Developing the Research Computing Workforce Pipeline from K–12 to Early Career through Experiential Learning

CI-XP STUDENT PROGRAM

5/2026 Midwest RCD Annual Meeting- Amanda Hassenplug

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CI Workforce Development/Student Programs

CI-XP Program

Cyber Infrastructure-Student Experience Program (CI-XP) purpose is to provide work opportunities and real workplace experience that enhance the student's education through the development of:

1. professional skills,
2. responsibilities,
3. habits,
4. attitudes,
5. self-confidence, and
6. self-development.

This program includes all students in RCAC, Envision Center, the Scientific Solutions Group, and Summer Internship Programs.

Since 2007: **462**+ college age students supported (135 graduate and 327 undergraduate)

Since 2023: **194** K-12 students impacted

Current collegiate students (12-31-2025): **81** (9 graduate and 72 undergraduate)

Current K-12 students engaged (12-31-2025): **67**

During 2025: **25** mentors across RCAC
Since 2007: **65** mentors across RCAC

Variety of student projects:

RSE, Data Science, Hardware Repair, Communication/Outreach, Data Center, Networking, AR/VR/XR, Technical Writing, Project/Program Management System Administration, and more.

Students hold seats on the CI-XP steering committee

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K-12 program overview

K–12 → STEM Identity → Discovery → Research Pathways → HPC & AI Workforce

Bring STEM to life for students, educators, & communities through engaging, hands-on experiences that spark curiosity & build early pathways into technology. Empowering learners and educators while opening doors to future STEM pathways.

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Bringing STEM to Life at Scale

Deliver engaging, hands-on experiences that spark curiosity and introduce students, educators, and communities to AI, coding, cybersecurity, and real-world applications of high-performance

Immersive Programs, Facilities & Partnerships

Offer AI and coding camps (Code Explorers), cybersecurity programs (CyberSafe Heroes), middle school STEM day camps, interactive museum experiences, and educator workshops, complemented by guided tours of the RCAC Data Center and Envision Center to showcase real-world cyberinfrastructure in action

Expanding Access & Building the Pipeline

Through regional and statewide partnerships, broaden participation in STEM while creating early pathways from K–12 engagement into research, cyberinfrastructure, and future HPC & AI careers

Summer internship program overview

Started as NSF REU but transitioned to alternative funding opportunities.

Anvil REU
Research Experience for Undergraduates

Program details:

- 11 weeks
- On site at Purdue West Lafayette, IN
- Furnished residence housing provided
- Paid internship
- Social media promotion
- Surveys, feedback, and metrics

People & projects:

- 4 projects
- 2 undergrad interns & 2 mentors per project (sometimes 3 mentors)
- Communications & photographer staff support
- Program manager oversight

Events & professional development:

- 8+ Anvil specific seminars & trainings
- Attendance at PEARC national conference & student program
- Collaborations: seminars, Graduate RA support, networking events, professional feedback, and national lab overviews.
- Mid-point presentations
- Virtual Symposium
- Closing presentations
- Pre-program trainings & touchpoints
- Various additional events

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NSF Research Experiences For Undergraduates

Student Impact & Exposure

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Student Impact and Exposure – CI-XP

Social Media & Communication exposure and recognition

- Pre, throughout, at end of the summer programs
- Student Spotlights throughout the school year
- Promotion of thesis and other accomplishments

Symposiums and presentations

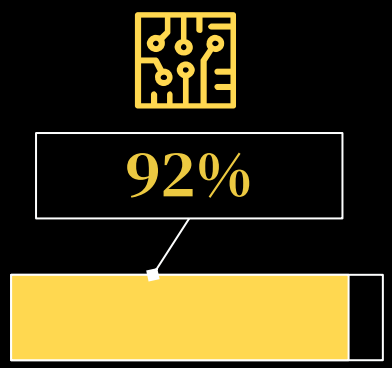
- Virtual and in-person for RCAC and Purdue
- In-person presentations at national conferences (PEARC, SC, etc…)
- Virtual presentations for collaborative partners (Faculty, LBNL, PSC, and PNNL)
- End of semester CI-XP student program presentations

Opportunities obtained based on exposure and student program experience

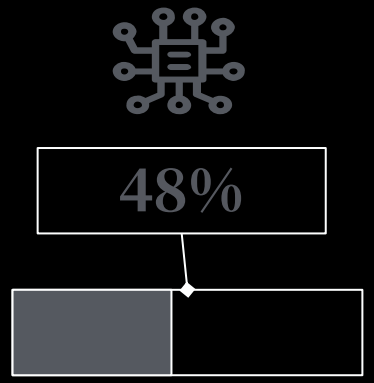
- Internships & Full-time employment
- Participation in HPC events (Hack-a-Thon's, etc…)
- Research experience/projects at home institution
- Student work with RCAC and/or home institutions during academic year
- Publication of papers and posters at Supercomputing and other national conferences
- Using campus computing resources at home university
- Bringing back programming to home university (if from non-Purdue institution)
- Attendance at computing conferences and student conference programs

