The Director’s Message

Looking back over 2014, this has been a banner year for our Consortium and there is much to look forward to in 2015. We are very excited about our new STEM Takes Flight at Virginia’s Community College initiative. This competitive NASA Space Grant award of $500,000 is providing scholarships, NASA research experiences and industry internships for community college students majoring in STEM fields. The award will also provide faculty professional development in partnership with NASA Wallops Flight Facility and three new community college courses. Students should apply now for the research and internship experiences. At least 102 students and 20 faculty will be directly impacted in the two-year performance period. More details are provided on this page and page 9.

It was an honor to host our Space Grant colleagues in September for the Mid-Atlantic Regional Space Grant Director’s meeting in Colonial Williamsburg. We had 12 state Space Grant programs represented and 93 attendees, including NASA representatives and VSGC’s member universities, affiliates and partners. This was an excellent opportunity for us to network with each other, share best practices and foster collaborations and partnerships.

VSGC was honored with three prestigious awards in 2014. Virginia Aerospace Science and Technology Scholars (VASTS) received a “Programs That Work” award from the Virginia Math/Science Coalition. Virginia Space Coast Scholars (VSCS) received a NASA Robert H. Goddard Team Achievement Award and the NASA Langley Aerospace Research Student Scholars (LARSS) program that VSGC managed for the past 8 years, received a NASA Langley Research Center Team Achievement Award. LARSS has been rolled into the NASA internship, fellowship and scholarship (NIFS) program together with all NASA internship opportunities. During VSGC’s management of LARSS, 1,979 students were placed in research internships at NASA Langley; 296 of those placements were sponsored by Space Grant consortia in 45 states (see page 2).

Happy holidays,

Mary Sandy

Opportunities for Virginia’s Community College Students Pursuing STEM Degrees

Virginia’s Community College students pursuing studies in science, technology, engineering or mathematics (STEM) fields statewide have access to new scholarships, research experiences, internships and courses thanks to a $500,000 NASA grant awarded to the Virginia Space Grant Consortium. The Consortium’s newly announced program, STEM Takes Flight at Virginia’s Community Colleges, is designed to provide scholarships as well as real-world work and research experiences that foster community college retention in STEM academic tracks through graduation with an associate’s degree or transfer to a four-year institution. The STEM Takes Flight website at www.vsgc.odu.edu/stemtakesflight provides detailed information on all program components described below and links to applications.

The Community College Bridge Scholar (CCBS) component will provide a $5000 award and mentoring to 15 students during the spring 2015 semester and 2015 – 2016 academic year. Applications are currently under review and students will be selected soon.

NASA research experience through the Build/Fly/Learn component will allow selected students to work in teams to undertake hands-on paid summer research projects at NASA Langley Research Center. Individual paid student summer research projects at NASA Langley Research Center and NASA Goddard Space Flight Center’s Wallops Flight Facility will also be offered.

Ten students will receive grant-sponsored internships through the Consortium’s Commonwealth STEM Industry Internship Program. The program is already open to community college students; however, the additional sponsored funding will increase the number of community college students who can be placed.

Three new courses will be offered. Two multi-disciplinary courses designed to engage community college students in mission development and planning will be available through Eastern Shore Community College. Students will develop and fly a sounding rocket payload as part of RockSat-C, a student flight opportunity at NASA Wallops in summer 2016.

Continued on Page 9
VSGC was honored with the Virginia Math/Science Coalition Programs That Work Award for the innovative Virginia Aerospace Science and Technology Scholars program for high school juniors. The award recognizes exemplary mathematics, science, and integrated science, technology, engineering, (STEM) programs for which there is evidence of a positive impact on student or teacher learning.

The NASA Langley Research Center Team Award recognized the highly successful Langley Aerospace Research Student Scholars Program (LARSS) for undergraduate, graduate and select high school students. The program placed nearly 5,000 student interns in research positions at NASA Langley during the 28-year history.

The NASA Robert H. Goddard Team Achievement Award was presented for the innovative Virginia Space Coast Scholars (VSCS) program for high school sophomores. Mary Sandy, VSGC Director, accepted the award on behalf of the VSCS team.

A salute to 262 NASA Langley Aerospace Research Student Scholars (LARSS) interns who participated in the summer of 2014. This was the largest group in the 28-year history of the program.

