DEI and Outreach efforts from the NSF FTPP consortium

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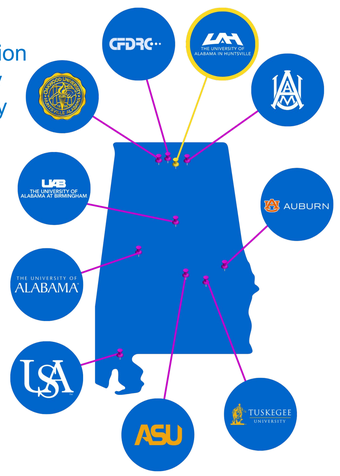
About FTPP

Led by The University of Alabama in Huntsville (UAH), an Alabama coalition of nine universities and a research corporation is supported by a $20 million **Future Technologies & enabling Plasma Processes (FTPP)** 5-year (2022-2027) grant from the National Science Foundation (NSF). This follows a previous award of $20 million from NSF's Established Program to Stimulate Competitive Research (EPSCoR).

FTPP aims to **transition plasma research into agricultural, manufacturing, space science, space weather prediction and other applications**, establishing Alabama as a Southeastern regional hub for plasma science expertise and creating thousands of high-paying technical careers in the state and region.

- CFD Research Corporation
- Alabama A&M University
- Alabama State University
- Auburn University
- Oakwood University
- Tuskegee University
- University of Alabama
- University of Alabama at Birmingham
- University of South Alabama
- University of Alabama in Huntsville



- **Mission:** FTPP will build research, education, economic, and workforce capacity in pursuit of making foundational discoveries in space and laboratory plasma physics and create future societally transformative technologies in the State of AL, utilizing Alabama's statewide expertise in plasma science and technology.

- **Diversity:** Our mission is to promote diversity, equity, and inclusion in all aspects of our research, education, and workforce development initiatives. We are committed to creating a culture of belonging and respect, where individuals from all backgrounds are welcomed, supported, and empowered

- **Three thrusts of FTPP: Research, Commercialization, and Educating an Alabama Plasma Workforce**
  1. Research: advance foundational plasma science with foci on four natural and laboratory plasma systems, to lay the foundations for
  2. Commercialization: creating future technologies in advanced materials, bio-medical products, sterilization of food, seeds, and equipment, and developing space weather fore/nowcasting tools, and
  3. Educating: expanding a highly trained, inclusive PSE workforce

Outreach Audiences

FTPP Internships & Programs

FTPP hosts a series of outreach programs, including summer programs, that are aimed at bringing students not typically exposed to space physics into the Space Physics community through working on real research projects.

RIPP	CIPTA	SE REU	ISWC
Regional Introduction to Plasma Physics	Corporate Internship Plasma Training in Alabama	South Eastern Research Experiences for Undergraduates	International Space Weather Camp
Undergraduate Students	Undergraduate and Graduate Students	Undergraduate Students	Undergraduate and Graduate Students
• 9-Week Summer Internship Program • **Paid Internship** • On-campus housing available • Must be a rising Junior or Senior • Must be enrolled full-time at an institution in the southeastern U.S. (AL, AR, KY, LA, MS, SC, WV, VI, and PR) • Minimum GPA: 2.75	• 10-Week Summer Internship Program • **Paid Internship** • Housing stipend • Receive experiences on plasma technology applications at a private company • Must be a rising Junior or Senior • Must be enrolled full-time at an FTPP institution • Minimum GPA: 3.0	• 10-Week Summer Internship Program • **Paid Internship** • On-campus housing • Participate at one of our parter's REU programs (UAH, UAB, ASU) • Must be a rising Sophomore, Junior, or Senior • Must be enrolled full-time at an institution in the southeastern U.S. (AL, AR, KY, LA, MS, SC, WV, VI, and PR) • Minimum GPA: 3.0	• 1 month Summer Camp Program • **Tuition Included** • Travel/Housing Expenses to DLR, Germany and UAH, Huntsville • All-Expense Paid Trips • Networking with German and South African experts and students • Must be a rising Junior, Senior, or Graduate Student • Must be enrolled full-time at an institution in the southeastern U.S. (AL, AR, KY, LA, MS, SC, WV, VI, and PR) • Minimum GPA: 3.0

FTPP has partnered with the Alpha Kappa Alpha Sorority Power Of Internships in South Eastern (P.O.I.S.E.) program, offering a summer STEM Outreach and Marketing internship to minority college women in the SE U.S.

