

MAY 2015

Virginia Spacelink



VIRGINIA
SPACE GRANT
CONSORTIUM



The Director’s Message	3
Annual Aerospace Day Activities.....	4
VSGC Visits Capitol Hill	4
Academic and Career Webcasts Offered	5
Industry Internship Program Management Update	5
Virginia Tech Students Create Wearable Technology.....	6
Industry Support for Virginia Aerospace Science and Technology Scholars	6
VSGC Receives Two Programs That Work Awards	6
VSGC Receives NSF Distinguished Geospatial Education Partner Award.....	7
Exploratory STEM Saturday Series.....	8
Earth System Science Course Funded Through NASA	9
Seventy-Seven Scholarship and Fellowship Awards Made for 2015-2016.....	9
2015 Student Research Conference	10

The Director's Message



Dear Colleagues:

I am excited to tell you about a new NASA MUREP grant in partnership with the Hampton University Center for Atmospheric Sciences that will allow us to offer our Earth System Science course, which is currently in development. This course, in partnership with NASA and Thomas Nelson Community College, will be offered statewide via the online course offerings of the Virginia Community College System. NASA, academic and other subject matter experts have been helping us shape the content. We plan to first offer the course in spring semester 2016 for dual-enrolled high school students as well as community college students. Our goal is to secure additional funding to incorporate the course into a Virginia Earth System Science Scholars program that would include summer academy experiences at NASA Langley. The grant covers costs to offer the course over a five-year period.

I am also pleased to announce that we have new staff. We have added two STEM Education Specialists to help us with expanded programming. They are Joyce Corriere, who has extensive experience as an Earth Science educator, and Anne Weiss, who previously coordinated the NASA Education Online Network (NEON) program and has higher-ed and

precollege STEM teaching experience.

Our summer is a beehive of activity. With our NASA members we are implementing student research experiences at NASA Langley and NASA Wallops for 25 Virginia community college students from across the Commonwealth and providing a three-day residential professional development program for 20 STEM community college faculty at NASA Wallops. These programs are paid for, in part, by a competitive Space Grant award. One hundred eighty rising precollege seniors will be participating in three, one-week summer academies at NASA Langley through the Virginia Aerospace Science and Technology Scholars program and 80 rising precollege juniors will participate in two summer academies at NASA Wallops as part of Virginia Space Coast Scholars. A total of 240 rising high school sophomores and juniors will attend one of three, three-day residential BLAST STEM programs at U.Va and Virginia Tech.

We work in partnership with the Colorado Space Grant and NASA Wallops for the RockOn! sounding rocket payload program in June and are sponsoring a team of ODU students to participate in the RockSat-C launch from Wallops this summer. More than 50 Virginia undergrads have been placed in paid summer industry internships at companies across the Commonwealth through our Commonwealth STEM Industry Internship Program.

This year marks my 25th anniversary as Director of the Virginia Space Grant Consortium. Looking back, it has been a wonderful journey, made so by NASA and Space Grant Colleagues, dedicated and caring staff, and knowing that we have significantly grown STEM workers and made a difference in the lives of so many students and educators and in academic research capabilities. I

became a director soon after the National Space Grant College and Fellowship program was initiated by NASA, so it is also rewarding to see the tremendous impact of our program as a national network of state networks.

Have a wonderful summer!

Mary Sandy

VSGC MEMBER INSTITUTIONS

College of William and Mary
Hampton University
Old Dominion University
University of Virginia
Virginia Polytechnic Institute and State University
NASA Langley Research Center
NASA Goddard Space Flight Center's
NASA Wallops Flight Facility
MathScience Innovation Center
Science Museum of Virginia
Virginia Air and Space Center
State Council of Higher Education for Virginia
Virginia Community College System
Virginia Department of Education
Center for Innovative Technology

VIRGINIA SPACE GRANT CONSORTIUM

Mary Sandy, Director
Chris Carter, Deputy Director
Brenda Neil, SpaceLink Editor
Brennan Griffith, Media Specialist
vsgc@odu.edu

Annual Aerospace Day Activities



VSGC was an active participant in the ninth annual Aerospace Day at the Virginia General Assembly, February 4-5 and served on the planning team. Aerospace – Virginia’s High-Tech Economic and Jobs Engine was the theme for this year’s event, which highlighted the strength of Virginia’s aerospace sector with representation from NASA Langley Research Center, NASA Wallops Flight Facility, the Mid-Atlantic Regional Spaceport, industry and academia. Students from VSGC’s Virginia Aerospace Science and Technology Scholars (VASTS) and Virginia Space Coast Scholars (VSCS) programs participated in Aerospace Day activities to reinforce the impact these programs have on Virginia’s STEM educational and workforce development efforts.