VSGC Receives Recognition for Student Programs

On hand for the Virginia Math/Science Coalition Programs That Work award for VASTS; L-R; Ian Cawthray, Roger Hathaway, Susan Ramsey, Mary Sandy, VSGC Director, Pat Wright, State Superintendent of Schools, Debbie Ross and Priscilla Hill.

Members of the LARSS team include, (clockwise from center) Margaret Pippin, Mary Sandy, Gwen Wheatle, Brenda Neil, Shelley Spears, Garnett Hutchinson, Sarah Pauls, Alan Pope, Renee Williams, Kathy Powell and Debbie Murray.
Nearly 500 Virginia high school students participated in VSGC-managed K-12 STEM education programs this summer at NASA Langley Research Center, NASA Wallops Flight Facility, the University of Virginia and Virginia Tech. These dynamic, innovative programs are provided free of charge to students thanks to funding and in-kind support provided to VSGC through the Commonwealth of Virginia, NASA and industry.

**Virginia Aerospace Science and Technology Scholars (VASTS)**
180 high school juniors participated in one of three week-long summer academies at NASA Langley Research Center. Scholars worked in project teams to design an aerospace mission and were immersed in hands-on experiential STEM activities under the guidance of NASA mentors and VSGC master teachers. Prior to the summer academy, VASTS students participated in online coursework throughout the school year.

**Virginia Space Coast Scholars (VSCS)** — 80 high school sophomores participated in one of two summer academies which focused on the science, engineering and technology integral to current missions at NASA Wallops Flight Facility and the Mid-Atlantic Regional Spaceport. VSCS has an online component featuring five modules that engage students during the school year.

**Building Leaders for Advancing Science and Technology (BLAST)** — 234 rising high school freshmen and sophomores participated in one of three residential programs at the University of Virginia and Virginia Tech. BLAST is designed to increase student interest and curiosity in STEM through hands-on activities that inspire and motivate students for STEM careers and studies.

VSCS students visit Wallops Ground Validation and Testing Site where measurements are taken to determine the size of raindrops.

The VSCS students receive a briefing on the HS3 hurricane mission in the Global Hawk Operations Center-East at NASA Wallops.

During the summer academy VASTS Scholars tour the Habitat Lab at NASA Langley and learn about the types of research conducted there.

VASTS scholars receive a briefing and tour of the NASA Langley model shop.
Featured here are three successful teacher professional development programs hosted by VSGC this summer for 97 Virginia K-12 teachers. Fifteen teachers also participated in GEOTREK-12 (see article on page 6).

**STEMtastic**

STEMtastic featured a five day professional development opportunity for 25 elementary school teachers and informal educators. The program is a partnership among Virginia Space Grant Consortium (VSGC), Virginia Air and Space Center, NASA and local school systems. These educators participated in engaging hands-on activities that were developed with NASA content and supported by Virginia standards of learning.

Throughout the week, teachers simulated a trip to Mars as they integrated new activities into their curriculum. Dr. Ed Murphy from UVA and Dr. Bill Moore from Hampton University were guest speakers during the event. At the end of the program, VASC selected four teachers from the workshop to lead summer camp activities for area students.

**Taking Engineering By Storm**

Taking Engineering By Storm was a teacher professional development workshop co-hosted by VSGC and New Horizons Regional Governor’s School. The workshop was part of the Virginia STEM CoNNECT program funded by the Virginia Department of Education. Twelve math and science high school teachers attended the two-day workshop which was held at New Horizons in Hampton. VSGC consultants Heather Smith and Greg Overkamp instructed the teachers on how to program the robots and use them effectively in engineering design challenges. During the workshop, teachers were provided with the new LEGO EV3 kit and the Space Challenge Add-On Activity Pack. NASA in partnership with LEGO provided several of the robotic kits for the program.

Guest speaker Daron Moore gave an exciting overview of his accomplishments in the Portsmouth area with his high school robotics teams. At the end of the program, teachers provided lesson plans on how they would incorporate the robotic kits into their instruction.

**Space Sports STEM Adventure**

VSGC hosted a Space Sports STEM Adventure, which was a teacher professional development workshop for elementary school teachers. Over sixty elementary teachers participated in the workshop. Cherie’ Farrington, an Olympic figure skater, introduced participants to her Move to STEM program which combines athletic activities with STEM concepts. Teachers participated in activities such as Parabolic Penguins and Newton’s Balancing Act.

