

Alabama Space Grant Consortium
Lead Institution: The University of Alabama in Huntsville
Director: Dr. L. Dale Thomas
Telephone Number: 256-824-6800
Consortium URL: www.asgc.uah.edu
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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 Alabama Space Grant Consortium is a Designated Consortium funded at a level of \$760,000 for fiscal year 2017.

B. PROGRAM GOALS

The ASGC has the following goals to accomplish their mission and in support of the NASA's and the National Space Grant Program's goals and objectives for 2015-2018. The ASGC 3-Year Strategic Plan, Vision, Mission, Goals and SMART Objectives were approved and implemented by the ASGC Executive Management Council on January 23, 2015 at UAB and they were revised in March 2016 to account for new or adjusted goals and objectives as a result of the additional augmentation funds. The specific goals of the program, followed by the SMART objectives, Metrics, Target Numbers and Deadlines are as follows:

Overarching Management/Operational Goals:

The management goals of the ASGC are to manage program activities efficiently and at a low cost. We do this by maintaining a network of academic, non-profit and industrial affiliates that provide STEM educational activities throughout the state. We strive to expand our affiliate membership. We strive to solicit underrepresented groups and women to participate. We review our strategic plan annually, seek external support, require matching from recipient institutions on many of our programs, and augment activities initiated by other groups whenever possible.

Primary Space Grant Programmatic Elements: ASGC has organized its contributions into the following categories: Internships, Fellowships and Scholarships, Research Infrastructure and

Higher Education. These goals will improve STEM instruction, increase and sustain youth and public STEM engagement, enhance STEM experiences of undergraduate students, better serve groups historically under-represented in STEM fields and design graduate education for tomorrow's STEM workforce.

1a). Internship, Fellowship & Scholarship (NIFS) Program Goals

- Support a number of motivated students and mentors encompassing a wide range of experiences in internships at NASA centers and/or collaborating industry;
- Support and maintain our internships, fellowship and scholarship program with high-caliber students;
- Recruit fellows and scholars at all 7 member Ph.D.-granting institutions;
- Each graduate fellowship will be matched by another of equal value using local funds (approved and modified in 2016 to reinstate funding for 2 full fellowships at each university) – 1 funded by NASA and the other using state funds); and
- Actively recruit and support students in STEM fields from traditionally underrepresented groups at a rate consistent with National Center for Education Statistics (NCES) for AL. The diversity goals of the National program (40% women and 33% underrepresented minority students) are in support of the NCES enrollment in degree granting institutions, by race/ethnicity of student and state of jurisdiction.

Internship, Fellowship & Scholarship (NIFS) SMART Objectives

- 1). A diverse group of 1-2 students from Alabama Universities will be placed as interns at NASA centers and/or collaborating industry each year in 2015-2018.
- 2). Each of the 7 member Ph.D.-granting institutions will have recruited and awarded a minimum of 3 fellows or scholars per university per year.
- 3). In 2015-2018, each affiliate will continue to match each fellowship it receives (\$37K) with the other fellowship to be administered by ASGC at the same value (\$37K) and will maintain the \$24K stipend level to remain competitive with other Federal agencies. (*This brings an additional \$222K of non-Federal funds into the ASGC fellowship program each year*).
- 4). All recruited fellow and scholar awardees in 2015-2018 will have a diversity target level of 33% minority (increased from 25% in 2012) and 40% female participants each year.
- 5). All interns, fellows, and scholars will be longitudinally tracked in 2015-2018 for 1 year or until they take their “next step”.

1b). Higher Education Program Goals

- Support special courses in Space Hardware Building and Project Management;
- Maintain student *Building Space Hardware* programs throughout the State of Alabama;
- Participate in the Space Grant Nationwide Solar Eclipse Ballooning Project in 2017 and its related activities;
- Actively recruit and support students and faculty in STEM fields from traditionally underrepresented groups each year at a rate consistent with NCES for Alabama.

