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National Science Foundation grant will educate next generation of semiconductor researchers

University of Dayton

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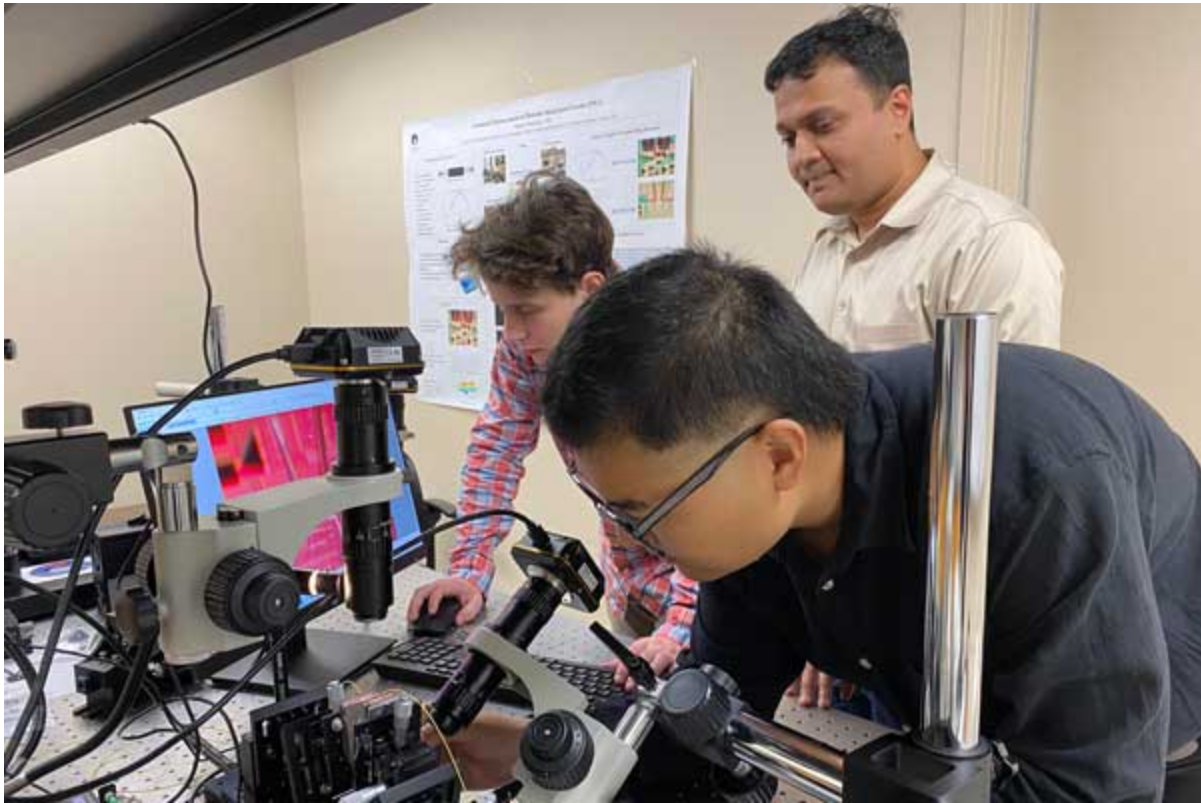
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National Science Foundation grant will educate next generation of semiconductor researchers

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Tuesday March 21, 2023

The University of Dayton has received \$353,378 from the National Science Foundation to educate the next generation of researchers working on semiconductor materials and electronic and photonic devices.

Undergraduate college students nationwide are invited to apply to a 10-week summer session where they will receive hands-on training and conduct research in the UD Nanofab Lab under the guidance of UD physics, electro-optics and photonics, and chemical and materials engineering faculty. Students will present their work at the annual UD summer STEM research symposium. The students' work also will help support research at the Air Force Research Laboratory at Wright-Patterson Air Force Base.

Interested students can see a full program description and link to apply below. Participants will receive a stipend, housing, travel funds and allowance for materials, supplies and meals.

"This program helps to promote scientific progress in basic and applied scientific research in the field of semiconductors and it helps to develop a diverse workforce with the necessary skills to succeed in the quickly growing semiconductor industry, which is critical for the nation's technology advancement and national security," said [Jay Mathews](#), a UD associate professor of electro-optics and physics who is overseeing this NSF Research Experiences for Undergraduates program at the University of Dayton.

[Read the NSF abstract about the project here.](#)

Last August, [the University of Dayton joined leading Midwest research institutions in the Midwest Regional Network to Address National Needs in Semiconductor and Microelectronics](#) to support the semiconductor and microelectronics industry's research, supply chain and workforce needs.

