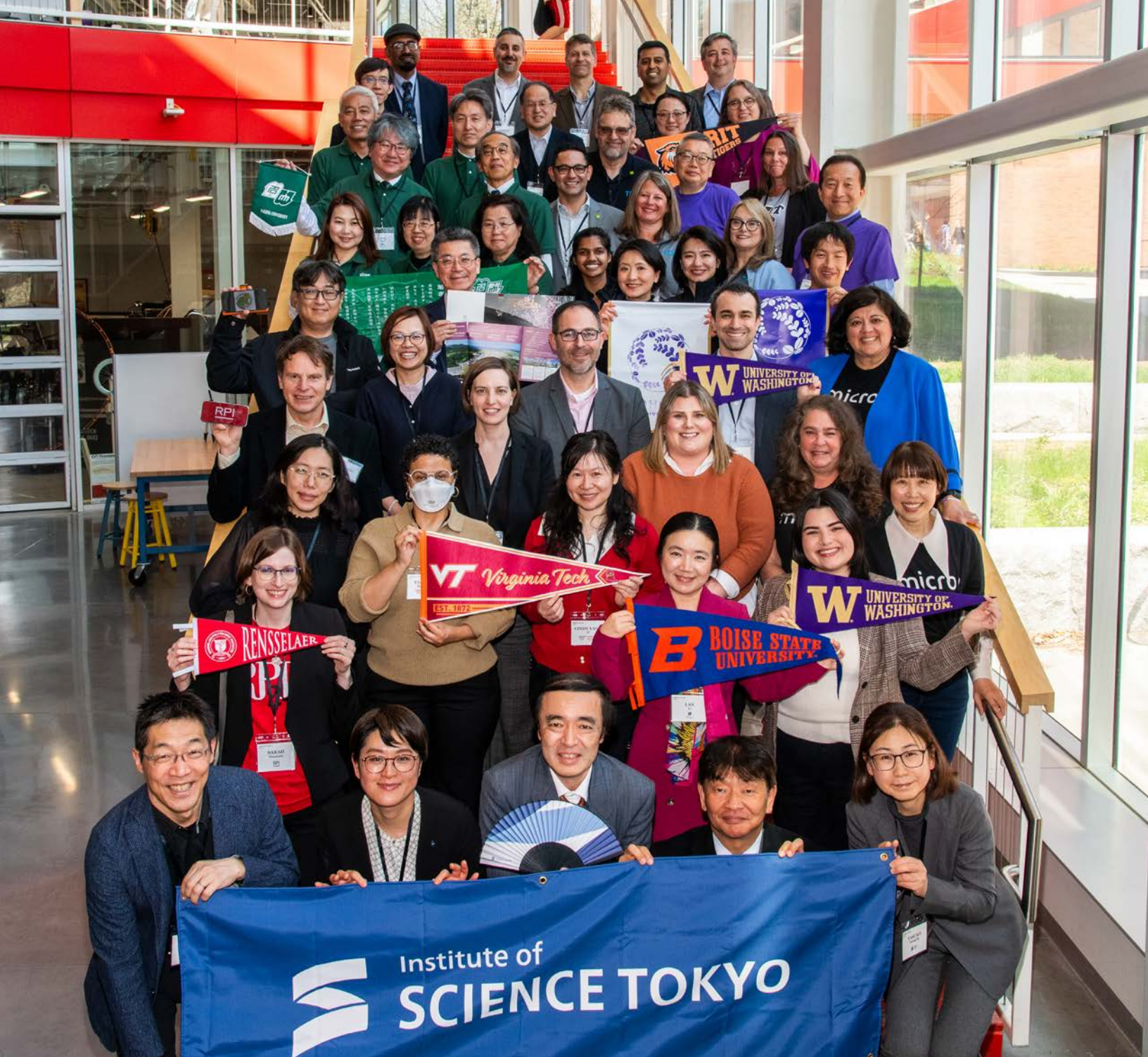




UNIVERSITY of WASHINGTON

UPWARDS

for the **Future** Network

2025–26
Year 3 Summary

UPWARDS Network Workshop

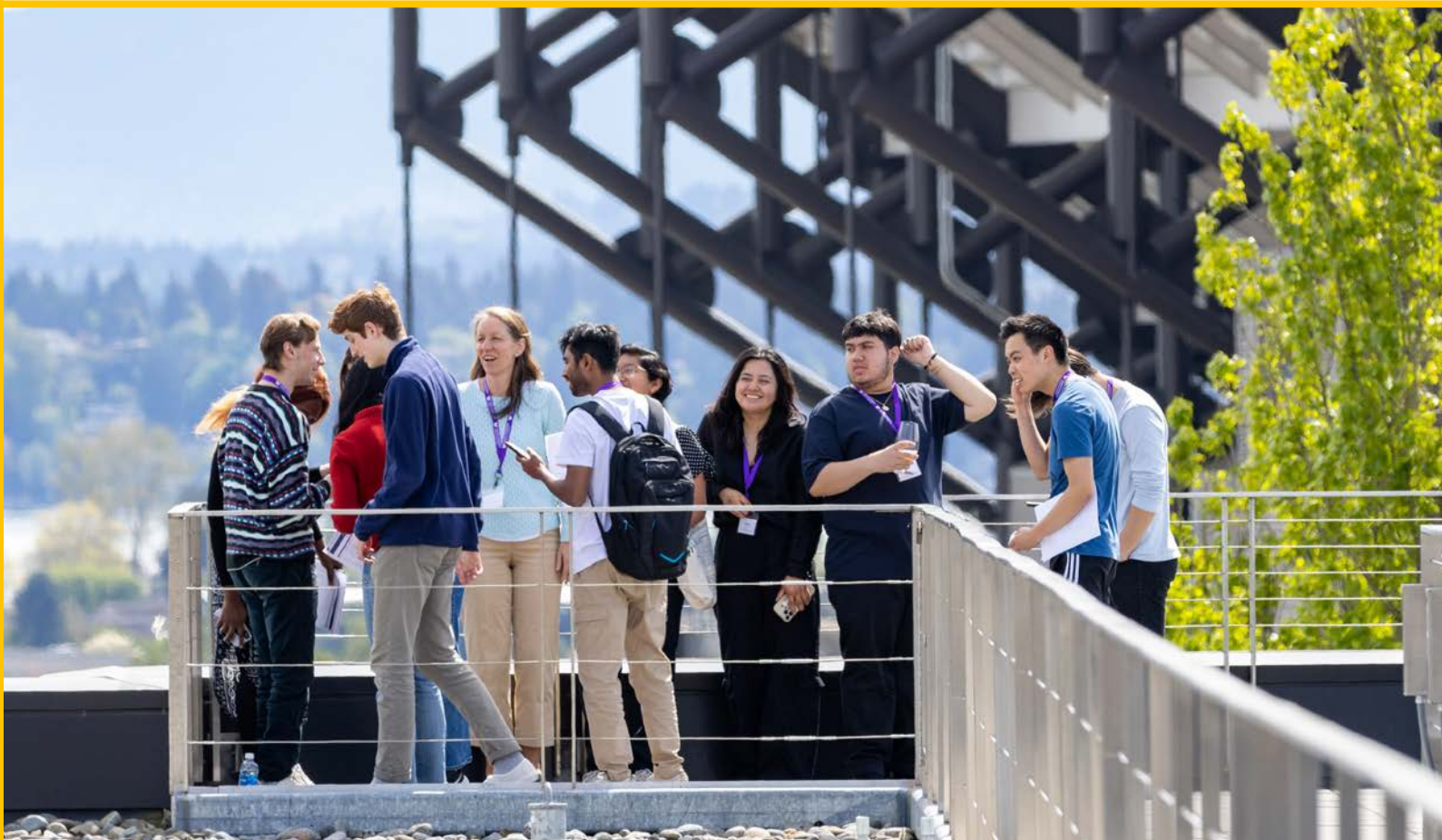
In November 2025 and April 2026, the University of Washington participated in the fifth UPWARDS workshop at Science Tokyo and the sixth workshop at the Rochester Institute of Technology, with two faculty members and two staff members attending. Discussions addressed curriculum development, experiential learning, and student and faculty exchanges and yielded plans and action items for the next year.

Student Exchange Initiatives

In August 2025, the University of Washington hosted the UPWARDS Summer Intensive — an immersive, weeklong educational experience designed to prepare the next generation of semiconductor leaders.

The program convened 11 undergraduate and graduate students from the UPWARDS U.S. and Japanese partner universities, with Japanese participants traveling from Hiroshima University, Kyushu University, Nagoya University, the Institute of Science Tokyo, and Tohoku University.

The Intensive also extended its reach to educators by including two instructors from Northwest Indian College and two from Whatcom Community College through the University of Washington's Research Experience for Teachers program (RET), broadening the program's impact across Washington's educational landscape. Throughout the week, students engaged in technical instruction, hands-on laboratory work in the [Washington Nanofabrication Facility](#) (WNF), and guest lectures delivered by University of Washington engineering faculty. Direct engagement with industry leaders from Micron Technology and Tokyo Electron gave participants a clear view of workforce needs and emerging technical trends, helping them connect academic preparation to real-world career pathways in the semiconductor ecosystem.