Higher Education SMART Objectives

- 1). Initiate or continue 2 special courses in Space Hardware Building and Project-Management at 2 Alabama universities each year in 2015-2018.
- 2). Maintain 15 student building space hardware programs at 6 universities and community colleges each year in 2015-2018, including 2 programs at 2 HBCU's.
- 3). Support 2-3 BalloonSat teams to participate in the Space Grant Nationwide Solar Eclipse Ballooning Project on 8/21/17 and its related activities at 2-3 universities and CC's.

- 4). All recruited higher education participants each year in 2015-2018 will have a diversity target level of 33% minority (increased from 25% in 2012) and 40% female participants.

1c). Research Infrastructure Development Program Goals

- Recruit a diverse cadre of students to work on mentored research projects at our established REU Programs at Alabama universities;
- Ensure all REU projects funded with NASA funds shall be aerospace science and technology or STEM focused; and
- Actively recruit and support students and faculty in STEM fields from traditionally underrepresented groups at a rate consistent with NCES for Alabama.

Research Infrastructure Development SMART Objectives

- 1). A diverse group of 15-18 students will be recruited to work on mentored research projects at 3 Alabama universities via our Research Experiences for Undergraduates Programs each year in 2015-2018.
- 2). All recruited research infrastructure development participants each year in 2015-2018 will have a diversity target level of 33% minority (increased from 25% in 2012) and 40% female participants.

Secondary Space Grant Programmatic Elements: ASGC has organized its contributions into the following categories: Precollege and Informal Education. These goals will improve STEM instruction, increase and sustain youth and public engagement in STEM and better serve groups historically under-represented in STEM fields.

2a). Precollege Program Goals

- Support a select set of projects and events that emphasize the development of K-12 teachers, particularly in pre-service and in-service program areas, which encourage young students to prepare for STEM careers;
- Leverage funds with larger contributions from other sources;
- Focus on in-service and/or pre-service teacher training that results in deeper content understanding and/or competence and confidence in teaching STEM disciplines;
- Support science education needs in underserved schools;
- Support NASA Education programs;
- Evaluate programs to insure continuous improvement; and
- Direct programs to underrepresented and underserved populations.

Precollege SMART Objectives

- 1). Support 12 in-service and/or pre-service teacher educators to attend professional development and teacher educator workshops focused on space-related math and/or science curricula each year in 2015-2018 that utilizes NASA STEM content.
- 2). ASGC shall fund a minimum of 3 teacher-educator, \$1K scholarships each year in 2015-2018, using an application process through the education departments at ASGC affiliates. Each teacher-education scholar will be invited to attend the annual awards banquet at NASA MSFC and given access to NASA educational materials.
- 3). In 2015-2018, 2 state Regional Science Olympiad and Science Fairs that are supported by the ASGC and held annually at the lead institution will have over 1,500 participants each year.

2b). Informal Education Program Goals

- Actively engage members of the public including traditionally underrepresented groups;
- Leverage funding;

- Engage college students in informal education initiatives; and
- Track impacts and evaluate programs success via quantitative and qualitative methods to insure continuous process improvement.

Informal Education SMART Objectives

- 1). Each year in 2015-2018, support 1 Alabama science center/museum within the NASA Museum Alliance within the state with outreach and teacher education projects.
- 2). Require each group that receives ASGC funding to provide a plan to deliver outreach activities each year in 2015-2018.
- 3). Support 1,500 elementary and secondary students in NASA STEM engagement activities each year in 2015-2018.

C. PROGRAM/PROJECT BENEFITS TO PROGRAM AREAS

1). **Aligns to NIFS, Higher Ed & Research:** *“The ASGC has provided me with invaluable opportunities to continue my education in aerospace engineering at the University of Alabama as well as work on design projects and collaborate with others.”* (Chandler Nichols - 2017 Space Grant Nationwide Solar Eclipse Ballooning Project-University of Alabama).

