

InSpace
ANU INSTITUTE FOR SPACE

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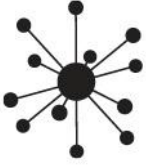
PARLIAMENT INQUIRY INTO DEVELOPING AUSTRALIA'S SPACE INDUSTRY

The ANU Institute for Space (InSpace) is a flagship innovation institute and front door to the multidisciplinary space capability across the Australian National University. Launched in 2018, before the creation of the Australian Space Agency, the institute's purpose is to create opportunities for ANU innovators to supercharge Australia's space capability.

- As an advocate, we are the voice of ANU space capabilities, stimulating funding, and inspiring career choices in space.
- As a navigator, we uncover and create compelling opportunities for space innovation, research, and commercialisation connecting ANU teams with the space sector.
- As a catalyst, we convert space innovation and research opportunities into funded missions that lift ANU research performance and deliver commercialisation and impact, for the benefit of our space sector.
- As a funder, we fund space innovation, research and infrastructure when strategic funds are available, in partnership with others.
- As a steward, we cultivate an entrepreneurial mindset and behaviours.

InSpace aligns its priorities to the Australian Space Agency's (ASA) civil priorities, and the federal government priorities for national action in Defence, Home Affairs and Science. We represent 22 Mission Specialists from space disciplines across the ANU supported by a world-class team of space industry professionals – our Mission Control. Our diverse team spans space law, ethics and policy, space medicine, economics, engineering and sciences, artificial intelligence, agritech and space flight qualification. Eight of our Mission Specialists serve on Australian Space Agency Technical Advisory Groups which set priorities and shape the 10-year roadmaps for Australia's space industry, including Earth Observation, Space Situational Awareness, Advanced Communication and Space Medicine and Life.

ANU InSpace has project collaborations with most international space agencies, including NASA, JAXA (the Japan Aerospace Exploration Agency), DLR (the German Aerospace Centre), CNES (France's National Centre for Space Studies), the New Zealand Space Agency and ESA (the European Space Agency). Our international organisation partnerships are



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extensive, and in the past year, we have signed four new MOUs and 16 new NDAs to explore industry collaborations both domestically and around the world.

As an innovation institute, we are dedicated to changing the lives of Australians by crossing perceived discipline boundaries to create truly collaborative space research and commercialisation. Here are a few of our missions:

Satellites tell us where fires may happen before they happen

As more industries pivot into space, unique collaborations will help to fuel novel innovations. In the spirit of multidisciplinary collaboration, we paired a bushfire researcher with an astronomer to produce a state-of-the-art, satellite payload capable of sensing fuel conditions and alerting authorities to areas *at risk* before bushfire season. The OzFuel mission team includes NASA and the Canadian Space Agency, complementing their upcoming missions to directly detect fire spread. OzFuel's industry partners, Fireball. International, are experts in direct detection on the ground and rapid data dissemination to the fire services, and Leonardo, are the providers of the unique infrared sensing payload.

Australia and ANU lead the world in next-generation satellite communication

The future of communication is optical—not radio waves. ANU InSpace, CSIRO and the ACT state government are supporting the construction of an optical communications ground station at Mt Stromlo Observatory and leading the development of the Australasian Optical Ground Station Network (AOGSN), a first-in-the-world network across Australia and New Zealand. The partnership also includes Defence Science Technologies, the University of Auckland and the University of Western Australia.

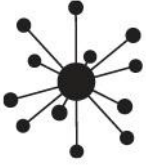
The AOGSN is developed with industry dialled in from the start. When expanded to include other nodes across Australia and New Zealand, demand for the use of this network has been overwhelming with 12 industry partners and six space agencies signed up to use the network.

The network's unique capabilities – to provide uninterrupted high bandwidth optical communications, are enabled by Australia's size and climate, as well as the large collecting aperture of these research telescopes.

