It helped me decide whether or not I wanted to go straight into grad school or start working full time first. My research and the associated scholarship proved to be very useful in finding a job, and I was asked about it in every single interview I had this year. Without this opportunity I do not believe I would have received multiple job offers at elite companies. Thank you NASA and OSGC!*” **Aligns to NIFS, Higher Education, and Research Infrastructure.**

D. PROGRAM ACCOMPLISHMENTS

•NASA Internships, Fellowships, and Scholarships (NIFS): OSGC funded 81 “Significant” Scholarship and Fellowship student awards in FY17. As of this writing, only 2 “official” NASA internships have been awarded: 1 @ Ames (female), 1 at @ Marshall (female) bringing the total NIFS awards to 83. Of the 83 awards, 20 were made to Underrepresented Minority (UM) students (24.10%) which exceeded the 19.55% OSGC target, and 38 awards to females (45.78%) which exceeded the 40% target. Note that these numbers will change with additional NASA Center/industry/university internships awarded in the next few weeks.

OSGC’s Scholarship (Junior/Senior/Community College) and Fellowship (Master’s 1 and Master’s 2) programs provide financial support to students pursuing STEM degrees at an Ohio Affiliate university. Pre-service teacher scholarships are awarded to students pursuing licensure in Science/Mathematics in the College of Education. Two (2) Special scholarships are also awarded to honor two former Directors (Kenneth J. De Witt and Paul C. K. Lam) who passed away. All awards are competitive and offered to U. S.’ citizens; Underrepresented Minority students, women, and persons with disabilities are especially encouraged to apply. A key feature of the program is an emphasis on exposure to research relevant to NASA under the direction of a faculty mentor. Awardees present their research or educational lesson plan (as a poster or oral presentation) at the annual Student Research Symposium held in March or April at the Ohio Aerospace Institute (OAI), the Lead Institution. Students also write a report on said research which is published in the *Student Research Symposium Proceedings*. All supported students are

tracked and individual awards and profiles are reported in the NASA Office of Education Performance Measurement (OEPM) Reporting System.

- Scholarships** – Awarded 80 undergraduate scholarships [51 Junior and Senior; 11 Community College; 16 Pre-Service Teachers, and 2 Special Scholarships – 37 females (46.25%; 21 UM (26.25%)]. Junior, Senior, and Community College students conduct research under the supervision of a faculty mentor. Pre-Service teachers create a future lesson plan using NASA Education materials under the supervision of a faculty mentor and also attend a mandatory Fall Education Workshop conducted by Glenn Office of Education personnel.

- Fellowships** – Awarded 3 Master's fellowships (1 female) to students pursuing an advanced STEM field of graduate study and also conduct research relevant to NASA. Master's fellowships are for one year and may be renewed for an additional 6 months.

- Internships** – Thus far, have awarded 2 internships (1 @ Ames and 1 @ Marshall – both females). Plans are nearly complete to finalize additional NASA and industry internships.

Exceeded OSGC Goal 1 (SMART Obj. 1.1, 1.2, 1.3, 1.4); Goal 2 (SMART Obj. 2.1, 2.2). OSGC is investing in the Nation's diverse STEM workforce through support of NIFS with student research, real-world experiences, and engagement of students in NASA's missions. OSGC's NIFS support the National Space Grant (SG) Program goal to contribute to the nation's science enterprise, NASA current areas of emphasis and aligns with: NASA's Strategic Obj. 2.4; NIFS LOB; API ED-17-1; & ACRA CoSTEM Report Obj. 4, Points 3-5.

- Higher Education (HE) projects:

OSGC funded multiple SICHOP (Student-Innovative-Creative-Hands-on Project) grants (i.e., Rocket/Robotics/UAS/Balloon Satellite/SAE Mini Baja - Raider Racing teams); provided travel funds for students presenting at technical meetings. Other Higher Education programs include: support to Women in Engineering, and National Society of Black Engineers programs at multiple universities, participation in NASA's Space Grant Midwest Rocket Competition. Curriculum Grants: Ohio Northern University, Integrating Microprocessors Across the Mechanical Engineering Curriculum; The Ohio State University, Flight Testing Experience for Aerospace Engineering Students; Continuing curriculum grants include: Wilberforce University, Novel Curriculum for the Electrical/Computer Engineering Program; Kent State, Innovation in Aircraft Design; Wright State (UM female), Minority Engineering Mentorship Program; also provided campus allocations to representatives for OSGC-related travel and campus activities. Funded 3 NASA Robotic Mining Competition teams (i.e., U Akron, Kent State, and Wright State).

