

NEWSROOM

[Home](#) / [News](#) / [2025](#) / [September](#) / The First Ripple - Student Research at JLab

THE FIRST RIPPLE – STUDENT RESEARCH AT JLAB

PHYSICS ALUM EXCELS AT TRANSLATING SCIENCE

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*Read time: about 2 min**Story courtesy of Jefferson Laboratory*

At the heart of Jacob Bird's experimental research with the U.S. Department of Energy's [Thomas Jefferson National Accelerator Facility](#) is something more foundational than data science or detectors.

Bird, a 2025 graduate and a [physics major](#), was a DOE [Science Undergraduate Laboratory Internships \(SULI\)](#) program participant at Jefferson Lab. He credits the power of mentorship for his dream of becoming a physics professor.

Whether he's helping students navigate the complex foundations of calculus, refine study strategies or apply to graduate school, Bird's passion for teaching began when he worked as a physics tutor.

"Working with students at different levels of physics and mathematics has shown me the importance of translating complex science into something digestible," said Bird. "It's been really fulfilling to watch them take on challenging ideas and gain confidence in themselves as they learn how to find solutions."

That experience reinforced his love for hands-on, experimental work and deepened his interest in a career in science, technology, engineering and mathematics (STEM).

Bird recalls his first SULI poster presentation as one of his proudest moments. "After a summer of intense research, I reached a point where I fully understood my project and could confidently communicate my findings," he said. "That experience showed me that research is not just about knowledge, it's about the ability to explain

your work to others.”

Now in his second SULI term, Bird credits his own mentors with helping him gain confidence, sharpen his problem-solving skills and clarify his career path. “My mentors have shaped my path in every way,” Bird said. “I’m especially inspired by [Dr. Peter Monaghan](#). He saw potential in me early on and helped guide me through the complexities of research.”

“I always like the analogy of throwing a pebble into a pond and watching the ripples. That is how it starts, with the mentor and the student,” said Monaghan, associate professor of physics at Christopher Newport, joint appointee at Jefferson Lab and Bird’s mentor. “You give them that initial nudge, and hopefully they go on to learn, grow and eventually mentor others.”

“His mentorship showed me what it means to be a dedicated scientist and a supportive mentor. I hope to pay that forward by helping future students the way Dr. Monaghan helped me,” said Bird.

“Students get a really good opportunity to broaden their horizons, learn about the science that goes on right on their doorstep at a world-class facility, interact with all the people there, and learn skills that they're not going to get in the classroom,” said Monaghan. “It's research, so they get the chance to build not just their knowledge of the science, but also their skills. The SULI program gives them the experience and the opportunity to do that.”

At Jefferson Lab, Bird supports the final installation and commissioning of the Coordinate Detector (CDet), part of the Super BigBite Spectrometer (SBS) experiment in Experimental Hall A.

The CDET is currently being used in an experiment to measure the ratio of proton’s elastic electric to magnetic form factors. The Jefferson Lab accelerator delivers a beam of electrons which interact with protons which are in a cryogenically cooled liquid hydrogen target. A small fraction of the incident beam electrons elastically scatter off the protons. CDET tracks the scattered electrons to aid in identifying the elastic scattering interactions from a large background of inelastic scattering interactions.

"My project focus is the final construction, commissioning and installation of the Coordinate Detector," he said. "That includes retrofitting each module to ensure light-tightness, valid power supply and completing the final installation."

Bird has begun a Ph.D. program in experimental nuclear physics at Old Dominion University. In five years, he hopes to be finishing that degree and applying for postdoctoral opportunities. Long term, he dreams of becoming a university professor who combines research, teaching and mentorship.

“The SULI program has played a huge part in helping me reach this point,” Bird said. “It has shown me the real-world impact of nuclear physics and helped me understand what kind of scientist and mentor I want to be.”

He encourages other students to apply to the program and be open to learning at every stage. “Progress in research isn’t always linear,” he said. “There are setbacks and challenges, but you grow through those moments. You learn to ask questions, to listen and to keep pushing forward.”