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NEWSLETTER

Spotlight on K-12 STEM Education

For the past three summers, the Connecticut Center for Advanced Technology (CCAT) has held its annual professional development workshop for teachers called FOCUS (Facilitating Ongoing Content Understanding in STEM). The topic of this past summer’s workshop was FOCUS: Energy, with a focus (pun intended) on sustainable energy. On the topic of their workshop, CCAT states that “sustainable energy is an engaging, authentic STEM context that is an emerging 21st century field critical to the highly skilled workforce pipeline of the future; framing learning in such contexts is at the core of a more transformative approach to STEM.” A total of 15 teachers participated in the August workshop (7 middle school and 8 high school teachers), and an estimated 1,500 students will benefit indirectly from the program.



Karen Lamb (top left), Linda Kimble (top right), and Manashi Sinha (bottom right) working on a hands-on project at the August 2013 workshop.

A professional development program like FOCUS is not totally new. The FOCUS program is one of the latest steps in an evolutionary process aimed at finding better ways to support and supplement the teaching of STEM subjects in our schools. “FOCUS followed and is based on another successful program supported by CT Space Grant, the NASA-PLAN (Photonics & Lasers, Aerospace, and Nano-

technology) Teachers Academy,” says Nick Balisciano, the Education Manager at CCAT.

Nick is very optimistic about the positive effects of the program. “The program provides teachers with high-quality curriculum materials that are engaging, richly contextual, and aligned to standards. It gives teachers time to do the activities and become comfortable with them. It also provides classroom supplies and allows participants to discuss, reflect, and plan for how they will use the activities following the best practices in STEM education. All of these things allow us to be of maximum help to teachers and to have a greater impact on their students than we could were any of these components missing.” With three successful years behind them, Nick and the rest of the team at CCAT “hope to be able to scale up the program to serve many more teachers in the long term.”

The Connecticut Center for Advanced Technology, Inc. (CCAT) is a nonprofit corporation founded in 2004 that serves as an innovative economic development center of excellence for the state, region and nation. Nick Balisciano (nbalisciano@ccat.us) is the Education Manager in on the Education & Workforce Development Staff at CCAT. ♦



Connecticut Center for Advanced Technology, Inc.



Connecticut Space Grant College Consortium



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Spotlight on K-12 STEM Education Development with Ms. Susan Pedrick

In the 2013 national and global economies, STEM Education seems more important than ever in preparing US students to compete for high-tech jobs and in preparing America to compete worldwide in the STEM fields [1]. The Connecticut Space Grant directs a portion of its annual funding toward STEM Education development in CT schools and universities. In many cases, this development is in the form of educator workshops that help our STEM teachers learn new and interactive ways to interest students in STEM fields. One such workshop occurred with collaboration at Tufts University in July 2013. With the support of the CT Space Grant, two teachers from the University High School of Science & Engineering (UHSSE) in Hartford, CT were able to attend the Northeast Regional Space Grant Teacher Workshop at no personal expense. We caught up with one of the teachers—Ms. Susan Pedrick—to find out how the July workshop has helped her.

“The workshop was focused on using Lego® NXT Mindstorms to help create some hands-on, open-ended design projects that utilize STEM concepts. I found it to be a great introduction to modular programming like LabView. Our engineering students need to program with VEX during the Principles of Engineering (POE) class and our robotics students program a competition robot each year with LabView,” said Ms. Pedrick when asked how the NASA Educator Workshop enriched her teaching of those subjects. VEX is a robotics design system used to teach students about STEM career opportunities, and LabView is a graphical programming platform that helps engineers bridge the gap from design to testing of systems.

The experience Ms. Pedrick gained with NXT

Mindstorm systems led her to conduct a mini-build competition for the new freshman members of the Robotics Team using these systems. Based on the similarities between the NXT systems and the other systems used at UHSSE, the NXT system is a great way to get hands-on work for the newest students on the team and build interest for the rest of their high school careers and beyond. As a result of her experience at the workshop, Ms. Pedrick “would like to incorporate LabView (modular) programming for VEX into the POE class. The curriculum is set up with RobotC (code) programming. [She] would like to see students exposed to both kinds of programming.”

“These workshops are very valuable for meeting with other colleagues who are teaching the same subjects. I learn almost as much from them as I do from the program directors”, said Ms. Pedrick. We asked Ms. Pedrick for her thoughts on the most important factor in getting kids interested in engineering at a younger age. Her response: “I have found that hands-on activities like building with Legos or VEX have something that will attract ALL students no matter the level of their prior knowledge. ALL students become engaged and it is possible to differentiate instruction to



their ability.”

