

Subject: Development of a proposal for Australian membership of ESO

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Background

The European Southern Observatory (ESO) is an intergovernmental organisation providing astronomical research infrastructure for its member states based on a subscription proportional to GDP. It operates two 4-metre optical/infra-red telescopes and four 8-metre optical/infra-red telescopes and demonstrates world class productivity with these facilities. ESO (in partnership with the USA and Japan) is building ALMA, a millimetre/sub-millimetre telescope, and is independently designing the E-ELT, a 42-metre optical/infrared telescope. The AAL roadmap recommends that membership of ESO be considered as an alternative to Magellan/Gemini/GMT in the 2011/12 timeframe.¹ ESO's Director-General has encouraged Australian membership and visited the Australian community in November 2008. AAL's ESO Working Group was set up to investigate membership of ESO.

The ESOWG conducted a poll of the Australian astronomical community in April 2009.² ESO capabilities were compared with Gemini and Magellan capabilities and a general preference for ESO was expressed. AAL concluded that the ESOWG should pursue the matter of membership of ESO further.

Proposal

To inform decision makers, a proposal will be developed by June 2011. That proposal will consider the economic and scientific returns from ESO membership, with due regard for the opportunity cost of such membership. The ESOWG estimates that preparation of the proposal will cost \$100K plus two person years of effort.

Scientific considerations will include:

1. The time Australia would be allocated on ESO's 8-metre optical/infrared telescopes and the competitiveness of those telescopes compared to Australia's existing 8-metre access (Gemini and Magellan).
2. The time Australia would be allocated on the European Extremely Large Telescope (E-ELT) and the competitiveness of that telescope compared to the Giant Magellan Telescope.
3. Any Australian access to the ALMA radio telescope, a new facility operating at millimetre wavelengths.

¹ *Australian National Astronomy Facilities: A guide for decision-makers*, October 2008, available online:

http://astronomyaustralia.org.au/publications/Astronomy_Roadmap.pdf

² *ESO membership poll*, April 2009, available online:

<http://astronomyaustralia.org.au/ESO/esopoll.pdf>

Economic considerations will include:

1. The joining fee (expected to be of order €80M), annual subscription (expected to be of order €8M), and any expenditure required in Australia to support ESO activities. Note: 25% of the joining fee could be an in-kind contribution such as access to existing Australian telescope facilities.
2. ESO operates a juste retour policy whereby all member states benefit in proportion to their share in ESO. For example, assuming the €1,000M E-ELT is approved by ESO Council in 2010, Australia would expect of order €50M in telescope building contracts.
3. ESO expects the labour component of instrument building contracts to be provided by the contracting institution
4. The economic multiplier factors relating to industry expenditures in innovative areas.
5. ESO could play a leadership role in the funding and construction of the Square Kilometre Array.
6. Societal and educational benefits of astronomy.

Timeline

5th November 2009: AAL members vote at AGM on whether to proceed with the development of the proposal.

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December 2009: Engagement of an astronomer at ~0.5FTE to manage the development of the proposal.

Early-2010: AAL representatives visit ESO's headquarters in Garching to commence negotiations for Australian membership of ESO, including contracting opportunities for the E-ELT.

Mid-2010: AAL engages economic consultants to assist with the development of the proposal.

Late-2010: AAL members comment at AGM on the ESO option.

Early-2011: Preliminary draft of proposal submitted to DIISR.

June 2011: Proposal submitted to DIISR for DIISR's consideration of a New Policy Proposal for the May 2012 budget.