Student Impact and Exposure – Summer Interns

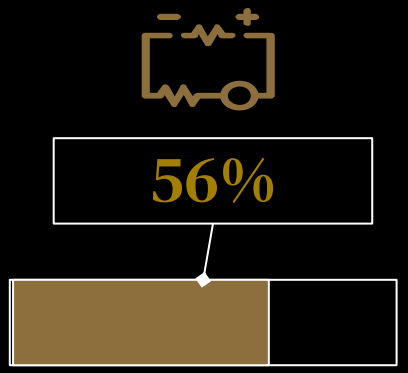
Opportunities based on skills & experience gained during summer internship program



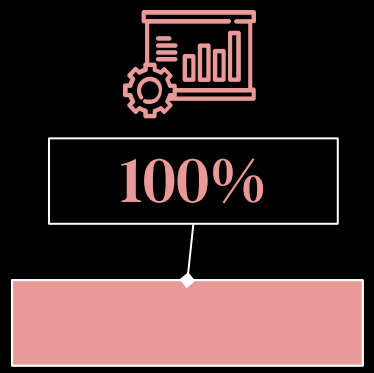
Of 2022-2025 summer interns obtained internships for the following summer and/or student work for the fall semester.



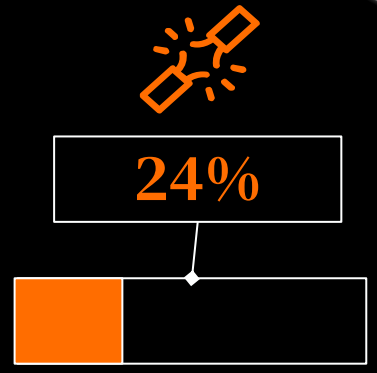
Of 2022-2025 summer interns participated in other HPC/RC events, activities, research, published papers, presented at and/or attended a national conferences.



Of summer interns between 2022-2025 were retained in student positions at RCAC.



Of summer interns between 2022-2025 are considering a career in HPC, which wasn't always originally the case.



Of summer between 2022-2025 plan to or have gone on to graduate school, which wasn't always the initial intent.

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Partnerships & Collaboration

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Partnerships- K-12

Strategic K–12 & Informal Learning Partnerships
Collaborations with schools, statewide programs, Girl Scouts, Indiana 4-H, and the Indiana Children's Museum to expand access to AI, cybersecurity, and high-performance computing

Conference & Ecosystem Integration
Engagement through AI in P–12 Education Conference and national outreach venues to connect educators, students, and institutions to NSF cyberinfrastructure and scalable STEM programs

Sustained Pipeline Development
Partnerships extend beyond single events into camps, classroom integration, and educator engagement, building a continuous pathway from early STEM exposure to HPC & AI workforce readiness

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Partnerships- Summer internship program

Partnered to provide workshops and presentations between programs, participated in the end of summer virtual symposium, collaborated on program resources and documentation, and networking and other none project based activities were shared.

Summer interns gave mid program presentations and received feedback from staff and interns at these locations. Gained an understanding of the potential impact of their projects beyond RCAC and Anvil. Staff at PNNL also reviewed end of program presentations

Summer interns were provided a presentation on PSC (and PSC interns received an Anvil tutorial), summer interns gave mid program presentations and received feedback from staff and interns. Gained an understanding of the potential impact of their projects beyond RCAC & Anvil.

ACCESS interns visited Purdue's WL campus. While here they met with RCAC leadership, toured the data center & learned about the ANVIL supercomputer. The students had lunch with summer interns, discussed programs, projects, & built relationships which, continued to grow at PEARC.

Funding Ideas for Student Programs

NSF & Federal Workforce Grants-Expand support through NSF programs (e.g., CI, AI Institutes, Broadening Participation) to fund student training, REUs, and scalable outreach aligned with national workforce priorities

Industry Co-Investment & Sponsorships-Partner with industry (AI, energy, cybersecurity, tech) to support student programs, hackathons, and internships that align with workforce needs and provide real-world experience.

