# SmartSat CRC and partners commit $7 million to develop AI-enabled spacecraft that can operate autonomously

*Adelaide, 3 July 2023* – SmartSat Cooperative Research Centre (SmartSat ), Australia's leading space research centre, today launched a $7 million project to develop new autonomous spacecraft using artificial intelligence (AI).

The three-year project, *Spacecraft Autonomy and Onboard AI for Next Generation Space Systems,* known as *SCARLET-α,* will bring together eight SmartSat partners: Airbus, Asension, Deakin University, Defence Science and Technology Group, Leonardo Australia, Saab Australia, Swinburne University of Technology, and University of South Australia (UniSA) in a collaborative research effort.

SCARLET-α aims to create a set of autonomous algorithms that will enable small and distributed spacecraft to make decisions independently, optimise the use of available resources and capabilities, adapt to changing conditions, and handle critical situations, without intervention from Earth.

The project will focus on high impact areas of spacecraft autonomy and onboard AI as identified and prioritised with the industry and defence partners, including:

- Onboard processing and actionable intelligence
- Small spacecraft and constellation resilience
- Dynamic optimisation of constellation resources
- Real-time tasking and resource allocation

SmartSat CEO Professor Andy Koronios, says that, to date, onboard processing has been limited to data collection, but researchers hope the algorithms they develop will allow spacecraft to perform many tasks with less intervention from human operators.

"As autonomous technologies advance and are embraced, their place in space will expand and present new opportunities for applications here on Earth. The next generation of satellite communications and earth observation will be achieved using integrated systems of satellite constellations operating autonomously and performing multiple tasks in real time. Such AI-enabled technologies promise to transform the major sectors of our economy, such as agriculture, farming, and mining, and better serve our defence and national security objectives.

This investment is possible through the great support of the Federal Government CRC Program Australia and will help develop cutting-edge technologies in space autonomy."

"With next-generation space systems on the horizon, the possibilities for science, discovery and innovation are endless. SmartSat is well placed to progress Australia's spacecraft autonomy capabilities to help our nation remain innovative and at the forefront of technology."

SmartSat CRC Chair of Artificial Intelligence, UniSA STEM Professor Ryszard Kowalczyk, who is leading the project, says spacecraft autonomy will be a key feature of the next generation space systems.

“Spacecraft that can operate independently of ground contact will be able to respond to unexpected events in real time without needing to wait for commands from Earth. This autonomy will improve Australia’s remote sensing capabilities and other vital services undertaken in space, allowing us to push the boundaries even further in orbit.”

“It will help increase the responsiveness and continuity of space-based observations, minimise communication and data access delays, and reduce the costs for both space and ground operations."

SCARLET-α is the flagship of a suite of projects SmartSat will deliver under its SCARLET lab (laboratory), a SmartSat initiative to develop innovative technologies across spacecraft autonomy, on-board Artificial Intelligence (AI) and data analytics. The lab provides a collaborative platform to bring together researchers and industry to advance autonomy and produce tangible outcomes for Defence and Civil pursuits, enabling Australia’s next space missions.

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**ABOUT THE SMARTSAT CRC**

The SmartSat Cooperative Research Centre brings together over 100 national and international partners who have invested over $190 million, along with $55 million in Federal Government funding under its Cooperative Research Centres Program, in a $245 million research effort over seven years. Working closely with the Australian Space Agency & Defence, SmartSat is making a strong contribution to the Australian Government’s goal of tripling the size of the space sector to $12 billion and creating up to 20,000 jobs by 2030. Priority industry sectors for SmartSat include telecommunications, agriculture and natural resources, and defence and national security. https://smartsatcrc.com