



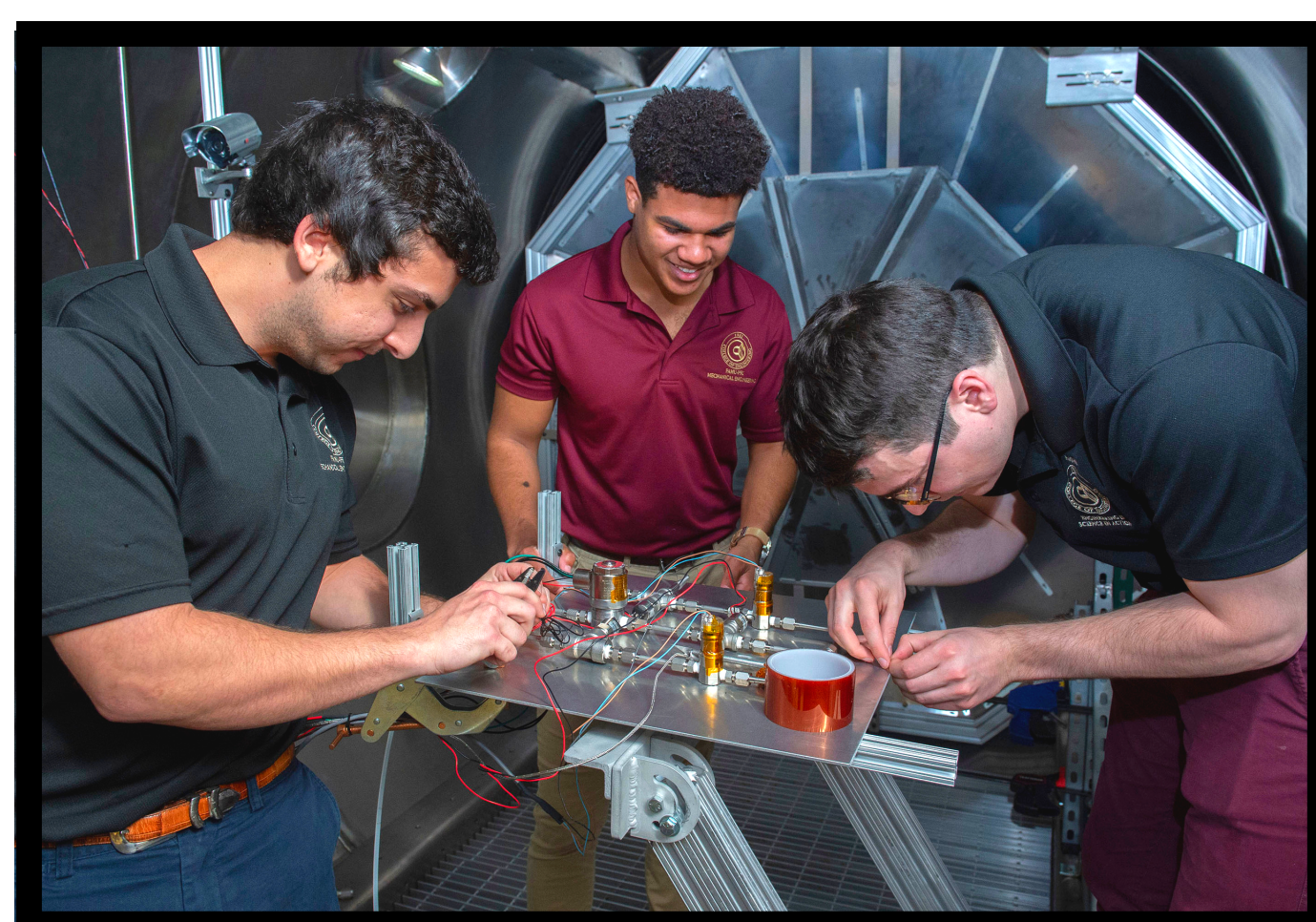
# Preparing Students to Work in Diverse Settings and Across Distance: Inter-University, Interdisciplinary Capstone Teams

