## Key areas of discussion

### 1. Relative value of different 8-metre-class telescope options

A major discussion centred on which international telescope access options would best serve the Australian astronomy community after the end of the ESO strategic partnership.
The early Slido responses suggested mixed levels of interest in Subaru and Keck, with Subaru appearing to have a somewhat more even spread across low, medium and high importance (low/medium/high - 24/43/33), while Keck had a larger proportion of respondents ranking it low (33/44/22%). When asked about a possible interim relationship if a Chilean partnership was not ready immediately, Magellan (52%) appeared slightly preferred over Gemini (16%), though both were seen as relevant.
Speakers emphasised that no single facility would meet all needs. The emerging model was not "Subaru alone" or "Keck alone", but rather a package likely involving a northern facility, such as Subaru or Keck, combined with a southern facility, such as Gemini, Magellan or a Chilean partnership. There was repeated concern that southern hemisphere access must remain central, given Australia's existing capabilities and science priorities.

### 2. Are there any additional criteria for selection of 8m facilities you would like to see?

- Prioritise southern access: At least one southern hemisphere facility is seen as essential, given Australia's science priorities and links to SKA, LSST/Rubin and AAT.
- Ensure strong capability: Facilities should offer broad instrumentation, IFUs, multi-object spectroscopy, ToO capability, mature pipelines and scope for Australian instrument contributions.
- Secure meaningful access: Respondents favoured sustained partnership access with enough nights to enable large, ambitious programmes, not small fragmented allocations.
- Look beyond telescope time: Governance influence, comparable partners, training, technology/software collaboration and locally delivered in-kind contributions were valued.
- Prioritise excellence over lowest cost: Selection should focus on research quality, strategic fit and long-term benefit, not simply the cheapest financial package.

### 3. What other things do we need to take into account regarding a time allocation system, and the role of the single liaison point?

- Coordinate access nationally: Explore a streamlined national model or single point of contact to reduce TAC burden and support joint facility proposals.
- Keep a trusted TAC process: Use a fair, transparent national TAC-style system with expert reviewers and Australian representation.
- Support breadth and ambition: Enable both small projects and large programmes, with equitable access for emerging fields and E/MCRs.
- Facilitate collaboration: Ensure international collaborators and cross-facility science are supported, recognising astronomy as globally collaborative.

### 4. What other key elements have we missed?

- Strengthen national capability: Future-proof the AAT or consider a new National Observatory to support sovereign capability, training, instrumentation and long-term Australian access.

- Prioritise southern and SKA-aligned access: Maintain strong southern hemisphere capability, including 30-m-class access where possible, to maximise SKA and broader survey synergies.
- Invest in local facilities and instrumentation: Consider whether funds should support AAT modernisation, automation, data reduction pipelines, or completion of current instrumentation projects rather than small amounts of external telescope time.
- Support students and ECRs: Use national facilities more effectively for training, ECR-led proposals, proposal-writing support and activities that build community ownership of observing time.
- Broaden strategic partnerships: Explore collaboration with Oceania, South and Southeast Asian astronomy communities, and ensure priorities do not unintentionally favour some research areas over others.

**5. What is the right timeline, or minimum viable timeline, to secure a partnership in your perspective?**

- Maintain continuity: Many respondents wanted a partnership in place before, or soon after, the ESO partnership ends, with 2027–2028 commonly suggested.
- Avoid a major access gap: Several emphasised minimising disruption for Australian research, especially for students and ECRs, potentially through provisional or runway access.
- Allow time for a robust partnership: Some felt a sustained, worthwhile partnership may justify a 2–3 year setup period, rather than rushing into a weaker arrangement.
- Recognise open-access options: A minority argued there is no immediate 8m "cliff edge", as Australians can still apply through open or de facto open calls, though large programme leadership may be constrained.
- Align with broader planning: Timing should also fit government, organisational and Decadal Plan implementation processes, rather than being considered in isolation.

## Open Questions

**What lessons can be learned from the failure of the message to land with government regarding the importance and benefits of ESO membership?**

The key lesson is that the government's concerns were not primarily about the importance or benefits of ESO membership, but about the substantial cost and the fact that a large proportion of that investment would go offshore. These appear to have been the two main concerns. The package presented today responds directly to those issues by seeking to demonstrate stronger value for Australia. A further lesson is that future proposals need to make the alignment with national priorities, including SAA priorities, clearer and more compelling.

**Assuming Australian optical astronomy survives this period, what are we learning from this?**

One clear lesson is that Australian optical astronomy can survive an existential crisis, but we need to learn carefully from how we reached this point. A key reflection is that the community gave up some existing capability in anticipation of a promised long-term pathway. In hindsight, that may not have been the best approach. We should be cautious about relying on long-term assumptions or institutional memory over a decade-long timeframe. Future arrangements need to be explicit, durable and structured in a way that protects national capability if circumstances change.

