



U.S. DEPARTMENT
of **ENERGY** | Office of
Science

Andrew Swope



Contact Workforce Development for Teachers and Scientists

Address

U.S. Department of
Energy
SC-3.3/ Forrestal
Building
1000 Independence
Ave., SW
Washington, DC
20585

Email

Send us a message

sc.wdts@science.doe.gov

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Materials Leap from Community College to National Laboratory

**Everett, Washington, student gains research experience
through DOE Office of Workforce Development for
Teachers and Scientists' Community College Internships
program**

By Allan Brettman

Andrew Swope couldn't believe a national laboratory would hire a community college student.

"I'm like no way," said Swope.

It was true.

Swope was a student at Everett Community College in 2022 when he heard about the U.S. Department of Energy (DOE) Office of Science's Office of [Workforce Development for Teachers and Scientists \(WDTS\) programs](#). The WDTS offers six core programs, including the one that appealed to Swope—[Community College Internships](#). Like other WDTS offerings, the Community College Internships (CCI) program provides opportunities to expand technical skills and expertise while exploring career pathways in science, technology, engineering, and mathematics (STEM).

"My statistics instructor, Matthew Fuentes, returned from a supercomputing conference and he was talking about all the stuff he'd seen there," Swope recalled. "And he says, 'By the way, the national labs have this internship program for community college students.' And I'm like, holy smokes, I am so applying for that."

At the time, Swope, the son of a Boeing Co. engineer, had envisioned a career in science, but a national laboratory was not yet part of the equation. That changed quickly.

National laboratory in his backyard

He soon learned there was a national laboratory practically in his backyard: [Pacific Northwest National Laboratory \(PNNL\)](#) about 200 miles away in Richland, Washington. And Swope learned PNNL is a global leader in materials science, one of his areas of career interest.

"I tailored my CCI application to reflect my strengths and my awareness that PNNL is strong in materials science and engineering," Swope said.

In the summer of 2023, Swope found himself working in the lab of [Ankit Roy](#), a computational scientist in PNNL's Materials Dynamics group. By the time the 10-week internship had ended, Swope had contributed to two projects and was listed as a co-author on a study funded by the DOE Office of Nuclear Energy and published in Materialia, "[Chemical composition based machine learning model to predict defect formation in additive manufacturing](#)."

"Andrew demonstrated exceptional skill and dedication during his time in our lab," Roy said. "He was a quick learner, picking up complex machine learning concepts in a short span and delivering excellent results. He was able to work on multiple projects, including the prediction of corrosion rates in magnesium alloys. He has a bright future ahead in the field of materials science."

First CCI internship leads to second

Swope returned to [Everett Community College](#), located north of Seattle, with a clarified vision for his future. That vision included a return to PNNL.

“It was really cool, being able to work in an actual, professional STEM environment,” Swope said. “There’s a lot of interesting stuff that you never hear about in a classroom unless you’re actually in the environment. I had not had any materials science exposure at all when I went in, so I had to basically pick up everything as much as I could while working on it.”

Swope applied to CCI again in late 2023 and was again accepted to work at PNNL, which is located in south-central Washington State, along the Columbia River. PNNL is one of 17 DOE national laboratories.

This time, in early 2024, he worked in the lab of [Wu Xu](#), chief scientist in the Battery Materials and Systems group in the Energy Processes and Materials Division at PNNL.

“I worked with electrolyte compositional testing for a specific battery chemistry,” Swope said. “The work I was doing explored how a specific electrolyte composition affected the performance of those cells. To be honest, it would have helped to have a background in chemical engineering. I spent a lot of nights on my own reading and trying to understand chemical interactions and their behaviors.”

Quick learner makes important discoveries

Nevertheless, Swope was a quick learner, said Xu, who was a co-mentor with [Ju-Myung Kim](#), a PNNL materials scientist.

“Even though Andrew had never conducted battery research previously,” Xu said, “he got the experimental skills quickly and did well in his daily research activities like electrolyte preparation, coin cell assembly and testing, and data collection and analysis. The project Andrew worked on during his internship is focusing on the development of advanced electrolytes for lithium metal batteries under the [Battery500 Consortium](#).”

In just a year, Swope made two important discoveries thanks to CCI. He learned about the existence of PNNL and that materials science may be in his future.

“I definitely had never thought about materials science until last summer,” he said in June 2024. “We'll see where my degree takes me. But I would definitely consider working in a materials science field now.”

Swope, with his community college degree, will soon enroll at the University of Washington, pursuing a bachelor's degree in mechanical engineering. But first, he has another internship. He will be working at the Seattle-area office of Blue Origin, the space exploration company established in 2000 by Amazon founder Jeff Bezos.

“I may be working on one of the rockets they're designing, or helping design flight hardware,” Swope said. “It's just like at PNNL—they don't give you fluff intern projects.”