Bowman, C. D. D.<sup>1</sup>, Elkins-Tanton, L. T.<sup>1</sup>, Briggs, D.<sup>1</sup>, Frieman, J. D.<sup>2</sup>, Gallagher, M. T.<sup>3</sup>, Garvie, L. A. J.<sup>1</sup>, McCarville, D. <sup>1</sup>, McConomy, S.<sup>4</sup>, McCoy, T.<sup>5</sup>, Triplett, G. E.<sup>6</sup>, and Ward, B. C.<sup>6</sup>

<sup>1</sup>Arizona State University, <sup>2</sup>NASA Glenn Research Center, <sup>3</sup>Cleveland State University, <sup>4</sup>Florida A&M University-Florida State University, <sup>5</sup>Smithsonian Institution, <sup>6</sup>Virginia Commonwealth University

NASA's Psyche Mission, led by Arizona State University (ASU), is scheduled to launch in 2022 and arrive at the mostly-metal asteroid, (16) Psyche, in early 2026.

Student Collaborations opportunities include development of interdisciplinary senior capstone projects tied to the mission.



## Benefits of Inter-University, Interdisciplinary Teams:

- ✔ Students experience being remote from a customer and from team members.
- ✔ Students experience teaming with diverse disciplines and using virtual collaboration tools (e.g. Slack, Web-Ex)
- ✔ Provides access to non-local, specialized technical mentors (such as those at NASA Centers), professionals who are accustomed to working with remote colleagues.
- ✔ Introduces disciplines not offered at a particular institution (for example, engineering management).
- ✔ Provides greater fidelity to NASA space missions and other large academic, industry, or government efforts, which involve diverse teams working together at a distance.

## Conclusion and Future Plans:

The relatively minor differences in the challenges faced by inter- vs. single-university interdisciplinary capstone teams suggest that the benefits outweigh the issues.

In the future, the Psyche Capstone Program intends to expand this offering to interested university partners.

