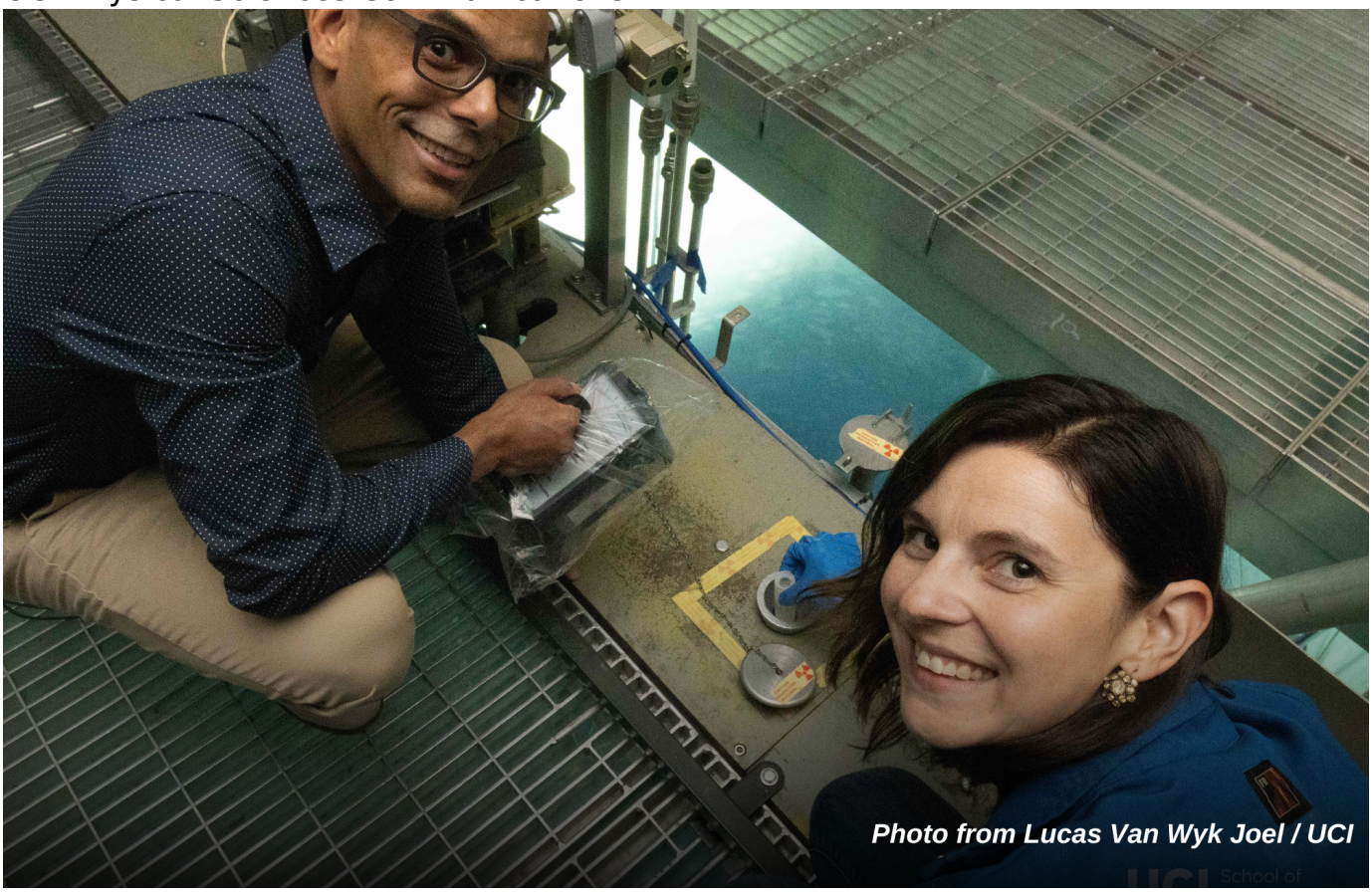
A new era for the UC Irvine Nuclear Reactor Facility

Professor Sarah Finkeldei is bringing new life to the decades-old facility.
Monday, March 25, 2024
Lucas Van Wyk Joel
UCI Physical Sciences Communications



Professor Sarah Finkeldei and Professor Shen Dillon in UCI's Nuclear Reactor Facility in Rowland Hall, getting ready to send a sample down to the reactor core for irradiation experiments.

Picture Credit:
Lucas Van Wyk Joel

The UC Irvine Nuclear Reactor Facility (UCI NRF) opened in 1969 under the leadership of Nobel laureate and founding chair of the UCI Department of Chemistry Professor Frank Sherwood "Sherry" Rowland.

The reactor once helped analyze the bullets that killed President John F. Kennedy, and today Assistant Professor Sarah Finkeldei of the UC Irvine Department of Chemistry, alongside Reactor Facility Manager John Keffer, is ushering in a new era for the facility.

UCI NRF recently collaborated with nuclear energy company Serva Energy, which last year succeeded in creating an isotope at UCI NRF — Actinium 225 — that carries immense promise as a treatment for certain types of cancer, including late-stage cancers. It is a collaboration Finkeldei hopes will open the door for similar projects in the future.

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UCI NRF is also helping support the training of the next generation of nuclear scientists through Department of Energy funding for undergraduate involvement in facility activities.

Undergraduates involved at UCI NRF include Cristian Bautista Triana, Jacqueline Ferrer, Lauren O'Brian and Jack Shire of the Departments of Chemistry, Chemical and Biomolecular Engineering, and Physics & Astronomy, respectively.

"Having undergraduate students there to help with the project allows for the training of the next generation of nuclear scientists right here at UCI," said Finkeldei. Undergraduates "get industry contacts, and they work hands-on at the reactor. There aren't many places in the U.S. or the world, where you can do that."

Finkeldei sees UCI NRF student involvement as a key part of what the facility will be able to achieve in the years to come. "It is essential to continue expanding our nuclear capabilities at UCI in order to enable new research directions, including the recent medical isotope developments," Finkeldei said.

For their work at UCI NRF, undergrad Jack Shire won a $10,000 scholarship from the Department of Energy's Office of Nuclear Energy as part of the University Nuclear Leadership Program (UNLP). Funding for the scholarship came from a DOE grant awarded to Finkeldei, enabling UCI students to apply for scholarships and fellowships over the next 10 years.

Read more: Professor Sarah Finkeldei wins $4.3 million DOE grant to push nuclear energy into the future

The Nuclear Regulatory Commission also licensed in total four undergraduate and graduate students as nuclear reactor operators, after the students trained for a year at UCI NRF.

Besides the training and research happening at UCI's NRF, in 2023 Finkeldei organized a UC Office of the President-funded Nuclear Science Workshop alongside Director Dr. Mavrik Zavarin of the Seaborg Institute at Lawrence Livermore National Laboratory (LLNL). The one-week workshop took place at LLNL and the University of California Livermore Collaboration Center (UCLCC), and it provided 20 undergraduate students from across UCI a hands-on opportunity to learn about nuclear science, tour laboratories at LLNL and network with a slew of national labs, including LLNL, Los Alamos National Laboratory, Idaho National Laboratory, Oak Ridge National Laboratory and Lawrence Berkeley National Laboratory. The workshop was exclusively for UCI undergrad students, two-thirds of whom came from underrepresented groups or were first-generation students.

The Nicholas Endowment, a philanthropic organization based in Irvine, is funding the workshop this year. The workshop will take place at Lawrence Livermore National Lab and the UCLCC, and will host about 40 UCI undergraduates.

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