Research/SICHOP Grants include: Cedarville University – Solar Splash Competition; Central State University (MSI) – Balloon Satellite Program; University of Cincinnati – UC Galactics 2018 NASA SLI Competition, Low Earth Orbit Platform for Aerospace Research & Development (LEOPARD), CubeCats Heimholtz Cage, Programmable Flight Simulator for Teaching & Research; Ohio Northern University – Solar Powered Aircraft, Wind Tunnel Wand Positioning System, SAE Aero Design Competition, Polar Robotics – Robotic Football Competition; The Ohio State University – NASA Micro-g NExT Challenge, Buckeye Space Launch Initiative; Ohio University – AIAA – OHIO Rocket Design & Eng. Team, Investigation of Plasma Use in Rotating Detonation Wave Engines, Unmanned Aerial Vehicles Used as Haptic Interfaces; Wright State University – SAE Aero Design, 2018 SAE Mini Baja - Raider Racing.

Special projects include continued support for the Statewide Unmanned Aircraft Systems (UAS) Program. OSGC was able to expand this program with a dedicated community college PI which now includes 4-year universities and community colleges (new schools this year include Kent State and Case Western Reserve). The program began after receiving funding for CC-

STARS! (Community College – STEM Training and Retention of Students!). Two workshops were held (one in NE Ohio, and in Dayton at Sinclair Community College).

The 26th Annual Student Research Symposium was held at OAI on March 23, 2018. Students of all rankings from Community College, Education, Junior, and Senior Scholars to Master's Fellows gathered at OAI to present the results of their year-long research projects. All presentations (posters or PowerPoints) were evaluated by University faculty, OAI Senior Researchers and Associates, NASA Glenn scientists, and industry. Various industry members and NASA Glenn Human Resources hosted a table offering career assistance. Supported student teams also brought in displays including: The University of Akron Robotic Mining team and their robot, C.H.R.I.S.T.E.E., Professor Marlin Linger (Case Western Reserve University) Unmanned Aerial Systems (UAS) and Ohio Drone LLC demonstrated various drones. After lunch, a STEM panel consisting of former scholarship and fellowship recipients from NASA Glenn, GE Aviation, Facebook, and Ohio Drone LLC inspired this year's students and explained how to "Launch A STEM Career." The panel was very well received, and plans are to continue this each year. Note that the Ohio Drone LLC company was formed by two former OSGC scholarship recipients as a result of serving together on the STEM Panel in 2017. The company is only a year old and reported they are profitable.

Supported a group of Wilberforce University (MSI) students to attend NASA Glenn's University Day (October 19-20, 2017). Dr. Jennifer Williams reported "*the event was so informative for our students, and many expressed an interest in performing research in the future for NASA!*" Also supported Wilberforce students and Dr. Williams to attend the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE) 2017 meeting (October 30-November 3, 2017, Minneapolis, MN). Supported a Cleveland State University student to attend the ASEE (American Society for Engineering Education) Conference for Industry & Education Collaboration (February 7-9, 2018, San Antonio, TX).

OSGC will support 2 undergraduate students at Ohio Northern University this summer and possibly at other affiliates. The students will be working on STEM research under the guidance of their faculty mentors.

Exceeded OSGC Goal 1 (SMART Obj. 1.1, 1.2, 1.3, 1.4) and OSGC Goal 2 (SMART Obj. 2.1, 2.2, 2.3). OSGC's HE programs are advancing the Nation's diverse STEM workforce pipeline through support of student/faculty hands-on projects, student research, real-world experiences, and engagement of students in NASA's missions. OSGC's HE programs support the National SG Program goal to contribute to the nation's science enterprise, NASA current areas of emphasis and aligns with: NASA's Strategic Obj. 2.4; STEM Engagement LOB; Institutional Engagement LOB; API ED-17-1; and ACRA CoSTEM Report Obj. 4, Points 3-5.

