

STEM

At the United States Naval Academy

*Science * Technology * Engineering * Mathematics*

The USNA STEM Office is focused on addressing an urgent national priority—persuading more young people to pursue careers in science, technology, engineering, and mathematics while engaging our own midshipmen in quality STEM programs and outreach to the community.

The Odgers Professorship was established in 2010 by a private testamentary gift to the US Naval Academy Foundation from the Carol and Ralph E. Odgers Family Trust.

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**February 24, 2012
Mini-Stem:
A visit from the
New Jersey Schools.**



USNA STEM OFFICE

**proudly sponsored by the National Defense Education Program,
Office of Naval Research and the Naval Academy Foundation.**

USNA Launches IceGoat1



MIDN 1/C Ben Aspholm and Bob Bruninga both from the Aerospace Engineering Department, make some final adjustments to IceGoat1's antennae.

Maritime buoys serve many purposes globally. Their fixed positions define traffic lanes for recreational boaters in the Chesapeake Bay and assist large cargo vessels through international shipping lanes. Ocean buoys also provide an excellent platform to collect atmospheric and ocean data. Fixed and free floating ocean observation buoys are important to the U.S. Navy and directly support Navy climate and environmental observation programs.



This spring, the U.S. Naval Academy will launch its first Arctic Buoy prototype, named "IceGoat1". This free floating buoy will transmit real-time environmental data and images via satellite from the Arctic Ocean. Data from IceGoat1 will be added into the data bases of the World Meteorological organization for weather and ice forecasts, and into the International Arctic Buoy Program research database of over of over 70 platforms currently reporting in the Arctic. (More information can be found at www.iadp.apl.washington.edu)



LCDR John Woods at the IceGoat1 Launch Party

Solar powered for autonomous use, the IceGoat1 is constructed from the "shell" of an Airborne Expendable Ice Buoy (AXIB) from LBI, Inc., which has proven reliable in extremely harsh environments. The IceGoat1 construction process serves as a valuable project based learning experience for midshipmen and satisfies a course requirement within the USNA Oceanography Department.

Four midshipmen and three USNA faculty members will travel to Barrow, Alaska over Spring Break and participate in the NASA BROMEX experiment. This experiment will focus on the interactions between the declining sea ice and atmospheric chemical reactions unique to the Arctic. Support for this trip is being provided by the USNA STEM and Midshipman Research Offices.



Faculty and Midshipmen Participating in the NASA BROMEX Experiment:

LCDR John Woods
CDR Carl Hager
CDR Joe Smith
1/C Kyle Crowder
1/C Ben Aspholm
2/C Rebecca Watson
2/C Will Parker

IceGoat1 in the Community

On February 7, Annapolis Elementary students learned about the experiment first hand, and were able to sign IceGoat1. The students were also instructed on how to build a buoy by LCDR Gwen Gray.



Top left: MIDN 1/C Kyle Crowder and 3rd Grade Students from Annapolis Elementary School work on a Build A Buoy

Top right: 3rd graders from Annapolis Elementary.

Right: LCDR John Woods showing Annapolis Elementary Students the IceGoat1

Bottom: Annapolis Elementary 3rd Grade Students with LCDR John Woods, MIDN 1/C Ben Aspholm, and MIDN 1/C Nathan Kren



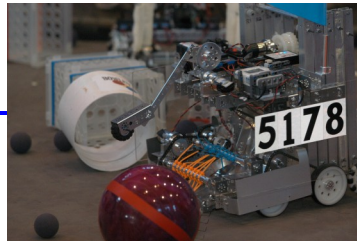
FIRST Technology Challenge Qualification Tournament

On January 14, 2012, over 100 high school students gathered in Dahlgren Hall (USNA) to participate in a Maryland statewide robotics qualifying tournament.

The 18 teams, each consisting of between 6 and 10 students, brought the robots that they had designed, programmed, and driven to compete with one another through various courses and challenges. The timed unmanned section of the competition relied on the students having programmed their robots to correctly navigate the course, including picking up and moving various sized objects, and then parking in the designated area. The battle section allowed students to drive their robots and compete against another team to collect and defend objects on the course.

