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Australian satellite on countdown to launch from Cape Canaveral

CUAVA-1 will carry experimental payloads for deployment from the International Space Station

CUAVA-1, an Australian designed and built spacecraft, will be launched onboard a Space-X Falcon 9 SpX-23 rocket this **Saturday, 28 August 2021**. Scheduled launch time is 5.37pm AEST, from the Kennedy Space Center at Cape Canaveral, Florida.

A lead project of the Australian Research Council Training Centre for CubeSats, Uncrewed Aerial Vehicles and their Applications (CUAVA), this first mission is one of many expected to help pave the way for the development of a sustained commercial and scientific space industry in NSW and Australia.

CUAVA-1 will carry four experimental payloads intended to give scientists and research students fresh insights from near-Earth orbit during its 12-month mission.

CUAVA-1 is being launched to the International Space Station for deployment into orbit about 400 kilometres above Earth, expected later this year.

The CUAVA-1 mission aims to:

- Investigate Earth's plasma environment and space weather using onboard radiation detectors;
- Observe Earth using novel imaging technology;
- Test equipment designed for use in a future satellite that will search for signs of life on planets around Alpha Centauri, our nearest star system;
- Link with the international amateur radio union for education and outreach.

The CUAVA-1 mission will give students and postdoctoral researchers unique access to develop skills and experience with space-flight in readiness for employment within the Australian space industry.

The Director of CUAVA, Professor Iver Cairns from the School of Physics at the University of Sydney, said: "This mission shows that Australian universities are at the forefront of our emerging national space industry. Our CUAVA Training Centre is leading in the development of near-Earth space technology and is a critical link in training the next generation of space engineers and scientists."

Partly funded by the NSW Government, the project is an important step in the development of Australia's burgeoning space industry.

NSW Minister for Jobs, Investment, Tourism and Western Sydney Stuart Ayres said: "CUAVA is leading the way in developing the space technology of the future and training the people that will use it.

"NSW congratulates CUAVA on the launch of its first satellite. Our state is home to almost half of Australia's space-related businesses and generates around half of all space-related revenue nationally: there is no better place to support space technology research and development to create the jobs of the future."

Australian Research Council CEO Professor Sue Thomas said the launch was a significant outcome from the Training Centre.

'We increasingly rely on access to space for vital data and services, and a skilled workforce is required to grow the sector and capitalise on global opportunities – it is exciting to see CUAVA undertaking this essential research.

"CUAVA is funded under the ARC's *Industrial Transformation Training Centres* scheme which fosters close partnerships between researchers and end-users to provide innovative Higher Degree by Research and postdoctoral training for industries that are vital to Australia's future."

CUAVA-1 mission control will be the first space-flight managed by Saber Astronautics through the new Responsive Space Operations Centre (RSOC) in Adelaide. CEO of Saber Astronautics, Dr Jason Held said: "Saber is delighted to fly the CUAVA-1 satellite out of the newly minted Responsive Space Operations Centre, which went live at Lot Fourteen in Adelaide last March."

The CUAVA-1 launch is also a vital step in building international space cooperation. The Cape Canaveral launch is being managed through the Japanese launch provider, Space BD.

Cubesats are a low-cost and simple way to access near-Earth obit for scientific and commercial purposes. They are built from small boxes just 10 centimetres cubed, weighing no more than 1.3 kilograms each, and are packed-full of high-tech equipment. CUAVA-1 will include three cubes, making a box 30 centimetres long and about three kilograms in mass.

Based at the University of Sydney, CUAVA is a joint project involving the University of NSW, Macquarie University, multiple Australian commercial and government partners and the Rochester Institute of Technology in the USA. CUAVA's

government partners are the Australian Bureau of Meteorology and the Department of Defence. Its commercial partners include Air@Wave Communications, ArborCarbon, HyVista and Saber Astronautics.

www.cuava.com.au Twitter: @ARC_CUAVA

DOWNLOAD images and video at this link.

VIDEO + STILLS OF THE LAUNCH available shortly after lift-off.
NASA links for these assets: mission blog, NASA Live TV and NASA resources.

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Mission Summary

Reference number	VK2USY CUAVA-1
Size	30cm x 10cm x 10cm; 3 Unit CubeSat format
Mass	3000 grams (3 kg)
Equipment	Commercial ‘off-the-shelf’ control and operating systems; four research instruments
Mission purpose	Scientific research, technology demonstration, linking with the international radio amateur community, national capacity building
Altitude at launch	405km
Mission duration	1 year
Mission conclusion	Complete burn-up in upper atmosphere at >80km altitude

Payloads

- ISTI (Imager, Spectrograph, and TinyTol Instrument) developed by the School of Physics, University of Sydney. Includes RGB camera, hyperspectrum for image core, and TinyTol for the Breakthrough Foundation.
- KEA GPS Instrument developed by the Australian Centre for Space Engineering Research, University of New South Wales.
- Radiation Detector with integrated Power Over Databus payload developed by the School of Aerospace, Mechanical and Mechatronic Engineering and the School of Physics, University of Sydney.
- RUSH (Reconfigurable Systems for Space) developed by Macquarie University.

Satellite bus and commercial off-the-shelf (COTS) components:

- Electrical Power System (EPS): GOMspace P31U with two lithium-ion battery cells and 7 solar panels made by GOMspace with 2 panels made by Air@wave. Both types of solar panels consist of two Azurspace triple-junction solar cells in series in each panel, with sun sensors integrated.
- Command and Data Handling(C&DH): Innovative Solutions In Space on-board computer (OBC).
- Communications: Innovative Solutions In Space crossed dipole pair antenna with a VHF Uplink/ UHF downlink transceiver.
- Attitude Determination and Control System (ADCS): CubeADCS from CubeSpace with integrated reaction wheel system. It also includes three magnetorquers, a three-axis magnetometer and a gyroscope. Sun-sensors integrated into solar panels used as inputs to the ADCS system.
- Structure: Innovative Solutions in Space 3U PC104 form factor structure.