Astronomy Australia Ltd.

Industry Engagement **Why & how?**

Wednesday 8 November 2022

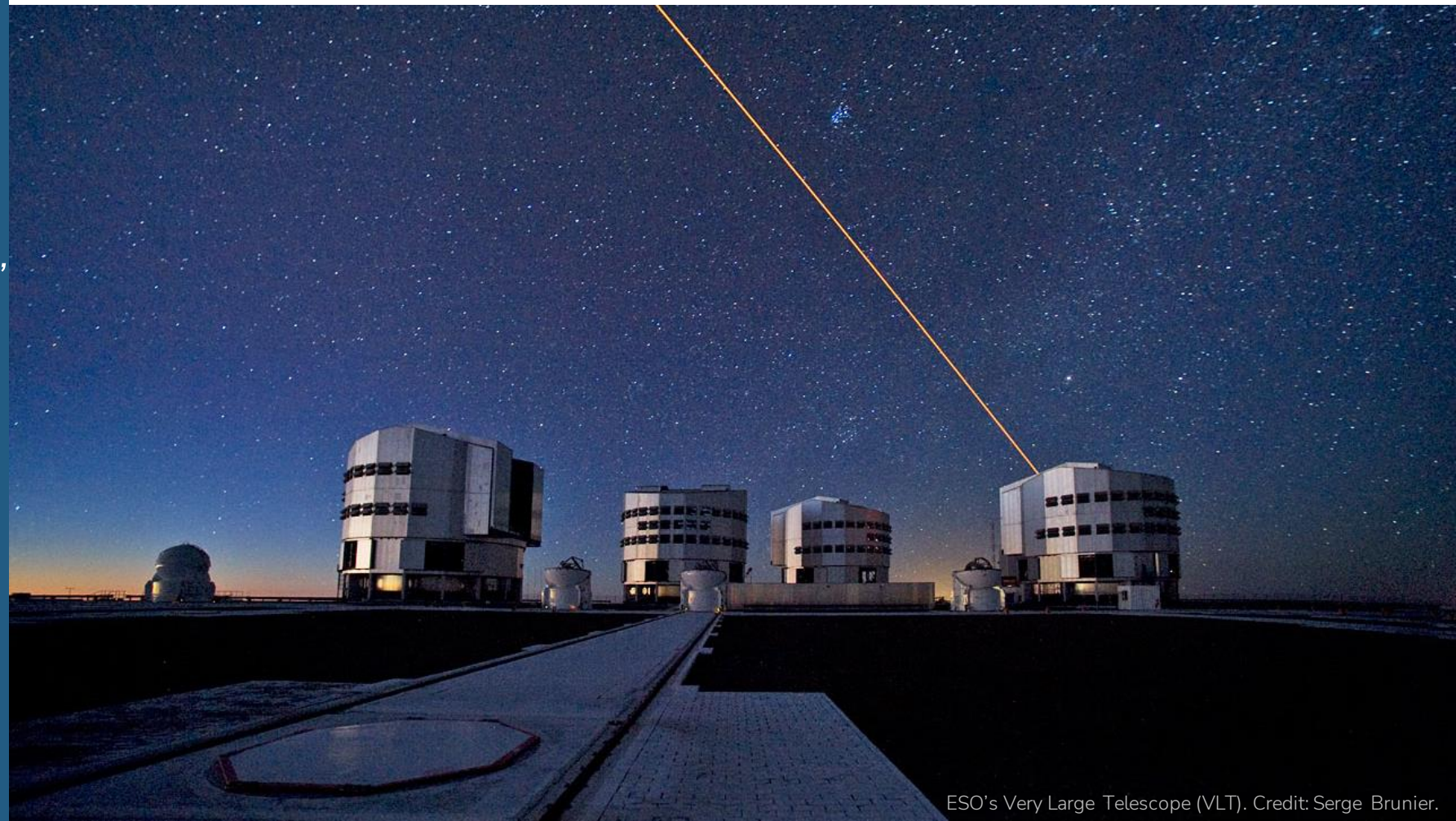
Dr James Murray
AAL Director of Programs

QuasarSat's digital phased array technology can potentially link to hundreds of satellites at once.
Credit: QuasarSat.

