THE GOVERNOR'S SCHOOL for SCIENCE AND TECHNOLOGY

New Horizons REGIONAL EDUCATION CENTERS

Spring 2015

Newsletter

GSST TEAM WINS NASA CHALLENGE

After a year-long competition among high school teams across the country, evaluators from NASA, Lockheed Martin and the National Institute of Aerospace selected Team ARES, made up of current and graduated Governor's School students, as the winner of the high school portion of the Exploration Design Challenge. As winners of the challenge, Team ARES worked with the NASA and Lockheed Martin spacecraft integration team to study space flight radiation exposure. The project resulted in launching a radiation shield on the very first Orion mission to space! During the Exploration Flight Test-1, Lockheed Martin hosted Team ARES at NASA's Kennedy Space Center in Florida to watch their experiment launch into space! More information can be found on the back on this newsletter.

The Governor's School for Science and Technology Class of 2015 was awarded $3,473,163 in scholarships from numerous top tier colleges and universities!

Virginia Living's editorial team has once again named the Governor's School for Science and Technology to its **Top High Schools and Colleges 2014 list**. *Virginia Living*'s Top High Schools and Colleges 2014 list recognizes schools for excellence and innovation in five categories: Arts and Humanities; Science, Math and Technology; Performing Arts; Heath and Medicine; and Capital Improvements.

US PHYSICS OLYMPIAD

Each year, the American Association of Physics Teachers (AAPT) and the American Institute of Physics (AIP) sponsor a competition for high school students to represent the United States at the International Physics Olympiad Competition. The mission of the U.S. Physics Team Program is to promote and demonstrate academic excellence through preparation for and participation in the International Physics Olympiad. As part of the competition, the AAPT administers the FNet test to thousands of highly qualified students across the nation to build the US Physics Olympiad team to compete in the International Physics Olympiad in Mumbai, India. From the over four thousand students who qualified to take the test, eleven of which were from the Governor's School, approximately 400 students nationwide were selected to the semi-final competition in mid-March. In Virginia, students from only two schools were selected for this special honor. Governor's School student, Louis Rizzi from Menchville High, received a Bronze Medal in the US Physics Olympiad Team Qualification Competition. This means that nationwide, Louis finished in the top 100 on the semi-final exam.

VIRGINIA REGIONAL SCIENCE BOWL

Governor's School students Trilby Brush, Grafton High; Shalni Kumar, Poquoson High; Louis Rizzi, Menchville High; Dominic Abbondanzo, Lafayette High; and Gabrielle Guill, Smithfield High competed at the **Virginia Regional Science Bowl** on Saturday, February 7, 2015 at Jefferson Labs. The team finished with a perfect 4-0 in the Rutherford Division of the Morning Round Robin. In the afternoon Double Elimination round, they finished third place overall which is the Governor's School highest finish ever! The team won a $400 dollar prize and trophy. The Virginia Regional Science Bowl is one of 70 high school and 50 middle school regional Science Bowl tournaments sponsored by The U.S. Department of Energy to encourage students to excel in mathematics and science and to pursue careers in these fields. More than 250,000 students have participated in the National Science Bowl® throughout its 25-year history, and it is one of the nation's largest science competitions.

TIDEWATER SCIENCE AND ENGINEERING FAIR

Six seniors and twenty-one juniors from the Governor's School presented their research findings at the **64th Annual Tidewater Science and Engineering Fair** (TSEF) held Saturday, March 14, 2015 at Old Dominion University. The TSEF encourages middle school and high school students from Hampton Roads to become involved in, and excited about, learning the processes of research and the technical writing skills needed to clearly and effectively communicate the results of their experiments. The Fair provides students the opportunity to exhibit and discuss their projects with judges and evaluators from academia and industry. Nearly 300 students presented their research via poster session to several of nearly 100 category judges. Top awardees in the high school division advanced to the Virginia State Science and Engineering Fair and the International Science and Engineering Fair and an additional 40 special awards judges identified students who will earn recognition from their organizations, this year totaling over $25,000. Of the top four (4) overall winners in the high school division, three were from GSST! Matthew Trepte, Grafton High, placed 2nd overall and 1st in the Computer Science Category. Other GSST students who placed 1st in their categories include: Rhiannon Edward, Warwick High, Environmental Science; Quinton Lassiter, Warwick High, Energy & Transportation; Gabriella Guill, Smithfield High, Behavioral Science; and Louis Rizzi, Menchville High, Engineering: Electrical & Mechanical. There were only fourteen categories for which awards were given, so GSST won first place in five of the fourteen categories!

15TH ANNUAL CNU REGIONAL MATHEMATICS CONTEST

Nineteen Governor's School students competed in the **CNU High School Math Contest** held on November 15, 2014 at CNU. Sponsored by MathWorks and Mu Alpha Theta, the CNU High School Math Contest is an annual mathematics competition for high school students in southeastern Virginia. The goal of the competition is to cultivate interest in good mathematics. Governor's School teams took 1st, 2nd, and 3rd place in their division!