Beyond technical training, the summer intensive intentionally cultivated cross-cultural collaboration, global awareness and international leadership skills. Experiential activities around Seattle, including a visit to the Space Needle and kayaking on Lake Union, gave students opportunities to build relationships outside the classroom and laboratory. Participant reflections underscored the program's lasting impact, with one 2025 student describing the experience as a milestone in personal and academic growth, and another noting how the program clarified the importance of international collaboration and interdisciplinary networking in shaping a research career. Building on the strong outcomes of this year's program, UPWARDS plans to continue expanding experiential learning opportunities across its network through future exchanges, workshops and industry-engaged programming.

In Summer 2025, the University of Washington's UPWARDS program sponsored four undergraduate students who participated in the UPWARDS Summer Programs hosted in Japan:

- **Koume Matsutori:** Kyushu University and the Tokyo Electron Summer Camp for Women (in collaboration with Tohoku University)
- **Matthew Schuld:** Kyushu University
- **Vivienne Petracca** and **Isaac Briefer:** Nagoya University

Curriculum Development Innovations

To incentivize students to complete semiconductor-related coursework, we have begun to introduce several new microcredential options. One is a digital badge, received upon completing a departmental focus area in semiconductor processing, which can be shared on platforms such as LinkedIn. Another option is the IEEE Micro-credential: Intro to Cleanroom Processing. We believe these additional credentials will inspire students to consider elective semiconductor coursework.

We also created a new cleanroom lab module known as the Art Wafer Project — added to courses EE 331 and EE 486 — to introduce students to basic microfabrication processes, including lithography, deposition and etching. Students visit the cleanroom twice a quarter in small groups of eight to 10 per session. Each student uploads an image, which they use to create a photomask and fabricate their designs onto a silicon wafer. This year, we had enrollments of 72 and 20 students in these two courses, respectively.

We have also developed an UPWARDS Research Experience for Teachers (RET) to give K-12 or community college instructors the opportunity to conduct research and to develop new curriculum related to semiconductor technologies. In the summer of 2025, UW UPWARDS hosted two teachers on campus to participate in semiconductor-related research:

- **Tawakalt Akinjobi** from the Northwest Indian College
- **Chloe Boland** from Whatcom Community College

Both spent six weeks on campus and received a stipend of \$8,000. The invaluable experience was designed to facilitate them in creating a curriculum for use within their home institutions.

Four instructors will be enrolled in the RET program for summer 2026. We hope this program will help K-12 instructors inspire their students to consider careers in semiconductors.

As part of our ongoing effort to enhance experiential learning in semiconductor education, EE 331: *Devices and Circuits 1* has adopted the Cornell NanoScale Facility (CNF) Virtual Reality (VR) educational platform in spring 2026 through the CNF VR Early Adopters Program.

Supported by UPWARDS funding (\$10K per year for two years), the program equipped EE 331 with eight Meta Quest 3 headsets (one per student, per lab section), along with licensed access to CNF's library of immersive cleanroom modules, including:

- *Cleanroom Gowning*
- *Cleanroom Safety*
- a four-part photolithography series
- *Micron's Careers in a High-Tech World VR*

Students complete the modules in VR prior to their hands-on lab sessions, allowing them to enter the WNF better prepared and able to make more productive use of limited lab time.

As demonstrated in the photo below, students engage with the content collaboratively in the EE 331 lab space, exploring cleanroom environments and processing tools that would otherwise be inaccessible at this scale.

Early observations suggest that the VR platform meaningfully extends the reach of experiential learning in the course. Additionally, Professor Ta-Chang Chen is exploring further integration through a planned UW–Japan study-abroad fabrication course developed in partnership with UPWARDS member institutions.



Experiential Learning Opportunities

Three short courses were successfully conducted at the Washington Nanofabrication Facility (WNF) in 2024 and two have been completed in 2025. Two additional courses are planned for 2026.

- Each of the one-week courses hosts 12 students for lectures and hands-on cleanroom experiences.
- Four of the courses were co-sponsored by Micron or UPWARDS.
- Courses have focused on veterans from Bellevue College, Pathways for Inclusive Excellence (PIE) students from UW, UPWARDS students from Japan, and TRiO students from Oregon State University.

In Spring 2026, UPWARDS also sponsored one short fabrication lab session in an ECE class:

- EE331 *Devices and Circuits I*, with 50 enrolled students

We also invited a guest speaker to EE201 Computer Hardware Skills to discuss micro-fabrication through a talk titled Micro-fabrication is Awesome. This event was attended by 110 students.

