

ASTRO 3D Climate Survey 2024

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Contents

Section 1: Background	3
Purpose	3
Methodology	3
Confidentiality and Anonymity	3
Target Groups	3
Communication with Respondents	4
Areas of feedback	4
The Survey Scales	4
Data analysis	5
Section 2: Main Results	6
Overall Experience as an ASTRO 3D member	6
Snapshot of Key Themes	6
(i) Leadership & Collaboration	6
(ii) Communication	7
(iii) Professional Development	7
(iv) Culture, Values, Equity, Diversity & Inclusion	7
Key strengths	8
Key Areas for Improvement	9
Change since 2018 and 2021	10
Overall trends	10
Leadership and Collaboration	10
Communication	12
Professional Development	12
Culture, Values, Equity, Diversity and Inclusion	13
Section 3: Achievements and Impact	15
Gender Parity	16
Equity, Diversity and Inclusion	16
Supporting Young Researchers	17
Community and Cohesion	17
Large Scientific Programs	18
Section 4: Conclusions and Recommendations for Future Centres	19



Section 1: Background

Purpose

The purpose of the ASTRO 3D Membership Survey is to provide the Centre with an understanding of key factors impacting how its members fit into, engage with, and benefit from the Centre. The Centre conducted surveys in 2018 and 2021, and many of the questions have been carried over to this 2024 survey to allow the Centre to understand how experiences have changed as a result of policies and initiatives implemented during the lifetime of the Centre. This final survey also includes additional questions about the legacy and achievements of ASTRO 3D.

Methodology

Confidentiality and Anonymity

The survey was administered by the ASTRO 3D Equity, Diversity and Inclusion (EDI) Committee. Because the survey was run internally, great care was taken to minimise the number of people with access to the survey data. The survey was conducted via Smartsheet and only one committee member had access to raw survey responses. One comment contained identifying information of a sensitive nature. This comment was addressed with the Director and redacted from the dataset to preserve anonymity. All responses were de-identified before being given to the analysis taskforce, made up of another three committee members. The analysis taskforce produced plots and collated free-form responses which were then given to the report writing taskforce, consisting of two final committee members.

The EDI committee received verbal feedback from at least 5 people at one node that they did not fill out the survey “on principle” because it was being conducted internally and the anonymity of their responses could not be guaranteed. The previous two surveys in 2018 and 2021 were carried out by an independent company.

Target Groups

The survey was sent to all active members listed in the ASTRO 3D database, as well as a number of previous members (alumni) for which contact information was available.



Communication with Respondents

The survey was open for 4 weeks from August 12th to September 6th, 2024. The original deadline of August 30th was extended to increase the number of respondents. Information about the survey was circulated via email from the Centre Director as well as through Director's Update Newsletters. Some Node leaders and EDI committee members also communicated directly with members at their node via email or through in-person reminders.

The final response rate was 56% of active members listed in the ASTRO 3D database.

Areas of feedback

The survey was divided into four main areas of feedback:

- i) Leadership and Collaboration
- ii) Communication
- iii) Professional Development
- iv) Culture, Values, Equity, Diversity, and Inclusion

The Communication area combines "Information Sharing" and "Communication Channels" which were separated in previous surveys.

The Survey Scales

The multiple choice survey questions asked respondents to rate their level of agreement with each statement, using the following scale:

1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree

The only exception is the initial question, "How would you rate your overall experience as a member of ASTRO 3D?", which was rated on the following scale:

1=Poor, 2=Fair, 3=Average, 4=Good, 5=Excellent

Both of these scales are industry standard for climate surveys. Applicants were also given the option to select "N/A" if they did not feel the question was applicable to them.

Finally, the survey included a few free response questions where respondents were asked to comment on the main achievements and legacy of ASTRO 3D.



Data analysis

For each multiple choice question, the analysis team calculated the fraction of respondents in each category, as well as the fraction of respondents that agree or strongly agree with the provided statement. “Not applicable” responses were removed prior to analysis to avoid negative bias for questions related to activities that were applicable to a smaller fraction of respondents, such as ECRs.

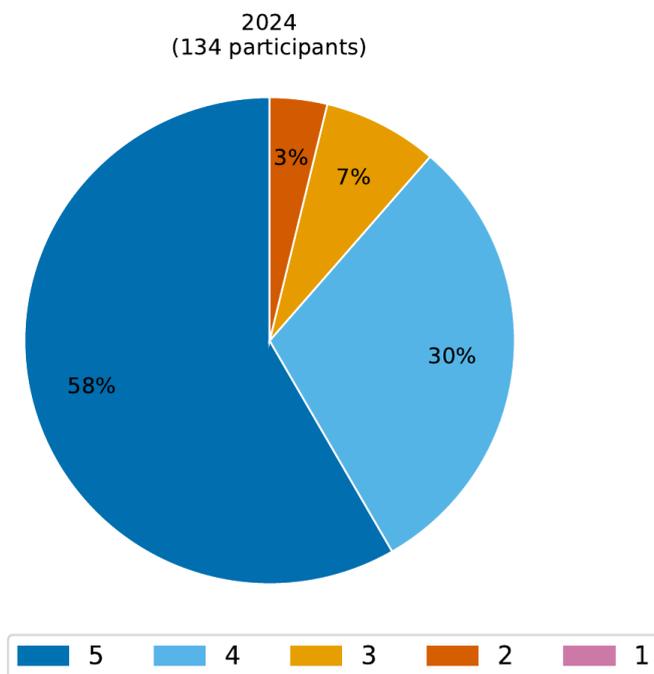
For questions that were carried over from previous years, the fraction of respondents that agreed with the statement was compared with the fractions from 2021 and 2018 to evaluate which areas have seen most significant progress over the lifetime of the Centre.