INTERSERVICE/INDUSTRY TRAINING, SIMULATION AND EDUCATION CONFERENCE

In December, Governor's School students Sahaj Bhatt, Warwick High and William Brayshaw, Smithfield High attended the **2014 Interservice/Industry Training, Simulation and Education Conference (**I/ITSEC) in Orlando. The team was one of only six high school teams across the nation given the opportunity to demonstrate a simulation project. Sahaj and William simulated a Robot-Assisted Human Response to Tornado Disasters project and were awarded 3rd place in the competition! I/ITSEC is the world's largest modeling, simulation, and training conference. It consists of peer-reviewed paper presentations, tutorials, special events, professional workshops, a commercial exhibit hall, a serious games competition, and STEM events for teachers and secondary students. I/ITSEC is organized by the National Training and Simulation Association (NTSA), which promotes international and interdisciplinary cooperation within the fields of modeling and simulation, training, education, analysis, and related disciplines at this annual meeting.

VIRGINIA GOVERNOR'S SCHOOL MAKER CONFERNECE

The Virginia Tech Institute for Creativity, Arts, and Technology (ICAT) **2015 Virginia Governor's School Maker Conference** held on April 16th & 17th in Blacksburg was attended by over seventy students from four Governor's Schools. Virginia Governor's School Makers Conference is an opportunity for Virginia Governor's School students to share what they make with peers and the Virginia Tech community. The student exhibits were judged by Virginia Tech faculty across five categories: Process, Science, Art, Design, and Engineering. A sixth category, People's Choice, included judging by secret peer ballot. GSST exhibits earned five of the six category top awards and received four Honorable Mentions. One GSST exhibit was chosen to return to Virginia Tech on May 4 for ICAT Day, a major annual public conference showcasing this year over forty research collaborations by Virginia Tech faculty and students across traditional discipline boundaries developing new possibilities for exploration, expression, and creativity.

To view a presentation regarding the Governor's School (GSST) Class of 2015 award and accomplishments, as well as a listing of all award participants/winners, visit http://www.nhrec.org/~jbridges/GSSTClassof2015.pptx.

The regional NCWIT (National Center for Women & Information Technology) Award for Aspirations in Computing honors Christy Coghlan, Jamestown High, Vanessa Lomeli, Bethel High, Macallan Cruff, Poquoson High and Alexandra Kemper, Jamestown High for their computing-related achievements and interests. Awardees are selected for their computing and IT aptitude, leadership ability, academic history, and plans for post-secondary education. Recipients receive two engraved awards: one for her, and one for her school's trophy case. They also receive opportunities for scholarships, internships, research experiences, and other educational and employment opportunities provided by NCWIT member organizations. The NCWIT Award for Aspirations in Computing offers both a national and local award competition to generate support and visibility for young women's participation in computing around the country. Each local award taps into the powerful network of NCWIT Alliance members: teams from academia, non-profit organizations, startups, and corporations come together to build a community of support for young women interested in computing.

GREAT COMPUTER CHALLENGE

Eleven teams from the Governor's School competed in the 2015 **Great Computer Challenge** held at ODU on March 7th.. The Great Computer Challenge is a joint project of WHRO, the Consortium for Interactive Instruction and Old Dominion University! This is a competitive opportunity for students to demonstrate their knowledge of various computer applications and programming skills. Categories include: Graphic Design, Desktop Publishing, Music Composition, Desktop Presentations, Web Design, Internet Scavenger Hunt, Integrated Applications, Scientific/Non-Business Programming, Visual Programming, CAD, JAVA Programming and Video Editing.

Student Highlight

In December, Governor's School student Wesley Jordan from Menchville High, presented his senior research project to the ODU computer science research team. Wesley is taking existing computer web archiving capabilities and transferring them to mobile devices. Wesley's demo paper was submitted to the Joint **Conference on Digital Libraries** (JCDL) and won Best Poster for his MobileMink app. As discussed in the paper, MobileMink provides the linkage between the live and mobile webs that is lost during archiving. It also helps increase the archival coverage of the mobile web through crowd sourcing. Mentor, Justin Brunelle stated that *"JCDL is the premier international digital libraries conference – this is a *huge* honor since he was up against world renowned researchers showcasing their work."*

WEST POINT BRIDGE COMPETITION

Governors' School students Trevor Broady, Lafayette High and Samuel Washburn, Poquoson High made it to the semifinals of the **2015 West Point Bridge Competition** by ranking in the top 20 nationwide. They were the top ranked team in Virginia! The West Point Bridge Competition is designed to provide middle school and high school students with an introduction to engineering.

What GSST Students are Saying

Please allow me to add my name to the list of college students who are extremely grateful for the rigor of the curricula of GSST classes. Being challenged by GSST classes has allowed me to feel well-prepared for and confident in my coursework at U.Va. I am sure that this is the case for many GSST graduates, and that it will be the case for many more. I am confident that GSST will continue to flourish, and I am eager to watch the program grow over the next few years.