**Can we expect some prioritisation of funding for AAT to not only deliver raw data, but actually reduced science-ready data for all of its instruments?**
In many cases, AAT instruments already provide science-ready or near science-ready data products, but there are still areas where improvement is needed.
Some instruments have issues with pipeline performance or calibration precision, and these are being actively worked on. For example, there are known pipeline challenges for some instruments, with new software versions under development and progress expected as those updates are implemented.
More broadly, prioritising reduced, science-ready data would be valuable, as it would make AAT observations more accessible and scientifically useful for the community. This should be considered as part of any future investment in AAT capability, alongside improvements to observing preparation tools and data-processing software.

**Have we considered philanthropy from Australian sources as an alternative and or supplementary form of funding? This works elsewhere**
Yes, we have, it just has not been forthcoming so far.

**GAIA, LSST 4MOST and other facilities will produce lotsa data. Why not prioritise the AAT and use connections or open skies for 8m access and use as leverage.**
There is a strong case for considering how the AAT could be used to maximise Australian science from those surveys.
There may be opportunities to leverage the AAT for follow-up, particularly for LSST/Rubin-related science and transient follow-up, although this would need careful development. It is not clear that open-skies access to large facilities can be relied on easily or strategically, but there may be scope for creative arrangements, such as exchanging AAT time for limited access to larger facilities.
There has already been some success in selling or using AAT time for specific follow-up programmes, and further opportunities could be explored. For example, some groups with access to larger facilities may value AAT time, and partners such as Japan may have interest in southern observing time. This could potentially provide leverage in future partnership discussions.
Overall, the idea is worth exploring further: prioritising the AAT and using it strategically as a complementary facility could strengthen Australia's position, but it would require a clear proposal and input from groups with relevant facility access or science needs.

**Following up on my comment about revamping the AAT, what would it cost to make it work for several more decades?**
A proper assessment would be needed before giving a reliable cost estimate for extending the working life of the AAT by several decades. This should include an updated condition report on the current infrastructure, including the telescope, dome, control systems and broader operational requirements.
The basic telescope structure appears to be in relatively good condition, but a detailed study would be needed to assess what upgrades would be required. This would include the cost of modernising or roboticising operations, updating the dome and control systems, and ensuring that the telescope can continue to operate reliably over the long term.
There are precedents from other facilities that could help inform such an assessment, but the specific costs for the AAT have not yet been fully worked through. Some work is expected to look at making the telescope control system more robust and reducing the risk of sudden failure, but those activities are still in progress.

**Can Australia look to provide leadership and collaboration with younger, growing astronomical communities in South East Asia**

Yes, Australia could potentially play a stronger leadership and partnership role with younger and growing astronomy communities in South East Asia.

There are emerging opportunities in the region, including new telescope facilities being developed in Indonesia. These could provide opportunities for collaboration, although they may also compete with Australia in areas such as southern-sky follow-up. Australia has also previously sold AAT time to Thailand, and this kind of engagement could potentially be expanded.

It is important to recognise that many countries in the region do not have the same level of funding for astronomy infrastructure as Australia. This creates both an opportunity and a responsibility for Australia to help build regional networks, rather than viewing these communities only as competitors.

Developing stronger partnerships with South East Asian and East Asian communities could also complement discussions with Japan, including around access to ALMA and broader East Asian observing networks. Overall, this is a constructive idea that should be explored further as part of Australia's future astronomy strategy.

**Are any avenues to ALMA access being considered other than the Japan strategic partnership?**

In addition to a possible Japanese strategic partnership, ALMA access may also fit within discussions around a Chilean partnership. Some Australian researchers may also continue to access ALMA through existing international collaborations or other individual pathways.

It was also noted that Australia already has access to ALMA open-skies time, and that the available open-skies allocation is not currently being fully used. Up to 5% of ALMA time can be allocated through open skies, but only around 2% is currently being awarded. The advice is that this may reflect the competitiveness of the proposals being submitted, so Australian researchers should continue to apply strongly. There is no formal barrier preventing an Australian researcher from being PI on an ALMA large programme, apart from the overall open-skies time limit.

**Are we giving enough consideration of how the future of the AAT interacts with the future of legacy ATNF facilities?**

Yes, this is being considered, and there are clear synergies between the future of the AAT and legacy ATNF facilities that should be explored further.

From the ATNF perspective, one area of particular interest is the development of a national transients capability. There has already been discussion about how the AAT could contribute to optical follow-up of radio transients, and this is expected to be considered further through the upcoming AAT workshop. Understanding the technical synergies between optical and radio facilities will be an important part of that process.

There are also broader strategic links. The ATNF has a strong track record in regional collaboration, including through long-baseline radio astronomy partnerships with countries such as Thailand, Korea and Japan, and through activities connected to the SKA pathway. This creates a useful connection between optical astronomy, radio astronomy, SKA-related science and Asia-Pacific collaboration.

More generally, the AAT and ATNF represent important domestic capabilities. Their futures should not be considered in isolation, particularly where there are opportunities for shared science cases, technical development, regional partnerships or operational efficiencies.