In addition, VSGC Director Mary Sandy and Deputy Director Chris Carter spent the day meeting with Delegates Lingamfelter, Rust, Scott, Robinson, Lemunyon, and Yost; as well as Senators McWaters, Carrico, Peterson, Watkins, and met with Secretary of Education Anne Holton. Sandy also briefed the House Education Committee and served as panelist on the Aerospace Roundtable hosted by Virginia Secretary of Technology Karen Jackson.



VSGC Visits Capitol Hill



PHOTOS:

(TOP LEFT) VSGC Deputy Director, Chris Carter, visits with the legislative aide to Delegate Scott Lingamfelter of the 31st District.

(BOTTOM LEFT) L-R: Oktay Baysal, ODU Dean of Engineering; Megan Healy, Assistant Vice Chancellor for Academics, Virginia Community College System; the Honorable Anne Holton, Virginia’s Secretary of Education; Mary Sandy, VSGC Director and Jarice Mason, Appomattox Regional Governors School student and alumnus of Virginia Aerospace Science and Technology Scholars (VASTS) and Virginia Space Coast Scholars (VSCS) programs.

(TOP RIGHT) (L-R) Congressman Dave Brat (7th District) met with Mary Sandy, VSGC Director and student Dakota Wengberg, during the National Space Grant Congressional Visits to Capitol Hill February 25-26. Dakota is an alumna of the Virginia Aerospace Science and Technology (VASTS) program and participated in the online course for the Virginia Space Coast Scholars (VSCS) program. Dakota is planning to attend the U.S. Naval Academy this fall.

Academic and Career Webcasts Offered

The Commonwealth STEM Industry Internship Program (CSIIP) is a free online program funded by the Commonwealth of Virginia and managed by the Virginia Space Grant Consortium (VSGC). CSIIP connects Virginia college undergraduates pursuing a STEM major with Virginia companies offering paid STEM internship opportunities. As a part of CSIIP, VSGC in partnership with the Institute for Advanced Learning and Research (IALR), has produced webcasts, available on line to students and the general public covering topics related to career planning, job searching and moving successfully into the workforce.

Although the webcasts are intended to serve as a resource for college students, we recently learned the CSIIP webcasts have been selected by the Wendell Scott Foundation as the basis for session themes used in their Steer into STEM after-school program. According to Chinique Scott, “This program (STEER into STEM) is offered to students participating in the Wendell Scott Foundation Legacy Leaders Mentoring Program and students from local high schools in Danville, VA. Up to fifteen students participate in this after-school opportunity. Students are provided with STEM exploration activities such as Computer Programming through Scratch & Robotics, Coding, tours of local STEM facilities and guest speakers.”

Each session theme based on a different CSIIP webcast series is followed up with an activity, field trip, or guest speaker that relates back to the webcast with group discussions on each topic. The webcasts are used to expose the students to the opportunities available within the STEM industry. Many of these students have an interest in STEM, but are unsure of the career opportunities available to them right here in Virginia.



Michael Duncan, (R) Director of Research and Commercialization, Institute for Advanced Learning and Research, interviews guest speaker Claire Jacobs (L), Internship Coordinator, Christopher Newport University.

WEBCAST TITLES INCLUDE:

- ▶ Pursuing STEM Careers;
- ▶ Transitioning from College to the Workforce;
- ▶ Advanced Science and Technology Careers;
- ▶ Biotechnology Business and Career Opportunities in Virginia;
- ▶ NASA and Aerospace in Virginia;
- ▶ Linking Your Future to Virginia’s Emerging Economic Sectors;
- ▶ Pathways to Success: Your Guide to Virginia Space Grant Consortium Scholarships, Internships and More;
- ▶ Making a Good First Impression: The Impact of Social Media;
- ▶ Interviewing and Sealing the Deal.

