Physics prof, students earn national honors

Don't believe the *statement that there are no places left to explore. A world of unknowns is all around you, and a Drake professor and his students are trying to go there.*

Dr. Klaus Bartschat, professor of physics, is guiding three undergraduates in depicting, on computers, the actions of electrons that strike, or "excite," atoms. Starting with general mathematical formulas, the students have used the software package "Mathematica" to create moving, three-dimensional pictures of these collisionally excited atomic states.

"This project fits right in with the trend of getting physics across with simulations in addition to formulas and experiments," Bartschat says. "With the software and hardware available today, we can create images that were unthinkable five years ago."

The professor knows. An expert on the theory of atomic collisions, Bartschat has received research grants for more than $500,000 since coming to Drake in 1988. He frequently publishes in professional journals, addresses international conferences, communicates with other scientists worldwide and has served on numerous scientific committees and organizations.

For his contributions to the theory and numerical treatment of atomic collisions, Bartschat recently was elected a Fellow of the American Physical Society. Only one-half of one percent of the society's membership is recognized each year by election to fellowship status. He and other new fellows were honored at the society's Centennial Conference in March in Atlanta, where Bartschat gave an invited talk. Up to 9,000 people were expected to attend the event, making it the biggest physics meeting ever held.

Making a name for Drake in Physics are (from left) Professor Klaus Bartschat and undergraduates Dave Loveall, Melissa Hamley and Bruce Miller.

In addition, the three undergraduates — Melissa Hamley, a junior from Oak Grove, MO; Dave Loveall, a senior from Sheldon, IA; and Bruce Miller, a senior from Lakeland, MN — presented their research project at a special undergraduate session of the Division of Atomic, Molecular and Optical Physics meeting, part of the APS Centennial Conference. Theirs was one of only five undergraduate papers invited for presentation.

"I expect we'll get a lot of input at the meeting, so we'll get ideas for how to improve the [computer] code we developed," said Hamley, a mathematics major, before the conference. "We've been working on the project so hard, we haven't had time to get nervous." The three students have created a website as part of their research project, which is funded by a National Science Foundation grant. The site at <http://bartschat.drake.edu/dloveall> contains 3-D graphs and movies that can be viewed with various types of software.

"All the data we have correspond to a big table of numbers," says Loveall, who wrote most of the computer code for the project. "But even a great mathematician would have no idea what it means. Our project combines all the information into a version you can see."

Article transcribed from Update – Alumni News of Drake University, Spring 1999 by David Loveall