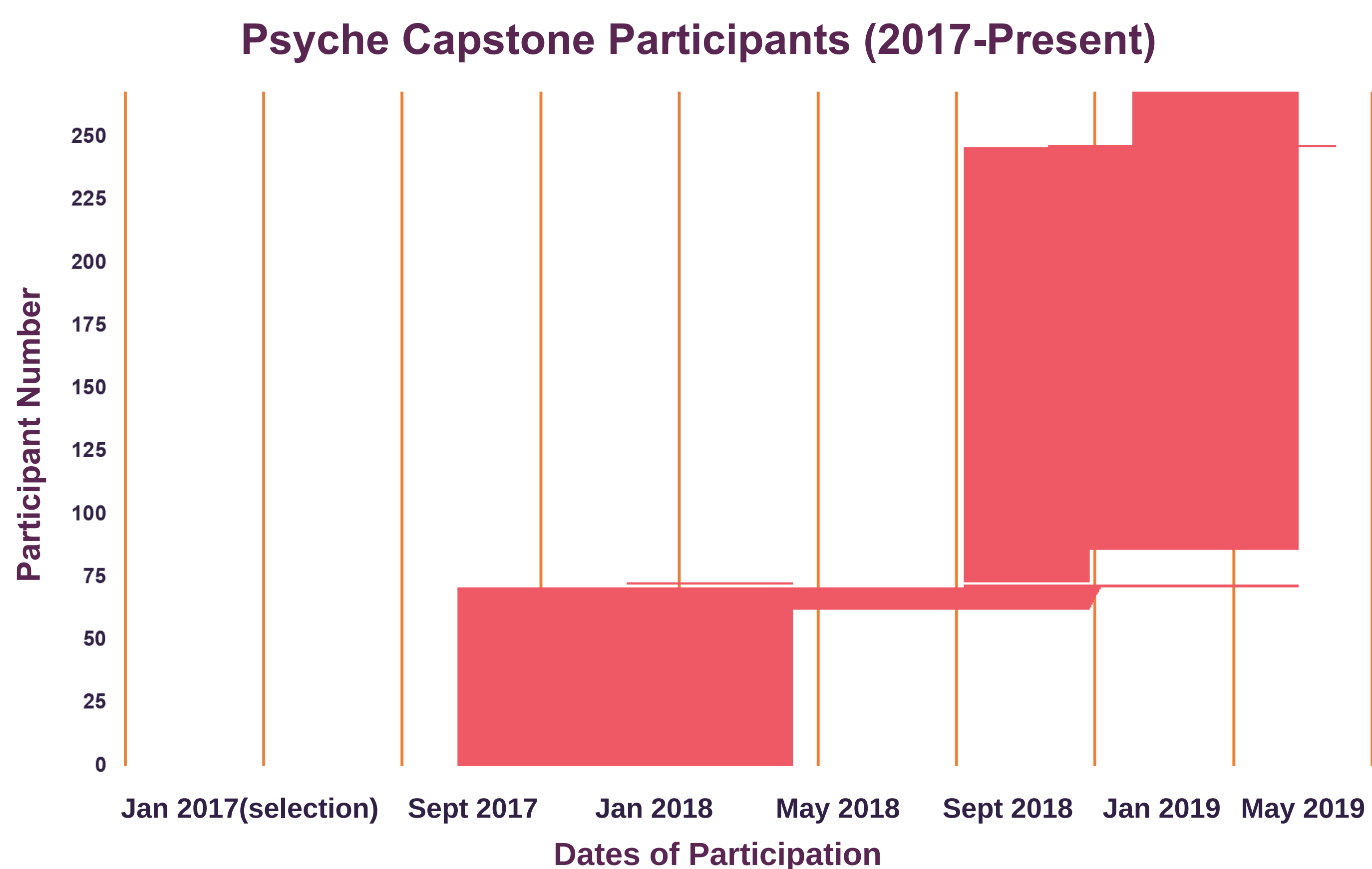
"This was a very good experience when it comes to **communication and organization of projects.**"  
- Mechanical Engineering student

"I learned hugely **valuable lessons about communication, managing remote teams, and leading virtual projects.** These skills will be invaluable wherever I end up."  
- Project Management student

"The main benefit that I obtained from the Psyche capstone project was being able to **gain experience leading a multifunctional team.** I believe that there is only so much that lectures and class work can teach - neither of which can replace the hands-on learning that this project provided."  
- Project Management student

"[Our project manager] was incredibly helpful and professional. Starting this project, **I never expected to have a project manager as another member of our group, but I could not have been happier to have [him] on board.** [He] helped us solve problems or get answers to questions that normally would have had us spinning our wheels for longer than we could afford. "  
- Electrical Engineering student

NASA  
**PSYCHE**  
MISSION  
<http://bit.ly/2InCiuU>



TEAM TYPES (2017 - Present)	Single - University			Challenges	Single-University		Inter-University	
	Single Discipline	+	All On-Campus Students		9 Teams	●	●	●
	Single Discipline	+	All Online Students		1 Team	●	●	●
	Single Discipline	+	On-Campus & Online Students		1 Team	●	●	●
	Multiple Disciplines	+	All On-Campus Students		24 Teams	●	●	●
	Multiple Disciplines	+	On-Campus & Online Students		4 Teams	●	●	●
	Multiple Disciplines	+	All On-Campus Students		1 Team	●	●	●
	Multiple Disciplines	+	On-Campus & Online Students		2 Teams	○	●	●

- Capstone courses assign teams using different mechanisms and at different times.
- Deliverables/ requirements/ timelines vary by capstone
- Disciplines have different cultures, norms, work habits
- Students have little experience working with other disciplines; may not value their contributions
- Course assessments are handled differently, at different times
- Peer-assessment across disciplines requires extra coordination
- Access to facilities may be restricted to certain disciplines
- Student schedules from different majors seldom align
- University semester schedules vary.
- Scheduling meetings is complicated by time zones

