

**Profile of the
Department of Physics
University of Wisconsin-La Crosse
2004 Regents Teaching Excellence Award Recipient**

The Transformation of the UW-La Crosse Physics Department

A Problem Department: In the late 1980s, the UW-La Crosse Physics Department had a total of 5 majors, 5 faculty members, and a graduation rate of one major per year. The Department had received poor reviews from the University's Academic Program Review Committee, and UW System Administration had recommended phasing out the Physics Department because of its low graduation rates.

Problem-Solving: UW-La Crosse's administration decided to give the Physics Department a second chance by hiring a new chair and an experienced faculty member to turn the department around. Many changes were made, including a complete overhaul of the curriculum, a reconfiguring of its faculty members as effective teachers, mentors and scholars, and a re-commitment to providing an array of learning opportunities that were entirely student-centered. Specifically, the Department:

- Introduced new academic programs and emphases;
- Implemented Dual Degree Programs with four Engineering programs at four different universities, providing students who complete the program with both a B.S. in Physics from UW-La Crosse and a B.S. in engineering from the partner institution;
- Promoted and supported an abundance of research opportunities for undergraduates, with both internal and external funding;
- Built a scholarly community through weekly seminars for faculty and students;
- Revitalized the Department's contributions to UW-La Crosse's Teacher Education program in the sciences and ensuring the rigor of the teachers it produces;
- Engaged in aggressive recruitment of new students and new majors and followed this up with strenuous advising and retention efforts;
- Renewed their assessment of student learning based on student feedback;
- Improved outreach activities to create for themselves a vital role in the community outside the university;
- Developed a faculty mentoring program; and
- Implemented a Distinguished Lecture Series in Physics.

Successful Transformation: Through hard work, innovation and determination, all of these changes resulted in a dramatic transformation. Today, the UW-La Crosse Physics Department is the largest undergraduate Physics program in Wisconsin, going from 5 majors in 1990, to 115 in 2003-04; and from 1 graduate per year, to 24 graduates in 2003. This program is exemplary and it is nationally recognized as such. The National Task Force on Undergraduate Physics selected the Department as one of the most successful undergraduate programs in the nation, and physics departments throughout the country are following the Department's lead and model in attempts to revitalize their programs.

In the Words of the Department's Students

- “I first took classes in Physics at UW-L while I was a senior at a local high school. From that moment on, I knew I was in the middle of something special What makes the UW-L Physics Department special is its ability to reach students on many different levels. They achieve this through the classroom, laboratory, advising sessions, and in many activities outside of the classroom. They excel as a whole because of the diversity and professionalism of the faculty and support staff. The faculty is dedicated to their students and work. I feel that I owe my success as a graduate student to the people of the UW-L Physics Department.”
 - Brian A. Kinder, 2000 UW-La Crosse Graduate; current Ph.D. student in Optical Sciences at the University of Arizona and recipient of NSF Teaching Fellowship

- “One of the most extraordinary things about the Physics Department is the emphasis placed on undergraduate research. The majority of the faculty is currently doing research projects that include and depend on student involvement. Any student who wants to do research is not only strongly encouraged to get involved, but the faculty works very hard to help them get funding.”
 - Amelia R. Bloom, 2004 UW-La Crosse Graduate; undergraduate recipient of Wisconsin Space Grant Consortium and NSF funding; current graduate student in Physics.

- “I was given the opportunity to conduct undergraduate research in an environment that fostered both education and creativity. This allowed me to be a part of a process that truly changed my life and that I am still deeply involved in. I believe this to be an invaluable asset to undergraduate students pursuing education in physics and something that the UW-L Physics Department can offer students that they might not find elsewhere.”
 - Brian J. Sollers, 1996 UW-La Crosse Graduate; completed a Ph.D. in Physics and is currently a senior optical scientist in a small engineering firm.

Department Facts, Activities, and Resources

- *Personnel:*
 - Seven full-time faculty and one Academic Staff Lecturer (all with doctorates) with expertise in Astronomy, Computational Physics, Condensed Matter, Lasers, Laser Spectroscopy and Nuclear Physics;
 - Physics faculty have brought in more than \$850,000 in external education and research grants in the last 5 years and over \$1,000,000 in equipment;
 - In the last 5 years, physics faculty have published over 25 scholarly papers and made over 75 presentations at national and international conferences;
 - Hosts the annual Distinguished Lecture Series in which Nobel Laureates in Physics spend two days with students and faculty giving formal seminars and informal class lectures;
 - The Department Chair has given invited talks at national conferences and to several physics departments in the nation on the successful revitalization of the UW-La Crosse Physics Department.

- *Students:*
 - 115 Physics majors (18 % women and 2% minorities) with 24 Physics majors graduating in the 2002-03 academic year;
 - 29 students are currently in the Biomedical concentration and Optics emphasis programs, which are part of Wisconsin's High Tech Initiative; 22 students have pursued graduate studies in these areas;
 - Aggressive and successful recruiting through student-centered advising yields high retention rates (70% in the first year and 95% for subsequent years).
 - Student selected to present at the Annual Council on Undergraduate Research (CUR) Capitol Hill Poster Session in Washington, D.C. (4 times in last 6 years);
 - Physics students have won the College of Science and Allied Health Outstanding Senior Award 3 times in the last 5 years;
 - In 2004, a Physics student was selected for the Scholars Program offered by the Department of Homeland Security. She was one of 50 undergraduates in the nation selected and the only undergraduate in Physics.

- *Curriculum :*
 - Physics major requires a minimum of 38 credits with 5 options available: Biomedical concentration, Business concentration, Astronomy emphasis, Computational Physics emphasis, and Optics emphasis;
 - The Department offers 5 General Education courses, the most of any department in the College of Science and Allied Health, with over 30 distinct courses taught by Physics faculty every 3 years;
 - The Department offers a Dual Degree Program in Physics and Engineering in collaboration with UW-Madison, UW-Milwaukee, UW-Platteville, and the University of Minnesota (more than 80 students have transferred to these programs in the last 5 years).
 - A new Dual Degree program has been approved internally between the Departments of Physics and Physical Therapy.
 - Weekly seminars feature undergraduate research, invited research scientists and engineers, as well as a variety of Physics Club activities;
 - The Department's outreach activities reach more than 10,000 people each year and include the Physics & Laser Light Shows performed by the Department's faculty and students for elementary and middle school students.

- *Assessment:*
 - Course assessment tools and Student Evaluation of Instruction (which in Physics have ranged from 4.00 to 4.25 out of 5.00 for the past several years) are used along with program assessment techniques that include exit interview, alumni surveys, feedback from engineering and graduate institutions.
 - National assessment tools for Physics and Astronomy courses are used to assess and improve the program.
 - Showcased as an exemplary undergraduate Physics program by the National Task Force on Undergraduate Physics, most recently in an article in the September, 2003, issue of Physics Today. Many programs are subsequently modeling themselves after the UW-La Crosse Physics program.