Watch for the new 2015 webcast series coming soon under Events at csiip.spacegrant.org.

Industry Internship Program Management Update

The Commonwealth STEM Industry Internship Program (CSIIP) continues to evolve and expand. John Iacobucci, who served as CSIIP program manager since its inception in 2012, retired as of February 27. John launched the program in 2012 and helped to make CSIIP a successful program. To date, CSIIP has placed 172 students in paid internship positions throughout the Commonwealth.

Debbie Murray, former Program Coordinator of the Langley Aerospace Research Student Scholars (LARSS) program since 2006, has been appointed as Program Manager of Internships and Research Experiences, with CSIIP and STEM Takes Flight at Virginia’s Community Colleges programs under her direct supervision.

Prior to her current position, Murray served as VSGC’s Program Coordinator of LARSS, an internship program for undergraduate and graduate students at NASA Langley. Murray also served as the NASA Faculty Fellowship Program Manager for 17 years prior to being the LARSS program coordinator.

Virginia Tech Students Create Wearable Technology

Who knew you can wear technology? The Virginia Tech students who participated in the Wearable Technology Symposium in April certainly do! Held at NASA Johnson Space Center (JSC), the symposium was offered as part of a collaboration between Virginia Tech and JSC with funding support from the Virginia Space Grant Consortium for the third year in a row. Students designed projects involving intelligent textiles and wearable technologies for space flight. NASA mentors commended the projects and their potential usability. Students commented that the lessons learned, feedback, and entire experience were valuable.

Pictured here are Dr. Tom Martin (R), and Dr. Paola Zellner (2nd from right) along with the participating students who visited the Apollo Mission Control room during a tour of JSC.



Flexible interactive cuff checklist.

Industry Support for VASTS

As an industry sponsor for the Virginia Aerospace Science and Technology Scholars (VASTS) program, Science Systems and Applications Inc., (SSAI) visited VSGC this spring and presented a financial contribution to VSGC Director, Mary Sandy. Other industry sponsors this year include: Sierra Lobo; National Institute of Aerospace and SRA International, Inc.

Pictured, L-R; Ian Cawthray, VSGC Education Program Coordinator; Dr. Robert Fleishauer, SSAI Program Manager; Mary Sandy, VSGC Director; Clara Armstrong, SSAI Deputy Program Manager; and Rudo Kashiri, VSGC Education Programs Manager.



VSGC Receives Two Programs That Work Awards

VSGC's Virginia Space Coast Scholars Program (VSCS) in partnership with NASA Wallops Flight Facility and VSGC's Engineering Technology Exploratory Saturday Series received Programs That Work Awards from the Virginia Mathematics and Science Coalition in January. This award recognizes innovative, exemplary work in effective education of students or teachers in science, technology, engineering and math (STEM) concepts throughout the Commonwealth of Virginia. Programs that receive this award must display effective innovation and document both the concepts taught and the impacts of the program on the learning of STEM concepts by participants. The Exploratory Saturday program is a partnership between the Greater Peninsula Governor's STEM Academy, VSGC and local businesses. VSGC won two of the eleven awards given this year.



L-R: Bill Murray, Managing Director, Corporate Public Policy, Dominion Virginia Power, and VSGC Director, Mary Sandy.

VSGC Receives NSF Distinguished Geospatial Education Partner Award

No GPS or satellite was needed to analyze the good news. The Virginia Space Grant Consortium (VSGC) earned the National Science Foundation's (NSF) Distinguished Geospatial Education Partner Award for its GeoTEd program. The award will be presented at the annual GeoEd Conference in Louisville, Kentucky, June 8 to 10.

As cited by the National Science Foundation, the VSGC's Expanding Geospatial Technician Education Through Virginia's Community Colleges (GeoTEd) project "has made significant contributions in support of geospatial education at two-year community colleges in Virginia and the surrounding region. GeoTEd faculty have served in state and national projects including providing significant contributions to the development of the National Geospatial Technology Competency Model (GTCM) courses. GeoTEd faculty have also participated in iGETT workshops and ESRI's T3G Institute, and have effectively integrated the content into their curricula and shared with other faculty."



