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Gabe Spalding

BLOOMINGTON, Ill.— Illinois Wesleyan University Professor of Physics Gabriel C. Spalding will be the inaugural recipient of the Jonathan Reichert and Barbara Wolff-Reichert Award for Excellence in Advanced Laboratory Instruction from the American Physical Society (APS) for his efforts to expand laboratory instruction nationwide for Undergraduate students.

“Gabe’s work is a model for transforming physics education nationally,” said Illinois Wesleyan Provost Jonathan Green. “He has developed an unrivaled educational opportunity for our undergraduate students, combining strong theoretical foundations with an integrated and intensive laboratory sequence throughout the curriculum. Our students enjoy a hands-on experience in physics rarely encountered outside of graduate school, which is one of the reasons our students are so desirable to the very best graduate programs.”

The prize was established to recognize and honor outstanding achievement in teaching, sustaining and enhancing an advanced undergraduate lab course or courses, and will be formally presented in March. The APS represents over 50,000 members, including physicists in academia, national laboratories and industry in the United States and throughout the world.

Spalding was a founder of ALPhA, an association of college and university faculty and staff members dedicated to experimental physics instruction, and served as the association’s first president. Spalding said that the need for such an organization became clear to him and his colleagues after surveying other institutions and discovering many undergraduate programs nationwide offered relatively sparse lab instruction after the first year.

“We found, too, that there was a great deal of stagnation in what was offered,” Spalding said. “People were teaching the same things they could have taught 50 years ago. Physics is a high-tech field, just like electrical engineering, for example, where you can’t really justify that sort of stagnation.”

To help his peers gain experience in teaching advanced labs, Spalding chaired or co-led two conferences on lab instruction beyond the first year of college. Each of the conferences included hands-on exposure to contemporary experiments that could be used in undergraduate lab courses.

“Everybody brought equipment to these conferences, which is a logistical nightmare getting radioactive sources and all the electronics and lasers through the TSA,” Spalding quipped. “From these experiences, however, people wanted

more, so we started and now sustain an ongoing series of training programs across the country where people could spend two and a half days getting trained on one experiment, of their choice, by expert mentors."

Illinois Wesleyan's physics department has taken a lead role in integrating additional lab instruction into the undergraduate curriculum. Spalding said IWU has offered a dozen lab instruction courses for physics majors over the past two years.

"The entire Illinois Wesleyan physics department could have been recognized by the award from the American Physical Society, because it's really everybody in the department who has contributed to building something very significant when you compare our program to others," Spalding said.

"I do hope these awards raise the profile of the issues we are trying to address," he added. "The critical mass of instructional labs (at Illinois Wesleyan) is a springboard for our students to move beyond the classroom. The skills they develop allow them to ask their own research questions and establish the structure needed to answer those questions."

While serving as ALPhA president, Spalding also initiated a project that makes single- photon detectors available for instructional labs across the nation. Research indicated the high cost of single-photon detectors was often prohibitive in collegiate labs, so the American Association of Physics Teachers (AAPT), ALPhA and the manufacturer Excelitas Corporation joined together, coordinated by Spalding, to provide less expensive detectors sufficient for undergraduate experiments. To date, Spalding has personally shipped 240 single-photon detectors to 61 institutions including Yale and the University of California at Berkeley.

"The single photon initiative is drastically changing what people are able to do in teaching quantum mechanics," said Spalding. "If you look at the textbooks before this, they're highly mathematical tomes that don't really mention experiment. Now, there are new texts reflecting this new initiative on experiments, and we've been a big part of that. It's very exciting."

Spalding's recent research utilizes holographically textured fields to trap and manipulate matter. For more than 10 years, Spalding has taken Illinois Wesleyan students to the University of St. Andrews in Scotland where they take part in his research projects on the possibilities of non-invasive methods of targeting and destroying tumors. He has also chaired the annual Optical Trapping and Optical Micro-Manipulation Research Conference since 2004.

Spalding, who has been with Illinois Wesleyan since 1996, earned a doctorate from Harvard University.

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