

Alabama Space Grant Consortium
Lead Institution: The University of Alabama in Huntsville
Director: Dr. John C. Gregory
Telephone Number: 256-824-6800
Consortium URL: asgc.uah.edu
Grant Number: NNX15AJ18H

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 2016.

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 (Base + Aug.):

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 (CoSTEM goals).

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 go back to funding 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 NCES for AL. The diversity goals of the National program (40% women and 33% underrepresented minority students) are in support of the National Center for Education Statistics (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 for the three-year period.
- 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 National Space Grant Total Solar Eclipse Event 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 national SG Total Solar Eclipse event 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 (CoSTEM goals).

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:** *“Alabama Space Grant had a positive impact on my education and life before I even knew the organization existed. As a student in Space Hardware Club, a space education program supported by Alabama Space Grant, I gained valuable experience working with other students on technical space-related engineering challenges in a team environment. The technical and team experience built as a member of Space Hardware Club continues to serve me well as I have started my professional career. As an ASGC fellow, I have enjoyed supporting research activities that will advance space exploration. I have learned about electric propulsion systems and the challenges associated with integrating the technology into satellites and deep space missions. The experience and education has solidified my desire to continue to support research and technology development that increases access to space as part of my professional career. Since completing my Undergraduate degree, I have had several opportunities to make a difference in the aerospace industry. I worked as a product engineer for a small company named RadioBro, supporting development activities for data acquisition systems to be used in the aerospace industry. When I went back to school to work on my Master’s degree, I had the opportunity to learn about Hall Thrusters and other electric propulsion technologies that will be critical for future deep space missions. As part of the ASGC fellowship, I have had the opportunity to play a small part in test activities for the Hall Thrusters planned for use on the future Asteroid Redirect mission. It has been an honor and a privilege to see how NASA and industry professionals are developing and testing propulsion systems for the next generation of deep space missions.”* (Ethan Hopping - 2015 NASA Propulsion Academy-NASA/MSFC, 2016 Fellow, University of Alabama in Huntsville).

2). **Aligns to NIFS & Higher Ed:** *“Being a recipient of the Alabama Space Grant opened a lot of doors for me in the industry, specifically in terms of opportunity for professional development. I have just accepted a job offer from SpaceX and will begin working immediately after graduation.”* (Colin Stelly - 2015 & 2016 Space Grant Scholar, NASA MSFC Robotics Academy-NASA/MSFC, Auburn University).

“I am a Pathways Intern at Johnson Space Center for NASA and I have worked in 4 different groups so far doing many different projects that are currently being utilized to advance the Aerospace industry, and NASA.” (Morgan Bolling – 2015 & 2016 Space Grant Scholar-University of Alabama).

3). **Aligns to NIFS, Precollege & Informal Education:** *“While I have not played a direct role in the aerospace industry, I have founded a student organization, Laws of Science, devoted to building interest in STEM at the Law School I currently attend. I hope to one day have a guest speaker from NASA’s General Legal Counsel and promote STEM education to students and the*

general public.” (Moriah Smoot - 2015 Space Grant Scholar & 2015 UAB REU Intern-University of Alabama Birmingham).

D. PROGRAM ACCOMPLISHMENTS

- *NASA Internships, Fellowships, and Scholarships (NIFS):* A total of 56 "significant" Fellowships/Scholarships were awarded. 12 Fellowships for Graduate Students (9 Doctoral; 3 Masters). 42 Undergraduate Scholarships (23 Sr.; 19 Jr.). 2 Scholarships for Pre-Service Teachers in STEM (1 Jr; 1 Sr.). All 7 member Ph.D.-granting institutions recruited and awarded fellows/scholars in FY2016 (AAMU: 9, AU: 13, UA: 10, UAB: 4, UAH: 11, USA: 6 & TU: 3 students). Each member matched 1 fellowship for each one it received, bringing an additional \$222K of non-Federal funds into this program. Of the 56 Fellowship/Scholarship awards, 23 were to under-represented students (41%), and 23 were made to female students (41%). We supported 7 students (all “significant”) as interns (3 female, 4 male, 1 under-represented minority) in the summer of 2016 at NASA Centers (MSFC, JPL and with Industry). *We met or exceeded all target objectives.* Highlights include: A patent was issued for research supported by the ASGC through AU and former fellow, Dr. David J. Branscomb. The IP entitled “*Robust Pre-Impregnated yarn for Manufacturing Textile Composites*” was submitted on 4/16/13 and was issued on 11/1/16. Former UAB fellow, Dr. Christina Richey won the Harold Masursky Award in 2015 for Meritorious Service to Planetary Science and Exploration. Dr. Richey is currently a cross-divisional Program Officer at NASA HQ as well as the Deputy Program Scientist for the OSIRIS-Rex mission, and the Deputy Science Advisor for Research and Analysis for the Science Mission Directorate. Former UA fellow, T. Brian Shirey, accepted a position at NASA’s JPL in June 2016 as a Planetary Protection Engineer.