Applications & Recruitment - 2023 vs. 2024

Students Registered on our website.

- **2023**: 104 / **2024**: 168
- 62% increase

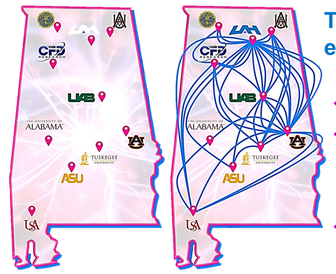
alabamaphysics.com

In-Person recruitment (events attended):

2023
- CUWiP - January 20 - 22, 2023
- AKA Poise - February 25, 2023
- FTPP Summer Marketing Intern

2024
- CUWiP – January 21, 2024
- Career Fairs: UAH, AAMU, ASU
- UAH Research Horizons – March 4, 2024

Workforce Needs & Certifications



FTPP partner universities. Lines represent the interconnection between the universities.

Two workforce assessments for plasma science and fusion energy [1], [2] identified major issues with:

- Declining number of plasma faculty
- Small number of departments and institutions teaching plasma

- NASA decadal assessment [3] and the FESAC report [4] called for emphasis on:
  - Plasma-specific educational and research programs
  - Provide opportunities to diverse and less advantaged populations.

[1] E. Thomas et al., J. Fusion Energy, vol. 22, no. 2, pp. 139–172, Jun. 2003
[2] FESAC report, "Assessment of the Workforce Development Needs for the Fusion energy Sciences," 2014.
[3] Plasma Science: Enabling Technology, Sustainability, Security, and Exploration. Washington, D.C.: National Academies Press, 2021.
[4] Report of the Fusion Energy Sciences Advisory Committee, "Powering the Future: Fusion & Plasmas," 2020. https://arxiv.org/pdf/0710.0856.pdf

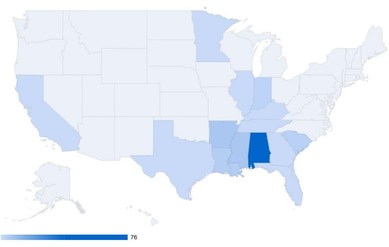
Diversity in the Space Physics Community

Yalim, M. S., Zank, G. P., Provenzani, L., Spencer, D., Howatson, K. "Diversity in the space physics community: An overview of collaborative efforts led by The University of Alabama in Huntsville", *Frontiers in Astronomy and Space Sciences* (June 2023)

frontiers

Summary of the various summer programs that the CSPAR and SPA at The University of Alabama in (including all FTPP programs) and how they have contributed to increasing diversity in the field.

- Analyze the applicant and participant data of the CPU2AL and REU summer programs that have been organized by collaborative efforts led by UAH in terms of demographics.
- Compare the diversity in this data with international and national metrics to see where our summer programs are standing at about this topic.



GeoMap of FTPP applicants for 2024. Efforts are focused on NSF EPSCoR southeastern states: AL, AR, KY, LA, MO, SC, WV, the US Virgin Islands, and Puerto Rico.

Summary of demographic data for the four CPU2AL summer programs over 3 years (2019, 2021, and 2022). Top: Applicants and participants for each program by year. Middle: Minority applicants and participants by program and year. Bottom: Female applicants and participants by program and year.

Support for our DEI and outreach efforts derives from two National Science Foundation (NSF) programs, an NSF Research Experiences for Undergraduates (REU) grant and two successive NSF EPSCoR Track-1 grants: Connecting the Plasma Universe to Plasma Technology in AL: The Science and Technology of Low-Temperature Plasma (CPU2AL) and Future Technologies enabled by Plasma Processes (FTPP).