For the free response questions, responses were divided into categories representing general themes to produce bar charts quantifying which areas respondents thought represented the greatest achievements and legacy of ASTRO 3D.

Section 2: Main Results

Overall Experience as an ASTRO 3D member

88% of people rated their overall experience as a member of ASTRO 3D as either “excellent” or “good”, with only 11% rating their experience as “average” or “fair”. No respondents rated their experience as “poor”.



90% of people agreed or strongly agreed with the sentiment that “working at ASTRO 3D is an enjoyable and rewarding experience.”

Snapshot of Key Themes

(i) Leadership & Collaboration

Overall, the survey showed that members generally have strong confidence in the leadership team and understanding of the leadership structure. 78% understand how the leadership is organised, and 88% agree that the leadership team communicates a shared vision, purpose and direction. 87% of respondents believe the leadership team encourages open and honest communication, which has increased significantly from 78% in 2021 and 64% in 2018. The fraction of respondents who agree that the leadership team is working to build a collegial environment also increased consistently, from 75% in 2018 to 85% in 2021 and 90% in



2024. 83% of people expressed agreement that their Node and Project leaders promote a positive working environment.

The survey also revealed a high level of awareness of the goals of the Centre. 93% of people reported being aware of and understanding the objectives of ASTRO 3D and 92% reported being aware of the research and activities of ASTRO 3D. This was in part due to the yearly science meetings and annual retreats. 88% of respondents agree or strongly agree that science meetings are a helpful way to understand research happening across the Centre, and 88% feel that annual retreats are a good way to build new connections and feel part of the larger team.

Almost 90% of people feel ASTRO 3D as an organisation is greater than the sum of its parts and the connections they have made through ASTRO 3D will endure beyond the Centre.

(ii) Communication

80% of respondents agreed that communication and collaboration with the leadership team are easy and straightforward. ASTRO 3D disseminates information through a wide range of media, and the surveys have consistently revealed that members engage with different sources of information depending on their personal preferences. The regular readership of the fortnightly Director's Update has declined slightly from 74% in 2021 to 64% in 2024. However, the fraction of people that find it useful has increased slightly from 64% in 2021 to 70% in 2024. The satisfaction with ASTRO 3D website has gone up to 55% in 2024, which was only 12% in 2018. The fraction of people that attend the monthly Director's Update and find it useful remains below 50%. Similarly, the fraction of people that attend the ASTRO 3D colloquium series has remained below 30%.

(iii) Professional Development

78% of respondents agreed that ASTRO 3D helped them to raise their scientific profile. 74% of people agreed that ASTRO 3D has helped them to develop new professional skills and 65% agreed the Centre helped them to develop transferable skills. A significant fraction of respondents (20-30%) did not engage in training and professional development workshops, primarily because they were specifically aimed at Early Career Researchers (ECRs). However, 66% of the people that did attend these courses found them useful.

(iv) Culture, Values, Equity, Diversity & Inclusion

The survey responses clearly indicated the strongest positive feedback in the areas of equity, diversity and inclusion. 93% of people believe that ASTRO 3D is doing a good job to

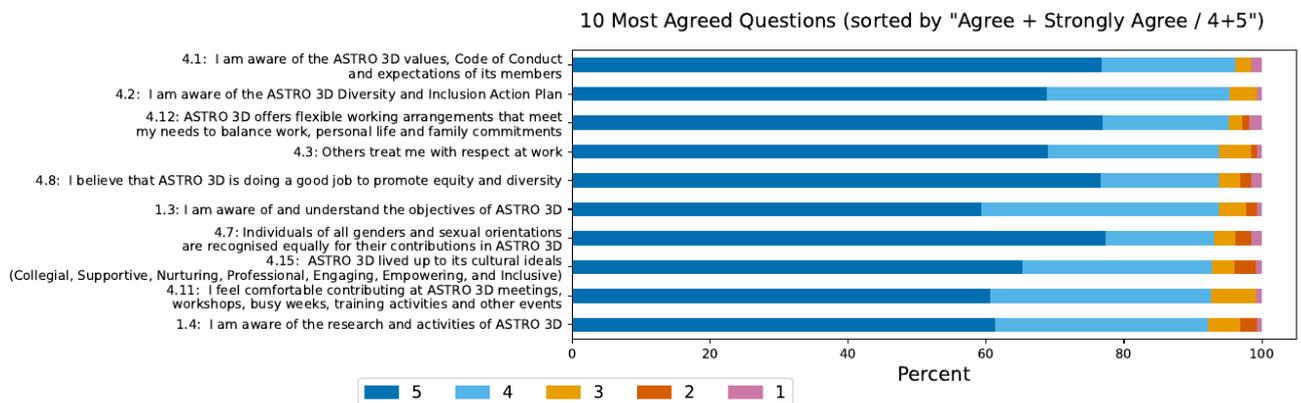


promote equity and diversity. The Centre has done an excellent job of developing EDI policies and communicating these policies and expectations to its members: more than 95% of people are aware of the ASTRO 3D values, Code of Conduct and expectations of its members, as well as the Diversity and Inclusion Action Plan. This is reflected in the culture of the organisation: 94% of people agree that others treat them with respect at work. 92% agree or strongly agree that ASTRO 3D fosters an environment where people of diverse backgrounds and lifestyles can work together effectively. 93% believe individuals of all genders and sexual orientations are recognised equally for their contributions in ASTRO 3D. 92% agree or strongly agree that ASTRO 3D has left a positive legacy on the culture within the Australian astronomical community.