Higher Education projects: Provided support for 17 "significant" participants and 796 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 Mgmt. Provided support for **26 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 6 universities (AAMU, AU, UA, UAH, USA, TU and Alabama State) and 3 CC’s (Bevill, Gadsden, and Shelton State). This included 4 programs at 4 HBCU’s (BalloonSat, 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 CC’s: Bevill and Shelton State all have SSP’s. We established new HBCU CC 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. Progress is continuing on the *Space Grant Nationwide Solar Eclipse Ballooning Project*. We sent students and faculty members from UA and UAH to the Space Grant Solar Eclipse Workshop in Bozeman, MT in July 2016. During this workshop the participants built and prepared the entire payload and ground station systems to prepare for the upcoming August 21, 2017 solar eclipse. The UA team plans to launch in South Carolina and the UAH team plans to launch at the Austin Peay State University Observatory in Clarksville, TN. We are collaborating with the USSRC to run a ballooning eclipse outreach project with 100 HS students from all over the world and we have a practice “dry run” currently scheduled for June

20, 2017. *We met or exceeded all target objectives.* Highlights include: Alabama Astrobotics, a collaboration of UA and Shelton State CC, earned the most points in NASA's Robotic Mining Competition, winning the Joe Kosmo Award for Excellence as the top overall team in May 2016 at KSC. The UA team is the first team in history of the NASA RMC to win 1st place overall three times, the first team to ever repeat as champions and the first team to ever win the overall championship more than once. In all, the team brought home \$10K in prize money for the 2nd year in a row and is also the most decorated team in the history of the NASA RMC, having more first place finishes than any other team. The CubeSat team from Auburn University was selected by NASA for a launch opportunity to fly their nanosatellite as an auxiliary payload aboard a NASA mission that is currently planned to launch in 2018, 2019 and 2020. The selections were part of the eighth round of the agency's CubeSat Launch Initiative. Their "TRYAD" will study terrestrial gamma ray flashes (TGFs) with a pair of CubeSats in low-Earth orbit (LEO). The multipoint observations will constrain TGF beams, which will allow students to distinguish between TGF models and thunderstorm electric fields.

- *Research Infrastructure projects:* Provided support for a diverse group of 40 "significant" participants and 25 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. 18 "significant" under-represented (27.5%) and 22 females (55%) were included. Highlights include: UAB REU students Brianna Kenney (Alabama A&M University) and David Goodloe (Birmingham-Southern College) won a grant from the National Science Foundation to present their REU research at a poster session of the American Institute of Physics and the American Physical Society's PhysCon 2016. It took place in November 2016 in San Francisco, CA. UAH REU student, Bradley Henderson, College of Engineering, was selected to present his research at Alabama's first Posters at the Capitol student research poster event, which is held as part of the Alabama Higher Education Day on February 23, 2017 at the State Capitol in Montgomery. This event is so legislators can recognize that a healthy education fund supports high-impact practices like undergraduate research, and that it is an investment in the state. This event highlights undergraduate research being done around the state with the potential to inform public policy and decisions made by the private sector. *We fell short of our diversity objectives by 5%, but met all other target objectives.*
- *Precollege projects:* ASGC funded 2 teacher educator scholarships in FY2016 (1 UAH and 1 AU/2 females). Supported a yearlong program using problem-solving using the Mobile Mathematics Circle specifically targeted under-represented, underserved middle and HS students from Mobile County (122 students from 16 schools). This program also organized a Mobile Math Olympiad. Supported 504 middle/high school students in the 2017 North Alabama Science Olympiad held in February 2017 at UAH. Supported 369 K-12 student projects from schools in 12 counties in North Alabama to compete in the North Alabama Regional Science and Engineering Fair (NARSEF) in March 2017 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 Alabama Science and Engineering Fair (ASEF) in April 2017 at UAH. We plan to support in-service teachers to attend the LiftOff 2017 Summer Institute in Houston, TX managed by the Texas Space Grant Consortium in collaboration with NASA JSC in June 2017. ASGC supported the Tech Trek