“The ASGC not only helped me financially in school through their scholarship program, but they also support the Space Hardware Club year after year which has deeply impacted my academic and personal growth. Through this club, I have learned hands on engineering skills which then helped me land various internships and part time engineering positions while also helping me develop leadership skills which have translated well to team interactions. The Space Grant has also offered me years of mentorship and has promoted community involvement and outreach. Through the Space Grant I have also been able to make important professional connections which will leave a lasting effect on my career. When I graduate in May, I will begin a full-time position with the Jacobs ESSSA (soon to be ESSCA) group at NASA’s MSFC. I am currently employed there part-time as a Materials and Processes Engineer working on solid rocket motor insulation development for the Solid Rocket Boosters on SLS.” (Chloe McFadden - 2017 UAH Space Hardware Club, 2016 NASA MSFC Internship/MSFC, 2016 & 2017 Space Grant Scholar-University of Alabama in Huntsville).

2). **Aligns to NIFS & Higher Ed:** *“Even though I have not graduated yet, I was fortunate to obtain an internship at Dynetics working in their Propulsion Department in the Space Division on a subcontracted project for NASA's SLS. My summer internship turned into a seasonal co-op position for the Fall 2017 semester. I was able to use skills from both NASA Academy and the Dynetics Internships to be a project manager for my senior design team as we design a Lunar Lander for a lunar sample return mission. Through their continued support and encouragement, the Alabama Space Grant Consortium has afforded me the confidence to pursue opportunities I had previous thought of as out of reach. I am grateful for all that ASGC has done to enrich my education and my experience in the space industry.”* (Beth Dutour - 2016 NASA MSFC Academy-NASA/MSFC, 2017 Scholar, University of Alabama in Huntsville).

3). **Aligns to NIFS, Precollege & Informal Education:** *“I am a fifth grade teacher at Roger B. Chaffee Elementary School in Huntsville, Alabama. I want to say thank you to the Alabama Space Grant Consortium for providing the funds for me to go the Johnson Space Center this June for the Liftoff Teacher Institute. I attended the Space Academy for Educators at the U.S.*

Space and Rocket Center a couple of summers ago, and I use NASA lessons often in my science classroom. I am thrilled with the opportunity to learn at Johnson Space Center this summer, and I look forward to bringing the ideas back to my students this fall. Once again, thank you for this incredible opportunity!" (Lori Nelson - 2017 Teacher Educator-Roger B. Chaffee Elementary School).

D. PROGRAM ACCOMPLISHMENTS

- *NASA Internships, Fellowships, & Scholarships (NIFS):* A total of 60 "significant" Fellowships/Scholarships were awarded. 11 Fellowships for Graduate Students (9 Doctoral; 2 Masters). 45 Undergraduate Scholarships (25 Srs.; 20 Jrs.). 4 Scholarships for Pre-Service Teachers in STEM (2 Jrs; 2 Srs.). All 7 member Ph.D.-granting institutions recruited and awarded fellows/scholars in FY2017 (AAMU: 15, AU: 12, UA: 6, UAB: 7, UAH: 9, USA: 4 & TU: 7 students). Each member matched 1 fellowship for each one it received, bringing an additional \$222K of non-Federal funds into this program. Of the 60 Fellowship/Scholarship awards, 26 were to under-represented students (43.3%), and 26 were made to female students (43.3%). We supported 9 students (all "significant") as interns (6 females, 3 males, 4 under-represented minorities) in the summer of 2017 at NASA Centers (Ames and MSFC and with Industry). *We met or exceeded all target objectives.* Highlights include former UA scholar, Ms. Bianca Covington, who is currently an Engineer at Samsung Austin Semiconductor, donated \$500 to the ASGC—"I am a former recipient and am glad to pay it forward." ASGC Fellow, Mr. Ethan Hopping, used 3-D printing to successfully build and test Hall-effect thruster which gives it the ability to reach deep-space destinations that are currently inaccessible to their chemical counterparts. Mr. Hopping graduated from UAH in 2017 and is now an Aerospace Engineer at Blue Origin in Kent, Washington.