Key strengths

The questions were sorted by the fraction of people that either agree or strongly agree with each statement. 8 of the top 10 questions with the highest fraction of agreement were in category iv) Culture, Values, Equity, Diversity & Inclusion, and the remaining 2 were in i) Leadership and Collaboration.

For all of the top 10 questions, more than 90% of respondents either agreed or strongly agreed. There was a high level of awareness of the code of conduct and the Diversity and Inclusion action plan, and Centre members reported feeling comfortable contributing at ASTRO 3D events. Respondents feel they have flexible working arrangements that meet their needs. Centre members are treated with respect at work, and individuals of all genders and sexual orientations are recognised equally for their contributions in ASTRO 3D. Finally, there was widespread consensus that ASTRO 3D is doing a good job to promote equity and diversity and lived up to its cultural ideals to be a collegial, supportive, nurturing, professional, engaging, empowering and inclusive Centre. This reflects ASTRO 3D's world-leading achievements in gender equity and the achievement of 50:50 gender balance across the Centre in 2023; a positive impact that will last far beyond the lifetime of the Centre. The survey responses also revealed that the leadership team has done an excellent job in building a unified and connected Centre. More than 90% of people reported being aware of and understanding the objectives, research and activities of ASTRO 3D.





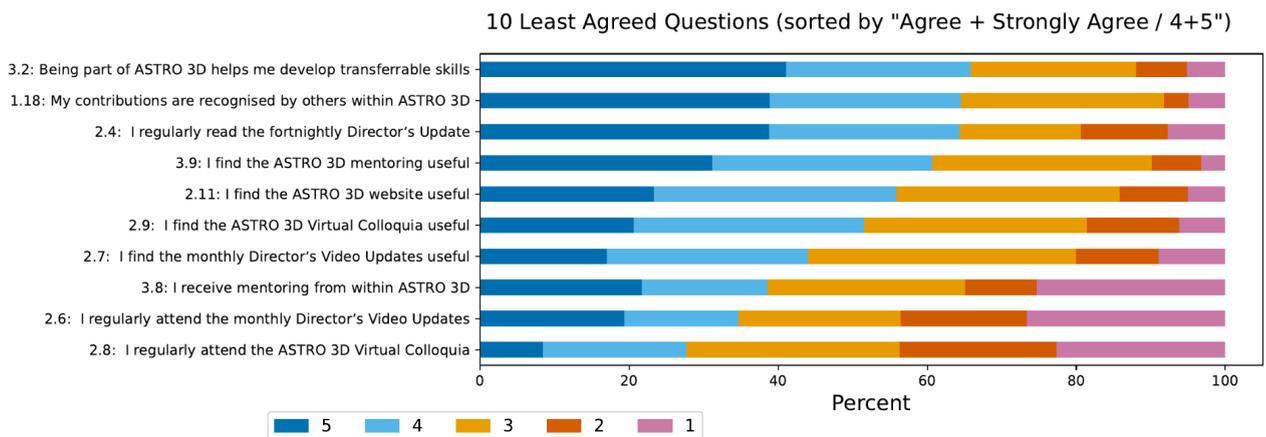
Key Areas for Improvement

The 10 questions with the lowest fraction of agreement were mostly in category ii) Communication (6 questions), followed by iii) Professional Development (3 questions) and i) Leadership and Collaboration (1 question).

ASTRO 3D has members across the globe who have varying roles and are at a wide range of career stages. Therefore, no method of communication suits everyone and the Centre disseminates information through a variety of channels. For each mode of communication, between 25-60% of people reported regularly engaging with it and finding it useful. The regular readership of the fortnightly directors updates has declined slightly from 74% in 2021 to 64% in 2024. However, the fraction of people that find it useful has increased slightly from 64% in 2021 to 70% in 2024. The satisfaction with ASTRO 3D website has gone up to 55% in 2024, which was only 12% in 2018. The fraction of people that attend the monthly Director’s Video Update and find it useful remains around 35-45%. The fraction of people that attend the ASTRO 3D colloquium series has remained between 25-30%.

Many of the professional development programs organised by the Centre are primarily aimed at ECRs, and therefore the fraction of people that report engaging with and benefiting from these programs is relatively low compared to other areas. 65% of respondents agree that being part of ASTRO 3D helps them develop transferable skills. Around 38% of people report receiving mentoring, and 60% agree that the mentoring program is useful.

64% of respondents agree their contributions are recognised by others within ASTRO 3D. Whilst this is a considerable percentage, it suggests that some members feel their contributions go unnoticed due to the large scale of the Centre.