•Research Infrastructure projects:

Support faculty and student Principal Investigators for the following Faculty Research Initiation Grant Proposal (FRIGP) programs: University of Cincinnati – Developing a Novel Trace Element Biosignature Using BIO-SIMS with Implications for Detecting Life on Ancient Earth and Mars Miami University – Electrical Discharge Machining Induced Microstructural Changes and Its Effect on Fracture and Fatigue Properties of Ti-6Al-4V for Space Shuttle Applications, Ohio University – Investigation of Plasma Use in Rotating Detonation Wave Engines, Comparison of Bone Porosity, Diameter, Mineral Density, and Bending Stiffness as

Indicators of Radius Strength; Youngstown State University – Development of Continuously Reinforced Filament for 3D Printing.

A new collaboration this year was created with the Ohio Aerospace Institute and the Indiana Space Grant Consortium (Barrett Caldwell) to fund a student research associate at NASA Glenn Research Center for 13 weeks in Spring/Summer, 2018 (student is a former OSGC community college scholarship/Glenn internship recipient while she attended Cincinnati State Technical and Community College; she has now matriculated to Purdue University).

OSGC will support 2-4 UM undergraduate students from both Ohio MSIs: Central State University and Wilberforce University in Summer, 2018. The students will be working on STEM research under the guidance of their faculty mentors.

Exceeded OSGC Goal 3 (SMART Objs. 3.1, 3.2, 3.3, 3.4). OSGC RI programs are advancing the Nation’s diverse STEM workforce pipeline through support of student/faculty hands-on research projects, real-world experiences, and engagement of students in NASA’s missions. OSGC’s RI programs support the National SG Program goal to contribute to the nation’s science enterprise, NASA current areas of emphasis and aligns with: NASA’s Strategic Obj. 2.4; STEM Engagement LOB; Institutional Engagement LOB; API ED-17-1; and ACRA CoSTEM Report Obj. 4, Points 3-5.

•Precollege projects:

Supported pre-service teacher workshop conducted by Glenn Research Center (GRC) Office of Education for OSGC Education Scholars (October 20, 2017); FIRST Robotics (Buckeye Regional); Cedarville University, supported 7 students (5 female; 2 male), 1 faculty to attend National Science Teachers Association (NSTA) Conference; 2 summer camps for girls: Camp GEMS, Ohio Northern University; Women in Engineering, University of Dayton. Outreach K-12 program component with HE SICHOP grants [Ohio Northern University-Pathways classroom visits to 3 Ada middle schools; Wright State-Thurgood Marshall HS, Dayton Public Schools (DPS), DPS Math/Science Olympiad, Math Counts; Miami University hosted Dater High School (Urban Cincinnati school) students who brought airfoils they designed for testing in the MME wind tunnel; students use their results to guide the building of a small plane they fly in their gymnasium.] Also supported “STEM Night in Lucy’s Lab” at Wright State University Lake Campus featuring Author Michelle Houts.

Awarded the following mini-grants to Ohio K-12 teachers for innovative STEM programs utilizing NASA content: Benjamin Logan Local School, Enriching Mathematical Learning & Teaching with Chromebooks; Bishop Liebold School, Human Space Flight; Bishop Mussio Elementary, Rendezvous with a Comet; Huron City Schools, Coding Challenge ACCEPTED!; Meadowview Elementary School (awarded to former OSGC Education Scholar), Robotics Club; Roswell Kent Middle School, Atmospheric CO₂ Sampling & Analysis; St. Vincent-St. Mary High School; Satellites; Talawanda Schools, Space Camp; Waterville Primary School, Blowing Your Mindstorms as WeDo Robotics.

Special projects include: continued support for the Knox County Eclipse Space Balloon Project [this group is now working with various groups in Central Ohio to build and fly high altitude balloons and have branched into rocketry and are collaborating with James Flaten (MN SG)]. For teacher training, support to the iSPACE STEM Educators Academy (iSEA) where participating educators replicate training to colleagues in their schools/districts.

Exceeded OSGC Goal 4 (SMART Objs. 4.1, 4.2). OSGC’s Precollege programs further professional development for Ohio K-12 teachers; increase use of NASA-related materials in classroom instruction, increase comfort level in teaching STEM subjects, and increase

proficiency in NASA’s missions while exciting students to pursue STEM careers. OSGC’s Precollege programs support the National Space Grant Program goal to contribute to the nation’s science enterprise and aligns with: NASA’s Strategic Obj. 2.4; STEM Engagement LOB; Institutional Engagement LOB; Educator Professional Development LOB; API ED-17-2, 17-5; and ACRA CoSTEM Report Obj. 4, Points 1-2.