Industry Engagement in the **Decadal Plan**

The Decadal Plan called for the establishment of *"a central body to promote and facilitate industry engagement with the next generation of global facilities."*

The Decadal Plan Mid-Term review marked this as: NOT ACHIEVED.



ESO's Very Large Telescope (VLT). Credit: Serge Brunier.

Industry Engagement **focus**

Additional reasons for IE:

- **Building the business case for ESO & economic benefit**. The Government wants to see evidence of commercial translation of university research.
- **Because opportunities are there**. Astronomy research can go far here, but communication between academics and industry remains the biggest hurdle for many researchers to get started.

Andrew Jameson (ADACS) with the new Keck RTC. Credit: Karl Glazebrook.

Industry Engagement: **How do we start?**

Regardless of the motivation for doing industry engagement, the first step is the same.

Understand and document what we have.

Technology created for the ASKAP telescope has been utilised for industry engagement ventures. Credit: CSIRO.

Industry Engagement:
How do we start?

- A commercialisation audit
- Key technologies / facilities and skills
- Industry partners (~5 per node)

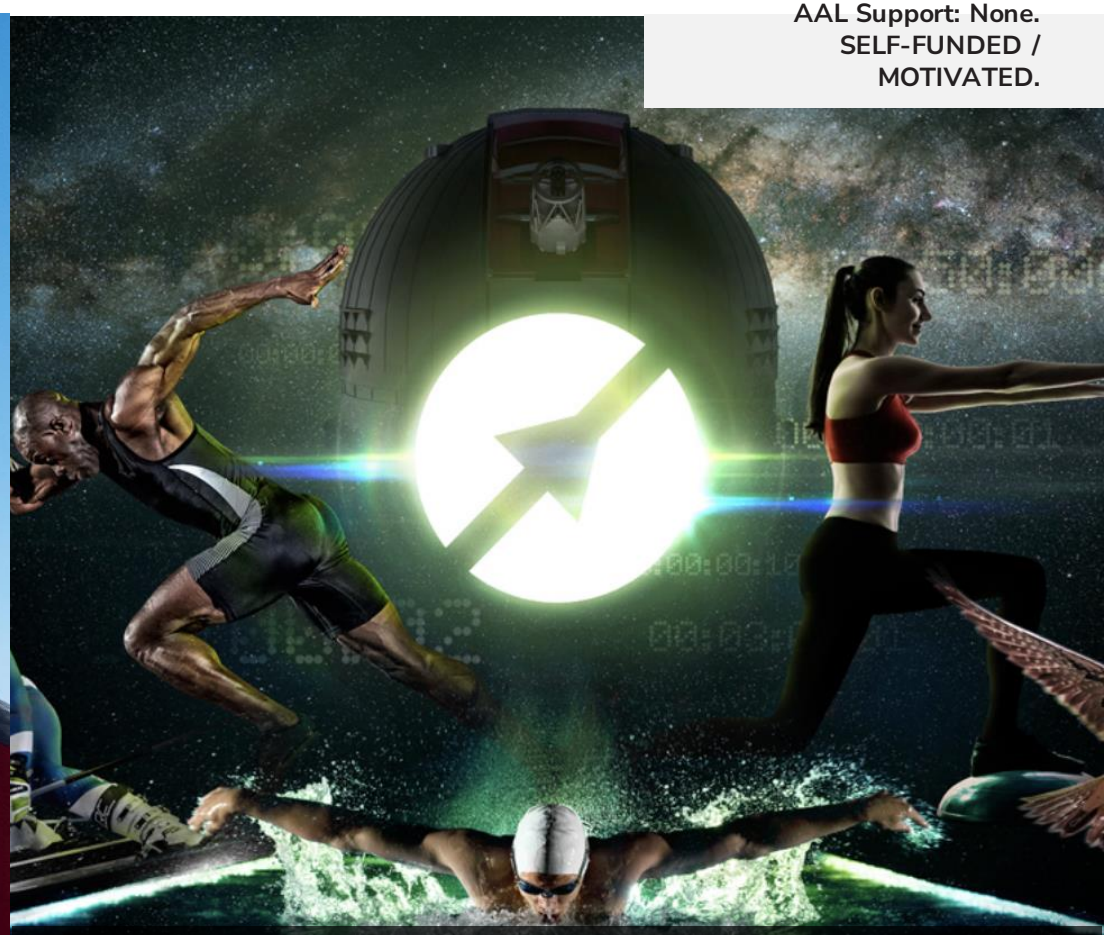
Astralis partnered with watchmakers for Hector. Credit: Nicholas Hacko.

