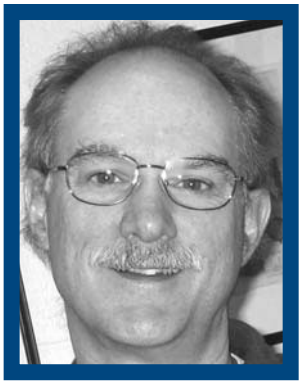
Biophysicist in Profile



Richard Ludescher

The 12 teaching awards he has received so far attest to what drives Rutgers University's Richard Ludes-cher: his passions for biophysics and the education of future scientists.

Ludescher was born in Dubuque, Iowa, to Oliver and Margaret Ludescher, and grew up there with his brothers Bill and Chris and sister Hannah. "I was always in trouble for taking things apart," he explains, including a camera from his grandfather. At the age of nine his parents bought him a chemistry and erector set that included a microscope. By age 11 he was convinced his future lay in medicine. To get a head start, he memorized all the bones in the human body.

Once he entered Wahlert High School, however, his initiative suddenly dissipated. "I had my own interests," he states, "and they weren't always the interests the teachers had." He got good grades in the classes he liked, but not so in all the others. Steering clear of sports, he became the literature editor of his high school newspaper by his senior year. After graduation, he attended the University of Toronto but, not seeing eye to eye scholastically, transferred to the University of Iowa after one semester.

His interest in social sciences, especially archeology, led Ludescher to major in anthropology. "I thought anthropology would be exotic," he reminisces, but by his junior year he realized anthropology was not his calling and changed his focus to philosophy.

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After graduation, he began work on a PhD in philosophy at the University of Iowa, but quickly realized that was a mistake as well after one semester. Bored by school and not sure what he wanted to do, Ludescher worked odd jobs for awhile. Deciding that he wanted to find a fulfilling career, in the fall of 1977 he re-enrolled as an undergraduate at the University of Iowa in basic sciences.

"I got sufficient background to apply to graduate school in chemistry or biology," says Ludescher, who worked in a biology lab under Carol Newlon. "He worked in my lab on identifying yeast cell cycle mutants that cause the production of defective mitochondria," says Newlon, now Chair of the Department of Microbiology and Molecular Genetics at UMDNJ-New Jersey Medical School in Newark. "The thing that most impressed me about Rick, who at that point was trying to figure out 'what he was going to do when he grew up', was the depth of his thinking as well as his skills in math and chemistry." In the winter of 1976-77, Ludescher attended a lecture by Frank Stahl, now professor emeritus at the University of Oregon, whose experiment on the semi-conservation mechanism for replication of DNA in the late 1950s earned him worldwide recognition. Following the lecture, he was able to talk to Stahl, who noticed Ludescher's love of physical biochemistry. Stahl recommended that he go to the University of Oregon to study molecular biology. Later that year Ludescher graduated from the University of Iowa and moved to Oregon to start work on his PhD in chemistry.

In 1984, PhD in hand, Ludescher left Oregon to take a postdoctoral fellowship at the University of Minnesota Medical School with David Thomas. "He did research on the application of time-resolved phosphorescence to muscle protein structural dynamics," says Thomas. "He combines a profound understanding of photo-physics with an appreciation for the complex structural dynamics of proteins and other biomaterials." After three years at Minnesota, Ludescher decided it was time to move on. He found a job at Wichita State University in the chemistry department, but within a year "saw an ad for the science department at Rutgers for protein chemists."

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Eighteen years later he remains at Rutgers, where he works on developing optical techniques to look at local structure and mobility in an amorphous, solid biomaterial. "I think what I'm doing now is really enjoyable because it involves an area which has always been my love in science: optical spectroscopy," he says. "It involves identifying novel molecules with unusual spectroscopic properties and trying to identify how those properties can report on the local environment."

Ludescher is also the graduate and undergraduate program director for the Foods Science Department. At Rutgers, Ludescher has the challenge of making undergraduates "understand what are really advanced topics in physical chemistry even though they have never had an advanced course in physical chemistry," he explains. Developing methods to teach students these theories of physical chemistry—without ending up with a lecture hall full of blank stares—took a lot of practice. His methods have evolved by looking at the problem in a practical way and working towards the theory. "I have to approach it in an intuitive fashion rather then a quantitative fashion," he explains.