The GeoTEd team has provided hands-on intensive geospatial professional development to 44 educators from 21 different community colleges in six states including eight dual-enrollment high school teachers. These Institutes comprise one-week residential workshops with a two-year commitment by the participants. Hosted by Virginia Tech and led by community college faculty, the GeoTEd Institutes have received excellent evaluation results and have demonstrated positive impacts on faculty competencies in geospatial technology.

Since the two GeoTEd Institutes were first offered, six new Certificate programs in GIS and three new GIS Specializations are now in place in Virginia's community colleges. At least 20 newly-developed GIS-prefix courses are now being offered. With an interdisciplinary approach, GeoTEd has supported and mentored the faculty integration of geospatial technologies into courses such as fire science, forestry, civil engineering technology, environmental science, computer science, information technology, business, nursing, and more. GeoTEd has led to hundreds of additional students using geospatial technologies through these courses.



GeoTEd has established a strong partnership with geospatial professionals from business, industry, and government agencies as demonstrated by the membership of the 25 member Advisory Committee. A partnership with NASA Langley Research Center has led to the development of a one-credit geospatial service-learning course. Based on this successful model, GeoTEd is developing a three-credit

service learning course to assess sea level rise on Virginia's Eastern Shore in partnership with NASA Wallops Flight Facility.

VSGC has received three NSF Advanced Technology Education grants. Chris Carter, VSGC's Deputy Director, serves as Principal Investigator for GeoTEd. Program partners include: the Virginia Community College System, Virginia Western Community College, Thomas Nelson Community College, Southwest Virginia Community College, the Virginia Geospatial Extension Program at Virginia Tech and the Virginia Association of Mapping and Land Information Systems.

www.geoted.org

Photos:

(TOP PHOTO) Geospatial field work at Mountain Lake resort.

(BOTTOM PHOTO) Faculty member uses GPS during field work.

Exploratory STEM Saturday Series

Guitar Hero is a STEM-related activity? There was no doubt about it at the recent Greater Peninsula Governor's STEM Academy (GPGSA) STEM Saturday Series, hosted at Thomas Nelson Community College, Canon Virginia, and NASA Langley Research Center. Students quickly learned that STEM does not necessarily involve test tubes or telescopes. In this series, which took place from January through March, pennies and popsicle sticks played some significant roles. Eighty-two students attended each of the Saturday programs and 78 parents attended each program as well.

The Exploratory Saturday Series, which VSGC conducts on behalf of the GPGSA for seventh- and eighth-graders, is a regional series of three Saturday events designed to engage and inspire students to pursue careers in engineering technology, information technology and other STEM (science, technology, engineering, and mathematics) fields. Event programs include STEM-themed hands-on activities, interactive problem-solving, guest speakers from local business and education, and informational sessions for students and parents.

Thomas Nelson Community College hosted the first Saturday event on January 24. This year's theme, "Designing the Future," incorporated Information Technology activities using Makey Makey kits. Students also created musical instruments from cardboard scraps, popsicle sticks, and other common materials, and played along with their own versions of Guitar Hero. As one participant remarked, "STEM was really rocking!"

The second event, "Connecting the Future," was hosted by Canon Virginia, Inc. on February 28. Activities for the students included building circuits, manipulating robot arms, and participating in solar car races. Parents were given a tour of the Canon facilities and listened to Ron Jones,

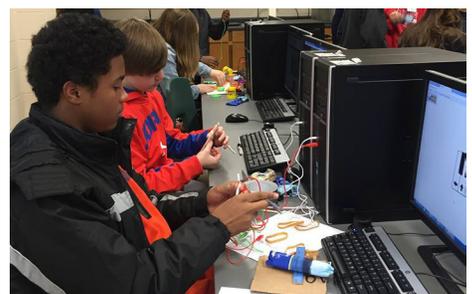
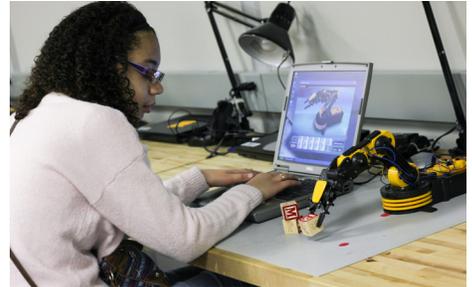
Engineering Manager, Newport News Shipbuilding, speak about "The STEM Concept and Workforce Pipeline."