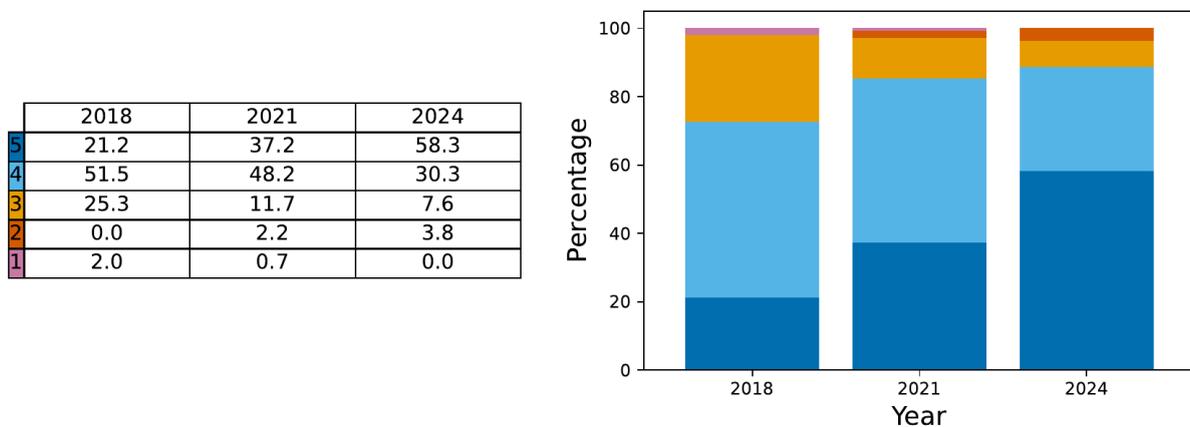


Change since 2018 and 2021

Overall trends

People’s overall experience as a member of ASTRO 3D has consistently improved over the lifetime of the centre. The percentage of “excellent” responses tripled from 21% in 2018 to 58% in 2024, and the percentage of “good” and “excellent” combined increased from 72% in 2018 to 88% in 2024.

5.1: How would you rate your overall experience as a member of ASTRO 3D?



The survey revealed consistent increases in the percentage of “strongly agree” responses from 2018-2021-2024 for almost all individual questions, in many cases quite substantially. These improvements reflect hard work from the leadership team to implement recommendations of previous surveys. In many cases the combined percentage of “agree” and “strongly agree” responses increased significantly over 2018-2021 as the Centre was being established and then remained relatively constant over 2021-2024.

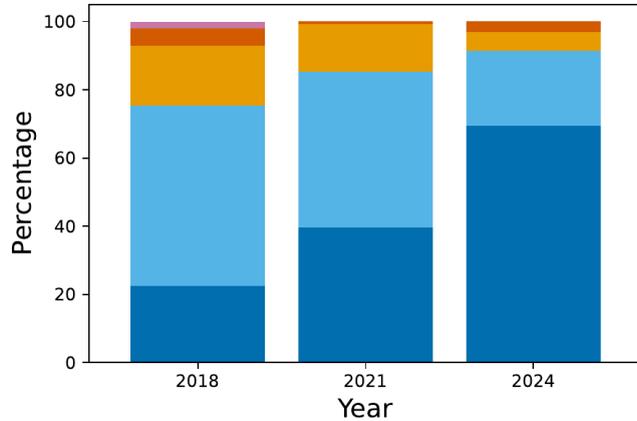
Leadership and Collaboration

All questions showed sentiment levels around leadership and collaboration increasing or remaining constant over the lifetime of the Centre. Between 2018 and 2024, there was a 47% increase in the fraction of participants that strongly agree that the Leadership Team is working to build a collegial and collaborative Centre. This is especially encouraging given that there were several major leadership changes, with 3 different Directors over the lifetime of ASTRO 3D. In each case, the outgoing Director worked with the incoming Director to ensure a smooth transition and maintain a positive culture across the Centre.



1.6: The Leadership Team is working to build a collegial and collaborative Centre

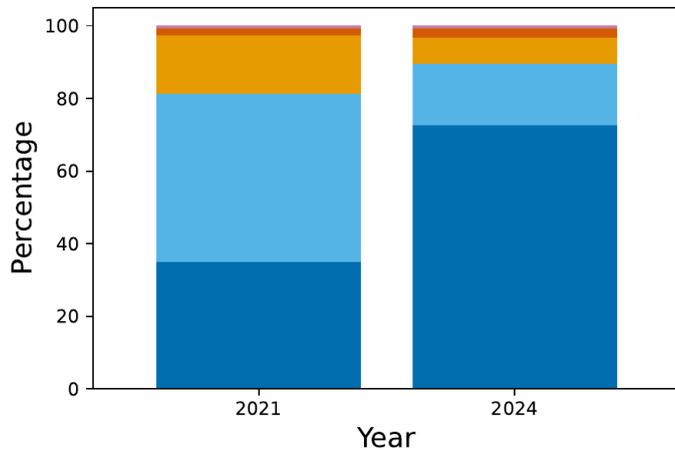
	2018	2021	2024
5	22.5	39.6	69.5
4	52.9	45.6	21.9
3	17.6	14.1	5.5
2	4.9	0.7	3.1
1	2.0	0.0	0.0



There was also a significant increase between 2021 and 2024 in the percentage of people believing that ASTRO 3D is greater than the sum of its parts. A large part of this is likely due to the media attention received by the 50:50 gender parity and other wider impacts.