Ludescher has a real passion for education. "Teaching has an immediate return," he states. "I really enjoy working with students. Even on the level of research I do, it's almost all on the level of working with students." His contact with undergraduate and graduate students has spurred many innovative programs to help them better understand science. He believes biophysics is extremely important and encourages young students to think about the world in a scientific way. He also believes biophysics will continue to expand and become a major player in biomedicine. "It's going to play a strong role in molecular biotechnology," he explains. "As we more fully understand the physics and chemistry of these macromolecules and how they interact, we'll be able to manipulate them in novel ways." It is this devotion to teaching that has resulted in so many awards, the most recent of which is the 2005 Endel Karmas Award for Excellence in Teaching. These awards are well deserved according to Suzanne Scarlata, professor of Physiology and Biophysics at Stony Brook University, who says that "as far as education, Rick is truly gifted in generating student excitement about science."

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Ludescher attended his first Biophysical Society meeting in 1981 in Denver, on a student travel award. "I just had a good time," he raves. "I enjoyed the science. I enjoyed the people I met." He has missed few meetings since. "The kind of science that is presented there is the kind of science I love," he admits. He also confesses that the meetings have an element of a reunion to them. There are some people he sees only at the Annual Meeting. He has also met new colleagues and collaborators there.

Richard Ludescher (right) with fellow Biophysical Society member Cathy Royer (center) and his wife Lisa (left) on a hilltop just north of Montpellier, France.

Since that initial meeting, Ludescher has become active in the Society, having served on and been elected Chair of the Education and the Professional Development committees. "Rick looks for new, effective solutions for presenting biophysics at many levels, mostly undergraduate and graduate, but also how science is presented in the lower grades," says fellow Education Committee member Sandy Ross, of the University of Montana, "this includes how the Society might effectively deal with school boards that, for example, wish to restrict teaching evolution." Ludescher be-lieves his continuous contact with students, as well as his varied background, have helped him while on the Education Committee because he can related to student needs.

Since 1992, he has been involved in the annual Student Symposium, often presenting an introductory lecture that explains biophysics to high school and undergradate students for the first time in ways that immediately engage them.

Aside from teaching and research, Ludescher is an ardent book collector, a hobby that can get expensive. He also enjoys hiking and kayaking with his wife, Lisa, a graphic designer who teach es at the local community college, and son Sam. Sam, who turns 13 this month, shows a talent for math and science, but does not show much interest in those areas yet.

As Ludescher's personal experience shows, the road to a research career is not always direct; it has a lot of twists and turns. Richard uses these experiences to help students who are following a similar path.

Membrane Biophysics
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sium. For additional information on the responsibilities of the Chair, please see our section on the webpage or contact this year's chair, *Nael McCarty* (nael.mccarty@biology.gatech.edu).

The 2007 Cole Award Dinner will be held on Saturday evening, March 3 (location to be announced) following the Subgroup Symposium presented that afternoon. The Kenneth S. Cole Award is presented annually to an investigator who has made a substantial contribution to our knowledge of membranes. If you want to attend the dinner but did not prepay with your dues, you can reserve a ticket by contacting *Carol Beck* at carol.beck@jefferson.edu . To encourage student participation in the subgroup, the subgroup is once again offering a free ticket to the Cole dinner for any student member of the Biophysical Society who enters the student poster competition. Additional free tickets will be available on a lottery basis to student members who do not enter the poster competition. The deadline for students to request tickets is January 31, 2007.

—*Nael McCarty* , Chair

Members in the News



Three Society members recently received the Pioneer Award, which honors scientists who use new and innovative ways to complete biomedical research. Pictured above from left to right, the awardees were *Arup K. Chakraborty*, of MIT and member since 2006; *Lila Gierasch*, of the University of Massachusetts and member since 1981; and *Gary J. Pielak*, of the University North Carolina, Chapel Hill and member since 1990.

Marc Baldus, of Max Plank Institute and member since 2001, received the Founders Medal of the International Council on Magnetic Resonance in Biological Systems. This award is given to scientists who have made contributions to developments in the magnetic resonance in biological systems.

Have you or someone you know who is a Biophysical Society member recently received an award or have accomplished something newsworthy? Then send information and a photo to Lee Bien at lbien@biophysics.org