•Informal Education projects:

Award Informal Education Innovation Proposal (IEIP) grants at: Case Western Reserve University, Northeast Ohio Regional Science Olympiad, and Elementary Science Olympiad; Cedarville University, Solar Splash Event; Cleveland State University, Engineering Diversity Connections Networking Program; The University of Toledo, Diversity Dream Big, Affiliate Societies Council, TechFest 2018; Ohio Northern University, STEM Day - Outreach Events at Local Elementary Schools, Ohio Northern University “Lunar Rover” (OSGC-funded HE project) for the Armstrong Air & Space Museum in Wapakoneta, Ohio, is used for demonstrations in the museum, parades, etc., in a continuing effort to educate the general public. Ongoing outreach programs at: Cincinnati Observatory and Drake Science Center.

Special projects include support for Star Gazers at the Cincinnati Observatory Center, a unique, bite-sized astronomy program that challenges viewers to get outside and experience the night sky.

Exceeded OSGC Goal 5 (SMART Objs. 5.1, 5.2). OSGC’s Informal Education (IE) programs provide educational activities to informal educators/public to increase understanding of NASA-related STEM subjects while motivating them to use NASA materials; promote NASA’s missions while exciting students to pursue STEM careers. IE programs support the National SG Program goal to contribute to the nation’s science enterprise and aligns with the following: NASA’s Strategic Obj. 2.4; STEM Engagement LOB; Institutional Engagement LOB; Educator Professional Development LOB; API ED-17-4, 17-5; and ACRA CoSTEM Report Obj. 4, Points 1-2.

E. PROGRAM CONTRIBUTIONS TO NASA EDUCATION PERFORMANCE GOALS

•Diversity: Of the 26 Affiliates, 2 are MSIs. Diversity for the Affiliates includes 6 UM members (23.08%); 7 females (26.92%); 2 Asian; 1 military veteran. 18 individuals comprise the OSGC Executive Committee (ExComm) which includes 5 UM members (27.78%) and 4 females (22.22%). The OAI Representative and the OSGC Program Manager are both females. Diversity is a priority in all OSGC programs. Of the 83 total NIFS student awards, 20 were made to UM students representing 24.10% (exceeded 19.55% target). Additional statistics will be provided in OSGC tracking tables and OEPM reporting submissions.

•Minority Serving Institution Collaborations: 2 Affiliates are designated as MSIs: Central State University (CSU) and Wilberforce University (WU). Both are federally recognized as HBCUs (CSU was designated a Land-Grant Institution in February, 2014). Both are Charter Affiliate members. 7 scholarships (3 STEM scholars per university; 1 CSU Education scholar) were awarded to UM students. CSU has an active balloon satellite program, and OSGC funds 2 students (1 per school) for a summer research experience. WU students/faculty participated in “University Day” (for UM students) at NASA Glenn (October, 2017), received a curriculum grant for Novel Curriculum for the Electrical/Computer Engineering Program; and a travel grant.

•Office of Education Annual Performance Indicators:

- API 2.4.1: ED-17-1 58 (Significant) (Number of NIFS to racially or ethnically underrepresented students, women, and persons with disabilities.)
- API 2.4.2: ED-17-2 85 (Direct) (Number of educators.)
- API 2.4.4: ED-17-4 10 (Number of informal education events.)
- API 2.4.5: ED-17-5 2,500 (Indirect) (Number of K-12 students.)

F. IMPROVEMENTS MADE IN THE PAST YEAR

- Amended the OSGC structure so the former Participating institutions are part of the Executive Committee and all members are called official “Affiliates.”
- Successfully collaborated with the Indiana Space Grant Consortium and the Ohio Aerospace Institute to support a Student Research Associate at Glenn Research Center in Spring/Summer, 2018 (student is a former CC scholarship/internship recipient now attending Purdue University).
- Formally added Baldwin Wallace University (BWU) as a new academic Affiliate – 3 scholarships were awarded, and BWU is on board as a fully participating Affiliate.
- Continue working with the Wilberforce University Campus Representative to strengthen relationships/collaborations. Three (3) scholarships were awarded, and Wilberforce is back on track with a dedicated person in place as a fully participating Affiliate.
- Former scholarship and fellowship recipients (who are now working in STEM) participated as a diverse panel at the Annual Student Research Symposium [6 participants: 4 males (3 underrepresented); 2 females; 3 participants from NASA Glenn; GE Aviation, Facebook; and Ohio Drone LLC¹]. In the past there was one keynote speaker; this new approach was very well received by all attendees.
- Successfully completed all of the FY2016 reporting requirements in the NASA OEPM Database System ahead of the deadline, and completed an additional request from HQ to revise OEPM data with a new timeframe for data (January, 2018).
- Continue working with Dr. Peter Lee and his team at The Ohio State University on “Evaluation of Gravity Sensing Mechanisms in Tissue-Engineered Skeletal Muscle” [selected for NASA Undergraduate Student Instrument Project (USIP) funding].
- Removed the Air Force Institute of Technology and Terra State Community College as academic Affiliates due to lack of involvement and a high turnover in personnel.
- Produced an OSGC newsletter; updated the OSGC website and student display, both housed at the lead institution.
- Successfully closed out the CC-STARS! program with the NASA Shared Services Center (NSSC) and NASA Headquarters.

