

The TIMESTEP* Summer Internship Program

Internships for Undergraduate Majors in the Physical Sciences at U. Arizona

The TIMESTEP Summer Internship Program is a unique opportunity for UArizona undergraduates in the Physical Sciences to connect with small- to mid-sized businesses based in Southern Arizona. In the era of COVID19 student retention and post-graduation job placement is critical to the future of UArizona. Student engagement in the local business community creates pathways for employment and exposes businesses to university resources.

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Critical UA Programmatic Needs

- Increasing student enrollment in majors in the Physical Sciences requires industry pathways.
- Modernizing curriculum requires input from industry partners.
- Astronomy, Math and Physics do not currently build local industry partnerships that include students.

UA Strategic Plan

- The Wildcat Journey:** provide students with the skills and mindsets to lead in the 4th Industrial Revolution.
- Grand Challenges:** fully leverage 4th Industrial Revolution advancements to lead in the areas of Space, Data and Computing.
- The Arizona Advantage:** fully embrace collaboration to fuel economic growth.

Student Intern and Applicant Demographics (2018-2022)

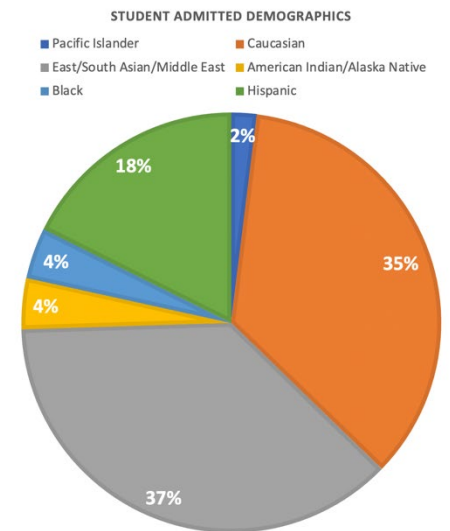
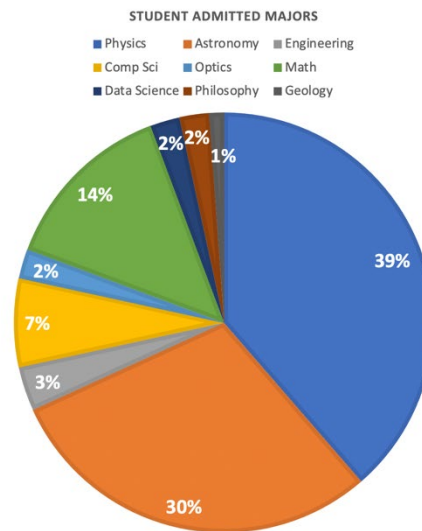
Applicants 2018-2022 (94 total):

26% Female (vs. AST 40%, PHY 23%)
 32% URM (vs. AST 34%, PHY 22%)
 67% BIPOC

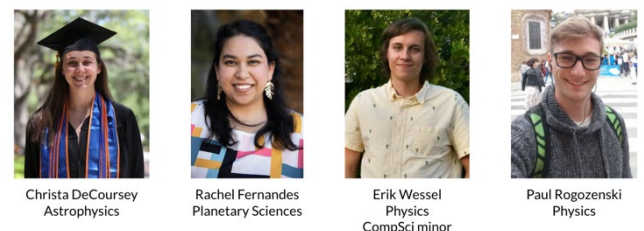
Admitted 2018-2022(47 total):

38% Female (vs. AST 40%, PHY 23%)
 32% URM (vs. AST 34%, PHY 22%)
 70% BIPOC

The Admitted and Applicant student population is representative of the demographics of female and URM scholars in Astronomy and Physics.



Graduate Coordinators promote student success



A team of 4 Graduate Students (above) supported teams of 4 student interns (left), to provide mentorship throughout the internship. The graduate coordinators participated in a 5 hour mentor training in April 2022 to prepare for their roles in the internship.

Employers

Small to mid-sized companies are targeted to strengthen economic development of Southern Arizona. TIMESTEP provides part-time funding for students (20hrs/week, \$5000). Returning companies pay for half of the student salary.

Benefits to Employers:

- Access to a talented and diverse pool of students with strong physics, math and computing backgrounds.
- Increase economic competitiveness (< 50% of UA Physical Science graduates stay in Arizona; 2016 ABOR).
- The opportunity to scout talent for full-time positions in their organization.
- The majority of participating Employers report the TIMESTEP program is mutually beneficial for both students and employers.

