

Taft NASA Tech Bridge Program

Solicitation: NASA Tech Bridge Program. Seed funding to develop long-term partnerships with NASA from institutions which have less than \$5M in funding from NASA, in particular HSIs. Focused R&D around an aerospace topic, with strong student involvement.

Topic: Develop novel approaches for space debris management. Managing the debris on Earth orbit is one of the responsibilities of NASA. A safe Earth orbit is a hard prerequisite for all future NASA missions. Debris presents an ever-increasing threat to the orbital environment.

Taft, in collaboration with aerospace company Interorbital Systems and artificial intelligence company Infyrno, to investigate new approaches in:

1. **Active Debris Remediation (ADR).** Investigate the potential of privately developed, ultra-low-cost rocketry for ADR and implications for new business models. Investigate creative approaches such as redirecting debris to the lunar surface for use in future lunar surface operations, such as in NASA's planned Artemis missions. The purpose: determine new kinds of economically viable ADR.
2. **Debris identification, characterization, and mission profile generation.** Using AI and data science techniques, identify and classify orbital debris to fit the envisioned new mission profiles. Investigate new data acquisition methods (e.g. by existing or new satellite constellations) and/or nontraditional data sources to go beyond USSPACECOM debris data.

Student involvement. Taft students will be heavily involved in both the aerospace and AI components. Potential to develop a new curriculum to train the near-future space debris workforce for tracking, characterization/identification, and active remediation.

Overall Budget: ~\$300k, around 24 months. Leading to a full NASA Tech Bridge award of \$2M-\$4M per year.