During lunch Janet Sellars from NASA presented engaging NASA resources to the teachers. As part of the program teachers fashioned a sporting event that could be used in the first Space Olympics. At the end of the program teachers presented their unique designs as they described how their Olympic events would occur on a “glooblech” planet surface, a simulated planet surface made out of cornstarch and water.
Summer 2014 marked the beginning of the two-year Integrative STEM for Preservice Teachers (inSTEP) program, which was funded by NASA Space Grant Innovative Pilot in STEM Education. inSTEP serves 32 college juniors, representing 14 Virginia colleges and universities. VSGC is proud to receive this prestigious award; only four awards were funded nationally for this initiative (Virginia, District of Columbia, South Dakota, and Kentucky).

VSGC’s programmatic goals are:
1. Increase the number of female and underrepresented minorities who are retained and complete teacher pre-service programs with the intention of teaching in grades 4-8 (goal – 50% female, actual – 80%; goal – 26% underrepresented minorities, actual – 40%).
2. Develop pre-service teachers who achieve mastery of pedagogy needed to confidently teach I-STEM topics and students’ understanding of STEM, specifically Earth Systems Science.

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<tr>
<th>Competency</th>
<th>Outcome</th>
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<tbody>
<tr>
<td>Science</td>
<td>+33%</td>
</tr>
<tr>
<td>Technology</td>
<td>+102%</td>
</tr>
<tr>
<td>Engineering</td>
<td>+472%</td>
</tr>
<tr>
<td>Mathematics</td>
<td>+19%</td>
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The program commenced with a residential Summer Academy July 6-17 at Christopher Newport University, NASA LaRC, NASA Wallops Flight Facility, and VSGC for students in the summer prior to their junior year. Thirty-two students and five master teachers worked day and night exploring integrative STEM education concepts, NASA missions, learning theories, and practical classroom applications. Students in their junior year are working with Extended Day Partners (such as Boys and Girls Clubs, YMCAs, etc.) in their local area to teach integrative STEM lessons for 40 hours and apply what they’ve learned in the summer. Throughout this phase of the project, students reflect on their experience and develop an online portfolio capturing evidence of their professional growth along the way.

VSGC will host a two-day institute in the summer bringing students together to address key issues that came to light throughout their Extended Day implementation. Students, with support of their assigned master teacher, will develop a professional development plan to address areas of opportunities for further development as they participate in 40 hours of additional professional development in their home and online communities.

For more information on the inSTEP Program, please email Elizabeth Joyner, ejoyner@odu.edu, visit the inSTEP website http://vsgc.odu.edu/inSTEP/, and join our Facebook page.
Fifteen high school teachers from nine high schools in the Thomas Nelson Community College (TNCC) service area attended a three-day professional development workshop GEOTREK-12 (Geospatial Training for Educators K-12), from August 13-15. Managed by VSGC, GEOTREK-12 is designed to introduce educators, regardless of discipline, to the most commonly used geospatial technologies (GST). These include global positioning systems (GPS), remote sensing, and geographic information systems (GIS). The workshop, hosted by TNCC and held at their Historic Triangle Campus, was supported by the Expanding Geospatial Technician Education Through Virginia’s Community Colleges (GeoTED) project.

Participant comments included, “I am more aware how to gather information quickly, layer that information, reach a conclusive decision and share real time results with others in record timing.”

Announcing 2015-2016 VSGC Scholarship/Fellowship Application Due Dates

--Graduate Research Fellowship due February 9
$6,000 add-on support to graduate students to supplement and enhance basic research support.

--Undergraduate Scholarship due February 9
up to $8,500 to rising juniors and seniors who are enrolled full-time in a program of study in science, technology, engineering or math (STEM) and have a specific faculty-mentored research project that has NASA or aerospace relevance.

--Community College Scholarship due March 16
a one-year, non-renewable award of $2,000 for students enrolled full time (12 credit hours or more) at one of Virginia’s Community Colleges.

--STEM Bridge Scholarship due March 16
$1,000 to 2015-2016 sophomore students from any federally recognized minority group enrolled full-time in a program of STEM at VSGC-member universities.

To view 2014/2015 scholarship and fellowship awardees, visit http://www.vsgc.odu.edu/awardees/20142015/
CSIIP Internships Continues Expansion

VSGC’s Commonwealth STEM Industry Internship Program (CSIIP) has launched its third year of placements and career opportunities. When CSIIP began in 2012, undergraduate STEM (science, technology, engineering, mathematics) students were placed in summer internships only. Since then, the program has expanded to include year-round internships, part-time students, and new partnerships with the New College Institute, Virginia Biotech Association and the Commonwealth Center for Advanced Manufacturing. Currently 145 companies statewide are participating.