Empowering Women in Semiconductors

With the appointment of Professor Jungwon Choi as UPWARDS faculty and the allocation of a \$50,000 discretionary fund to support initiatives aimed at increasing the representation of women in the semiconductor workforce, the UPWARDS program has expanded opportunities for student engagement. Initiatives such as mentorship, speaker sessions, and networking events have been introduced to raise awareness and encourage greater inclusion of women in an industry that has historically been male-dominated.

On May 8, 2025, the UPWARDS for the Future Network, in collaboration with Micron and Tokyo Electron (TEL), hosted *Career Chat: Women in Engineering*, an event at the University of Washington's Nanoengineering & Sciences Building. The event featured three distinguished speakers from TEL:

- **Lynda Jarrett**, Vice President of IT
- **Raney Terrizzi**, Senior Manager of Technology
- **Melissa Chan**, Manager of Process Engineering

Each speaker shared their personal journey as a woman in engineering, with a particular focus on experiences within the semiconductor industry. The speakers discussed challenges they faced, lessons they learned, and the paths that led them to their current leadership roles. The event concluded with a networking session, providing students and attendees the opportunity to connect with the speakers and other professionals who are passionate about semiconductor engineering.

On November 20, 2025, UPWARDS for the Future hosted the *Semiconductor Innovation & Career Pathways* event at the University of Washington, attracting 48 students interested in exploring the intersection of research, innovation and workforce development in the semiconductor field. The program featured:

- an overview of the UPWARDS initiative
- industry perspectives on emerging trends
- presentations followed by a career-focused panel with representatives from Micron Technology and Tokyo Electron (TEL)
- a networking session with University of Washington faculty and industry experts

As the UPWARDS program enters its third year, it plans to offer additional opportunities focused on career development, work-life balance strategies, and insights from industry experts, including representatives from Micron.

Memory-Centric Graduate Research Fellowships

The 2025 cohort of Memory-Centric Graduate Research Fellowships supported an exceptional, all-women cohort of six graduate students whose backgrounds span the breadth of engineering and the physical sciences.

UW UPWARDS is excited to welcome a new cohort of fellows this upcoming academic year. We are currently hosting [a call for applications for the 2026-27 academic year](#), with a deadline of July 15, 2026.



Drawing from six distinct departments across the College of Engineering and the College of Arts & Sciences, this cohort reflects the inherently interdisciplinary nature of memory and semiconductor research — bridging fundamental science and applied engineering to advance the next generation of memory technologies. Equally important, the cohort underscores UPWARDS’ commitment to broadening participation in the semiconductor workforce by cultivating talented women researchers across a diverse set of technical fields.

Each fellowship includes a stipend, benefits and tuition coverage for the 2025-2026 academic year. The second cohort of UW-UPWARDS graduate fellows comprises:

- **Mai Nguyen**, Physics
- **Yueyao Fan**, Materials Science and Engineering
- **Jane Keth**, Chemical Engineering
- **Jayita Dutta**, Electrical and Computer Engineering
- **Natasha Oget**, Chemistry
- **Zi Zhang**, Electrical and Computer Engineering



(L to R): Mai Nguyen, Yueyao Fan, Jane Keth, Jayita Dutta, Natasha Oget and Zi Zhang

Impact and Outcomes

Over the past year, our efforts have strengthened collaboration across the UPWARDS network in both the U.S. and Japan and produced meaningful progress for students, faculty and partner institutions. We have advanced a semiconductor-focused curriculum, expanded experiential and hands-on learning opportunities, and broadened access for students from underrepresented backgrounds — including veterans and members of historically excluded communities. **Over 300 students** have directly participated in our programs and more have benefited indirectly (such as through trained teachers and mentors).

Our commitment to supporting women in the semiconductor industry has continued to grow through mentorship, professional development and sustained engagement with industry partners. Together, these efforts are deepening academic-industry ties, building a more inclusive talent pipeline, and laying a strong foundation for the program’s continued growth in the year ahead.

Looking Ahead: 2026–27 Strategy

Building on this year's momentum, we look forward to enriching our program through the following goals:

- Continue the UPWARDS Summer Program, expanding on the success of our hands-on, immersive experience for students from across the UPWARDS network.
- Launch the IEEE microcredentials, giving students a recognizable way to demonstrate semiconductor skills.
- Introduce the UPWARDS Student Fellow Certificates in collaboration with partners across the UPWARDS network to formally recognize student engagement and accomplishment.
- Organize an UPWARDS workshop at a major semiconductor conference, broadening the program's visibility and strengthening connections with industry and academic leaders.

Alongside these new initiatives, we will continue all of our current programs: sustaining graduate fellowships, curriculum innovations, student exchanges, and our work to support women and underrepresented groups in the semiconductor workforce.