"The TIMESTEP program creates a win-win scenario for both employers and interns" - Rincon Research, 2022

"We were fortunate to receive a student with adaptability and motivation to tackle common industry issues while mutually benefiting from the partnership." - IR Labs 2022

"TIMESTEP has always provided talented engineers with the right skillset for our internships" - Madden Media, 2022

"As the hosting company, we benefited from getting both direct help from the intern student in our business operations and learning new knowledge brought to us by the intern." - MSE Supplies 2022

"Great opportunity to invest and also produce value" - Delta Thermal 2022

The program has featured 27 unique employers since 2018. The Summer 2022 program featured 14 employers based in Southern Arizona. Of these, 8 are returning companies (marked in bold), funding **\$22,500** to the program.

Summer 2022 Employers : **Airth**, Center for Quantum Networks (2 students), **Delta Thermal**, Hart Sci, **IR Labs**, **KinetX**, **Madden Media**, **MSE Supplies** (2 students), Neurovascular Research & Design, **NOIRLab**, OppSpot, Revolute Robotics, **Rincon Research**, and QScint.

Goal 1: To build a program valued by both students and employers

Experience of Employers Participating in the 2022 Program:

- 100% reported that students provided a meaningful contribution to the company.
- 100% reported that students met or exceeded expectations.
- 100% reported they would recommend the TIMESTEP program to other companies.
- 100% reported being interested in participating in the Summer 2023 program
- **93% indicated they would donate at least half the student salary for the 2023 program.**

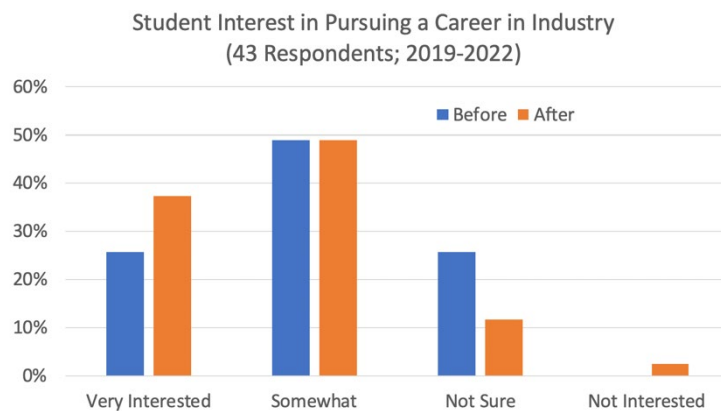
"We have hosted intern students from the TIMESTEP program over the last few years. The overall experience has been very positive for us." - MSE Supplies, 2022

"We appreciate having the student interns bring their curiosity and enthusiasm to our workplace. The Timestep program lays out a very organized internship period with documented expectations for the intern and the company that result in a good experience for both." - Bobby G. Williams, KinetX, 2022

"Excellent opportunity for both students and companies. Thank you!" - OppSpot. 2022

Students Report:

- Across 2018-2022, 98% of Interns would recommend this program to other students.
- 89% of Interns from 2021-2022 reported that TIMESTEP helped clarify their career path.
- Across 2019-2022, students report an increased interest in pursuing a career in industry after the internship and fewer students report being unsure of their interest in Industry (see right).



"I really wanted to observe a corporate environment and have more programming experience, so [the internship] was extremely helpful" -- 2022 Intern

"Prior to my internship, I was almost exclusively considering the academic path. However, after my experience with [this internship], I am now much more likely to consider working in industry after graduation. My experience has shown me that there are interesting problems and learning opportunities to explore outside of academia." - 2022 Intern

"I love the program and it really helped me secure an internship especially when things fell through with Covid. I am grateful it is around and there to help provide experiences especially at smaller local companies." - 2019 Student Intern, Reporting on Outcomes 2 years later. now working at Lockheed Martin

Goal 2: To give students the experience needed for direct entry into the workforce upon graduation

The TIMESTEP Internship Program has successfully connected students with regional employers.

- 97% of interns (2018-2021) have graduated.
- 52% of interns (2018-2021) are working in Industry, and 23% are in Graduate School.
- 45% of interns (2018-2021) found employment in Tucson, 3 in their TIMESTEP companies.
- Mel Rose, the graduate coordinator for the 2018 and 2019 programs, is working full time at Rincon Research and served a TIMESTEP Intern supervisor for our Rincon Intern in Summer 2022.
- **57% of Summer 2022 Employers have indicated they have offered or would consider continued employment for their Intern in Tucson. Three of the 2022 Interns have accepted positions so far.**

"In terms of finding a career, I feel that my past 3 months at my internship were far more valuable than the rest of my studies at the University of Arizona. In addition to skills I have learned, this internship has netted me the opportunity to return to Infrared Laboratories after graduation, as well as connections in the field to seek employment elsewhere. Without this, I would not know where to begin finding a job after I graduate" - 2022 Intern