Industry Engagement case study: **Keck Real-Time Controller**

Swinburne's **Professor Karl Glazebrook** and his team have helped to develop a new **Real Time Controller (RTC)** for the W. M. Keck Observatory's AO system.

The team (with help from ADACS) collaborated with University of Paris, ANU and Italian company **Microgate (project leaders)**, to develop a new RTC – with 100 times more computational throughput than conventional AO computations.

AAL Support: None. SELF-FUNDED / MOTIVATED.



Left: Professor Glazebrook at the Keck Observatory. Credit: Karl Glazebrook. Right: Project leaders Microgate are experts in fast precision timing for astronomy and sports science. Credit:Microgate.

Industry Engagement capability: **ADACS**

Astronomy Data and Computing Services (ADACS) is a joint venture between AAL, Swinburne and Curtin. Their specific capabilities include:

- System analysis & design
- Scientific computing
- HPC
- Machine learning
- Full-stack web development
- Large-scale database optimisation
- Cloud computing
- Scientific visualisation.

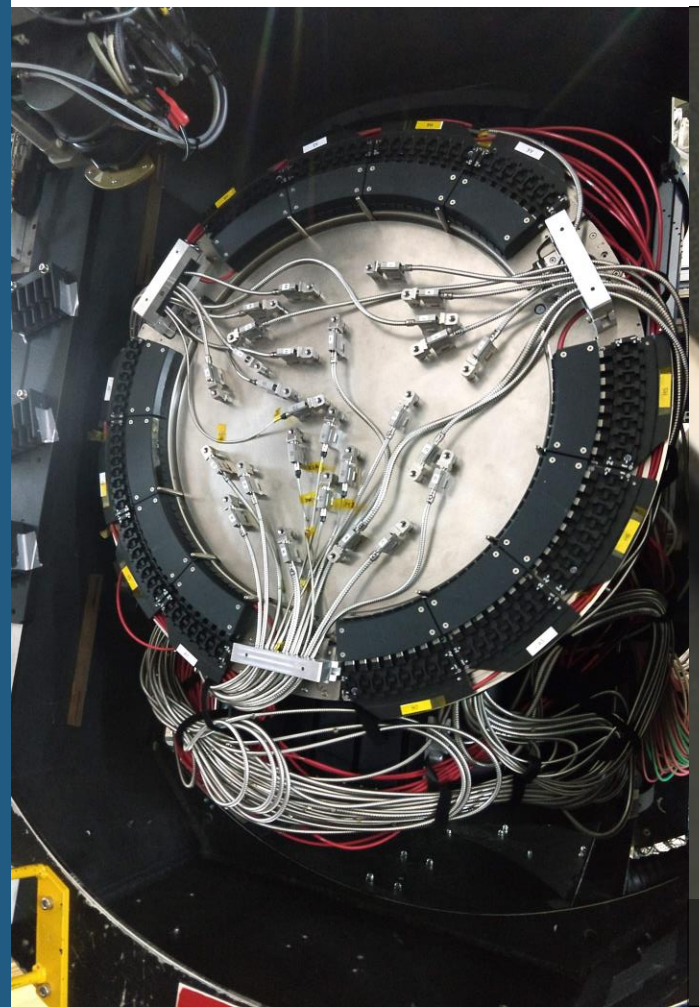
AAL Support: Established and supported via NCRIS.