The final Saturday series event was held on March 21, at NASA LaRC, with the theme of "Automating the Future." For the first time, students built and launched model rockets around 3D-printed fin cans. Student teams competed against one another to see which team could launch the greatest number of pennies to the highest altitude for the least amount of cost. In the words of Nathanael Miller, the program host at NASA this year, "I was blown away by this year's turn out and coordination. The number of roles that were filled and the excitement and energy that filled the entire session really made it work. Especially since this was the first time for a rocket launch. At the end of the session, I really felt like we had recreated the emotional trajectory — pardon the pun — of a real flight project."

GPGSA is one of the original six Virginia Governor's STEM Academies initiated over six years ago designed to expand options for the general student population to acquire STEM literacy and other critical skills, knowledge and credentials that will prepare them for high-demand, high-wage, and high-skill careers in Virginia. The GPGSA is a partnership among school divisions, postsecondary institutions, and business and industry. It offers courses of study in two career pathways: Engineering Technology and Information Technology. These are high-growth and high-compensation occupations within Hampton Roads and the Commonwealth of Virginia.

Photos (from top to bottom):

- (1)** At Canon Virginia, students participate in hands-on STEM activities.
- (2)** Tours and demonstrations were provided for students and parents.
- (3)** Canon Virginia activities included manipulating robotic arms and circuit building.
- (4)** Students designed, built and launched rockets at NASA Langley Research Center.
- (5)** Students used Makey Makey kits to explore information technology at Thomas Nelson Community College.





Seventy-Seven Scholarship and Fellowship Awards Made for 2015-2016

In continued support of its mission, vision, and strategic plan, the Virginia Space Grant Consortium (VSGC) awarded \$274,450 in graduate fellowships and undergraduate scholarships to 46 students pursuing higher education at VSGC member universities. This included 15 new and 18 renewal research fellowships totaling \$198,000. A total of \$76,450 was awarded through 12 undergraduate research scholarships. “The review team was very impressed with the quality and intellectual merit of the research projects proposed by the students,” stated Mary Sandy, VSGC Director.

The research awards require that students be engaged in a research project of interest to NASA and with a faculty advisor. Awards are based on evaluation of the applicant’s research proposal and relevance to NASA, academic merit and academic potential. Funding for the awards is provided by the Commonwealth of Virginia and NASA.

VSGC also awarded five Community College Scholarships at \$2,000 each and twenty-five STEM Bridge scholarships at \$1,000 each.

Earth System Science Course Funded Through NASA

The Hampton University Center for Atmospheric Sciences was recently awarded a NASA Minority University Research and Education Program (MUREP) grant. The Virginia Space Grant Consortium is a partner with the Center and will receive funding for its Virginia Earth System Science Scholars (VESSS) program which will provide an interactive, on-line science, technology, engineering, and mathematics (STEM) distance learning course in Earth Systems Science. It will be offered for high school juniors as a dual enrolled college course and also to community college students statewide in spring 2016.

“This is exciting news for us! Hampton University’s strong atmospheric science expertise is and will continue to be a great partnership for VSGC along with the NASA Science Mission Directorate, academia and other subject matter experts,” said VSGC Director, Mary Sandy.

The course integrates rigorous Earth Systems Science content and real world application, specifically featuring NASA’s missions, research and data.

Other collaborators include the NASA Langley Research Center Science Mission Directorate, the Virginia Community College System and Thomas Nelson Community College.

VESSS is modeled after the successful, award-winning Virginia Aerospace Science and Technology Scholars (VASTS) and the Virginia Space Coast Scholars (VSCS) programs held in partnership with NASA Langley Research Center and NASA Wallops Flight Facility respectively, which have online course components.

VSGC has awarded
\$6,292,628
in scholarships and fellowships to
1,507 students
since inception in 1989.