Higher Education projects: Provided support for 32 "significant" participants and 778 in other students in HE programs. HE programs are innovative student-led, hands-on student experiences in STEM disciplines at AL universities including space hardware building special courses, Sr. Design courses/Project Mgmt. Provided continued support for 2 revised special courses in Space Hardware Building and Project Management. Provided support for **25 Students Building Space Hardware Programs, or SSP's.** These SSP's were in the following areas: BalloonSat, CanSat, CubeSat, KSC Robotic Mining, MSFC Rover Challenge, and MSFC Student Launch (rockets) at 7 universities (AAMU, AU, UA, UAH, USA, TU and Alabama State) and 3 Community College's (Bevill, Gadsden, and Shelton State). This included 3 programs at 4 HBCU's (MSFC Rover Challenge and Student Launch at AAMU, CubeSat and Student Launch at TU, Rover Challenge at Alabama State and Robotic Mining at Shelton State). ASGC supports SSP's at Community College's: Bevill and Shelton State all have SSP's. We established new HBCU Community College partnerships with Bishop and J.F. Drake State in FY2014 and with Faulkner State in FY2015 and we established a new HBCU partnership in FY2016 with Alabama State University and with Stillman College in FY2017. A highlight for FY2017 is we were able to launch 3 BalloonSats from 2 locations (Austin Peay University in Clarksville, TN and SC State University in Orangeburg, SC) from 2 teams (UA and UAH) during the solar eclipse on 8/21/2017 as part of the *Space Grant Nationwide Solar Eclipse Ballooning Project.* 25 students were directly involved with this project and over 4,000 students attended outreach events as a result of this project. *We met or exceeded all target objectives.*

- *Research Infrastructure projects:* Provided support for a diverse group of 40 "significant" participants and 78 other student participants in RI programs such as the Research Experiences for Undergraduates programs (REUs). Students were directly funded on mentored research projects at 3 Alabama universities (UAB, UAH & USA) via our REU Programs. 13 "significant" under-represented (32.5%) and 27 females (67.5%) were included. Highlights include all REU students are required to attend informational meetings such as research ethics and professionalism training, writing workshops, data visualization and analysis workshops, sessions on laboratory safety, research ethics, copyright and patent policies, professional discourse, information literacy and preparing for graduate school, how to apply for a research Fulbright Grant and how to create an effective poster for the post-program poster session. *We fell short of our diversity objectives by 1%, but met all other target objectives.*
- *Precollege projects:* ASGC funded 4 pre-service teacher educator scholarships in FY2017 (4 AU/4 females). Supported a yearlong program using problem-solving using the Mobile Mathematics Circle specifically targeted under-represented, underserved MS/HS students from Mobile County (143 students from 14 MS/HS's). This program also organized a Mobile Math Olympiad we supported. We also supported 500 MS/HS students in the 2018 No. AL Science Olympiad held in March 2018 at UAH. Supported 375 K-12 student projects from schools in 14 counties in AL to compete in the No. AL Regional Science and Engineering Fair (NARSEF) in March 2018 at UAH. Provided support for 233 student projects in various categories of science and engineering projects from middle/high schools from 15 counties from the state to participate in the 2017 AL Science and Engineering Fair (ASEF) in April 2018 at UAH. We supported 1 MS teacher-educator to attend LiftOff 2017 Summer Institute in Houston, TX managed by the Texas SG in collaboration with NASA JSC in June 2017. We plan to support additional in-service teacher educators for the 2018 session. We also supported teacher educators to attend the Space Foundation Space Symposium in Colorado Springs, CO as "Teacher Liaisons". ASGC supported the Tech Trek for girls at UAH in June 2017. 65 rising 8th-grade girls from 39 schools across 17 AL counties participated in a weeklong residential camp, which featured intensive hands-on experiments and activities. All were designed to promote campers' interest in STEM fields. We supported 300 MS and 50 HS students at Winfield MS/HS with real microgravity experiment design and proposal development classes. One of the students' flight proposals will be selected to fly on the ISS in the spring of 2018. Winfield City Schools is the first community in AL to participate in this high visibility STEM education program that has garnered significant media attention across the nation. All ASGC-funded team projects such as NASA Student Launch Competition and our ASGC F/S programs require outreach components. *All ASGC outreach programs are multi-layered and target several different groups such as under-represented and underserved K-12 students and educators from the state. We met or exceeded all target objectives.*
- *Informal Education projects:* ASGC added a new informal education affiliate in 2016, the University of North Alabama's Planetarium and Observatory in Florence, AL. We provided funding for summer STEM Camps that give HS students the opportunity to learn from UNA STEM scientists in physics, astronomy, and mathematics and computer sciences. The