G. CURRENT AND PROJECTED CHALLENGES

- Collaborating with NASA HQ and all members of the National SG program to ensure that program continues to be funded in the future and face challenges in annual budget process.
- Working with leadership at lead institution and challenge with reduced funding and cost share.
- Ability to sustain CC-STARS! Program (i.e., scholarships, internships, and research grants)
- Provide orientation to new ExComm and community college affiliates

H. PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

- Lead Institution – Ohio Aerospace Institute (OAI). OAI is a 501 (c) (3), not-for-profit organization located in Cleveland, where the OSGC Program Offices are also located. OAI’s mission is to build Ohio’s aerospace economy through research and technology development, workforce preparedness, and engagement with global networks for innovation and advocacy. OAI is an active participating member providing financial, supplementary, and website support as part of the match.
- Membership – 26 Affiliates [18 University Affiliates, 7 Community College (CC) Affiliates, and OAI (successfully added Baldwin Wallace University in FY2017)]. 18 individuals from

¹The Ohio Drone LLC company was formed by two former OSGC scholarship recipients as a result of serving together on the STEM Panel in 2017; they are only a year old and reported they are profitable.

University Affiliate Members comprise the OSGC ExComm with full voting rights (12 are from the original Ohio universities with Colleges of Engineering). OSGC also collaborates with the College of Education at OSGC-member universities to recruit and award Education scholarships (for pre-service teachers) to students seeking certification in Science and Mathematics. All Affiliates are eligible to apply for OSGC funding opportunities.

Affiliate Members and OSGC Executive Committee (ExComm) Members (18):

- Baldwin Wallace University (BWU) – Private degree-granting university offering Bachelor's/Master's Degrees, certificates and professional education programs. Dr. James W. McCargar serves as Campus Representative (CR) and ExComm member. BWU is a new Affiliate. NASA Glenn Director Dr. Janet L. Kavandi is the 2018 Commencement Speaker.
- Case Western Reserve University – Private Ph.D. degree-granting independent research university. Dr. Roger Quinn serves as Campus Representative (CR) and ExComm member.
- Cedarville University – Private 4-year degree-granting university. Dr. Robert Chasnov, P.E., serves as Campus Representative and ExComm member.
- Central State University (MSI) – Public Historically Black 4-year degree-granting university; designated as a Land-Grant Institution. Dr. Augustus Morris, Jr., P.E. (UM male) serves as CR and ExComm member.
- Cleveland State University – Urban Public Ph.D. degree-granting research university. Ms. Rose Begalla (UM female) serves as Campus Representative and ExComm member.
- Kent State University – Public Ph.D. degree-granting research university. Dr. Joseph Ortiz (UM male) serves as Campus Representative and ExComm member.
- Marietta College – Private 4-year degree-granting university. Professor Craig Rabatin, P.E., serves as the Campus Representative and ExComm member.
- Miami University – Public Ph.D. degree-granting research university. Dr. James Moller serves as Campus Representative and ExComm member.
- Ohio Northern University – Private 4-year degree-granting comprehensive university. Dr. Jed E. Marquart, P.E., is the Director and also serves as CR and ExComm member.
- The Ohio State University – Public Ph.D. degree-granting research university. Dr. Mo Samimy serves as Campus Representative and ExComm member, and hosts all OSGC meetings in Columbus (centrally located within Ohio).
- Ohio University – Public Ph.D. degree-granting university. Dr. Shawn Ostermann serves as Campus Representative and ExComm member.
- The University of Akron – Public Ph.D. degree-granting research university. Dr. Craig C. Menzemer serves as Campus Representative and ExComm member.
- University of Cincinnati – Urban Public Ph.D. degree-granting research university. Dr. Kelly Cohen serves as Campus Representative and ExComm member.
- University of Dayton – Private Ph.D. degree-granting university. Dr. Robert J. Wilkens serves as CR and ExComm member. Dr. Wilkens replaced Dr. John G. Weber who retired.
- The University of Toledo – Public Ph.D. degree-granting research university. Dr. Lesley M. Berhan (UM female) serves as Campus Representative and ExComm member.
- Wilberforce University (MSI) – Oldest private Historically Black 4-year degree-granting university. Dr. Jennifer Williams, (UM female) serves as CR and ExComm member.
- Wright State University – Public Ph.D. degree-granting comprehensive university. Dr. Mitch Wolff serves as Campus Representative and ExComm member.
- Youngstown State University – Urban Public Ph.D. degree-granting urban university. Dr. Hazel Marie (female and former OSGC Fellow) serves as the CR and ExComm member.