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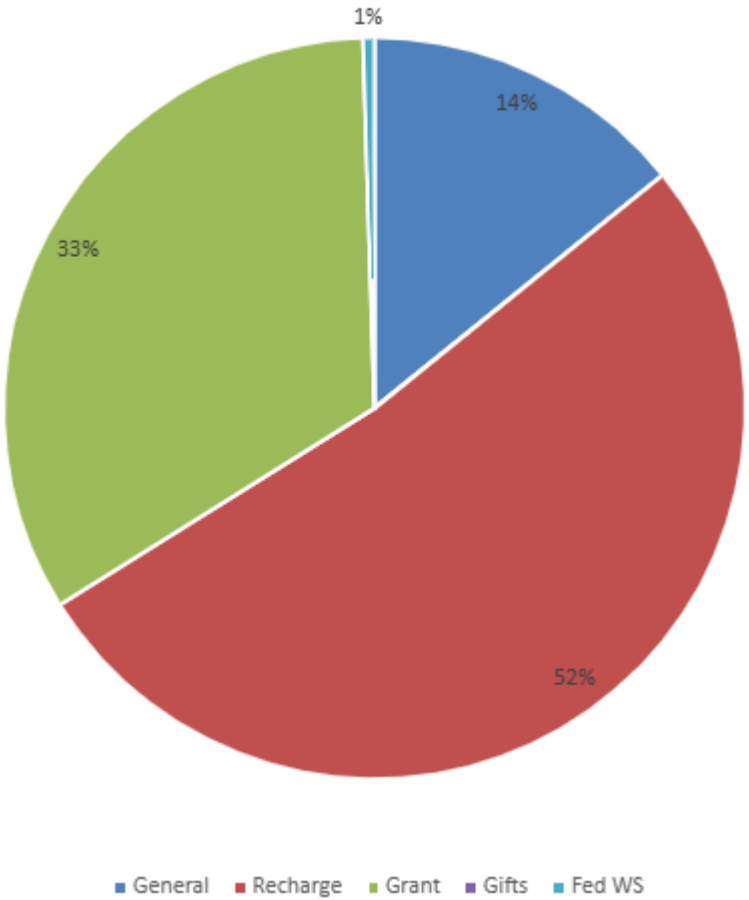
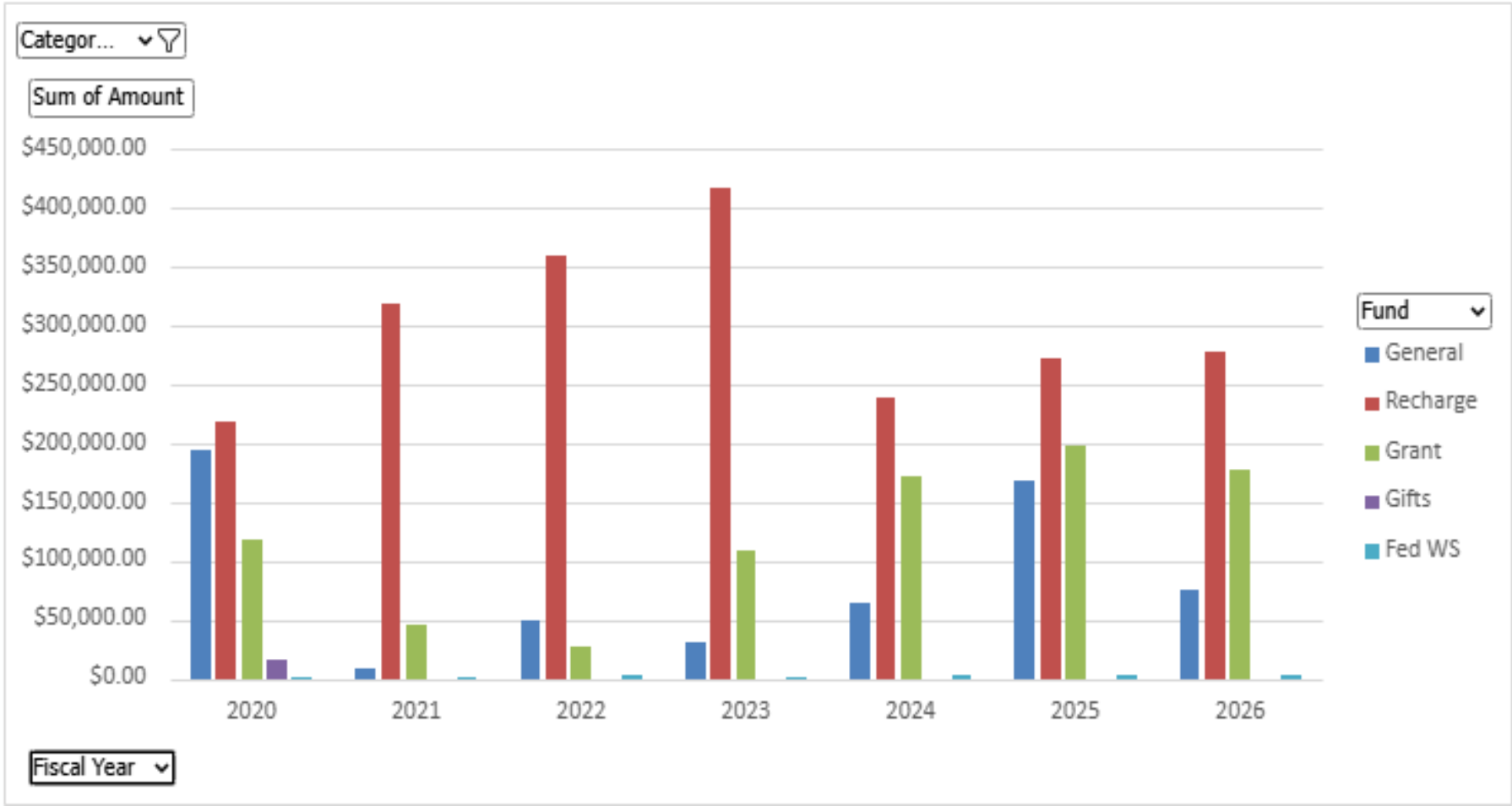
2026 Student Funding Breakout





Questions

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