



50% ●●●●●●●●●●
 Of all Nuclear Engineering PhDs were supported with DOE-NE IUP or NEUP funds from 2010-2018

Building the Nuclear Workforce of Tomorrow: DOE-NE's University Programs

The Department of Energy, Office of Nuclear Energy (DOE-NE) established the Nuclear Energy University Program (NEUP) in 2009 to place its university support under one umbrella. NEUP funds nuclear energy research and equipment upgrades at U.S. colleges and universities and provides student educational support. In addition to NEUP, DOE-NE administers the Integrated University Program (IUP), which works to attract qualified nuclear science and engineering (NS&E) students to nuclear energy professions. The program provides undergraduate scholarships and graduate fellowships leading to a major or minor degree or certificate in the fields or disciplines of NS&E relevant to the DOE-NE mission.

Since 2013, the Consolidated Innovative Nuclear Research (CINR) Funding Opportunity Announcement (FOA) has centralized DOE-NE's competitively funded programs. The CINR FOA includes funding opportunities for universities, national laboratories and industry/utility entities to perform high-impact research.

CINR helps the DOE accomplish its mission of leading the nation's investment in the development and exploration of advanced nuclear science and technology.

IUP and NEUP have supported more than 2,400 undergraduate and graduate level students in obtaining science, technology, engineering or math (STEM) degrees.

Of those students pursuing nuclear engineering degrees between 2011-2018, NEUP supported 331 Ph.D., 339 master's and 127 undergraduate students. IUP supported 162 nuclear engineering graduate degrees. Undergraduate data for the IUP program is currently unavailable. According to a 2018 Oak Ridge Institute for Science and Education report, 1,334 Ph.D. and 2,857 M.S. degrees were awarded by nuclear engineering programs in the United States^{1,2} between 2010 and 2018. DOE-NE has directly supported more than 50% of nuclear engineering Ph.D. degrees obtained in the United States.

The vast majority of IUP Fellows have gone on to start their own companies, work in industry, become faculty members at distinguished universities or researchers at national laboratories. Students funded by NEUP on research and development (R&D) projects are not tracked past graduation, but many of these students are active in the nuclear academic, national laboratory and industry communities. Here are a few IUP Fellow stories.



Raluca Scarlat, University of California, Berkeley

A 2009 IUP Fellowship recipient, Raluca Scarlat, studied fluoride-salt-cooled high-temperature reactor (FHR) technologies in Per Peterson's research group at University of California, Berkeley. Raluca is now an assistant professor of nuclear engineering and leads a research group that investigates the transport of tritium and other radioisotopes in molten salts. Her research is focused on thermal hydraulics and nuclear reactor safety in these molten salt systems. Since finishing her fellowship, Raluca has been awarded three NEUP R&D Cooperative Agreements to study tritium issues, overcooling transients in FHRs and molten salt thermal hydraulics. She has advised three other IUP Fellows and many other NEUP-supported graduate students since 2014.



Richard Skifton, Idaho National Laboratory

Working in Idaho National Laboratory's High Temperature Test Laboratory (HTTL), Richard Skifton is a research and development (R&D) scientist with expertise in the field of thermofluids. He is a 2012 IUP Fellow with experience in component design, computational simulation and experimental validation. Currently, he is building nuclear-grade sensors for R&D that happens at the lab. He is always looking for ways to improve thermocouples (high-temperature irradiation-resistant thermocouples [HTIR-TCs]), thermal conductivity probes (needle probes) and LVDT-based sensors to measure the geometry of reactor in-pile fuel rods (diameter gauges).



Ethan Chaleff, Kairos Power LLC Product Development Team

Now an employee of Kairos Power, Ethan Chaleff is assisting in the development of the FHR, supported by multiple NEUP IRPs. He is a 2013 IUP Fellow who studied molten salt reactor technologies as part of Dr. Tom Blue's research group at The Ohio State University. He has expertise in heat transfer, reactor physics, materials science and chemistry. Ethan integrates regulatory and customer requirements into the product development process at Kairos Power LLC.

REFERENCES

1. Oak Ridge Institute for Science and Education (ORISE), "Nuclear Engineering Enrollments and Degrees Survey, 2017-2018 Data." ORISE Number 80. April 2019. Accessed: August 13, 2019. <https://orise.orau.gov/stem/reports/ne-brief-80-2017-18-data.pdf>
2. Oak Ridge Institute for Science and Education (ORISE), "Nuclear Engineering Enrollments and Degrees Survey Data 50-Year Trend Assessment, 1966-2015." ORISE, March 2017. Accessed: October 5, 2018. <https://orise.orau.gov/stem/reports/ne-assessment-2017.pdf>

Release Date: October 2019