A month later, [14 University of Dayton faculty and staff in six labs became part of the Intel-funded Ohio-southwest Alliance on Semiconductors and Integrated Scalable Manufacturing](#) to help develop a workforce for Ohio's semiconductor industry needs.

Anyone interested in learning more about the University's semiconductor alliances can contact [Andrew Sarangan](#), chair of UD's Department of Electro-Optics and Photonics, at sarangan@udayton.edu.

For interviews, please contact Shawn Robinson, associate director of news and communications, at srobinson1@udayton.edu.

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REU Site: Semiconductor electronics and photonics at University of Dayton

Program dates: May 29-Aug. 4, 2023

Application due date: Monday, April 10

Apply here: <https://forms.gle/5XNW8hSJ96cZBDLY6>

Description

The REU program will provide a fully immersive 10-week experience for undergraduate students to perform research and receive training in semiconductor materials, electronic and photonic devices, and manufacturing. Each REU participant will receive:

- A stipend in the amount of \$6,000.
- Housing in UD student dormitories. Students will be housed in single rooms, and all the summer research students will be housed in the same dormitory.

- Partial meal allowance. Dining options on campus are limited during the summer, but participants will receive a small allowance for meals on campus.
- Allowance for travel funds to present results of summer research at a scientific conference in the academic year following the REU. These funds are intended to supplement funding from participants' home institution to help attend a conference.
- An allowance for materials and supplies for the research project. The research mentors will receive \$500 stipend for purchasing materials and supplies that are necessary for the participant to complete the research project.
- Weekly workshop on semiconductor manufacturing, which will include training at and use of the UD Nanofab facility. The workshop will give an overview of how semiconductor devices and integrated circuits are manufactured, including topics such as semiconductor material fundamentals, basic device physics, techniques for lithography, deposition of materials, etching of materials, layout and design, and applications of integrated circuits. This workshop will include Python programming assignments, but no previous experience with Python is necessary.
- Professional development workshops and training. Topics will include an overview of graduate school and how to apply, applying for fellowships and scholarships, technical writing,
- Focused mentorship under a UD faculty member. Each UD faculty member will have completed a formalized training program in mentorship, and the mentors will work closely with the participants to help them progress.

Eligibility

- Must be enrolled in an undergraduate degree program in science or engineering and have status as an active student at an accredited college or university.
- National Science Foundation funding is only for US citizens, but we may have additional funding through the UD Increasing Diversity through Mentored Research program, so we encourage international students to submit an application.
- Applications from students at historically-Black colleges and universities (HBCUs), Hispanic-serving institutions, or other minority-serving institutions are encouraged to apply, as are students from underrepresented groups in STEM (Women, Black, Latinx, American Indian, Alaskan Native, Hawaiian Native, Pacific Islander).

Selection criteria

This program will use a holistic approach to evaluate the applications, taking into account academic performance, motivation, lack of research opportunities available at the home institution, financial need, and personal background.

Diversity and inclusion

The Physics department and the Electro-Optics and Photonics department at UD have a long history of working with underrepresented students in STEM, especially from HBCUs and HSIs. This program grew from the Increasing Diversity through Mentored Research Physics Summer Experience, which worked directly with HBCUs and HSIs to bring underrepresented students in STEM to UD for summer research. The primary investigator on the REU, Dr. Jay Mathews, has lead numerous efforts involving diversity, and he received the 2019 Diversity and Inclusion Advocacy Recognition prize from Optica for his efforts.

Application requirements

- Complete the application form on Google, which will also have you upload the following documents.
- Personal statement. This should be submitted in PDF format and have a maximum of 750 words. This is where you can tell us about yourself, why you are applying to the program, and how this+ program will help you in your future career. You can also address things like your financial need, having overcome significant obstacles or personal events that have affected your academic performance, or your experience as a student from an underrepresented group in STEM (Women, Black, Latinx, American Indian, Alaskan Native, Hawaiian Native, Pacific Islander).
- Your current resume or curriculum vitae (CV) in PDF format.
- Your unofficial transcript from the college or university at which you are a student. There is no minimum GPA for this program.
- Contact information for two (2) professional references. Choose references that are familiar with your academic performance or can speak to your potential for success in research.

Some possible research areas for REU projects:

- Semiconductor lasers and optical emitters for silicon photonics
- Phase change materials for reconfigurable photonic devices and optical memory
- Infrared photodetectors for low-light imaging and telecommunications
- Direct laser writing of electronic and photonic devices
- Synthesis and characterization of semiconductor nanoparticles
- Memristor devices for neuromorphic computing

Funding

The REU program is sponsored by National Science Foundation Award # 2244146. Funds provided by this award include support from the Semiconductor Research Corporation (SRC).

Contact information

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