

ACRUX-2 Mission Team Descriptions

The ACRUX-2 Mission is the ACRUX Program's second mission, building on the foundation established by the ACRUX-1 Mission, which in 2019 successfully launched the first Australian student satellite in 50 years.

The goal is to be the first Australian student team to take a photo of Earth from low Earth orbit, which will be accomplished through the hands-on development of the ACRUX-2 satellite, a 3U CubeSat, and the ACRUX ground station, which is cable of sending and receiving UHF signals.

Team	Learning Opportunities
 Systems Engineering Team Ensure that the mission goals and requirements are met.	• Coordination of technical reviews across the mission's lifecycle • Requirements engineering management in JIRA • System architectures and interface management • Mission operations simulations using Ansys products
 Attitude Determination & Control Team Locate and control the satellite's position and orientation.	• Attitude determination sensors including gyroscopes, GNSS, magnetometers and sun sensors • Attitude control actuators including magnetorquers and reaction wheels • Algorithms for attitude determination and control
 Camera Team Integrate the camera payload with the satellite bus to capture photos of Earth.	• Embedded programming in C/C++ • Adapting a camera for the environment of space using Ansys products for simulation • Algorithm implementation for efficient mission operations
 Electrical Power Team Design and develop power generation, storage and distribution systems.	• Custom PCB design using Altium • Power systems simulation using Ansys products • Soldering surface mount components to assemble PCBs
 Software Team Develop software for the satellite and ground station to enable mission operations.	• Command of the operational modes of the satellite (CONOPS) • Coordination of the communication between on board hardware systems • Design and implementation of failure detection isolation and recovery (FDIR) algorithms • Storage and manipulation of data produced by hardware systems

 Mechanical Structure & Thermal Analysis Team Guarantee the structural integrity of the satellite and ground station, as well as a safe operating temperature.	• Design the satellite chassis using CAD software • Design an active thermal control system • Thermal/vibration simulation using Ansys products • Fabrication of components including use of CNC
 Communications Team Enable uplink and downlink between the satellite and ground station.	• Develop/document firmware for an RF transceiver board using C/C++ • Use high-speed electronics to perform signal processing • PCB design for an RF transceiver using Altium
 Program Operations Team Provide program level support which is vital to ensuring a successful mission.	• Hardware management, including procurement and storage • Cost management and expense tracking • Member recruitment, training, and events