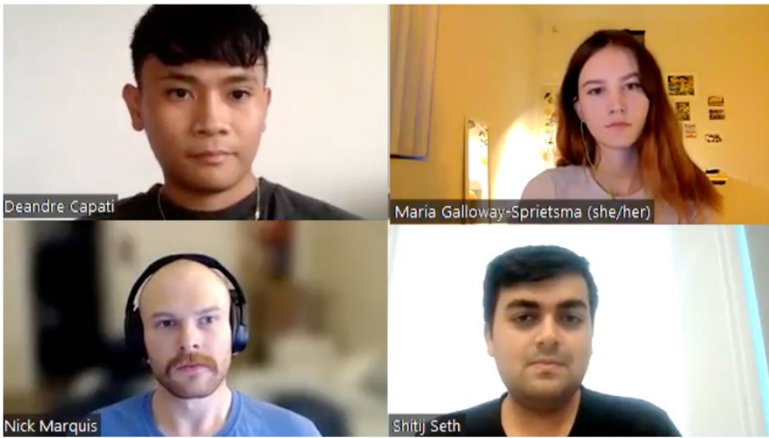
"This internship enriched my working experience and serves as a door opener for me in job hunting, potentially allowing me to continue working at MSE Supplies after graduation." - 2022 Intern

"I definitely feel as if my internship set me apart from other candidates. I did my internship at Lunewave working on sensors for autonomous vehicles and the hiring team at GM was really interested in my experience there and how I ended up at the internship and how it brought me into the auto industry." - 2021 Intern, Reporting on outcomes 1 year later, now working at General Motors

The TIMESTEP Program aims to provide students with **professional development opportunities** to ensure students have access to role models and are aware of local resources to support their career development.



Left: Student interns and Graduate Coordinators met with Paul Valdez- FORGE at Roy Place in Summer 2022 as part of a seminar for the Interns about entrepreneurship.



Diagnostics in Tucson)

Left: Summer 2022 Interns met with alumni of the TIMESTEP program in a virtual meeting to learn how past Interns utilized their internship to pursue careers in industry and apply for graduate school. Presenters:

- **Deandre Capati** (2018 Intern, now at Hermeus)
- **Maria Galloway-Sprietsma** (2019 Intern, now a Graduate student in Astronomy at UFlorida),
- **Nick Marquis** (2021 Intern, now at Madden Media in Tucson)
- **Shitij Seth** (2019 Intern, now at Accelerate

"As a woman, I felt very comfortable being directed by [my supervisor], a woman who not only owns her own business, but also possesses a great deal of flexible expertise in STEM technology." - 2022 Intern

"I just completed an interview for the Fisk-Vanderbilt bridge program. I used some of my notes from our mock interview for Howe Industries and I am feeling grateful that we were able to do that." - 2020 Intern, Reporting on outcomes 2 years later (now a graduate student in Astrophysics in the Fisk-Vanderbilt Bridge Program

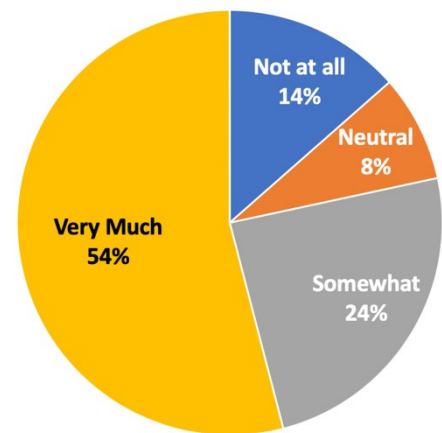
"I learned a huge amount of practical Engineering skills in many different fields. I learned different programming languages, and methods of creating embedded systems/control software. I am thankful for the amount of technical experience, but also the social experience working with other experts in this field." - 2022 Intern

Goal 3: To Improve Retention and Graduation Rates among UArizona Students

TIMESTEP aims to improve graduation rates by showing students many career pathways and increasing their confidence in achieving those careers.

78% of interns report the program is helping their motivation to continue their degrees (Pie Chart to right) and cohort graduation rates are high (see Goal 2).

To what extent has this internship help motivate you towards completing your degree (2020-2022, 37 Respondents)



"This has been an incredibly valuable experience for me. I have learned more about working in an industry setting, and how I can apply skills I have developed from my classes at the UofA." - 2022 Intern

"This internship was extremely valuable to me. I will continue to recommend it to any future undergraduate students who would like a better understanding of industry. Applying through TIMESTEP allowed me to avoid the despair of online internship applications and instead focus on my own professional development. I will always be grateful for this summer internship. -- 2021 Student Intern

Students shared their experiences with their peers at a TIMESTEP Internship symposium held on August 30th, 2022 in partnership with the University of Arizona Space Institute. The symposium was attended by students majoring in Astronomy and Physics (see image).