CSIIP continues to offer a no-cost, centralized, online application system to enable Virginia undergraduate students majoring in STEM the ability to search and apply for paid, STEM-related internships with Virginia companies. It provides registered companies with free, year-round access to a large state-wide pool of qualified students for their internship opportunities. Students provide one comprehensive application that can be reviewed by companies throughout the state. The program is funded by the Commonwealth of Virginia.

This year, five community college students will receive grant-sponsored internships through the STEM Takes Flight program, which seeks to reinforce the value of community college students to employers and increase their retention in the workplace. CSIIP is already open to community college students; however, the additional sponsored funding will increase the number of community college students who can be placed.

To qualify for CSIIP, students must be STEM majors, at least a rising college sophomore at the time of internship, and attending a Virginia college or community college or else be a Virginia resident if attending an out-of-state school. The minimum grade point average for consideration is 2.7 on a four-point scale.

Students are encouraged to apply now, as a number of companies begin making spring and summer internship selections as early as December. Companies are encouraged to register as soon as possible and to list internship opportunities in the system for maximum exposure. Visit the site at http://www.csiip.spacegrant.org/ to apply, register, or learn more.
Educational Resources Offered Through NASA ESTEEM

VSGC provides program integration and communication for the NASA ESTEEM grants program, which is managed through NASA Langley Research Center. VSGC works with grant recipients to foster a sense of community, organizing meet and greets at conferences, regular online meetings and annual face to face meetings, and assists the NASA Project Manager in the administration of the project.

NASA ESTEEM underwent a name change from NASA Innovations in Climate Education (NICE) to convey the broader scope of the educational resources being developed, as the study of climate naturally encompasses the study of earth systems and energy (http://esteem.larc.nasa.gov/). Since 2008, 75 climate education projects have been funded. The four most recent projects were awarded under NICE-T, with the dash T referring to the requirement for the lead on each project to be a Tribal College or University. VSGC assisted in organizing a joint orientation this past summer at NASA Langley and VSGC for the new NICE-T Principal Investigators (PIs), along with the new PIs from a similar program at Goddard. The new PI’s experienced three days of orientation meetings, NASA tours and networking opportunities to enhance their projects.

An Educator Professional Development Series on Climate Education was developed by VSGC and NASA Digital Learning Network (DLN) and VSGC continues to assist in its implementation. This series has also undergone a name change from “Ask NICE” to “Ask US - Useful Science resources from NASA ESTEEM. We’ll bring the content – you bring the questions.” (http://esteem.larc.nasa.gov/). This monthly series of interactive Google Hangouts models inquiry-based learning as resources developed by ESTEEM PIs are explored. This program was featured in the ESTEEM response to the White House “A Call to Action to Advance Climate Education and Literacy”, soliciting input as to best practices and programs currently in use. Of the 150 project descriptions submitted, the NASA ESTEEM submission was one of 26 selected for the first White House Fact Sheet on successful climate literacy projects in the nation. http://www.whitehouse.gov/sites/default/files/microsites/ostp/climateed-dec-3-2014.pdf

ESTEEM PIs with San Jose State University have recently won the prestigious national STEM Innovation Award for their Green Ninja Project (http://greenninja.org/). This award is given by the Silicon Valley Education Foundation in recognition of pioneering programs that have demonstrated innovative methods in STEM education. To date the Green Ninja Project has worked with more than 100 Bay Area teachers and reached more than 2,000 local students while episodes of the Green Ninja Show have had more than 1,000,000 views on YouTube.

Resources developed by ESTEEM PIs as well as PIs in climate education projects at NSF and NOAA may be submitted for inclusion in the searchable Tri-Agency Climate Education (TrACE) Catalog after undergoing an extensive review (https://esteem.larc.nasa.gov/trace/trace_catalog.php). This unique tri-agency collaboration was featured in the annual United States Global Change Research Project (USGCRP) report as an example of the kind of impactful collaborative effort that Co-STEM supports in the STEM education community.
A professional development workshop, The Virginia Informal Environments: Cultivating Vines of Commitment for STEM (VINES) engaged 55 education specialists from museums, zoos, parks, and historic sites across Virginia. This highly interactive, day-long workshop was a collaboration between Dr. Joanna Garner from The Center for Educational Partnerships at Old Dominion University and VSGC. Attendees took away strategies and materials to promote enduring personal connections with and commitments to STEM as related to the mission and values of their organization. Participants in the workshop connected the mission and values of their particular organizations with STEM-related concepts and skills. These informal educators learned about how transformative learning experiences and role exploration promote children’s motivations towards STEM fields. The product of this workshop was the design of a program, exhibit, or “summer camp” curriculum that encouraged transformative learning.