campers were engaged in a wide range of STEM activities through collaborative efforts of the three departments and the planetarium. They were able to engage in hands-on learning experiences with rockets, robots, programming, Galileo-scopes, spectral glasses, bright spectral lamps and multi-line lasers. These camps took place during the summer of 2016 and 2017. Over 100 HS students are engaged with this program. ASGC provided support for the Rocket City Weather Fest in February 2018 and funding will continue for teacher educators to attend in-service training sessions over the summer of 2018 at the U.S. Space and Rocket Center. One training workshop on Geosciences and Remote Sensing was hosted by AAMU with 78 participants in attendance from the southeastern region. Supported Von Braun Astronomical Society's "Astronomy Day" as a public outreach event on October 2017. *We met or exceeded all target objectives.*

E. PROGRAM CONTRIBUTIONS TO NASA EDUCATION PERFORMANCE GOALS

- **Diversity:** ASGC's Associate Director, Dr. Teresa Merriweather Orok (under-represented female), is from AAMU along with our Campus Director, Dr. Aaron L. Adams (under-represented). Our Campus Director, Dr. Gregory Murphy (under-represented), represents TU. The Campus Liaison for Bishop State CC is Dr. Latitia McCane (under-represented, female), the Campus Liaison for Gadsden State CC is Ms. Audrey Webb (female), the Campus Liaison for J.F. Drake State is Mr. Ronald Egson (under-represented), the Campus Liaison for Shelton State Community College is Ms. Beth Patrick (female), the Campus Liaison for Alabama State University (HBCU) is Dr. Cadavious Jones (under-represented) – added in January 2017. The newest Campus Liaison for Stillman College is Dr. Josiah Sampson – added in January 2018. Both AAMU and TU have members on the ASGC's Policy Advisory Council.

- **Minority Serving Institution Collaborations:** In ASGC 2 of the Full Members are HBCU's and several Community College affiliates are MSI's. AAMU and TU propose students for Fellows/Scholars just as UA and AU do. All members and affiliates, whether MSI's or not, must submit competitive proposals to be eligible for funding for any of our programs, such as MSFC Student Launch (rockets), Rover Challenge, BalloonSat, etc. The record shows they have consistently and successfully participated in these competitive programs. ***Our MSI member universities are:*** Alabama A&M University and Tuskegee University and we added Alabama State University in January 2017 and Stillman College in January 2018. ***Our MSI affiliate Community and Technical Colleges are:*** Bishop State, Gadsden State, J.F. Drake State and Shelton State. ***ASGC's collaborative interactions and programs with MSI's include:*** Fellowship/Scholarship programs at AAMU (15 students-1 fellow, 14 scholars) and TU (7 student scholars). Of the 60 Fellowship/Scholarship awards distributed, 26 awards were made to under-represented minorities (43.3%), and 26 awards were made to females (43.3%); NASA Rover Challenge Program at AAMU, Dr. Wing Chan; High powered rocketry programs (NASA Student Launch) at AAMU, Dr. Wing Chan and at TU, Dr. Sharan Asundi. Geoscience and remote sensing workshop at AAMU, Dr. Kaveh Heidary. CubeSat Program and a beginning BalloonSat Program at TU, Dr. Javed Khan. NASA Rover Challenge Program at Alabama State University, Dr. Cadavious M. Jones, Bridge Program to place students on the UA Robotic Mining team at SSCC, Ms. Beth Patrick

and Ms. Renea Randle, Shelton State/Dr. Kenneth Ricks, UA. Engineering Day at Shelton State CC (April 5, 2018), Ms. Beth Patrick invites student interested in STEM to attend presentations, participate in interactive demonstrations and compete in an egg drop and tennis ball launcher competitions. STEM Day at AAMU (April 2018). AAMU hosts a poster session, panel discussion on STEM, STEAM and STEMAH as well as MSFC Rover Challenge, MSFC Student Launch and BalloonSat demonstrations.