1.22: ASTRO 3D is an organisation that together is greater than the sum of its parts

	2021	2024
5	34.9	72.6
4	46.3	16.9
3	16.1	7.3
2	2.0	2.4
1	0.7	0.8

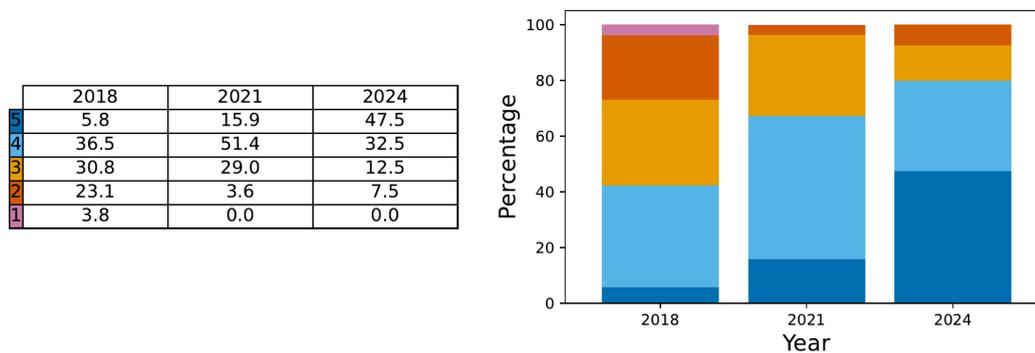


The fraction of respondents that agreed/strongly agreed that open and honest communication is encouraged by the Leadership Team increased from 64% in 2018 to 87% in 2024, and the fraction agreeing that their Node Leader keeps them informed about Node matters increased from 54% to 77% over the same period.

Communication

People became much more comfortable communicating and collaborating with the leadership team over the course of the Centre. The percentage of people who strongly agreed that this was easy and straightforward increased almost tenfold, from 5% in 2018 to 47% in 2024, while the percentage of people who agreed or strongly agreed almost doubled from 41% in 2018 to 80% in 2024.

2.1: Communication and collaboration are easy and straightforward with the Leadership Team

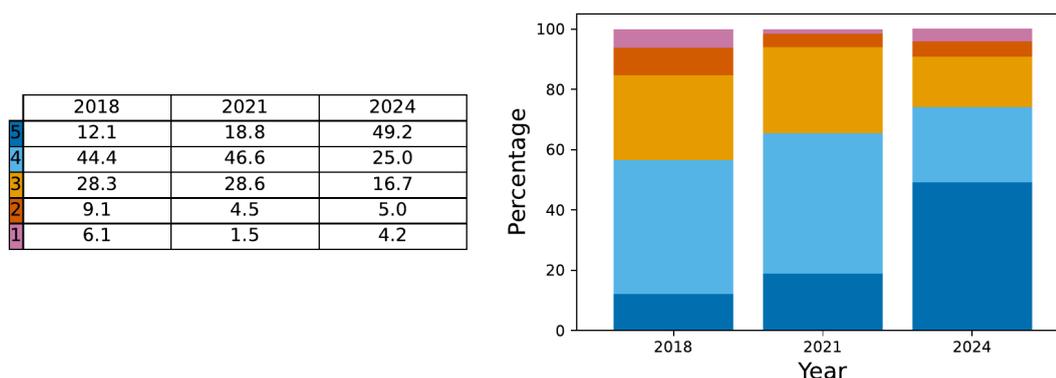


There was little change in the percentage of people attending the Director’s Video updates or the Virtual Colloquia, likely reflecting individual preferences in communication methods as well as schedule limitations. However, greater advertising could have helped to better promote the colloquia.

Professional Development

Between 2018 and 2024, there was a 30-40% increase in the percentage of people strongly agreeing that ASTRO 3D helps them to develop new professional skills and transferable skills. This reflects many training sessions organised as part of annual retreats as well as part of the year (supervision skills, grant/application writing, Python courses, Coursera initiative etc.). The percentage of people reporting that they strongly agreed training courses were useful increased from 24% in 2021 to 52% in 2024.

3.1: Being part of ASTRO 3D helps me develop new professional skills



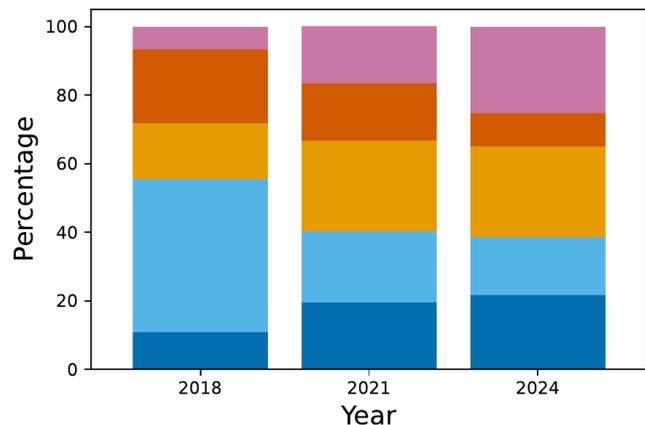


The fraction of people attending ASTRO 3D busy weeks, conferences and workshops remained approximately constant at 60-70% over the Centre, likely because these events target specific sub-groups of people.