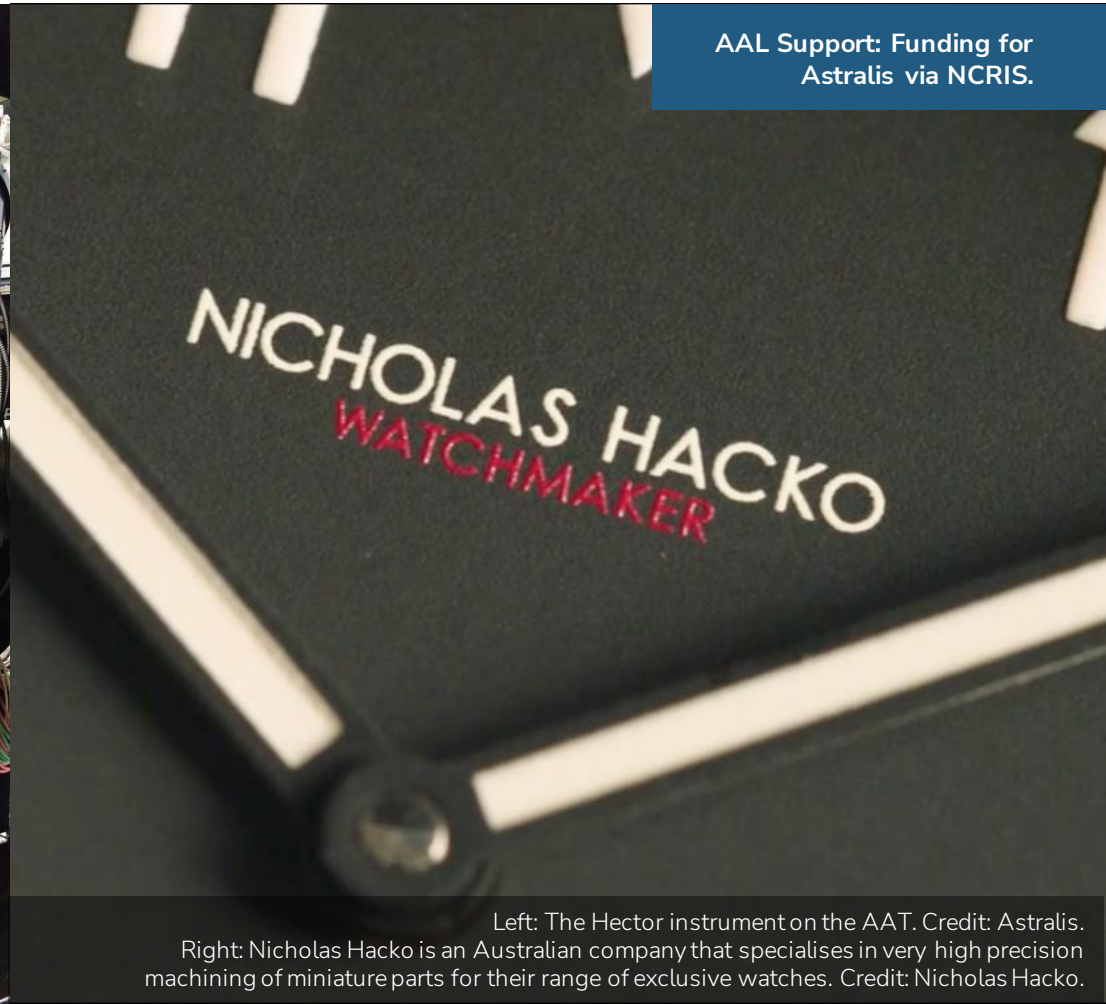
ADACS have been key partners in some recent examples of successful industry engagement.
Left: The Keck Real-Time Controller (with Swinburne University). Credit: WMKO.
Right: Stawell gold mine – mDetect project. Credit: Carl Knox, Swinburne University of Technology.

Industry Engagement case study: **Hacko and Hector**

A major new instrumentation project for the **AAT** has led to a partnership with one of the most specialised Australian watchmakers, **Nicholas Hacko**.

Specialising in very high precision machining of miniature parts, Hacko visited the project laboratory several times and worked through different prototypes, eventually manufacturing ~$40k of parts for the new Hector instrument.





AAL Support: Funding for Astralis via NCRIS.

Left: The Hector instrument on the AAT. Credit: Astralis.
Right: Nicholas Hacko is an Australian company that specialises in very high precision machining of miniature parts for their range of exclusive watches. Credit: Nicholas Hacko.

Industry Engagement case study: **QuasarSat**

CSIRO commercialisation specialist, **Dr Ilana Feain**, is a founding Director of **QuasarSat (**Quasar Satellite Technologies).

A new Australian start-up, QuasarSat is based on CSIRO phased array technology. It will potentially link to hundreds of satellites at once, dramatically increasing the efficiency and speed of real-time digital communications.

AAL Support: Some seed funding. MOSTLY SELF-FUNDED / MOTIVATED.