Eight years ago, ASGC began a program to systematically add Community Colleges as active affiliates. We have Student Space Hardware programs now at Gadsden, Shelton and Beville State. In 2014, we added a 3 new active affiliates, Faulkner, Bishop and Drake State (2 of these are MSI's). Alabama's Community College System enrolls half of all freshmen and sophomores in the state, and 36% of those are minority students and 60% women. These new affiliate Community Colleges will be collaborating on a program that will help us improve the participation of women and minorities in the STEM workforce. Various competitions such as the MSFC Student Launch Competition and our ASGC Fellowship/Scholarship programs require outreach components. All ASGC outreach programs target under-represented elementary, middle and high school students and educators in the state.

- **Office of Education Annual Performance Indicators:**

- API 2.4.1: ED-17-1 141
- API 2.4.2: ED-17-2 152
- API 2.4.4: ED-17-4 8
- API 2.4.5: ED-17-5 1,694

F. IMPROVEMENTS MADE IN THE PAST YEAR

- *New Affiliate Partnerships:* We are currently exploring new ways the ASGC can grow the number and mix of ASGC industrial affiliates and we plan to improve the alignment of ASGC programs with synergistic efforts of local and state Governmental and Industrial organizations. The Director and other members of the ASGC Management Committee are holding discussions with senior leaders from a variety of aerospace organizations within Alabama to identify existing or potential ASGC programs attractive to industrial organizations and the means by which those organizations could participate in the ASGC programs.
- *New HBCU Affiliate:* Stillman College (HBCU) in Tuscaloosa, AL was added as an ASGC affiliate in January 2018 to partner with them in their expansion of its STEM programs. They are interested in re-building their math department and recruiting more math and physical science majors to their college. Stillman plans to submit a proposal to the ASGC for developing a math enhancement workshop for prospective and current underrepresented students in Tuscaloosa.

- *Benchmark Peer Organizations:* ASGC is currently identifying peer Space Grant Consortia for benchmarking. The Director met with Mary Sandy of the Virginia Space Grant Consortia in November of 2017 and there are plans to meet with 2 additional Space Grant's in CY18. The objectives of the benchmarking effort will address:
 - Program portfolio content and management approaches;
 - Outreach strategies for both students and faculty;
 - Metrics used to gauge consortia performance; and
 - Establishment of benchmarks for effective consortia performance management.

G. CURRENT AND PROJECTED CHALLENGES

- *Website Overhaul:* ASGC is working on a full website redesign for the ASGC website. It was not visible in a search engine due to UAH hierarchical rules and the content is currently be completely reworked.
- *Scholarship Funding Levels and STEM Financial Aid Issues:* Management Committee discussions are planned regarding:
 - a. the need to increase the per student scholarship funding level (currently at \$1K/per year or \$500/semester);
 - b. a need for some affiliate representatives to be more active in the recruitment of students for this program; and
 - c. a pressing need to increase the number of minority students in the scholarship and fellowship applicant pool. Federal Student Aid regulations pose a major problem with getting strong minority students in STEM disciplines to apply for space grant scholarships and fellowships, as strong minority students in STEM disciplines usually have comprehensive financial aid packages and any space grant funding reduces their other funding.

• PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Affiliate and Management Council/Team Members (7)

•**University of Alabama in Huntsville (UAH).** (Public, research, Ph.D. degree granting university). Drs. Gerald R. Karr and Francis C. Wessling, Professor Emeritus and Professor, Dept. of Mechanical and Aerospace Engineering serve as the Co-Campus Directors /Members of the Management Council. UAH is also the **lead institution.**

•**Alabama A&M University (AAMU).** (Public, research, HBCU, minority serving, Ph.D. degree-granting university). Dr. Aaron L. Adams, Asst. Professor, Dept. of Mechanical Engineering, is Campus Director/Member of the Management Council.

