



Committee Secretary
Standing Committee on Industry, Innovation, Science and Resources
PO Box 6021
Parliament House
Canberra ACT 2600

10 February 2020

Dear Committee Secretary,

The Australian Academy of Science (the Academy) welcomes the opportunity to provide a submission to the Standing Committee on Industry, Innovation, Science and Resources into space industry in Australia.

The Academy's views are informed by the ongoing development of Australia's next decadal plan for space science, which involved expert working groups, community surveys, and broad-ranging consultation.

The purpose of Australian space science is to:

- Realise discoveries and innovations to grow knowledge and translation to practical benefit for the Australian community.
- Foster and leverage international collaboration to grow national capability and international credibility.
- Stimulate and support the growth of space-dependent technologies, industries and applications, and hence a sustainable sovereign space sector.
- Support Australia's national security priorities and protect critical infrastructure.
- Inspire engagement in STEM disciplines and grow the high-value workforce capability.

The single most significant support that the Australian Government could provide the Australian space sector is to provide national co-ordination in space science. There is no body with a mandated role of co-ordinating Australia's space science investments or actively support the development of space science. A range of organisations – Defence Science and Technology, the CSIRO, Geoscience Australia, and the Australian Space Agency, the National Committee for Space Science and universities – have different roles.

Despite the Australian Space Agency's establishment, this is a critical gap that needs to be filled. The Agency's charter does not explicitly mention science. Nor is science mentioned in the Civil Space Strategy, although it underpins key objectives and challenges. The Committee may wish to recommend that the Agency be permanently established with a legislative authority (similar to other agencies) and play a role in co-ordinating civil space science.

Space science is the foundation of the space industry. Without sufficient support to Australia's space science community, goals for the Australian space industry will not be met. **The Academy supports commitment and investment in a national capability for space science**, which would enable the

development of a sustainable and focused research and development program and support the space industry's development.

Development of space satellites, technology and equipment

Space science enables the space industry sector: it provides challenging projects, generates knowledge and skills, and leverages international expertise. A national program of challenging space missions will stimulate this sector's development, grow capability, and foster spin-off applications. **The Academy supports a national program of space missions, as part of a national capability for space science.**

Space missions would complement and support the Government's National Manufacturing Priority in Space, and Defence's objective to support key industry sectors through the Australian Industry Capability Program.

Australia is a long way from realising a sustainable space industry and sovereign manufacturing capability to meet our national priorities. Unless this changes, Australia will be unlikely to realise significant market opportunities except in limited niche areas.

One area of critical reliance is international satellites and the data they generate. This reliance spans many sectors, including defence and national security, positioning and timing services, earth observation, and weather forecasting. Some of these services are purchased, such as access to a satellite payload, but many are accessed for free. Such arrangements impose constraints and are inherently risky.

Discoveries made through fundamental scientific research are responsible for the vast majority of innovation and breakthroughs in the space sector. Mission-based approaches to space programs by international space agencies have led to many technologies now used in our day-to-day lives.

Investment in such fundamental research has stagnated in Australian in recent years. Without patient investment such as that made in the biomedical sciences, the pipeline of knowledge generated by fundamental research will run dry and stagnate our ability to innovate. **The Academy is also supportive of establishing a research translation fund, to mirror the Medical Research Future Fund.**

International collaboration, engagement and missions

Modern science is inherently an international endeavour, and space science is no exception.

Australian space science research has achieved world-class excellence. This is evidenced by the international standing of peer-reviewed Australian space and planetary science publications and Australia's ability to attract major international space conferences and contribute to international space science programs.

Through the Academy's membership as adhering member to the International Science Council's Committee on Space Research (COSPAR), Australia has a seat at the table for oversight and decision making for the space science sector. It has also allowed Australia to host COSPAR 2021, the committee's 43rd Scientific Assembly. The conference brought together the best in space research from across the world. As hosts, we will promote Australia's interests in space.

Space science should be utilised as a tool for regional and international diplomacy. The Academy stands ready to support these efforts through our existing partnerships and membership of international bodies such as COSPAR.

Australian space science is a strategic asset and provides the opportunity, if suitably funded, to link with large international space programs leveraging expertise and industry and market opportunities. While ad hoc funding commitments such as the Moon to Mars initiative are very welcome, an ongoing commitment to a space program is required to develop a sustainable space industry.

Future research capacity, workforce development and job creation

The COVID-19 pandemic has had devastating effects on Australia's research workforce, with the full impacts of the disruption not yet seen. University jobs cuts, and likely declining international research investment, will have a disproportionate impact on the space science workforce. To maintain Australia's future research capacity in space science, immediate intervention is required. By preventing a loss of skills and knowledge, Australia can lay the foundations for a more sustainable research sector, with flow-on effects to the prosperity of space industry.

Meeting our national space priorities requires growth of the knowledge-based workforce. Current shortages will be amplified by reductions in the research workforce due to COVID-19 disruptions and cutbacks.

Inspiring Australia in STEM

Space science and space activity excites and inspires Australians and students.

Realising Australia's space industry's opportunities requires a national innovation and education strategy spanning the primary, secondary, tertiary, VET and industry sectors. Such a strategy can use space science as a vector to grow participation in science, technology, engineering and mathematics (STEM), the STEM workforce, and the space sector. This should include strategies to grow STEM participation and increase diversity and inclusion, improving career pathways and opportunities for underrepresented groups.

Yours sincerely

Professor John Shine AC PresAA FRS

President

The Australian Academy of Science