Left: CSIRO commercialisation specialist Dr Ilana Feain is a founding Director of Quasar. Right: CSIRO's phased array technology was developed to give radio telescopes a wide angle view of the sky. Both images – credit: CSIRO.

Industry Engagement case study: **MyLM**

CSIRO project engineer Matt Shields is the founder of MyLM.

From his work on a parts tracking system for ASKAP, Matt saw how this could be applied to the biomedical devices supply chain.

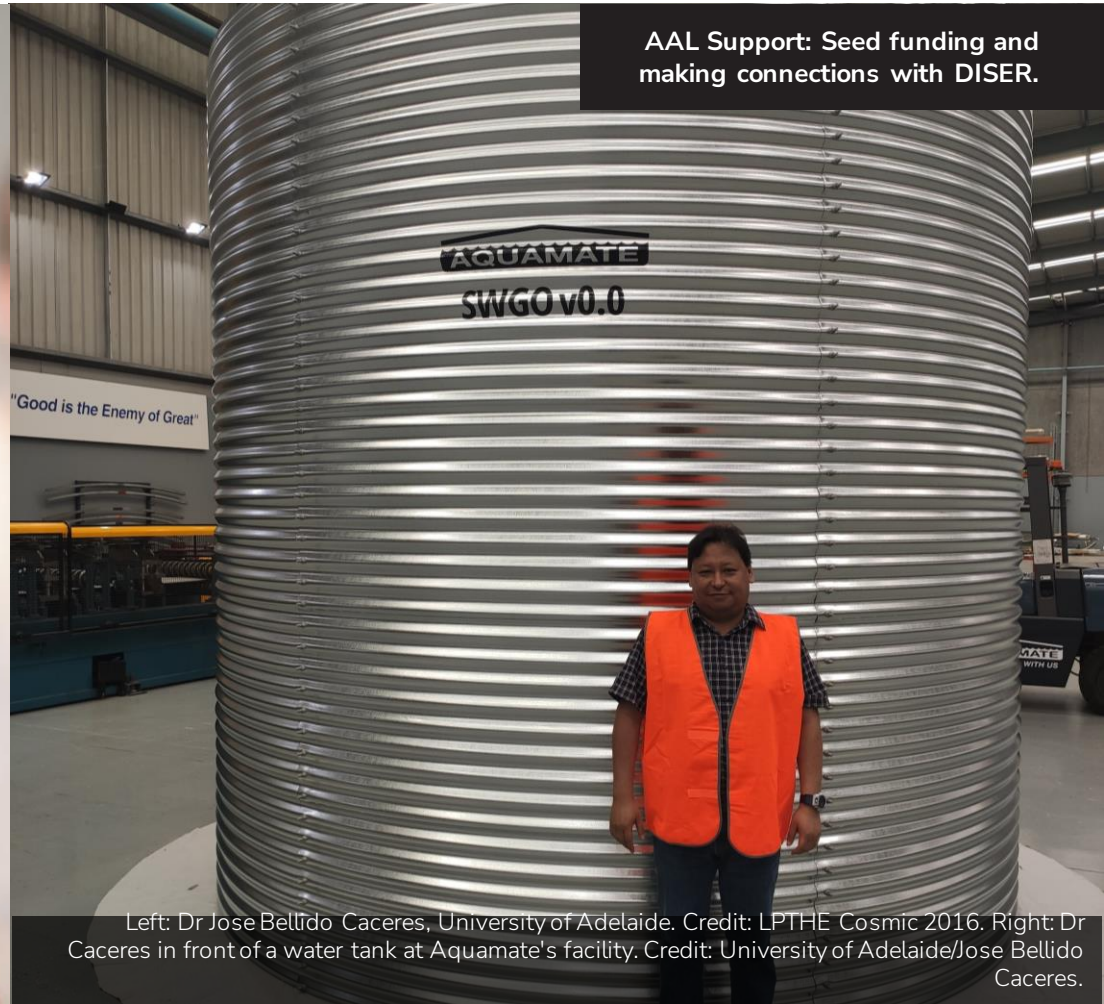
He then founded MyLM – a company that catalogues and tracks medical devices – allowing hospitals and medical institutions to better manage their inventory.

