

Indiana State University

2005 - 2006 Academic Annual Report

Department of Physics

Year in Review

Accomplishments

As you have heard, increasing public awareness of Indiana State University's accomplishments is crucial to building student enrollment, influencing policy makers, and developing a place of pre-eminence in the Midwest. What do you consider to be your department's accomplishments for the 2006-2007 year that will contribute to this effort? [Please list in priority order and limit to no more than 8.]

I. A 3-2 pre-engineering program has been established with the University Missouri-Rolla. It is currently functional but we hope to have the appropriate Dean, Provost and Presidential signatures by the end of the fall 2006 semester. II. The department created a department newsletter to be sent to all physics alumni and prospective students (a device for fundraising and recruitment). III. Dr. Guo-ping Zhang received a Promising Scholar award. IV. In October 2005, the department hosted two public talks by Dr. Tony Legget, a 2003 Physics Nobel laureate. V. A student co-authored paper was published in the European Journal of Physics (a peer reviewed journal) VI. Have developed an engineering physics track to attract more physics majors VII. Helped to organize and run the CAS Research Showcase, and had four students present results in that showcase.

Research and Scholarship

What is your assessment of accomplishments in the area of research and scholarship that is focused primarily on contributions to practice and discipline-based scholarship? Are you satisfied overall? In which areas do you feel your department does particularly well? In which areas do you feel your department needs to improve?

During the academic year 2005-06 the Physics faculty have published or submitted for publication 5 papers in peer-refereed journals. One of those papers had a student coauthor. The faculty have also made several research presentations at National Conferences (3) and at other universities, and have been active in research involving undergraduates (four undergraduate students presented their research projects at the CAS research showcase in April 2006, and one student won the ASM research scholarship. I am very pleased with this level of productivity, especially in regards to the involvement of our students in significant research.

Grants, Contracts & Off Campus Professional Service

What is your assessment of accomplishments in the area of grants, contracts, and off campus professional service? Are you satisfied overall? In which areas do you feel your department does particularly well? In which areas do you feel your department needs to improve?

Dr. Guo-Ping Zhang received a Promising Scholar Award. Dr. West served as an expert witness in a local murder trial. Dr. West also served as a judge for the Intel International Science and Engineering Fair. I feel that the department will perform at a much higher level in regards to grants and contracts in the 2006-07 academic year as we finally have all three recent hires now officially on tenure-track lines.

Teaching

We would like to highlight innovative approaches to teaching. Has your department developed any pedagogies or practices you'd like to share with us? Please describe briefly.

Dr. West has been utilizing the PRS electronic polling equipment in his classes for more than two years, and has introduced innovative "semi-cooperative" quizzes in order to encourage student team problem solving. All members of the department have an active interest in keeping up to date on the latest results of instructional research. Of our current physics majors, 63% have been actively involved in original research this year. All of our graduates in December 2005 and May 2006 have been actively involved in original research. This research has resulted in one publication with a student as a coauthor and numerous presentations at national and regional meetings.

Course Scheduling/Enrollment Management

What have been your greatest challenges in scheduling courses to meet student needs this year? How were you able to overcome them?

The greatest challenge was in providing a reasonable number of elective courses for our majors. Due to a large number of curricular changes made in the last few years, a regular rotation of courses is just now beginning to re-emerge. In addition, it has been difficult to rotate faculty into these courses on a regular basis, due to other pressing needs in the department. It is hoped that a year of relative stability will allow for a much wider suite of courses to be offered.

Outreach

What are the outreach opportunities for your discipline? (non-traditional modes of delivery and timing, etc)

We have made many efforts to strengthen our relationships with local high school physics teachers, two of which are alums of the department. It is not clear that the discipline lends itself well to distance education, although we are investigating the use of remote access and control of laboratory equipment for the introductory physics labs, especially in light of the laptop initiative.

Strategic Initiatives

Development Activities

What steps have you taken to support development activities in your department? How can your efforts be supported?

The department created a department newsletter to be sent to all physics alumni and prospective students (a device for fundraising and recruitment). Within one week of receiving the newsletter, 2% of all of our alumni had sent either an email or a snail-mail update concerning their recent activities. ALL of the comments concerning the newsletter and the department were positive.

Community Engagement I

Please summarize your faculty's efforts in community engagement this year.

In October 2005, as a department, we hosted two public talks by Dr. Tony Legget, a 2003 Physics Nobel laureate as part of the 2005 World Year in Physics world wide celebration. These two talks drew more than 300 audience members, many of whom were from the local community. In addition, there were research intensive discussions with faculty of ISU and Rose-Hulman earlier in the day. Dr. West and Michelle Baltz-Knorr hosted a visit by two fifth grade classes from Wenz Elementary School from Paris Illinois who were here to use our laboratories to study motion. Dr. West served as an expert witness in a murder trial in 2005. Dr. West and Michelle Baltz-Knorr both served as judges at the regional Science Bowl competition hosted by ISU in the spring, while Dr. Zhang served as a

judge for the 53rd Annual West Central Indiana Regional Science and Engineering Fair at Nortview High School, and the 33rd Indiana Junior Science and Humanities Symposium in March . In addition, Dr. Zhang and a student researcher were interviewed as part of the article "Catching the Research Bug," Tribune Star, Monday April 25, 2005, Hometown p. 3 by Dave Taylor.

Experiential Learning

We are interested in hearing about any innovative approaches you might have taken to incorporate experiential learning into your course or departmental work this year.

Of our current physics majors, 63% have been actively involved in original research this year. All of our graduates in December 2005 and May 2006 have been actively involved in original research. This research has resulted in one publication with a student as a coauthor and numerous presentations at national and regional meetings. In addition, physics department personnel were instrumental in organizing and running the CAS Research Showcase in the spring of 2006.

Future Goals

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The University is highlighting experiential learning, community engagement, and eminent programs as aspects of our campus that will attract students and resources. How is your department planning to contribute to these strategic initiatives in ways that will help ISU be recognized as a Pre-eminent University?

The department has developed a new multi-track undergraduate curriculum that offers more career choices to students and involves students in experiential learning by requiring them to perform research projects. We plan to formalize the 3-2 agreement with UMR, establish a similar agreement with University of Evansville, and continue talks with Purdue University about establishing a similar agreement with them. We plan to intensify recruiting activities to increase the number of majors, publicize and enhance the pre-engineering program, continue to develop research involving undergraduates, encourage and facilitate faculty scholarly productivity. Since enrollment in all physics programs is low, we see the development of the 3-2 engineering program the primary avenue for growth in enrollment, and an effective means for attracting talented students to ISU.