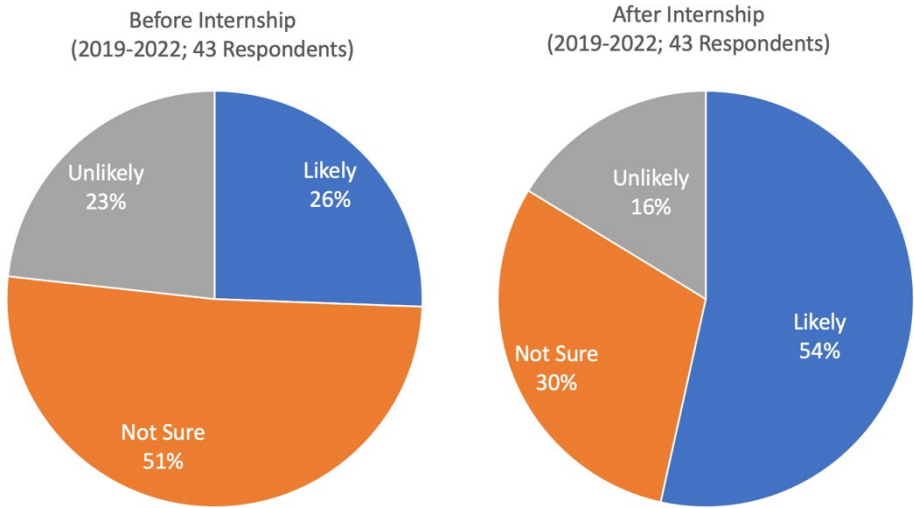
Goal 4: To increase regional economic growth and competitiveness by keeping talent local

Students report a marked increase in their interest in pursuing post graduate employment in the Tucson area (see Pie Chart).

"Most physics or math students only know of the graduate school route, and this internship opened my eyes to opportunities outside of graduate school." - 2022 Intern

"My internship advisor was able to connect me with Banner Hospital to set up a potential job as a QA tester for radiation therapy equipment. ... I could potentially continue down the path of medical physics, all due to a connection that I made during my time as an intern." - 2022 Intern

"Talking with the other interns helped me realize that there are a lot of interesting areas of research in tech companies in Tucson -- a lot more than I initially thought." - 2020 Student Intern



Summary

Results: The fifth year of the TIMESTEP Internship Program has successfully met all desired outcomes. Interns were exposed to career opportunities that exist within the Tucson area and enabled them to apply their classroom knowledge towards real-world applications. TIMESTEP’s summer internship program has been shown to increase student interest in local employment and has led to several permanent positions for students. Employers continue to report high satisfaction and a strong desire to continue participation in the program.

Opportunities: TIMESTEP’s internship program is an ideal recruiting tool for students to UArizona during times of economic uncertainty. The program enables increased job placement, teaches real-world business skills and entrepreneurship, and exposes students to potentially lucrative alternatives to graduate school.

The TIMESTEP Internship program is similar to the Praxis Internship program at Smith College, the John Metcalf Internship program at U. Chicago and co-op experiences (e.g. Northeastern, Georgia Tech) that provide pre-internship training and an on-campus coordinator. The small business cost-share model is similar to Cornell University’s Entrepreneurship Center’s Internship program. TIMESTEP is distinct in its unique combination of: a) support for diverse physical science majors; b) research faculty; c) curriculum modernization; and d) support for small businesses.

For the 2023 program we are hoping to continue to grow the program in terms of both the number of students and employers participating.

Funding Report: Summer 2022

We are grateful for funding from the below sponsors who supported the Summer 2022 TIMESTEP Internship program.



RESEARCH, INNOVATION & IMPACT
Societal Impact



Arizona Institute for
Resilient Environments
& Societies



THE UNIVERSITY OF ARIZONA
**TECH LAUNCH
ARIZONA**



ARIZONA FORGE

Funding to pay student salaries (\$5K each) and operate the internship was provided by generous donations from the Thomas R. Brown Family Foundation (\$33.3K), UArizona office of Research Innovation & Impact (\$18K), Arizona FORGE (\$10K), Tech Launch Arizona (\$5K), and the Arizona Institute for Resilient Environments & Societies (\$5K). Additional funding was secured from 8 returning companies (\$22,500). The internship is also supported by an NSF CAREER grant to PI Besla to fund program evaluation (\$10K).

UArizona RII funding also enabled the hiring of a full FTE program coordinator for the internship program, Rebecca Lipson, which was a **complete game changer** in our ability to run and expand the program. Rebecca enabled the program to expand to 16 students and 4 graduate student coordinators - we could not continue one-on-one mentoring for student interns without having her on full time. Rebecca also allowed us to offer more professional development workshops for the students, such as panels featuring past TIMESTEP alumni who offered students advice on navigating their careers after graduation.

We are grateful for the amazing support of the TRBFF program for funding this program and enabling us to offer such a valuable experience for these 16 talented students who participated in Summer 2022. We hope to continue our partnership with TRBFF in the near future.