Laser research to boost deep space missions

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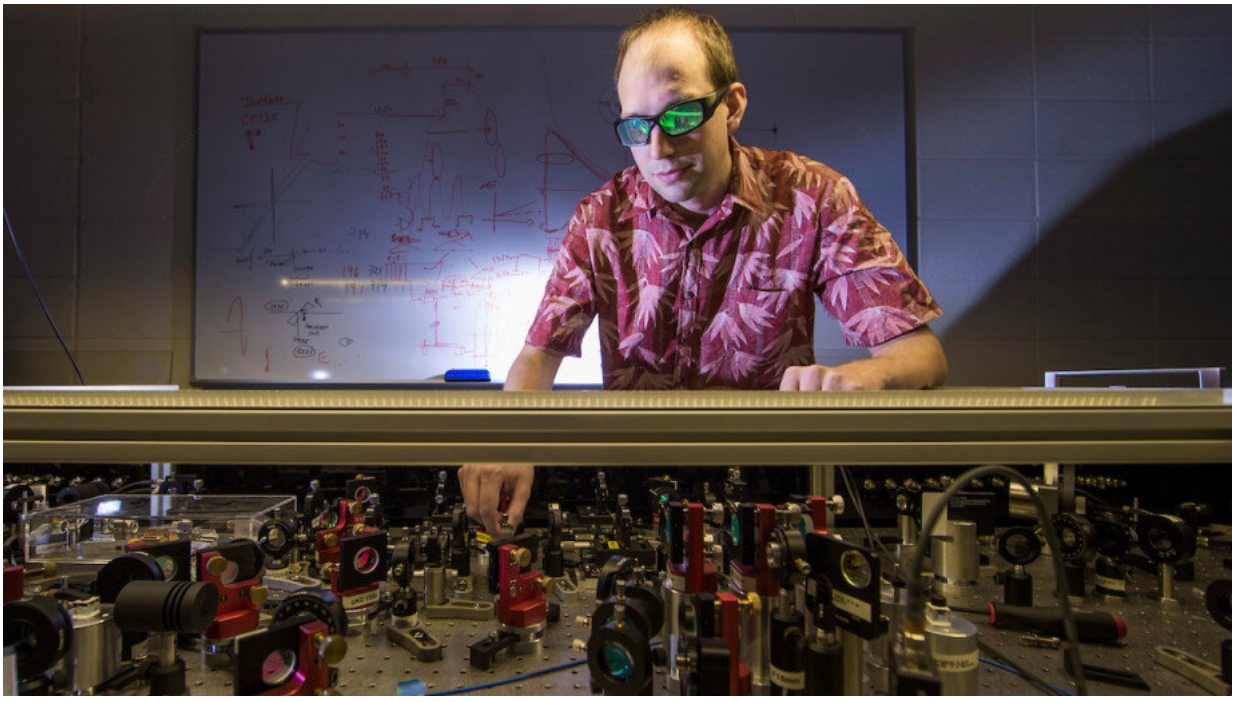

Associate Francis Bennet will lead one of two new ANU projects to help propel deep space missions. Photo: Lannon Harley/ANU

Canberra is one step closer to being Australia's home to deep space laser communication, thanks to a government funding for researchers at The Australian National University (ANU).

Two ANU projects have received funding from The Australian Moon to Mars Demonstrator Feasibility Grants from the Australian Space Agency

to help test new activities that will drive space exploration.

The first project will build a prototype deep space laser communications transmitter compatible with optical communication technology developed by NASA for missions including the Optical to Orion (O2O) demonstration, at a specialist facility in the ACT.

The facility could eventually be used by NASA to support deep space missions.

"This funding is going to allow us to build a prototype system compatible with future NASA missions which are going to deep space," project lead, ANU Associate Professor Francis Bennet, said.

"This is crucial to enable permanent operations on the Moon, improve astronauts' ability to connect to those back on Earth and even allow high-definition video to be sent and received from the surface of the Moon and Mars."

The ANU Quantum Optical Ground Station has received $200,000 to help researchers and industry better access unused data about our Universe. ANU is currently building the laser communications ground station at the Mt Stromlo Observatory in Canberra.

"The station will have laser communication systems which will allow very high speed communications for crewed and robotic missions going back to the Moon," Associate Professor Bennet, who is a Mission Specialist at the ANU Institute for Space (InSpace), said.

"This next space technology leap is going to be to laser communication, so this research will help enable that here in Australia.

"It's like what you can do with faster speeds on your home Internet. This

will enable more advanced technologies to travel further into space and transmit information back."

This funding boost will provide a pathway to a network of optical ground stations which could be leveraged for future space exploration.

"It's really exciting that we are able to build technology that could be used for future based communication for crewed missions," Associate Professor Bennet said.

Another ANU team has been funded more than $100,000 to develop laser measurement technology for the next generation gravity sensing mission, potentially for launch in the mid-2020s.

The project will be led by Associate Professor Kirk McKenzie, also a Mission Specialist at InSpace.

"The Gravity Recovery and Climate Experiment (GRACE) missions make global measurements of water motion, revealing effects of droughts on groundwater and aquifers and ice caps evolution over years and decades, crucial to understanding the effects of our evolving climate," Associate Professor McKenzie, said.

The project extends a successful decade-long Australian/NASA collaboration and partners with CEA Technologies, an Australian radar technology company based in Canberra, to produce the laser stabilization prototype.

"This is an important first step to upgrade inter-spacecraft laser ranging, so measuring the distances between spacecraft within millimeters via lasers," Associate Professor McKenzie said.

"It will also allow us to contribute to crucial Earth observations."

Provided by Australian National University

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