Kayla Holston, Hampton

What I liked about the Governor's School was that it was treated like a small college campus. I had more freedom, along with more responsibility. I strived to learn and connect with the students and professors, and this is how I first ended up at NASA's Langley Research Center. During my senior year in Governor's School, I did a mentorship at NASA in the Advanced Sensing and Optical Measurement Branch under my mentor Richard J. Schwartz. During this mentorship, I worked with 3D modeling using Autodesk 3ds Max to implement a 3D model of a wind tunnel into a gaming tool called UNITY in order to make the model more interactive. I learned a lot about wind tunnels, and even more about what my mentor does at his branch.

Jaquan Outlaw, Newport News

Jaquan Outlaw, a 2012 graduate of the Governor's School, is a Langley Aerospace Research Student Scholars intern from the Rochester Institute of Technology. Jaquan is working in the Small Business Innovation and Research department at NASA.

Director Highlight

Governor's School Director, Vikki Wismer, participated in an inaugural summit to identify solutions to close the excellence gap; the troubling disparity in academic performance between lower income and higher income students at advanced levels. Mrs. Wismer was personally invited by the Cooke Foundation to collaborate with more than 100 other principals, as well as, other school leaders and experts nationwide to learn about cutting-edge research and share best practices for supporting high-achieving, low-income students.

STUDENTS CREATE WINNING DESIGN FOR NASA'S FIRST FLIGHT OF ORION

Team ARES' shield is one of the most important components that will be evaluated on Exploration Flight Test-1. Their shield prototype isn't much bigger than a softball, but it will serve to test the concept for a much larger version to protect the Orion crew.

After a year-long competition among high school teams across the country, evaluators from NASA, Lockheed Martin and the National Institute of Aerospace have selected Team ARES, from the Governor's School for Science and Technology in Hampton, Va., as the winner of the high school portion of the Exploration Design Challenge (EDC).

The announcement came during a ceremony held at the opening of the 2014 USA Science and Engineering Festival in Washington. Team ARES was chosen from a group of five finalist teams announced in March.

The EDC was developed to engage students in science, technology, engineering and math (STEM) by inviting them to help tackle one of the most significant dangers of human space flight -- radiation exposure.

"This is a great day for Team ARES – you have done a remarkable job," said NASA Administrator Charles Bolden, who helped announce the winning team. He continued, "I really want to congratulate all of our finalists. You are outstanding examples of the power of American innovation. Your passion for discovery and the creative ideas you have brought forward have made us think and have helped us take a fresh look at a very challenging problem on our path to Mars."

Team ARES now will work with the NASA and Lockheed Martin spacecraft integration team to have the product of their experimental design approved for spaceflight. Once the equipment is approved, engineers will install it onto Orion's crew module. Later this year, when Orion launches into orbit during Exploration Flight Test-1 (EFT-1), Lockheed Martin will host Team ARES at NASA's Kennedy Space Center in Florida to watch their experiment launch into space.

During the EFT-1, Orion will fly through the Van Allen Belt, a dense radiation field that surrounds the Earth in a protective shell of electrically charged ions. Understanding and mitigating radiation exposure during Orion's flight test can help scientists develop protective solutions before the first crewed mission. After EFT-1, the students will receive data indicating how well their design protected a dosimeter, an instrument used for measuring radiation exposure.

Speaking at the U.S.A Science and Engineering Festival, Lockheed Martin Chairman, President and CEO Marillyn Hewson said, "The Exploration Design Challenge has already reached 127,000 students worldwide – engaging them in real-world engineering challenges and igniting their imaginations about the endless possibilities of space discovery."

Students around the world in grades K-12 still can be part of Orion's first flight by completing an online radiation shielding activity. Students who complete the activity by June 30 will have their names flown as virtual crew members aboard Orion.

Article courtesy of Ann Marie Trotta, NASA

To learn more about the EDC and related activities, visit: www.nasa.gov/education/edc

To learn more about NASA's education programs, visit: www.nasa.gov/education

To learn more about Orion and the EFT-1 mission, visit: www.lockheedmartin.com/orion & www.nasa.gov/orion

ABOUT ORION

NASA's Orion spacecraft is built to take humans farther than they've ever gone before. Orion will serve as the exploration vehicle that will carry the crew to space, provide emergency abort capability, sustain the crew during the space travel, and provide safe re-entry from deep space return velocities.

On December 5, 2014, Orion launched atop a Delta IV Heavy rocket from Cape Canaveral Air Force Station's Space Launch Complex Flight Test on the Orion Flight Test: a two-orbit, four-hour flight that tested many of the systems most critical to safety.

The Orion Flight Test evaluated launch and high speed re-entry systems such as avionics, attitude control, parachutes and the heat shield.

In the future, Orion will launch on NASA's new heavy-lift rocket, the Space Launch System. More powerful than any rocket ever built, SLS will be capable of sending humans to deep space destinations such as an asteroid and eventually Mars. Exploration Mission-1 will be the first mission to integrate Orion and the Space Launch System.

For more information on the Governor's School for Science and Technology call 757-766-0000 or visit us on the web, www.nhrec.org/governorsschool/.