

# Establishing a partnership with the Caltech Mission Operations Center for ASTERIA

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**Program: ASTERIA In-Flight Autonomy Technology Development (Initiative lead: Lorraine Fesq)**

## Project Objective:

The Arcsecond Space Telescope Enabling Research in Astrophysics (ASTERIA) will search for super-Earth-sized transiting exoplanets around our nearest Sun-like neighbors, the alpha Centari system.

The ASTERIA operations team will partner with the new student-run Caltech Mission Operations Center (CMOC) for operations support and performance trending. CMOC is located on the Caltech campus, and will be set up to allow students to work with multiple SmallSat and CubeSat missions, including ASTERIA.

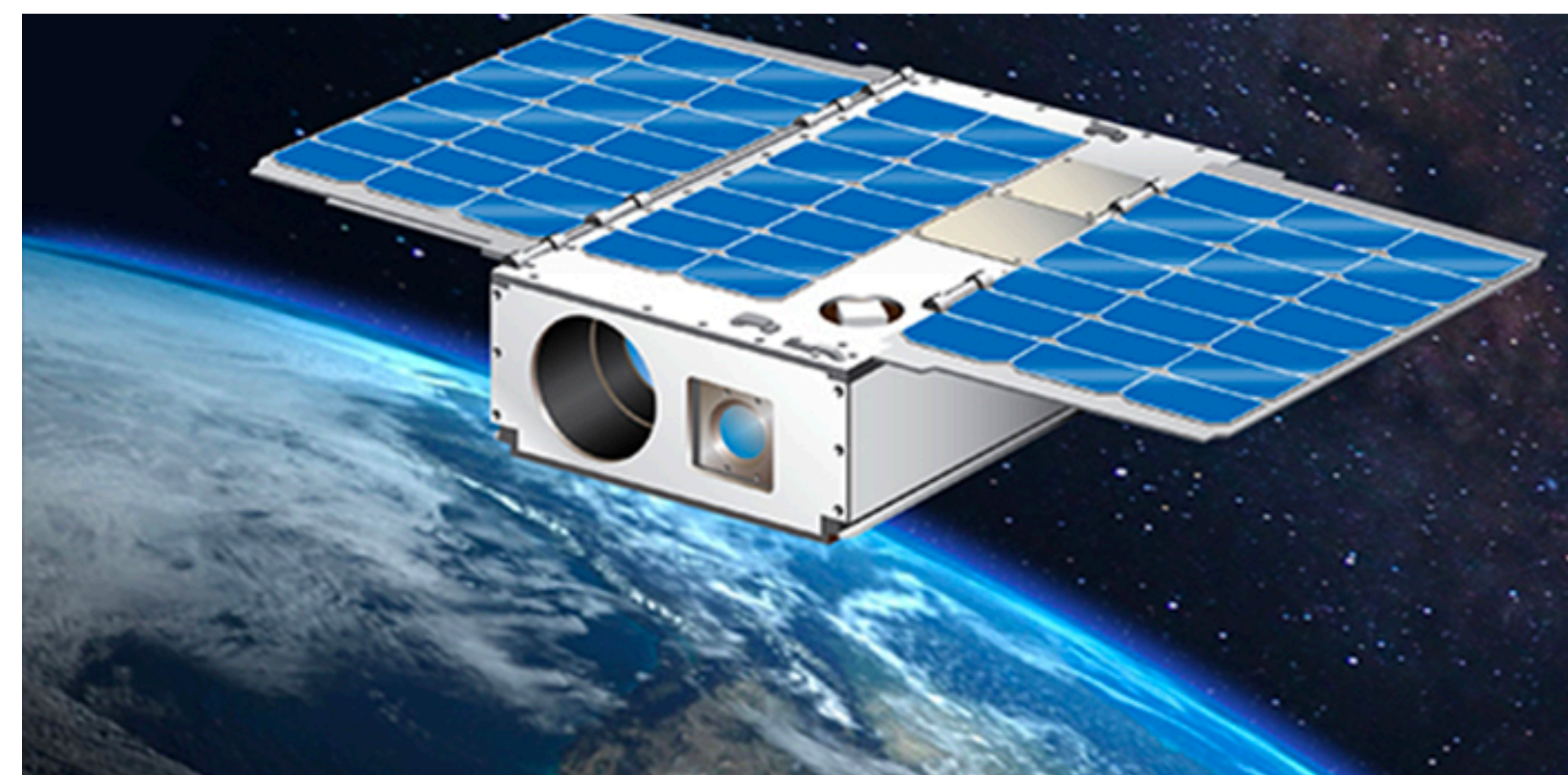
In July 2019, we received seed money to begin spinning up the CMOC partnership in preparation for our FY20 work.

