

A NEW ROLE FOR HIGH SCHOOL COMPUTERS

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A leading New Jersey newspaper recently admonished the state's school systems for engaging in a technology race that treats acquiring computers as an end in itself rather than a means to improve learning. The editorial in *The Record* advocated teaching elementary and high school students how computers can help them solve problems creatively, write fluently, and develop math skills.

This is exactly what we hope to achieve with our new NSF-supported program Computation and Communication: Promoting Research Integration in Science and Mathematics (C²PRISM). This initiative will place NJIT doctoral students who use computational techniques for cutting-edge research in mathematics or the physical sciences into Newark high schools. They will team with teachers to develop curricula in math, physics, chemistry and biology designed to teach students how to formulate significant questions, think analytically, and offer creative solutions. They will instruct the students and their teachers in advanced computational tools, and demonstrate how computing supports and enriches their research.

Outside of the scientific community, few people have had the opportunity to learn how computing has transformed research. Computational tools like modeling, simulation and statistical analysis have been revolutionary. The convergence of computing with the physical and mathematical sciences has triggered rapid advances in many areas, from pharmaceuticals to wireless telecommunications. Consider some of the exciting projects underway at NJIT:

- In chemistry, computational simulation is helping researchers develop medication to treat cocaine addiction and modeling techniques to understand molecular processes in nanotechnology.

- Mathematicians are using realistic mathematical and computational models for research that ranges from blood circulation and how small vessels supply tissues with oxygen to ocean acoustics to help the Navy detect submarines.
- Biologists are applying modeling, simulation and statistical analysis to ecology, helping to protect endangered species, and to neuroscience to map the structure and functions of the neural system.
- In physics, solar researchers use computational techniques to forecast sunspots and related phenomena that may affect aviation and telecommunications.

The C²PRISM program will give high school teachers the opportunity to learn about many such computing applications. In turn, the doctoral students will learn how to simplify discussion of their research and communicate effectively about it. The high school students mentored by researchers engaged in some of NJIT's most exciting research may very well be inspired to consider careers in science and technology.

We at NJIT are most excited about C²PRISM because it allows us to apply our special skills to a critically important cause. At one level, we will be helping to equip young people with more essential knowledge in science and math, and challenging them to improve their basic problem-solving ability. But the excitement and relevance of a career at the very "edge in knowledge" is what we must also communicate — particularly to underrepresented groups such as women and ethnic minorities — if we hope to foster the workforce needed to support a knowledge-based 21st century economy. ■