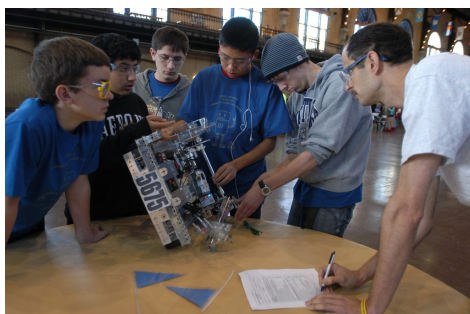


Each team had to begin with a LEGO NXT robotic base, but had creative liberty to build what they would consider to be the most ergonomic and efficient robot for the challenges they faced. Each component of the tournament introduced the students to the major challenges that are met by robotics engineers every day. Questions of design, pre-programmed patterns of motion, and finally remote control were answered the day of the tournament.



Captain Kevin Rudd, who facilitated the event had the following reaction: *I'm very happy that the Naval Academy was able to host this FTC Qualifying Tournament; STEM skills are very important to society as well as the Navy and Marine Corps and this event attracted and recognized 100 to 120 outstanding young motivated STEM-focused students, their coaches and mentors, family and friends, and many volunteers. It was a win-win event for everyone. In addition, we were able to showcase all of this talent in the beautiful and historic Dahlgren Hall. For me, this has been the most successful and memorable event in many years of supporting robotics tournaments and the STEM talent that they attract.*

The days success was made possible by the following midshipmen:



MIDN 1/C Michael Bertschinger
MIDN 1/C Paul Luffel
MIDN 1/C Jonathan Monti
MIDN 1/C Mor Rosenberg
MIDN 1/C Casey Strouse
MIDN 1/C Sunny Tsao
MIDN 1/C Sequoia Watson
MIDN 1/C Brendon Watts
MIDN 3/C Amanda Zablocky

MIDN 4/C Christofer Burgett Jr.
MIDN 4/C Wade Cofer
MIDN 4/C Michael Holland
MIDN 4/C Andrew Mcdougall
MIDN 4/C Joseph Palazzolo Jr.
MIDN 4/C Carlos Perez
MIDN 4/C Vicki Rand
MIDN 4/C Harrison Willoughby

The students who were successful in this qualifying round will go on to compete in the state championship.

Astronaut Convocation 2012



The Astronaut Convocation of 2012 was held on Monday, January 23rd. The evening began with a 'meet and greet' in Smoke Hall, followed by dinner with the brigade, and concluded with panel discussion in Alumni Hall. The four astronauts in attendance, all USNA Alumni, were Captain Michael Coats, Director of NASA Johnsons Space Center ('68); Captain Frank Culbertson, Sr. Vice President responsible for human spaceflight at Orbital Sciences ('71); Captain Ken Reightler, Vice President responsible for Engineering Services at ATK Aerospace Systems ('73); Captain Ken Bowersox, Aerospace Consultant ('78); Major General Charles Bolden, Administrator of NASA ('68). [All pictured to the left in order.]

The STEM Program invited a group of interested high school students to attend the event. Prior to the panel discussion the students were able to go to the meet and greet. After, they broke into smaller discussion groups led by midshipmen and discussed the past and future of human space flight – which was the topic of the panel discussion later that night. They learned of the newest NASA developments, including the Orion Multi-Purpose Crew Vehicle (MPCV) being built by Lockheed Martin, and scheduled for launch in 2014.

After the discussion groups, the students joined the brigade to listen to the panel discuss the future of human space flight. Following a brief introduction from each of the panelists, the discussion focused primarily around the distinction between private and government funding space missions, and the future of exploration, including a manned-mission to Mars. Feedback from the students was all extremely positive. The participating schools have already asked to be included next year.



The Orion MPCV

National Eagle Scout Association Jamboree

Almost 700 scouts filled the classrooms and lab spaces of Rickover Hall on Saturday, January 14. As part of the USNA National Eagle Scout Association Jamboree, STEM merit badges were offered in Nuclear Science, Chemistry, Computers, Electricity, Electronics, Energy, Engineering, Radio and Oceanography. Led by Midshipmen Max Johnson and Clayton Callander, USNA Eagle Scouts oversaw the merit badge sessions, which were offered in the morning and repeated in the afternoon, with support from the STEM Office faculty. The visiting scouts stayed at Camp Letts for the weekend.