## FY19 Results:

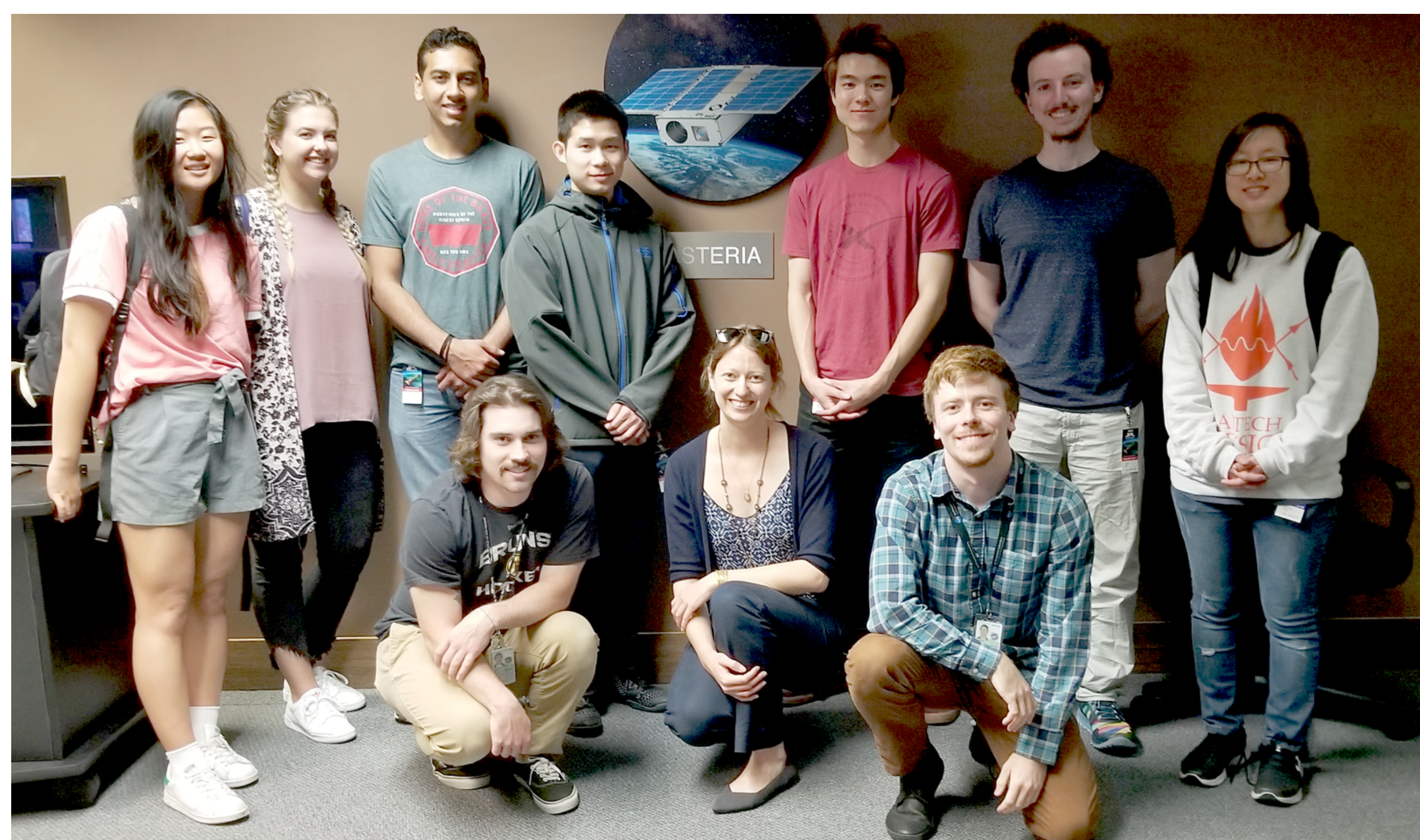
- Worked through pre-requisites to the ASTERIA-CMOC partnership
  - student onboarding and remote access as well as export control determination.
  - Vendor proprietary information determination is an ongoing effort.
- Held seminars to introduce students to the ASTERIA mission and basic mission assurance practices.
- Began a student project to create a generic, MATLAB-based tool for calculating target star and ground station observability,
  - May replace third-party closed-source software used by ASTERIA today
- We are positioned to hit the ground running in FY20, with a focus on data analysis and observation planning tasks.

## Benefits to NASA and JPL:

- institutional knowledge of how to initiate new partnerships between JPL missions and CMOC or other student-run operations centers.
- Future missions, such as Lunar Flashlight, could potentially decrease operating costs and improve operational support team through partnerships with student-run operations centers
- Train next generation of JPLers and disseminate our best practices through advising and access to an operational JPL CubeSat.



ASTERIA was launched in August 2017 and is now in an extended mission. It is carrying out several experiments, including observations of small transiting exoplanets.



CMOC students and advisor Bethany Ehlmann (center front) on a visit to JPL to shadow an ASTERIA pass, lead by Kyle Hughes (right front) and Ansel Rothstein-Dowden (left front).



JPL cubesats, current and planned. Future missions could benefit from student operations center partnerships.