Ms. Pedrick is a math teacher and the co-leader of the FIRST (For Inspiration and Recognition of Science and Technology) Robotics team at UHSSE. This year, she has become more a part of the engineering department at UHSSE by teaching 3 Introduction to Engineering Design (IED) classes and 2 Principles of Engineering (POE) classes. She has also taught Algebra I & II and Statistics. ♦

[1] STEM Education Coalition, “STEM Education, Good Jobs, and US Competitiveness”, June 2013. www.stemedcoalition.org



Industrial Internship Spotlight on: Lucas Johnson



If you were asked to guess how each student in the trumpet studio at the University of Hartford's Hartt School of Music spent this past summer, what might you say? Most would guess a summer full of practicing for orchestral auditions, or maybe a summer arts intensive, and those would be good, educated guesses. However, there is one player whose summer stands apart from the rest. Lucas Johnson spent this past summer with a CT Space Grant funded Industrial Internship working in the acoustics group at Pratt & Whitney, a division of United Technologies Corporation located in East Hartford, CT.

During his time at Pratt & Whitney, Lucas focused mainly on developing computational methods and tools to aid the acoustics group with the model-

ing and calculation of tone levels produced by turbine fans. He also helped the group to validate and develop an understanding of a tool used for sound prediction that will hopefully be applied to future generations of P&W jet engines.

"I learned technical skills such as mathematical tools for analysis of engine noise production and MATLAB scripting," said Lucas when asked what his experience taught him. "Personally, I learned how [to] learn from and communicate with coworkers from various engineering backgrounds. They worked hard to help develop my presentation and networking skills. I have definitely gained much more confidence in my ability to work as an engineer in a highly competitive industry."

Lucas' goals after finishing his undergraduate program are to begin working in acoustics right away. He intends to keep his sights set on a degree in audiology or psychoacoustics to use his skills "in a humanitarian effort to promote healthier living worldwide." He also hopes to find work in acoustics that allows him to travel.

On his overall experience at Pratt & Whitney, Lucas says "this experience has developed my professional skills and personal confidence so that I now feel able to contribute to the world of acoustical engineering. I am very grateful toward the CT Space Grant for providing me with this incredible opportunity, and I thank the Acoustics Group at Pratt & Whitney for seeing potential in me and working diligently to develop that potential."

From Manchester, Connecticut, Lucas Johnson is a senior Acoustical Engineering and Music student at the University of Hartford. He is a student in the classical trumpet studio at the Hartt School of Music, and spends his spare time with friends and family. He volunteers as an audio technician and guitar player for his church's Sunday services. Lucas is also involved with the InterVarsity Christian Fellowship at UHa. He enjoys hiking, biking, and exploring new places. ♦



Connecticut Space Grant College Consortium

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VISION STATEMENT

FALL 2013

Make the United States the Aerospace leader of our solar system.

Space Grant Award Recipients (Fall 2013)		
<p><u>Faculty Research Grants</u> Dr. Maria-Isabel Carnasciali (UNH) Dr. Alfred Gates (CCSU)</p> <p><u>Faculty Seed Research Grants</u> Dr. Brett Barwick (Trinity)</p> <p><u>Faculty Collaboration Grant</u> Dr. Christina Othon (Wesleyan)</p> <p><u>Faculty Curriculum Development</u> Dr. J. Harry Blaise (Trinity)</p> <p><u>Graduate Research Fellowship</u> Dana Parr (UConn)</p> <p><u>Graduate Travel Grants</u> Joseph Parisi (UConn) Stephany Santos (UConn)</p>	<p><u>Undergraduate Research Fellowships</u> Karen Brzostowski (Hartford) Ari Fischer (UConn)</p> <p><u>Industrial Internships</u> Kyle Allingham (UNH) Ravina Hingorani (Fairfield) Tyrone Post (Hartford) Benjamin Williams (Trinity)</p> <p><u>Student Project Grants</u> Peter Burrows (Trinity) Patryk Deptula (CCSU) Robert Garrone (Fairfield) Charlotte Guertler (Yale) Erik Quinonez (Trinity)</p>	<p><u>Undergraduate Directed Campus Scholarships</u> Dominique Dubois (ECSU) Katherine Pitz (Fairfield) Mohd Hossain (SCSU) Lisa Yamada (Trinity) Ikram Bestiane (University of Bridgeport) Holly Robillard (UConn) Zachary Jones (U of Hartford) Elvia Baca (U of New Haven) Jesse Tarnas (Wesleyan) George Ramirez (Yale)</p> <p><u>Undergraduate Travel Grants</u> David Kiely (CCSU) Peter Martin (Wesleyan)</p>

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