Educators receive certificates of participation

STEM Takes Flight
Continued from Page 1

A third system-wide online course led by Virginia Western and Thomas Nelson Community Colleges will allow faculty-led student teams to tackle the issue of sea level rise and its impact on coastal communities and ecosystems. A service-learning component will bring them to NASA Wallops where they will use geospatial technology and a review of the historical data to study the impact at NASA Wallops. The Old Dominion University’s Mitigation and Adaptation Research Institute (MARI) will advise the teams and provide webinars on the science of sea level rise.

Community college faculty will benefit from the STEM Takes Flight program through a residential professional development workshop in STEM disciplines, scheduled to take place at NASA Wallops Flight Facility in early June 2015.

A service-learning component will bring them to NASA Wallops where they will use geospatial technology and a review of the historical data to study the impact at NASA Wallops. The Old Dominion University’s Mitigation and Adaptation Research Institute (MARI) will advise the teams and provide webinars on the science of sea level rise.


STEM Exploratory Saturday Program Scheduled for Middle School Students

Select middle school students from Greater Peninsula school divisions will attend three upcoming STEM Exploratory Saturday programs in 2015. This program is a partnership between the Greater Peninsula Governor’s STEM Academy, VSGC and local businesses, and is designed to provide middle school students and parents with interactive hands-on activities, demonstrations and career planning resources.

Themes for the Saturday programs include, Designing the Future, Connecting the Future and Automating the Future and will be hosted by Thomas Nelson Community College, Canon Virginia and NASA Langley Research Center January 24, February 28 and March 21 respectively. Visit the website at http://www.nhrec.org.
The FAA Design Competition for Universities has moved to a new home but the general program format and process remain the same! The FAA is now sponsoring the program under the Airport Cooperative Research Program (ACRP) of the National Academies’ Transportation Research Board (TRB). The Competition is now called University Design Competition for Issues Facing Airports. VSGC has managed the FAA Competition for the past eight years and will continue to manage the Competition on behalf of the ACRP. Over 1,350 students, 95 faculty members and 66 universities have participated in the Competition for the past eight years.

This competition challenges both individuals and teams of undergraduate and graduate students working under the guidance of a faculty advisor to address issues currently facing airports and the National Airspace System. A copy of the guidelines for the 2014-2015 academic year is available at the Competition website; http://www.vsgc.odu.edu/ACRPDesignCompetition, which also provides detailed information and a wealth of resources for students. Final due date for all submittals is April 30, 2015.

This competition focuses on design solutions in the following broad areas: Airport Operation and Maintenance, Runway Safety/Runway Incursions/Runway Excursions, Airport Environmental Interactions, and Airport Management and Planning. Some specific challenge areas are defined in the Technical Design Challenges section of the guidelines. Students are not limited to the suggested topical areas listed. They are free to propose design solutions based on other topics that fit the four broad challenge areas.

VSGC is also managing the Airport Cooperative Research Program Graduate Research Awards (GRA) in 2015 for applied research in the public-sector airport-related aviation issues area. Students must be enrolled full-time in a graduate degree program at an accredited institution of higher learning during the 2015-2016 academic year. For more information and to find out how to apply, visit: http://www.trb.org/ACRP/ACRPGraduateAwardProgram.aspx

The purpose of the GRA program is to encourage applied research on airport and related aviation system issues and to foster the next generation of aviation community leaders. Awards are given across disciplines and are intended to stimulate thought, discussion, and research by those who may become the future airport managers, operators, designers and policy makers in aviation.

VSGC hosted the Mid-Atlantic Regional Space Grant Directors meeting in September at Colonial Williamsburg Hotel and Conference Center. The meeting was an excellent opportunity for Space Grants to network with each other, share best practices and foster collaborations and partnerships. Twelve space grants attended the meeting including the seven Space Grants from the Mid-Atlantic region (New Jersey, Pennsylvania, Alabama, Delaware, West Virginia, District of Columbia, Maryland and Virginia) as well as Oregon, Nebraska, Michigan, Louisiana and Alabama. Representatives from NASA Headquarters, NASA Langley and NASA Wallops Flight Facility, VSGC-member institutions and affiliates also attended.