Decadal plan for Australian astronomy 2026–2035

Australian Academy of Science

NATIONAL COMMITTEE FOR **ASTRONOMY**

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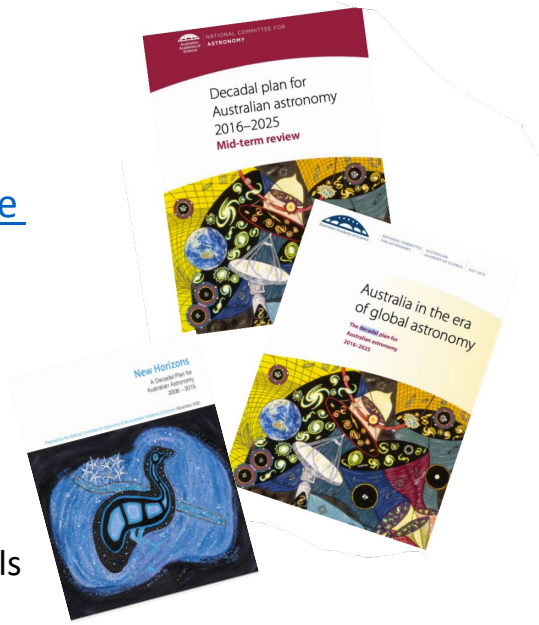
Acknowledgment of Country

The Australian Academy of Science acknowledges and pays respects to the Ngunnawal people, the Traditional Owners of the lands on which the Academy office is located. The Academy also acknowledges and pays respects to the Traditional Owners and the Elders past, present and emerging of all the lands on which the Academy operates, and its Fellows live and work. They hold the memories, traditions, cultures and hopes of Aboriginal and Torres Strait Islander peoples of Australia.

Overview

- The Australian astronomical community is carrying out a formal strategic planning process on a ten-year timeframe, reviewing its goals and progress at the mid-term mark.
- This process is run by the Australian Academy of Science's National Committee for Astronomy.
- It provides the opportunity for Australian astronomy to
  - carry out a review of its current capabilities, assess its impact both nationally and internationally,
  - provide a vision for the future and set priorities and develop strategies to implement the vision
  - Astronomy Australia Limited (AAL) supports the delivery of the infrastructure goals of the Australian Astronomy Decadal Plan



Vision and impact of the decadal plan

- The Decadal Plan not only articulates a strategic vision for Australian astronomy but also sets a roadmap for addressing critical scientific questions and building the necessary infrastructure.
- It examines:
  - Educational, training, and career pathways, reinforcing Australia's research leadership globally.
  - Engages with governmental bodies, and industrial, and research partners worldwide, the plan secures essential funding and fosters international collaboration.

Alignment with Government priorities:

- Provides advice and recommendations that directly benefit Government initiatives and priorities in the current Australian science system
- Support ongoing investments and identify further scientific opportunities for Australia

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Looking ahead: 2026–2035

- This future-looking plan aims to enhance the commercialisation of Australian astronomical technologies
- Further Australia's educational and diversity goals within STEM fields:
  - Advance educational initiatives
  - Promote diversity in the field
- Developed in the context of the Australian Government's priorities and will reflect these in its recommendations for the coming decade.
- Indigenous knowledge for the decadal plan: the greater alignment with the Closing the Gap policy in the new decadal plan, including a First Nations framework.

Big Questions in astronomy

- It is currently envisaged that the editorial board will draft the plan in the context of the Big Questions in astronomy, which in the 2016–2025 decadal plan are:

  - How did the first stars and galaxies transform the Universe?
  - What is the nature of dark matter and dark energy?
  - How do galaxies form and evolve across cosmic time?
  - How do stars and planets form?
  - How are elements produced by stars and recycled through galaxies?
  - What is the nature of matter and gravity at extreme densities?

Science questions are being discussed in the science working groups and may be updated in the next Decadal Plan

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Infrastructure priorities

- Partnership equating to 30% of an 8-metre class optical/infrared telescope;
- Continued development and operations of Square Kilometre Array (SKA) precursors, the Australian SKA Pathfinder (ASKAP) and Murchison Widefield Array (MWA) at the Murchison Radio-astronomy Observatory (MRO), and membership of the SKA telescope;
- Partnership equating to 10% of a 30-metre class optical/infrared extremely large telescope (ELT), such as the Giant Magellan Telescope (GMT);
- Capability within the national observatories (the Australian Astronomical Observatory, AAO; and Australia Telescope National Facility, ATNF) to maximise Australia's engagement in global projects through instrumentation development for these and other facilities;
- World-class high performance computing (HPC) and software capability for large theoretical simulations, and resources to enable processing and delivery of large data sets from these facilities.