Notably, there was a marked decrease in the percentage of people reporting they received mentoring within ASTRO 3D, from 55% in 2018 to 40% in 2021 and 38% in 2024. This may have been partly driven by a change in the way mentoring programs were run. Early in the Centre, ASTRO 3D ran a dedicated mentoring program to connect junior and senior researchers within its ranks. More recently, ASTRO 3D has joined forces with other Centres of Excellence to run a cross-Centre mentoring program, increasing the percentage of members receiving mentoring from outside the Centre.

3.8: I receive mentoring from within ASTRO 3D

	2018	2021	2024
5	10.9	19.6	21.7
4	44.6	20.6	16.9
3	16.3	26.5	26.5
2	21.7	16.7	9.6
1	6.5	16.7	25.3

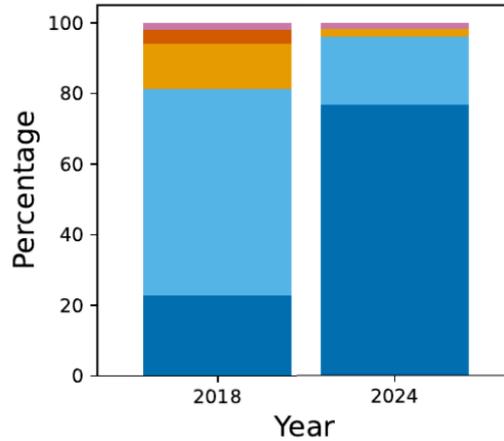


Culture, Values, Equity, Diversity and Inclusion

There was a marked increase in the percentage of people who strongly agreed they were aware of the ASTRO 3D values, Code of Conduct and expectations of its members, from 23% in 2018 to 78% in 2024. (Data from 2021 were not available). The fraction of people who agreed or strongly agreed increased from 81% to 96%. Similarly, in 2024, 95% of members reported that they were aware of the ASTRO 3D Diversity and Inclusion Action Plan. This reflects significant effort by the leadership team to ensure members were trained in the policies and procedures and leaders put strong emphasis on upholding the Centre values.

4.1: I am aware of the ASTRO 3D values, Code of Conduct and expectations of its members

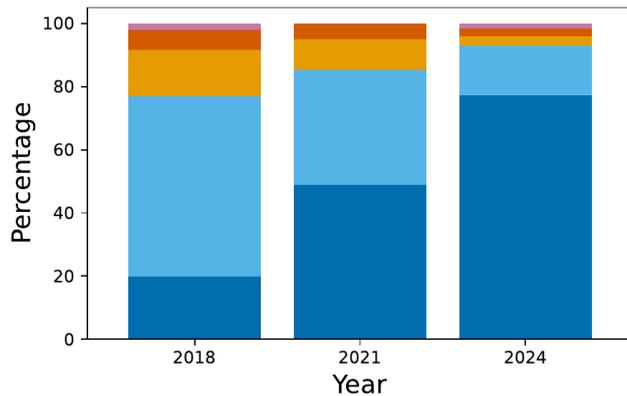
	2018	2024
5	22.8	76.7
4	58.4	19.4
3	12.9	2.3
2	4.0	0.0
1	2.0	1.6



There was also a high level of agreement that people of diverse backgrounds are recognised equally for their contributions in the Centre. There was a 57% increase in people who strongly agree that people of all genders and sexual orientations are equally recognised for their work, and a similar (53%) increase in the percentage of people who strongly agree that individuals of all nationalities, cultures and religions are recognised equally for their contributions.

4.7: Individuals of all genders and sexual orientations are recognised equally for their contributions in ASTRO 3D

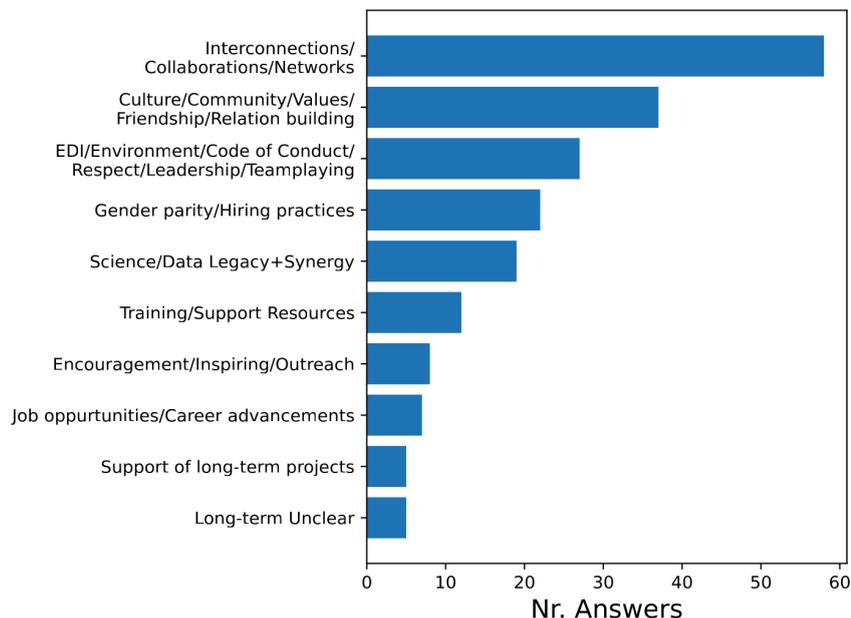
	2018	2021	2024
5	19.8	48.9	77.3
4	57.3	36.5	15.6
3	14.6	9.5	3.1
2	6.2	5.1	2.3
1	2.1	0.0	1.6