Looking to the future, Australia's longitude provides a critical view of the solar system. We are supporting CSIRO's Deep Space Network in Tidbinbilla to be a home for one of the three large hybrid antenna locations for the NASA deep space network, enabling deep space communication that makes travel beyond the moon possible.

NSTF – National Space Test Facilities are building a global testing hub in the southern hemisphere

ANU hosts the National Space Test Facilities (NSTF). Valued at more than \$130 million, these facilities and its expert teams qualify Australian and international mission payloads to increase mission assurance. The NSTF provides open access to any Australian industry through an innovative business model of co-funded partners, the ACT State Government, Defence Science Technologies Group, University of Auckland, and UNSW-Canberra.



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Testing for space radiation is critical, but it's not available widely across the globe. Our facilities give us a unique radiation testing opportunity that will allow Australia to become a hub for radiation testing off-the-shelf satellite components from around the world, to certify that they are safe and sturdy enough for launch and orbit. Through the NSTF, we maintain strong relationships with many global space partners, including major primes and international space agencies.

The NSTF was the first ANU facility to reopen after COVID due to the demand from multiple space primes such as Fleet Space Technologies and Gilmour Space Technologies and universities across Australia and New Zealand such as UNSW Canberra, the University of Auckland.

The Australian Space Agency's national space qualification capability audit highlighted the importance of the NSTF's space environment facilities, housed in the Advanced Instrumentation and Technology Centre at Mount Stromlo to the growing Australian space sector.

Space pollution: Protecting people, assets and our future in space

Space debris is a risk to space assets and life. There are countless satellites and pieces of broken space equipment orbiting our Earth which pose a threat to valuable space missions. Australia's vast size and climate make it an ideal location for space debris tracking and space traffic management. InSpace hosts The Centre for Space Situational Awareness Research (CeSSAR), a transdisciplinary centre aimed at incentivising responsible behaviour in space through the establishment of the first open-source data system for tracking and identifying orbiting objects, tracking compliance with national and international space debris mitigation norms, freedom from interference, and sustainable space activities.

RESPONSE TO THE PARLIAMENT INQUIRY INTO DEVELOPING AUSTRALIA'S SPACE INDUSTRY

ANU InSpace welcomes the Parliament Inquiry into Developing Australia's Space Industry as an opportunity to explore how the ANU can continue growing the national space industry sector through the development of sovereign research, manufacturing, continued international cooperation, commercialisation and economic development, together with the preservation of the space environment.

We hope this inquiry will highlight the value of a national space effort, the funding of inspirational space science missions and the value of getting Australia's space industry and academia involved in charting the future of space for our nation.

Our greatest concern about the Australian space industry today is the potential fracturing of the national industry into state sub-industries. The creation of these smaller, competing, state-led space efforts stops us from maximising national growth, harnessing areas of regional strength for the wider good and taking a holistic view of jobs and growth. We need to preserve national strength to compete on a global scale. Initiatives, funding and goals must remain national for maximum future benefits and economic growth.

We also support the funding of joint academic and industry space science missions as the most effective way to inspire the next generation of our space workforce and to reliably bring more women and minorities into the space industry. These inspiring missions must be adequately funded



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by the space agency and be open to diverse participation, national outreach and strong educational outcomes.

Finally, it is imperative that the Australian Space Agency is funded long term on a national level equivalent to the funding of other countries with similar GDP. The bright future of our space industry relies on it. Australia is blessed to have unique geography that will bolster national capabilities and bring us international projects and partners. Ground segment communication, launch sites, and space situational awareness are examples where national capabilities are important and have a positive impact on growing jobs, powering economic growth and developing an international competitive edge. Our agency must be adequately funded, to help grow these opportunities for all Australians.

Thank you for your time and this opportunity to introduce our organisation and talk about our multidisciplinary approach. We welcome any meeting that you would find beneficial and would be happy to be a trusted resource for the members of Parliament. As part of the national university, ANU InSpace strives to be a resource for all Australians.