Left: Matt Shields from CSIRO created MyLM. Credit: Matt Shields.
Right: MyLM was based on Matt's work to build an ASKAP parts tracking system. Credit: CSIRO.

Industry Engagement case study: **Water Tanks to Peru**

Dr Jose Bellido Caceres from University of Adelaide approached AAL with an opportunity – to help SA business Aquamate supply water tanks to a gamma-ray observatory in Peru.

AAL worked with DISER and the university to fund prototypes for field testing. If successful, Aquamate could win a ~$40M contract to supply 6,500 water tanks to the Southern Widefield Gamma-ray Observatory.



AAL Support: Seed funding and making connections with DISER.

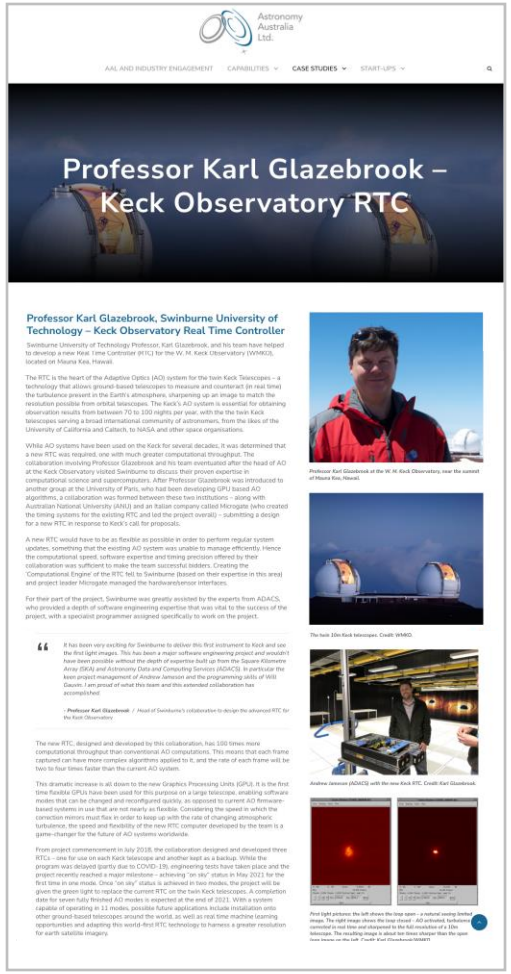
Left: Dr Jose Bellido Caceres, University of Adelaide. Credit: LPTHE Cosmic 2016. Right: Dr Caceres in front of a water tank at Aquamate's facility. Credit: University of Adelaide/Jose Bellido Caceres.

AAL Industry Engagement
Call to Action

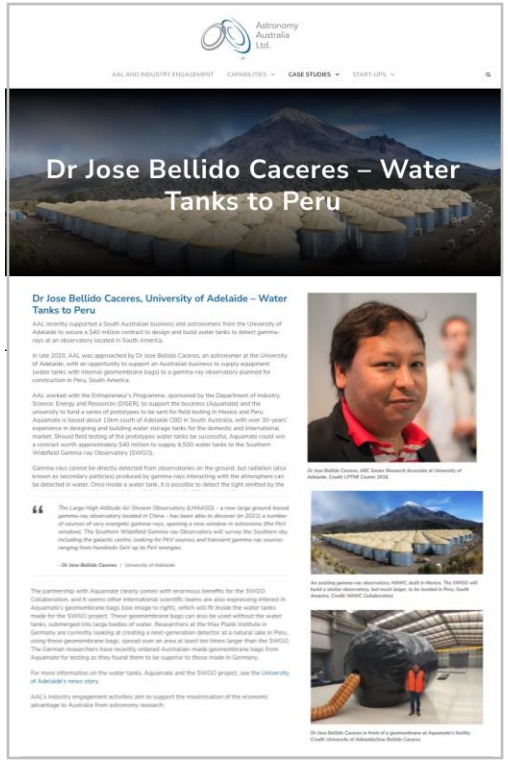
Call to Action

AAL wants to showcase more case studies and capabilities statements on our new industry engagement website.

Please get in touch with James Murray at AAL **to discuss your industry engagement project**.



An example of the **case studies** currently on AAL's IE website.



Left: The Keck Observatory RTC
Middle: Quasar Satellite Technologies.
Right: Water Tanks to Peru