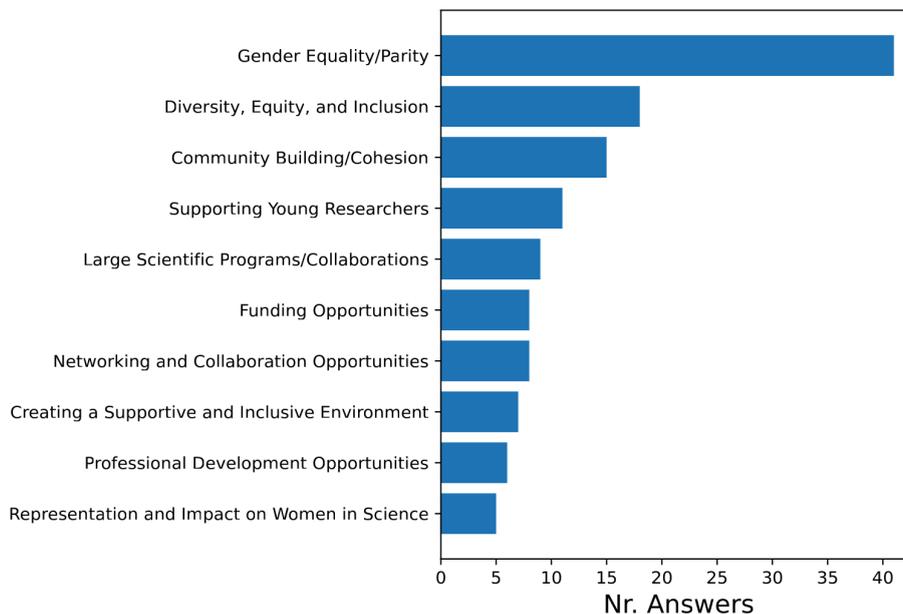
Section 3: Achievements and Impact

Respondents were asked to provide free-text responses on what they thought were the biggest impacts and achievements of ASTRO 3D as a Centre. Most people gave overwhelmingly positive feedback, accompanied by some constructive criticism on how the Centre could improve in the future.

The most commonly cited legacy of the Centre was to connect people across wide geographical areas and diverse research topics by building networks and collaborations. A significant part of this effort involved building a community with a positive culture that values friendships and camaraderie. People also noted that the Centre has driven a cultural shift in equity and diversity values, particularly through the introduction of equitable hiring practices and the subsequent achievement of 50:50 gender parity across the Centre. ASTRO 3D has also produced many high-impact science results, helping to boost Australia's reputation as a nation leading the world in astrophysics research. Smaller numbers of respondents mentioned that the Centre has advanced people's career prospects inside and outside of academia by providing training and support as well as job opportunities and paths for career advancement.



Similar themes were seen in the responses regarding the main achievements of ASTRO 3D. Here, the overwhelming majority of people referenced the achievement of 50:50 gender parity as the greatest achievement of the Centre. Many respondents also cited the broader achievements of ASTRO 3D in the broader area of Diversity, Equity and Inclusion, as well as the building of community and collaborations, and support of young researchers.



Gender Parity

The vast majority of people viewed the achievement of gender parity as the greatest achievement of the Centre. ASTRO 3D has changed the landscape of astrophysics research by *“demonstrating that gender parity can be achieved in a typically male-dominated field”*. Members believe that *“this achievement did wonders for bringing more attention and awareness to gender diversity issues within academia/astronomy.”* A few people commented that *“diversity is more than gender”*, and felt that ASTRO 3D could *“achieve greater diversity that is not just limited to gender, but ethnicity, socioeconomic background”* and *“improve in recognising different nationalities, cultures, and religions”*. The lessons learnt from the journey to achieve 50:50 gender parity will be very valuable for the implementation of policies to improve broader diversity in the future.

Equity, Diversity and Inclusion

People commended ASTRO 3D on *“creating a culture in which equity, diversity and inclusion were at the core of the organisation”*. They commended the Centre for actively rewarding not just scientific achievements, but behaviour that builds community and embodies the values of the Centre: *“I love the way the awards recognise the way people support each other to build a culture of collaboration.”* Many people highlighted that ASTRO 3D has significantly improved the culture of equity, diversity and inclusion within Australian astronomy. *“ASTRO 3D has made a significant step forward in practices that improve diversity, equity and inclusion... I have learnt much from initiatives such as improving the recognition of the neurodivergent and LGBTQ+ community.”*

The logo for ASTRO 3D is displayed in a stylized, purple, 3D font. The letters 'A', 'S', 'T', 'R', and 'O' are connected and have a slight shadow effect, giving them a three-dimensional appearance. The '3D' is also in a similar style but slightly smaller and positioned to the right of the main text. The logo is set against a dark background with a subtle starfield pattern.

