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DIVERSITY IN ACTION

Fermilab offers bright researchers key internships

Students eager to "peer into the nature of matter, energy, space and time" can apply for an exciting summer internship at this particle physics research facility

Fermilab equal opportunity office manager Dianne Engram: we're here to explore.

The summer internship program in science and technology (SIST) at Fermi National Accelerator Laboratory hosts students who are on track to become key researchers in R&D labs. At Fermilab, an international center of inquiry, they work on particle physics research into the laws of nature and the cosmos, and peer into the nature of matter, energy, space and time.

"Students have options," says Dianne M. Engram, equal opportunity office manager. "When they pick us, we want it to be because we have the best research opportunities."

Fermilab is managed by the Fermi Research Alliance, a partnership of the University of Chicago and Universities Research Association Inc, a consortium of eighty-six research universities, for the U.S. Department of Energy's Office of Science.

The lab is located on 6,800 acres in suburban Chicago. Its particle accelerators offer unique research opportunities. The lab welcomes thousands of scientists from around the world each year.

"This is a true R&D lab," says Engram. "We don't have a product or deadlines. We're here to explore and develop. Interns may work on prototypes of equipment that will be used on future experiments, or test materials to see if they will withstand the rigors of an experiment."

The evolution of FermiLab

Following the lead of the Civil Rights Act of 1964, the lab, which is a federal contractor, began reaching out for diversity. Engram notes that Fermilab is a participant in the National Consortium for Graduate Degrees for Minorities in Engineering (GEM) and provides internship opportunities for masters students in the GEM program. In fact, she says, there are five GEM alumni working at Fermilab as fulltime engineers and computing professionals.

The SIST program welcomed its first interns in 1971, before universities offered a computer science major, so the early interns were engineers and mathematicians. Today, SIST interns are undergraduates majoring in physics, electrical engineering, mechanical engineering, mathematics or computer science.

Initially, SIST was a summer work program, but when Engram took it over in 1990, she expanded the program to make it more relevant to the students' majors. SIST now includes a weekly scientific lecture series to orient students to the lab and its work. Topics range from basic explanations of the lab's equipment to its work in cancer therapy and its projects that search for dark matter. One of the summer 2014 student lectures was on "the green physicist's dilemma."

Engram explains that interns aren't always placed in their current field of study. The SIST committee sometimes selects stretch assignments that will help them grow intellectually and professionally.

Requirements and rewards

At least a dozen SIST undergraduates are selected each year from a pool of more than 200 applicants. The interview process includes a Skype meeting with the full committee, which includes scientists and engineers. "This gives prospective interns an opportunity to ask questions about the scope of our research and how they will fit into the overall picture. Wherever they work," she says, "they will emerge from the summer as experts in their fields."

The Fermilab summer internship in science and technology welcomed its 2014 interns, who lived in Illinois during the R&D-intensive, paid twelve-week program.

Interns need to pack only their clothes and a laptop. They fly or drive to Illinois, live in furnished apartments and share leased cars subsidized by the lab during the twelve-week summer program. Interns earn a weekly salary of more than $600, depending on credit hours completed. They work forty hours a week and provide final reports at the end of the internship. In their free time, they're encouraged to take advantage of Chicago's cultural activities.

SIST is only one of the lab's many internship programs, and SIST interns have opportunities to connect with students in other programs. Around 300 interns from around the world spend the summer at Fermilab.

Interns may be invited to travel with their research groups to attend collaboration meetings, such as the July NOvA meeting in Minnesota. They may also be named as co-authors on scientific papers as a result of their work at the lab.

"They do valuable work that has to be documented," Engram says. "They can put a scientific citation on a resume and refer to research on a website, which makes the internship particularly valuable."

Every intern is required to submit a written report at the conclusion of the internship and present it orally to the lab staff. Interns are encouraged to share their reports when they return to campus and at professional society meetings such as NSBE and SHPE. "We ask them to be our ambassadors on their home campuses," Engram says.

Most interns move on to advanced degrees. Two former interns are currently accelerator operators at the lab. Another, who completed his MSME through GEM, is a regular fulltime engineer.

"We want this internship to impact how students refine their choice of major," she says. "Sometimes students discover they are interested in a subdiscipline, such as astrophysics. We want to impact them early enough to make that decision."

Applications for the SIST program are available online. The deadline is February 6. Students must be U.S. citizens, permanent residents or foreign nationals who have received Optional Practical Training authorization from the U.S. State Department.

"Having an internship on your resume is more than just important," Engram says. "It's really critical. You can have all the theoretical knowledge in the world, but those who have the experience and know how to apply it are at a big advantage." *D/C*

Fermilab

Fermi National Accelerator Laboratory
www.fnal.gov

Headquarters: Batavia, IL
Employees: 1,750
Budget: $368 million FY 2013
Business: Physics R&D

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