for girls at UAH in June 2016. 65 rising eighth-grade girls from 39 schools across 17 Alabama 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, offering a targeted response to research showing that girls often take themselves out of the STEM talent pool while in middle school. 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 in the summer of 2016 and engaged over 100 HS students. ASGC provided support for the Rocket City Weather Fest in February 2017 and for the NASA Human Spaceflight Knowledge Sharing Forum in November 2016. Funding for educators to attend in-service training sessions over the summer of 2016 at the U.S. Space and Rocket Center was provided. 1 training workshop on Geosciences and Remote Sensing was hosted by AAMU with 82 participants in attendance from the southeastern region. Supported Von Braun Astronomical Society's "Astronomy Day" as a public outreach event on October 22, 2016. *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 Director for Bishop State CC is Dr. Latitia McCane (under-represented, female), the Campus Director for Gadsden State CC is Ms. Audrey Webb (female), the Campus Director for J.F. Drake State is Mr. Karl Henry (under-represented), the Campus Director for Shelton State CC is Ms. Beth Patrick (female) and our newest collaboration is with Alabama State University (HBCU). The Campus Director from Alabama State is Dr. Cadavious Jones (under-represented) – added in January 2017. 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 CC 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 SL (rockets), Rover Challenge, BalloonSat, etc. The record shows that 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. ***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 (9 students-2 fellows, 7 scholars) and TU (3 student scholars). Of the 56 Fellowship/Scholarship awards distributed, 23 awards were made to under-represented minorities (41.07%), and 23 awards were made to females (41.07%); BalloonSat program at AAMU, Dr. Monday Mbila; 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/Drs. Kenny Ricks and John Baker, UA. Engineering Day at Shelton State CC (April 13, 2017), 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 2017). AAMU hosts a poster session, panel discussion on STEM, STEAM and STEMAH as well as MSFC Rover Challenge, MSFC Student Launch and BalloonSat demonstrations.

Seven years ago, ASGC began a program to systematically add CC's as active affiliates. We have Student Space Hardware programs now at Gadsden, Shelton and Beville State CC's. In 2014, we added a 3 new active affiliates, Faulkner, Bishop and Drake State (2 of these are MSI's). Alabama's CC System enrolls half of all freshmen and sophomores in the state, and 36% of those are minority students and 60% women. These new affiliate CC's 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-16-1 45
- API 2.4.2: ED-16-2 128
- API 2.4.4: ED-16-4 10
- API 2.4.5: ED-16-5 1,673

F. **IMPROVEMENTS MADE IN THE PAST YEAR**

•***New Affiliate Partnerships:*** We forged a new partnership with Alabama State University (HBCU) in Montgomery, AL in January 2017 and with the University of North Alabama's Planetarium and Observatory in Florence, AL in May 2016.

- MSFC Cooperative Agreement Grant Awarded:* In 2016, ASGC was awarded a 5-year cooperative agreement grant to manage the NASA MSFC Faculty Fellowship and NASA MSFC Academies Programs. The total worth of the grant is \$234K. NASA MSFC Faculty Fellowship Program: Managed 17 Faculty Fellows in the summer of 2015 and 18 Faculty Fellows in the summer of 2016. NASA MSFC NASA Academies Program: Managed 36 NASA Academy Interns in the summer of 2015 and 38 in the summer of 2016.

- Improved Office Space/Facilities:* UAH (lead institution) has recently co-located all of the ASGC staff into a 5-office suite, reception area, and resource storage area totaling 1,291 sq. ft. on the third floor of Shelby King Hall. This nicely appointed space is very welcoming to guests, Faculty, Staff, and Students. Marketing and application materials describing our current initiatives and statewide contacts greet visitors to the space.

G. CURRENT AND PROJECTED CHALLENGES

- Leadership Change:* On January 1st 2016, John Gregory stepped down from his 4th term as Chairman of either the National Space Grant Alliance or the National Council of SG Directors, having served a total of 9 years. He has been the ASGC director since 1990 and he plans to retire within the next few months. We are in the process of seeking recommendations for a new director to forward to the NASA PM for approval. We plan to host a statewide discussion meeting at UAB in March which will include candidate presentations and potential lead institution changes. The NASA PM will be invited to attend.

H. 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. John Baker, Professor and Dept. Head, Dept. of Aerospace Engineering and Mechanics serves as the Campus Director/Member of the Management Council.

- 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 (7)

•Alabama A&M University, Alabama State University, Tuskegee University, Bishop State Community College, Gadsden State, J.F. Drake State Community & Technical College and Shelton State Community College 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., Campus Director.

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

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

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

•**J.F. Drake State Community & Technical College.** (Public, 2-year, associate degree-granting community and technical college, MSI). Mr. Karl Henry, Division Chair for Eng. Technologies/Elec. Engineering Tech. Instructor, Campus Director.

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

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: 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., Lockheed Martin, National Technical Systems, Orbital ATK, STI Electronics, Inc. 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.