Radio Merit Badge



Impromptu discussion on Navy Systems



(Top) : Engineering Merit Badge



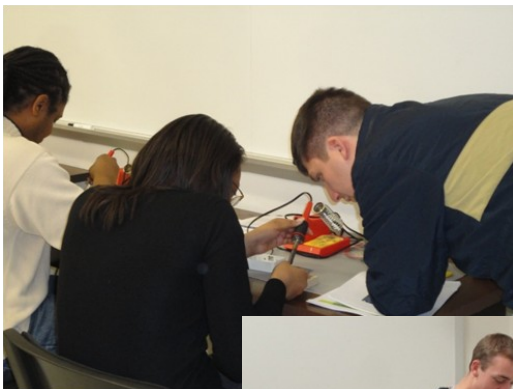
(Left): Nucleonic Merit Badge

ONR SeaPerch Teacher Training

On January 21, LCDR Casey Burns, (DC, USN), HN George Warren, and LS1 Arreni Mullins (all from the Navy Medical and Dental Clinic), along with eight midshipmen provided support for the USNA STEM Office's latest ONR SeaPerch teacher training. About 45 teachers and instructors attended the training, coming from Prince George's County, Queen Anne's County, Anne Arundel County, Virginia, and Pennsylvania schools and after school clubs.



MIDN Jordan Armstrong (left) and Ariel Coreth (on right) assist teachers who are water proofing motors and assembling propulsors for their underwater robots.

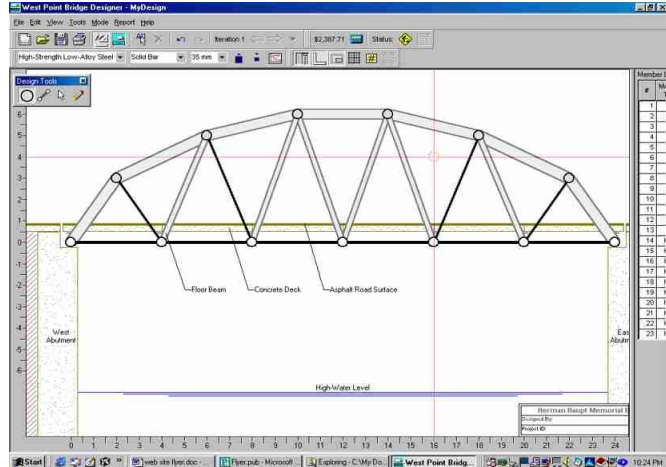


MIDN Michael McPherson (top left) and Eric Emerling (bottom right) supervise the soldering of the PC board components. Good soldering skills are critical to the successful completion of the controller. Mitch, as always, is right there.



The 2012 Army-Navy Bridge Design Contest

This year the U.S. Naval Academy and U.S. Military Academy hosted the first-ever Army-Navy Bridge Design Contest. The contest is a modified version of the national West Point Bridge Design Contest. In its 11th year, the West Point Bridge Design Contest was created to encourage students to develop creative problem solving skills to address realistic concerns in engineering. The participants download the West Point software, and design a bridge to address the particular challenge of the year. The “special edition” being sponsored by USNA and USMA was created for 6th and 7th grade students, with the students competing on behalf of either Army or Navy.



SCOREBOARD

1. **Awesome Army**
Army, West Virginia
2. **Turple Knights**
Army, West Virginia
3. **NavyNarwhal**
Navy, Minnesota
4. **NAVY10310**
Navy, Ohio
5. **PinkTealNavy**
Navy, West Virginia

The contest qualifying round began on January 19, and ended on March 1. A total of 127 teams competed with: 185 students, 63 Army teams, 64 Navy teams, and 5 undecided. The top 5 Army and top 5 Navy teams are able to move on to the Semi-Final Round, which will be conducted on March 30. After the Semi-Final Round the top Army and top Navy will be invited to the West Point Campus in New York to compete in the Final Round on May 3rd.

More information on the Bridge Building Contest can be found on the website, located at:

<http://bridgecontest.usma.edu>

National Engineers Week 2012

This year, the week of February 19-25, National engineers Week was celebrated throughout Rickover Hall. Faculty and Mids were tested on their knowledge of the 7 Wonders of the Engineering world, experienced hover-craft rides, witnessed mylar cannon demonstrations, and launched water rockets. T-shirt prizes were awarded to lucky participants.

