

Graduate and Undergraduate Research Opportunities

The nano-fs lab is a femtosecond laser spectroscopy and microscopy laboratory at the South Dakota School of Mines and Technology, in Rapid City, South Dakota. Our research focuses on nanoscience aimed at developing alternative energy technologies, for example, solar energy and biofuels. We are employing novel optical methods to probe the electronic properties of nano-structured materials for improved solar cells, to visualize the molecular mechanisms of the enzymatic conversion of cellulose to fermentable sugars (for biofuels). Other projects involving laser spectroscopy and imaging are available.

10-12 week undergraduate research experience: Up to 3 positions are available for Junior-Senior Physics or Engineering students. Students will be given a project in the lab, and become part of our research team. A stipend of \$3500 and partial housing allowance will be made available to the selected candidate(s).

Graduate Studies: Approximately 2-4 graduate assistantships are available to students interested in doing experimental applied physics research while pursuing the PhD in an interdisciplinary Nanoscience and Engineering PhD program focused on the science and engineering of nanomaterials. These positions carry an annual stipend of \$25,400 and partial tuition remission.

About the school and the area: SDSM&T is a small Engineering and Science College (approximately 2300 students) located at the foot of the Black Hills in Rapid City, South Dakota. Graduate class sizes are small (typically 7 to 10), participants in the Nano PhD program are primarily drawn from Physics, Chemistry, Materials Science and Chemical Engineering. The program encourages cross-disciplinary study, and students from the constituent disciplines typically work together in courses and research. The research foci in the physics department are condensed matter theory and experiment, and optical physics. With the recent NSF selection of nearby Homestake Mine, in Lead, SD, as the site for DUSEL, we expect the department to grow, and link to neutrino physicists working at DUSEL. More information about the program and the school can be found at the web-links listed below.

At the foot of the Black Hills, the school is within an hours drive of Mt. Rushmore, the Badlands, Devils Tower and historic Deadwood. The area is attractive for hiking, biking, hunting and fishing, and is rich in the history of the Black Hills mining era and the Native American Sioux Nation.

How to apply: Email Steve.Smith@sdsmt.edu, write or call:

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Department of Physics

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Links:

nano-fs lab: <http://nano-fs.sdsmt.edu>

Nano SE PhD program facts: <http://www.gradsource.com/profile.cfm?artid=27144>

Nano SE program description: <http://graded.sdsmt.edu/academics/programs/nano>

Physics at SDSM&T: <http://odessa.phy.sdsmt.edu/>

DUSEL: <http://www.deepscience.org/>