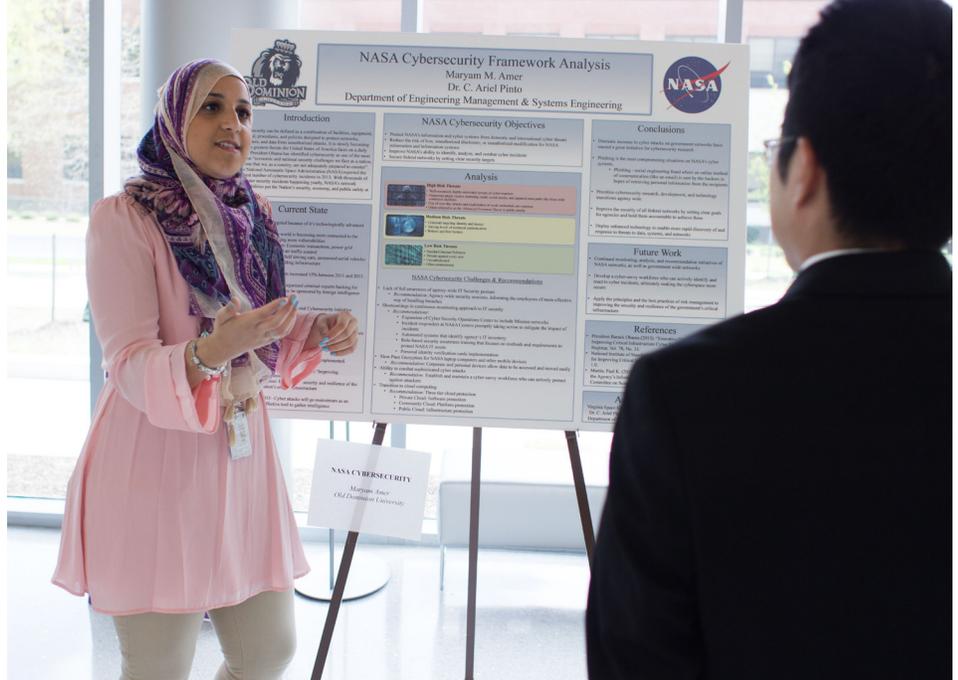
2015 Student Research Conference

One of the most rewarding days of the year for the Virginia Space Grant Consortium is the annual Student Research Conference for our scholarship and fellowship recipients. The Conference was hosted by NASA Langley Research Center on April 17 and was held at the new Integrated Engineering Services Building. Thirty-six graduate research fellows presented the results of their research in 15-minute oral presentations and nine undergraduate scholars presented posters during the conference. A luncheon, sponsored by Virginia Tech, was held as part of the Conference to honor the 2014-2015 scholars and fellows. ODU President John Broderick, who serves as Chairman of VSGC's Board of Directors made opening remarks. Dr. Srinath Ekkad, Associate Vice President for Research Programs at Virginia Tech also provided remarks.

The luncheon keynote address was provided by Dr. David Bowles, Acting Director of NASA Langley Research Center. Dr. Bowles gave an overview of the Center including the research and mission work being conducted at the Center. He also gave the students advice on planning their career path and how to reach their goals. At the end of the luncheon, the VSGC staff recognized Mary Sandy for her 25 years as Director of the Consortium.

Chris Carter, VSGC's Deputy Director, stated, "This is always one of our favorite days of the year. It is so rewarding to meet the students and hear them present the results of their VSGC-supported research."

Graduate Fellows provided oral presentations during topical sessions including: Aerospace; Applied Science; Structures and Materials; Astrophysics, and; Planetary Science. Several VSGC alumni, including some who now work at NASA Langley, attended the luncheon and student presentations.



Also attending the event were 24 VSGC undergraduate STEM Bridge Scholars who are sophomores and juniors at VSGC member institutions as well as 16 STEM Takes Flight Bridge scholars who attend Virginia community colleges. A separate agenda was provided for Bridge scholars to help them understand NASA's mission and STEM career options and to learn from a panel of experts working in STEM fields.

vsgc.odu.edu/src/

Photos (top to bottom):

1. ODU undergraduate student, Maryam M. Amer, presents her research project during the poster session.
2. Hampton University students shown here with a blended wing model during a visit the NASA Langley Research Center fabrication shop.
3. During the Student Research Conference, Matthew Giarra, a Ph.D candidate from Virginia Tech presents his research on insect hearts as inspiration for microfluidic pumps.
4. Chris Carter presents flowers to Mary Sandy in honor of her twenty-fifth anniversary as director.