DP 2016–2025 priorities

Please engage with the national and international facilities WGs, and science working groups to help develop infrastructure priorities for 2025-2036

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Timeframe

June 2023 to July 2025

Date	Activity
June-December 2023	Project initiation and establishment of working groups Presentation at ASA conference Development of working group plans and white papers
February-May 2024	Establish an editorial committee Nation-wide town-hall meetings and online consultation
June-July 2024	National presentation at ASA conference Development of working group reports Series of in-person town-hall meetings
September 2024	Working group white papers provided to the NCA – September 1 Incorporation into first draft of the decadal plan by the editorial committee – September 16
September-December 2024	Editorial committee preparation of exposure draft (including feedback by NCA / Academy of Science)
January-February 2025	Exposure draft consultation
March-June 2025	Report finalisation and prepublication
July 2025	Launch of the Decadal Plan at the ASA conference

We are here

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Decadal plan working groups

- White papers provided by working groups will provide the basis for the Decadal Plan, to be drafted by an editorial board appointed by the National Committee for Astronomy.

Working groups

- 13 working groups established.
- Working group chairs meet **monthly** to discuss how their consultation is going, to provide feedback to the NCA chair, and to ensure collaboration in the development of the WG white papers

Membership update:

- An overwhelming response from the community, with approximately **253 members contributing to various working groups**. This diverse group represents a wide range of institutions, fields, and demographics, showcasing the robust engagement of our community in shaping the future of Australian astronomy.

Working Group	Chair
1.0 Research:	
1.1 Galaxies and Cosmology	Professor Scott Croom
1.2 Stars, Planets, and the Galaxy	Associate Professor Sarah Martell
1.3 Time Domain and Multi-Messenger Astrophysics	Professor Eric Thrane Associate Professor Katie Auchettl
1.4 Theoretical Astrophysics	Professor Mark Krumholz
1.5 Aboriginal and Torres Strait Islander Astronomy	Dr Brad Tucker Ms Karlie Noon
2.0 Facilities:	
2.1 International and Space Facilities	Professor Simon Driver Associate Professor Emily Wisnioski
2.2 National and University Facilities	Professor Andrew Cole Dr Vanessa Moss
2.3 Data and Computing	Dr Minh Huynh Professor Chris Power
2.4 Instrumentation	Professor Richard McDermid
3.0 Impact and Engagement:	
3.1 Demographics, Society, and Workforce	Associate Professor Stas Shabala Associate Professor Emma Ryan Webe
3.2 Outreach, Education and Training	Dr Brad Tucker
3.3 Industry and Translation	Associate Professor Francis Bennet
3.4 Research Funding	Professor Simon Ellingsen

Editorial Board

- Through a rigorous process conducted by NCA, members were nominated and selected for the Editorial Board, ensuring the right expertise and diversity to cover critical research areas and gaps.
- The NCA approved the establishment of the Editorial Board, leading to the appointment of carefully considered candidates who will facilitate the editorial integration of the working group reports.

Editorial member	Role	State
Professor Virginia Kilborn	Chair	Victoria
Professor Sarah Brough	Deputy chair	New South Wales
Professor Tamara Davis	Board member	Queensland
Professor Cathryn Trott	Board member	Western Australia
Professor Mike Ireland	Board member	ACT
Professor Chris Power	Board member	Western Australia

Stakeholder consultation

- The decadal plan is binge developed through extensive community and stakeholder consultation. The findings and recommendations will be drawn from the conclusions of working groups
- Consultation is taking place throughout the two-year drafting process

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2024 Town-hall consultations

- Working group-led town hall consultations have taken place in the first half of 2024, both virtually and, where possible and required, in person providing an opportunity for community members to provide input into the preparation of the working group reports.

Townhalls implemented to date:

- Working Groups have implemented townhalls for their working groups. Most science townhalls are completed, whilst some such as infrastructure are ongoing

In-person July town halls: The findings so far

- Seven in-person with virtual option town halls scheduled for July to discuss initial findings to help white paper drafting
- **Locations**: Victoria, Queensland, Tasmania, Canberra, New South Wales, Western Australia and South Australia
- Dates between July 18th to August 2nd

Survey results

Thank you to everyone who completed the online survey!

- Individual survey: responses received: 563
- Institutional survey: responses received: 18

The demographics working group is currently working on the results of the survey, and relevant working groups will also be drawing on the survey.

Images for Decadal Plan document

- *We need you* to provide images to go in the decadal plan:
  - Please gather images for which you have the copyright, and are relevant for inclusion in the plan
  - Could be astronomical images, instruments, students and other people doing astronomy (please ensure correct permissions)
  - Upload request will come later this year

Decadal plan website

Website is a repository for documents, white papers, and working group and board memberships

https://www.science.org.au/supporting-science/science-policy-and-analysis/decadal-plans-for-science/astro2035

Acknowledgements

- We would like to sincerely thank all working group chairs for their leadership (see next for their sparkler talks)
- CSIRO for financially supporting the Decadal plan
- ASA for hosting communication channel
- Every astronomy community member who filled out the survey and is participating in some way in the consultation process
- All astronomy group leaders and their teams for providing detailed survey information
- Editorial board for agreeing to draft the DP
- Swasti Devi and the whole team at the Academy of Science for their support

For any Questions:

- For any questions reach out to Virginia at vkilborn@swin.edu.au and the Academy at nc@science.org.au

- Visit the website to gather more updates