**What are other options for AAT, such as closing or building a new one? How would be the costs ($ and scientific opportunity) like compared to the current status?**
There are several possible options for the future of the AAT, including continued operation, further investment and modernisation, or eventual closure. However, closing the AAT would carry significant risks. If the facility were to close, it would be extremely difficult — and potentially impossible — to reopen after even a relatively short period, because key technical staff, operational knowledge, software capability and specialist engineering expertise would likely be lost. Rebuilding that capability, particularly at a regional site, would be very challenging.
The broader point is that Australia needs to balance investment in international 8-metre access with investment in national facilities. Many countries continue to derive strong scientific value from older telescope facilities, and Australia is fortunate still to have domestic capability. Strengthening the AAT could help ensure that Australia is not facing the same crisis again in five or ten years, with both international access and national capability needing urgent attention at the same time.
At the same time, 8-metre access remains important and should not simply be set aside. The challenge is to develop a longer-term strategy and avoids locking Australia into arrangements that inadvertently weaken domestic capability.
While the current discussion has focused heavily on 8-metre access because there are immediate choices to be made, there is also substantial work underway on the future of the AAT. Upcoming workshops and planning processes will provide the opportunity to consider these options in more detail, including the scientific value, operational costs and opportunity costs of maintaining, upgrading or replacing national capability.

**This conference is in direct conflict with SPIE at the moment, so I think it's really important that we acknowledge that most of the people who are building our instruments are not here, and so they aren't able to have their voices heard.**
This concern is noted. A number of instrumentation experts are unavailable because of the clash, and there was some consideration of this in planning how the case was presented. Senior members of the instrumentation community have been consulted, and efforts are being made to ensure their perspectives are represented. However, if members of that community feel their views have not been adequately captured, that feedback should be encouraged and taken seriously.
More broadly, this highlights an important strategic issue. In presenting a value proposition to government, we need to be clear that investment in the AAT should be sufficient to set it up for success over the next decade. At the same time, we need to think carefully about how long Australia should commit to any overseas partnership, particularly given that more compelling opportunities or capabilities may emerge within a similar timeframe.
The key lesson is that the consultation process needs to capture the views of the instrumentation community explicitly, and future partnership decisions should balance immediate access needs with flexibility for future capability development.

**Why is there not more collaboration between Australia and New Zealand regarding a shared AAT-like telescope?**
One issue is that New Zealand has a relatively small optical astronomy community, which makes it harder to develop and sustain a major shared facility initiative. There have been attempts in the past to build stronger collaboration between Australian and New Zealand astronomers, including through joint meetings. However, these efforts have not developed into a coordinated national-scale partnership. A key challenge appears to be the lack of a

clear focal point or coordinating body within the New Zealand astronomy community for discussions of this kind.

What are the obstacles to building a combined multi-wavelength strategy for Australian sovereign facilities?
This question links closely to the broader discussion about how the AAT and ATNF could work together more strategically. There are already strong scientific connections between optical and radio astronomy in Australia, and collaboration between these communities has increased in recent years. In principle, there is no fundamental barrier to a more coordinated multi-wavelength strategy.
The main obstacles are likely to be funding, coordination and the risk that optical and radio renewal efforts are seen as competing rather than complementary. It will be important to avoid a zero-sum approach and instead present these facilities as part of a coherent national capability.
From the ATNF perspective, there is a strong case for framing legacy radio facilities as sovereign capability that complements the SKA. These facilities also support instrumentation, software development, data pipelines and technical expertise that feed into broader national and international priorities. Strengthening links with the AAT could help build a stronger optical–radio–SKA story.
There may also be practical opportunities for closer collaboration at the operational level. Optical and radio observatories share needs in areas such as software, engineering, logistics, operations and technical support, so there may be scope for efficiencies or shared approaches.
Another point raised was that a successful multi-wavelength strategy may need clear national science drivers. Large facilities such as SKA, CTA and LSST/Rubin have key science projects that help focus collaboration. A similar set of national key science projects for Australian sovereign facilities could help bring communities together, identify capability gaps, and create a stronger case for investment noting that the Decadal Plan does outline Science Questions for the next decade.

**What fraction of the community actually needs 8 metre time beyond what they could get through open calls?**
This question has come up several times, and it is an important one. While Australian astronomers can apply for open-access time on some facilities, relying on that alone would be a risky strategy. Experience from previous arrangements, such as with Gemini, suggests that when the available national allocation is small, researchers tend to submit smaller and more conservative proposals. Even with encouragement to be more ambitious, limited access makes it difficult for the community to design and pursue large, high-impact programmes.
To do breakthrough science, the community needs access to substantial amounts of telescope time. Australia has demonstrated particular strength in large collaborative programmes, such as GECKOS, MAGPI and other major survey-style projects. Those kinds of programmes are difficult to develop if access is fragmented, uncertain or limited to small allocations.
There is also a concern that some time-allocation systems can be highly siloed between national partners, making it difficult to assemble large allocations across multiple contributors. Without secure access, the community may end up thinking smaller, rather than building on one of its recognised strengths: ambitious, collaborative, large-scale science.
In short, open calls remain useful, but they are not a substitute for reliable partnership access if Australia wants to enable major programmes and maintain scientific ambition.