Community Colleges (CC) (7):

- Cincinnati State Technical and Community College – Associate degree-granting community college. Professor Abigail Yee (Asian female) serves as the Campus Representative.
- Columbus State Community College – Associate degree-granting community college. Professor Jeffery M. Woodson (UM male) serves as the Campus Representative.
- Cuyahoga Community College (Tri-C) – Associate degree-granting community college. Dr. Lam F. Wong (Asian male) serves as the Campus Representative R.
- Lakeland Community College – Associate degree-granting community college. Constance Edwards, serves as the CR (replaced Steven Oluic, Ph.D., who retired).
- Lorain County Community College – Associate degree-granting community college. Dr. Regan L. Silvestri serves as CR (replaced Dr. Rosa E. Rivera-Hainaj who resigned and accepted another out-of-state academic position).
- Owens Community College – Associate degree-granting community college. Dean Glenn Rettig serves as the Campus Representative.
- Sinclair Community College – Urban Associate degree-granting community college. Eric C. Dunn serves as the CR (replaced Lorraine A. Kapka).

College of Education:

- Cedarville University – Dr. Robert Chasnov, P.E., is the Campus Representative.
- Central State University (HBCU) – Dr. Rajeev Swami (UM male) is the CR.
- Cleveland State University – Kristine Lynn Still, Ph.D., is the Campus Representative.
- Kent State University – Dr. Joseph Ortiz (UM male) is the Campus Representative.
- Marietta College – Dr. Cathy Mowrer is the Campus Representative.
- Miami University – Dr. Ann Haley MacKenzie is the Campus Representative R.
- Ohio Northern University – Dr. Todd France is the CR (replaced Dr. Tena Roepke).
- The Ohio State University – Sean R. Thompson is the CR (replaced Cesar Seguil).
- Ohio University – Dr. Shawn Ostermann is the Campus Representative.
- The University of Akron – Dr. Craig C. Menzemer is the Campus Representative.
- University of Cincinnati – Dr. Regina Sapona is the Campus Representative.
- University of Dayton – Dr. Mary Kay Kelly is the Campus Representative.
- The University of Toledo – Dr. Mark Templin is the CR (replaced Libbey McKnight).
- Wright State University – Dr. Romena Garrett Holbert is the CR (replaced James Tomlin).
- Youngstown State University – Karen L. Henning is the Campus Representative.

Other Partners:

- Government: NASA Centers (especially Glenn Research Center) [Educational Programs Office Chief Robert LaSalvia, Education Specialist Susan Kohler, University Programs Officer M. David Kankam (UM male)]; Air Force Research Laboratory, and Wright-Patterson Air Force Base. All are involved partners and attend meetings/events regularly.
- Industry: ArcelorMittal, Cornerstone Research Group, Etegent Technologies, L-3, Lockheed Martin, Nanotech Innovations, Orbital Research, Sierra Lobo, ZIN Technologies. Industry partners have provided support for internships and financial/in-kind faculty support.
- Foundations: Nordson Foundation and the Nord Family Foundation have provided financial support for OSGC scholarships and fellowships.
- State of Ohio: Choose Ohio First (Ohio Board of Regents) has provided financial support for scholarships and fellowships.
- Education Outreach: Cincinnati Observatory Center, Drake Science Center, hyQ Academy, iSPACE. All Education Outreach partners are eligible to apply for OSGC grants.

This information may be revised when additional reporting information is collected and reported into the NASA OEPM database system and the submission of tracking tables.