Please note: the substantive content of the 2026 NRI Roadmap Survey begins at Question 20 (with prior questions dealing with administrative and other information).

As such all submissions that are published include the responses submitted from Question 20 onwards only.

Q20.

Part 2: Research themes

2.1 NRI comprises the assets, facilities and associated expertise to support leading-edge research and innovation in Australia and is accessible to publicly and privately funded users across Australia and internationally. We are seeking your input on possible directions for future national-level investment - i.e., where the requirements are of such scale and importance that national-level collaboration and coordination are essential.

The 2021 Roadmap used a challenge framework to support NRI planning and investment. With this in mind, consider likely future research trends in the next 5 - 10 years, and with respect to one or more of the 8 challenge areas identified in the 2021 Roadmap as listed below:

- describe emerging research directions and the associated critical research infrastructure requirements that are either not currently available at all, or not at sufficient scale and
- describe current national infrastructure requirements that you anticipate will no longer fit the definition of NRI in 5-10 years.

Do not limit your commentary to NCRIS funded capabilities.

Q21.

Resources Technology and Critical Minerals Processing

Q22.

Food and Beverage

Q23.
Medical Products

Q24.
Defence

Q25.
Recycling and Clean Energy

Q26.
Space

Q27.
Environment and Climate

Q28.
Frontier Technologies and Modern Manufacturing

Q29.

2.2 The 2024 statement of National Science and Research Priorities (NSRPs) includes outcomes linked to each priority to assist in identifying critical research needed in the next 5 to 10 years.
Consider the priority statements and, with respect to one or more of the 5 priority areas as listed below:

- describe emerging research directions and the associated critical research infrastructure requirements that are either not currently available at all, or
- not at sufficient scale and describe current national infrastructure requirements that you anticipate will no longer fit the definition of NRI in 5-10 years.

Do not limit your commentary to NCRIS funded capabilities, and where relevant, refer to the underpinning outcomes and research identified in the NSRPs document.

Q30.

Transitioning to a net zero future

Q31.

Supporting healthy and thriving communities

Q32.

Elevating Aboriginal and Torres Strait Islanders knowledge systems

Q33.

Protecting and restoring Australia’s environment

Q34.

Building a secure and resilient nation

Mathematics desperately needs investment in infrastructure. There has been, to my knowledge, no significant investment in mathematical research infrastructure over the lifetime of NCRIS, and mathematics has had little or no success with schemes such as LIEF. We operate entirely on such Discovery funding as individual mathematicians are able to attract, the minimal support provided by university (or generated by our teaching revenue) and sporadic access to international funders like the Simons Foundation. What we need is a residential research institute. These are common and incredibly productive and successful elsewhere in the world (Canada, Germany, the USA, the UK, Sweden, Spain and many others have such facilities), and represent excellent value for money: while generating excellent research they also bring very well funded researchers to Australia for sustained periods, which has the effect of contributing in the short term to tourism revenue, and in the long term to the reputation and international stature of our R&D system and our ability to attract and retain excellent mathematicians from overseas. The MATRIX Institute has been providing our only residential research institute for over a decade, but it is massively under-funded by comparison to the facilities in comparable economies - compare the MATRIX budget to that of BIRS in Canada. I would suggest that including a significant quantum of funding for MATRIX in the Roadmap would provide both capacity and stability over the next 5 years, allowing MATRIX to step up its operations to a level commensurate with facilities elsewhere around the world. The return on investment through increased output and profile in the mathematical sciences would be enormous.

Q35.

2.3 The case for a new NRI capability, or enhancements to existing capabilities, typically emerges through advocacy from research communities clustering around rigorously identified needs and goals. Such a concept could respond to a requirement for novel or expanded capacity within a domain, or across domains, and must be such that it could only be made available with national-level investment.
If you have identified such a requirement, briefly describe the need, the proposed infrastructure capability, the medium-term goals, impacted research communities, and the timeframe over which you advocate its establishment. Your response can include links to relevant existing reports.

As mentioned above, we lack a sustained and stably funded residential research facility. This may be because the word "infrastructure" usually brings to mind physical research based on experimentation or simulation, and is not often thought of in terms of human infrastructure. But think-tank infrastructure in the mathematical sciences is like supercomputing infrastructure for simulation-based research. Mathematical research occurs inside researchers' heads, but serious breakthroughs on the big questions require a high-intensity and sustained exchange of very dense and technical ideas among complex groups of researchers with complementary expertise. Typically this would involve blocks of 3-4 hours at a time, daily, over a period of 2-4 weeks, sharing space on a blackboard or whiteboard. It is impossible to achieve over videoconference applications - the information bandwidth of such channels is just not sufficient: mathematicians use extremely dense notation, technical language, pictures and physical interaction to achieve enormous conceptual/technical throughput during in-person interactions. The MATRIX Institute is the only facility in Australia that provides this sort of infrastructure, but it has insufficient capacity or funding for the need, and consequently lacks a suitable level of capability. I would recommend at least 5 years of significant investment (on the order of $1.5M-$2M per year) to achieve a sustained period of high-capacity activity at MATRIX.

Q36.

Part 3: Industry perspectives

This section is seeking input specifically from industry-based respondents. Other respondents can skip this section.

Recommendation 6 of the 2021 Roadmap related to improvements in industry engagement with NRI. To complement work on this topic that has occurred since then, we are seeking additional advice on NRI requirements as perceived by current or potential industry-based users.

Q37.

3.1 Have you (or your organisation) interreacted with or used Australia's NRI?

- ○ Yes
- ◉ No

Q38.

3.2 If so, please briefly outline the NRI capabilities you (or your organisation) have interacted with or used. Do not limit your response to NCRIS capabilities.

This question was not displayed to the respondent.

Q39.
3.3 Please indicate your (one or more) primary reasons for interacting with NRI:

This question was not displayed to the respondent.

Q40.
3.4 If you answered no, please indicate your (one or more) primary reasons:

- [ ] I did not know about it
- [ ] Other facilities suit my needs better
- [ ] I would like to, but cannot get access due to geographical location
- [ ] I would like to, but believed that access was only available to academic researchers
- [x] I am not aware of any capability that meets my needs
- [ ] Other (please specify)

Q41.
Part 4: Other comments
4.1 Please elaborate on any of your above responses or add any other comments relevant to the development of the 2026 Roadmap. Your response can include reference or links to existing reports that you recommend be considered during the 2026 Roadmap development process.

Q49.
4.2 Optional Document Attachment.
Note: Our strong preference is that answers are provided against the relevant questions in the survey. However, this file upload option is available for submissions in file format, where needed. Please ensure the document includes your name or organisation.