Some people felt that the Centre would have benefited from more transparent anonymous reporting channels. One respondent commented *“having a mechanism to flag issues [about conscious and unconscious bias] anonymously to third parties might have been useful”*. Another anonymous commenter named an individual leader, stating they would have liked ASTRO 3D to take a stronger position to combat that leader’s behaviour.

Supporting Young Researchers

Several respondents praised ASTRO 3D for having a positive impact on the professional development of ECRs: *“A lot of young scientists in their early career are going to be well prepared and equipped to keep doing research with collaborators all over the world thanks to ASTRO 3D.”* The Centre provided support in a range of forms including travel funding for observing, workshops and collaborative visits, professional development, and opportunities to network with senior researchers. *“Astro 3D has provided substantial training and resources for researchers to develop skills desirable in both academia and industry.”* Some people felt that ASTRO 3D could have done even more to prepare students and ECRs to navigate the significantly reduced job market after the end of the Centre. *“I am saddened that my students coming through the pipeline now will not have the same opportunities in Australia as the ones who came before them.”* ECRs were given many leadership opportunities within the Centre, and respondents noted that *“it is great to see people who started as junior postdocs end the centre with faculty positions and leading large teams within or affiliated with ASTRO 3D.”*

Community and Cohesion

ASTRO 3D was successful in facilitating strong connections between groups and researchers that are geographically isolated and/or previously did not collaborate. Many members expressed the sentiment that ASTRO 3D *“managed to create a sense of belonging, a community spirit.”* As noted by one respondent, *“I have enjoyed the enhanced access to colleagues I might not otherwise have had much to do with.”* This community-building resulted in a lot of sharing of new ideas. *“ASTRO 3D’s inclusive and collegiate culture has also boosted its scientific output as members are encouraged to collaborate and share knowledge rather than being competitive and isolated.”*

A big contributor to this community spirit was the annual Science Meetings and retreats which brought geographically isolated researchers together. Such meetings are great for team building, but come at a significant expense both financially and for the environment. One respondent noted, *“I would like to see future Centres of excellence in this field look to drop one of the two meetings [each year] and spend the money elsewhere.”*



Large Scientific Programs

A major success of ASTRO 3D is the scientific outputs of the Centre in each of its main areas of investigation: Origin of the Ionised Universe, Accumulation of Matter and Origin of the Elements. ASTRO 3D directly supported several surveys as core projects including SAMI, HECTOR, and GALAH, and respondents noted *“it’s not obvious [these projects] would have carried on in the same way without ASTRO 3D support”*.

ASTRO 3D also facilitated the development of impressive new surveys as a result of the strong cross-node collaborations. Respondents particularly highlighted *“the number of Large Science Programs on VLT/MUSE (MAGPI, GECKOS, MAUVE), considering how competitive it is to get time on that telescope.”* These three large programs were awarded a total of more than 800 hours on MUSE, the most in-demand instrument on the VLT and are all led by ASTRO 3D members spread over multiple node institutions across the country.



Section 4: Conclusions and Recommendations for Future Centres

As ASTRO 3D comes to a close, the results of this survey provide valuable lessons on how to implement effective policies and nurture positive environments in astronomy departments and future Centres of Excellence across Australia.

The overwhelming feeling from the 2024 ASTRO 3D Membership Survey is that the biggest legacy of the Centre will be its achievements in equity, diversity and inclusion and in building collaborations between researchers across Australia, thus improving the culture and scientific landscape of astronomy research for many years to come. As noted by one respondent, *“Creating a supportive and comfortable environment where all members were encouraged to engage with the science regardless of their background, identity and career stage... almost certainly resulted in a lot more scientific output from everyone including people who otherwise feel excluded!”*

Gender equality and other diversity measures do not happen on their own. The achievements are the result of hard work towards *“the development of policies and guidelines for inclusive meetings, hiring practices and workplaces. This provides a clear roadmap for future CoEs and academic departments to build more inclusive workplaces into the future.”* All policies and guidelines developed by ASTRO 3D will be made available on the legacy website to be used as reference by other universities and future Centres of Excellence.

There was a common feeling among the respondents that the achievements of ASTRO 3D cannot be taken for granted, and the community needs to work hard to ensure that the positive outcomes are not lost when the centre ends. *“While there are clear impacts in terms of culture in the near term, it's not obvious which of these will last when decisions go back to the universities without a financial stick to be enforced with.”* It is important for university departments and future Centres of Excellence to introduce policies and procedures to maintain and continue this momentum after ASTRO 3D has ended.

Respondents noted that the community would also need to put effort in to maintain the strong collaborations that have been facilitated by ASTRO 3D. *“Scientifically, the best of ASTRO-3D has been connecting different research communities: optical and radio astronomers, observational and theoretical astronomers, galaxy and stellar astronomers. This should continue somehow.”*

ASTRO 3D has had a truly positive impact on the Australian astronomy community, and many members expressed sadness that the Centre was ending. *“I will absolutely miss this Centre. It has been the bastion of positive values and making a positive difference in the Australian community for 7 years. I hope its legacy can continue through the years.”*