•**Auburn University (AU).** (Public, research, Ph.D. degree-granting university). Dr. David G. Beale, Professor, Dept. of Mechanical Engineering is Campus Director/Member of the Management Council.

•**University of Alabama (UA).** (Public, research, Ph.D. degree-granting university). Dr. Semih M. Olcmen, Assoc. Professor and Undergraduate Program Coordinator, Dept. of Aerospace Engineering and Mechanics serves as the Campus Director/Member of the Management Council (*Dr. John Baker stepped down in December of 2017*).

•**University of Alabama at Birmingham (UAB).** (Public, research, Ph.D. degree-granting

university). Dr. Yogesh K. Vohra, Professor and University Scholar, Dept. of Physics and Associate Dean of the College of Arts/Sciences serves as the Campus Director/Member of the Management Council.

•**University of South Alabama** (USA). (Public, research, Ph.D. degree-granting university). Dr. John W. Steadman, Professor and Dean, College of Engineering, serves as the Campus Director/Member of the Management Council.

•**Tuskegee University** (TU). (Private, research, HBCU, minority serving, Ph.D. degree-granting university). Dr. Gregory V. Murphy, Professor and Dept. Head, Electrical and Computer Engineering, is Campus Director/Member of the Management Council.

Minority Serving Institutions (8)

•Alabama A&M University, Alabama State University (Dr. Cadavious Jones), Tuskegee University, Stillman College (Dr. Josiah Sampson), Bishop State, Gadsden State, J.F. Drake State Community & Technical College and Shelton State are MSI's (as well as HBCU's).

Community Colleges (CC) (6)

•**Bevill State Community College**. (Public, 2-year, associate degree-granting CC). Ms. Maurice Ingle, Instructor, Drafting Design Engineering Technical Dept.

•**Bishop State Community College**. (Public, 2-year, associate degree-granting, HBCU). Dr. Latitia McCane, Dean of Instructional Services, Education Division.

•**Faulkner State Community College**. (Public, 2-year, associate degree-granting CC). Mr. Tremaine Pimperl, Division Chair, Mathematics and Pre-Engineering.

•**Gadsden State Community College**. (Public, 2-year, associate degree-granting CC, MSI). Ms. Audrey Webb, Advisor/Instructor, Electronics Division.

•**J.F. Drake State Community & Technical College**. (Public, 2-year, associate degree-granting community and technical college, MSI). Mr. Ronald Egson, Information and Communication Technologies Instructor.

•**Shelton State Community College**. (Public, 2-year, associate degree-granting CC, MSI). Ms. Beth Patrick, Instructional Outreach Specialist.

Government Affiliates: include the NASA MSFC, the Alabama Mathematics, Science, Technology and Engineering Coalition for Education (AMSTEC). We partner with them on various projects and programs such as running Advanced Rocketry and BalloonSat Workshops and managing the NASA Academy, NASA Propulsion Academy and NASA Robotics Academies during the summer for MSFC. Our contact at MSFC is Dr. Frank Six, University Affairs Officer.

Non-Profit/State: Alabama Commission On Higher Education, Dr. Elizabeth French, Director and AMSTEC works closely with the State Dept. of Education to improve math/science teaching statewide and systematic change of STEM education.

Industrial partnerships: include ADTRAN, Boeing, Dynetics, Inc., Leidos Inc., Lockheed Martin Space Systems Co., Orbital ATK, and Teledyne Brown Engineering.

Outreach partnerships: include the U.S. Space and Rocket Center and the University of North Alabama's Planetarium and Observatory. We partner with the USSRC and UNA on various K-12 teacher training and informal education projects.

Note: This information may be revised when additional reporting data is collected/ reported into the OEPM system.