**ENERGIZING SCIENCE LEARNING**

PSC programs in science education give the Pittsburgh region a jumpstart toward a cyber-savvy workforce.

Introducing “cool” technology into the classroom engages students,” says PSC’s director of outreach and education, Cheryl Begandy, “and increases their willingness to stay with subjects they may otherwise find too complicated or just uninteresting.” For Begandy and Pallavi Ishwad, education program director of PSC’s National Resource for Biomedical Supercomputing (NRBSC), the goal is to help re-define high-school science instruction, so that it can better prepare future scientists, engineers and educators to participate in the cyber-savvy, 21st-century marketplace.

**BEST** Begun in 2007 by Ishwad, Better Educators of Science for Tomorrow (BEST) introduces high-school teachers to a bioinformatics curriculum adapted from an NRBSC program called MARC (Minority Access to Research Careers) for undergraduate and graduate science students. Drafted and improved through classroom usage by an interdisciplinary group of STEM teachers, the BEST curriculum offers ready-to-use lesson plans for single-subject educators to extend their skills to the multidisciplinary outlook of bioinformatics, which draws on physics, chemistry, biology, computer science and math.

PSC’s BEST summer workshops have introduced bioinformatics to six Pittsburgh area high-schools. In this year’s workshop from June 6 to July 22, PSC staff mentored 10 high-school teachers.

“You have provided a tremendous amount of expertise and guidance in helping to shape our program,” said Edwina Kinchington, educators from these organizations are designing a professional development program for STEM teachers in western Pennsylvania to become leaders in integrating computational modeling and simulations into classroom learning.

“CAST,” says PSC’s Begandy, “brings to the classroom the same problem-solving, technology-rich approaches currently used in scientific research and in business.”

**CAST** PSC this year received a $100,000 grant from the DSF Charitable Foundation that extends Computation and Science for Teachers (CAST). PSC’s program – begun in 2008 – has introduced many Southwest Pennsylvania STEM teachers to easy-to-use modeling and simulation tools for classroom learning.

The DSF grant funds a three-way effort among PSC and the Maryland Virtual High School Project, which helped to pioneer the use of computational thinking in high-school learning, and the Math & Science Collaborative of the Allegheny Intermediate Unit, which provides educational services to Allegheny County’s 62 suburban school districts.

Educators from these organizations are drafting a framework for the CAST program for STEM teachers in western Pennsylvania to become leaders in integrating computational modeling and simulations into classroom learning.

**CAST WORKSHOP FOR TEACHERS**

At a July 25-27 workshop at PSC’s Computer Training Center, southwest Pennsylvania STEM teachers piloted several CAST-developed modules in classroom teaching of modeling and simulation.

**BEST STUDENT INTERNS**

Two Pittsburgh students, Annie Kayner (left) and Daniella Auth (right), with Pallavi Ishwad, were biomedical interns at the 2011 TeraGrid conference in Salt Lake City. Both took bioinformatics courses developed through BEST at Pittsburgh’s Our Lady of the Sacred Heart High School, and both have entered college with expertise and guidance in helping to shape our program,” said Edwina Kinchington, of the Pittsburgh Science & Technology Academy, one of six southwest Pennsylvania high-schools that have adopted BEST curricula as part of permanent elective course offerings. PSC’s Ishwad and Begandy both were recently renewed for a second three-year term on Occupational Advisory Committees for PS&TA, a public high-school with 65 percent minority enrollment. “The gift of this program to students is immeasurable,” said biology teacher Rebecca Day of Frazer High School.

More info: www.psc.edu/eot/k12/best.php

**OPEN EDUCATION RESOURCES**

Two of PSC educational programs, CMIST and SAFE-Net, provide open education resources on the World Wide Web for educators, students and parents. SAFE-Net’s website provides free materials to help parents, educators, students and individuals understand questions of cyber-security associated with wide usage of the Internet.

Through NRBSC, PSC also provides modules and vivid 3D video animations developed through its CMIST program (Computational Modules in Science Teaching). Three CMIST modules are freely available through the website: Molecular Transport in Cells, Big Numbers in Small Spaces, Simulating Atoms, Molecules and Brownian Motion, and Enzyme Structure and Function.

**SAFENET** (free materials) safenet.3rox.net

**CMIST** (free modules) cmist.allegheny.edu

**BIRTH OF A PROTEIN**

From the CMIST movie, Birth of a Protein, which uses vivid science animations to explain how proteins are created and generate energy for the body. The red cylindrical structure is a muscle fascicle, with an extending myofibril, composed of chains of two proteins, actin and myosin (inset: blue and purple with green heads). The myofibrils show ATP synthase (left) and acetylcholine (upper right), two molecules involved in protein creation and energy production in the mitochondria (gray cell).