



Galaxy scale ripples, understanding the Pillars of Creation, building our ability to explore

National recognition for astronomers from Perth, Hobart, Canberra, Sydney, and Melbourne.

- “We are the Universe, so we should get to know it better,” **Dr Sara Webb of Swinburne University**
- Building Australia’s ability to explore the cosmos, **Prof Matthew Colless of ANU**
- Making bright young radio galaxies, **Sophie Young of UTAS**
- Understanding the Pillars of Creation and other star factories, **Dr Shyam Menon of ANU** (now working at Rutgers Uni, USA)
- Galaxy scale ripples, **Dr Andrew Zic of CSIRO**
- Software that models the evolution of galaxies, **Prof Aaron Robotham of ICRAR-UWA**
- Making stars in a supercomputer, **Prof Christoph Federrath of ANU**
- “A common language to describe galaxies,” **Dr Katherine Harborne of ICRAR-UWA**

The Astronomical Society of Australia (ASA) will honour eight astronomers with prizes at its Annual Scientific Meeting, on **Wednesday 26 June 2024**.

"The Annual Scientific Meeting is an opportunity to celebrate the advances in Australian astronomy, an area of research in which Australia is a world leader. The ASA Prizes are an important component of this. It is wonderful to see the breadth and depth of contributions from all of this year’s winners, and indeed all nominees." says ASA President Associate Professor Stas Shabala.

- For interviews, contact Niall Byrne, niall@scienceinpublic.com.au, 0417-131-977 and visit www.scienceinpublic.com.au

“We are the Universe, so we should get to know it better”

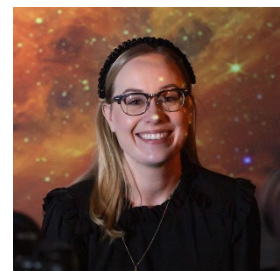
Sara Webb is not only chasing gravitational wave counterparts, hunting for fast radio burst progenitors, cataloguing the fastest flare stars in the galaxy and building AI tools to help astronomers work faster. She is also sharing the wonders of the Universe with millions of people through the media, YouTube, Ted talks, The Conversation and more.

Over the past three years, Sara has built an impressive outreach presence across multiple forms of media, with over 17 million social media views, and a reach of tens of millions annually through traditional media.

She has regular spots on ABC, Channel 7, Channel 9, SBS, BBC, Sky News, and Joy FM. She has published articles in The Conversation, COSMOS, and BBC Science Focus. She has presented a TEDx talk and public presentations to school groups.

Dr Sara Webb, Swinburne University, is the winner of the 2024 David Allen Prize for exceptional achievement in astronomy communication.

“Astrophysics allows us to glimpse into the cosmos and ultimately try understand ourselves as part of it,” she says.



See Sara's work at www.sarawebbscience.com

Building Australia's ability to explore the cosmos

Prof Matthew Colless AO, Australian National University, is the winner of the Astronomical Society of Australia's Ellery Lectureship 2023 for outstanding contributions in astronomy research.



Australia's leadership in optical astronomy is due, in large part, to the work of Matthew Colless over recent decades. As a researcher, Professor Colless has led pioneering work in constructing large samples of galaxies to understand their evolution and the large-scale structures they form, and to measure the amount of dark matter and dark energy. As a leader, he has ensured that up and coming astronomers have access to the best training and the best telescopes.

He led the Australian Astronomical Observatory (AAO) for nine years. Then as the Director of the ANU Research School of Astronomy and Astrophysics for ten years, he guided the reshaping of optical astronomy with the AAO transitioning from government to university.

Today, Australia's largest optical telescope is managed by the ANU; Astralis, a consortium of instrument builders at Macquarie University, ANU, and the University of Sydney, is developing new instruments; Australian astronomers have access to powerful European Southern Observatory (ESO) telescopes in Chile, and are working towards becoming full members of ESO to secure ongoing access and research opportunities exploring the southern sky.

More at <https://researchers.anu.edu.au/researchers/colless-mm>

Making bright young radio galaxies

The distant Universe is packed with radio galaxies emitting intense bursts of synchrotron light from supermassive black hole jets. Most of them are young, small and difficult to study.

Sophie Young, from the **University of Tasmania**, created a theoretical sample of these radio galaxies that can now be used to help study them in real life. She showed how they will influence their neighbourhood by injecting energy, and momentum into the gas clouds between stars.



***Sophie Young**, University of Tasmania, is the winner of the Astronomical Society of Australia's Bok Prize 2024 for outstanding research by an honours student or eligible masters student.*

More at <https://youngtassiescientists.com/scientist/sophie-young>.

Understanding the Pillars of Creation and other star factories

Dr Shyam Menon, ANU (now the Joint Rutgers-Flatiron Postdoctoral Fellow at Rutgers University and Flatiron Institute, USA), will receive the Astronomical Society of Australia's Charlene Heisler Prize 2024 for the most outstanding PhD thesis.



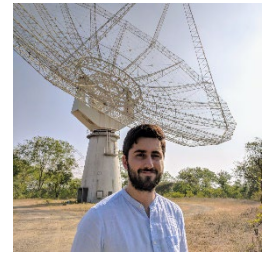
Shyam's PhD reveals how the light from stars control their own formation. Radiation from massive stars affect the star-birthing capabilities of the interstellar medium, that is the gas, dust and radiation found between stars in a galaxy.

His work has shed light on the formation of incredibly picturesque structures such as the Pillars of Creation in the Eagle Nebula, and the most extreme, luminous star-forming regions in our Universe.

<https://shm-1996.github.io/>

Dead stars reveal galaxy-scale ripples

Andrew Zic is using observations of pulsars – the remains of once-massive stars that are now nature’s most stable clocks – to search for weak ripples in the fabric of space and time known as gravitational waves. He led the third data release of the Parkes Pulsar Timing Array (PPTA) project at Murriyang, CSIRO’s Parkes radio telescope.



For almost two decades, the Parkes Pulsar Timing Array has used pulsars to create a gravitational-wave detector the size of the Milky Way. They are looking for tiny delays in the pulsar’s signal caused by gravitational waves. Decades of data are available for this unique way of seeing the Universe.

Andrew and his colleagues used the third data release to identify signatures of long-period gravitational waves produced by supermassive binary black holes at the heart of distant galaxies.

Dr Andrew Zic, CSIRO, wins the Astronomical Society of Australia’s Louise Webster Prize 2024 for outstanding research by a scientist early in their post-doctoral career.

<https://andrewzic.github.io/>

Software that models the evolution of galaxies

Today’s galactic astronomers have to use multiple telescopes working at multiple frequencies to study distant galaxies and understand their evolution. Aaron Robotham has created ProTools, a powerful suite of tools that combines images from multiple telescopes across multiple wavebands into one complete model.



By stacking and aligning images from multiple sources, Aaron’s software allows astronomers to better understand and interpret galaxy evolution observations. Users of the latest generation of ground and space-based observatories will benefit from his work.

Prof. Aaron Robotham, University of Western Australia/ICRAR, is joint winner of the Anne Green Prize 2024 for a significant advance or accomplishment by a mid-career scientist.

<https://research-repository.uwa.edu.au/en/persons/aaron-robotham>

Making stars in a supercomputer

Christoph Federrath's research focuses on understanding the formation of stars in the Universe, a process that controls galaxy evolution and sets the initial conditions for planet formation.



Christoph has developed theoretical models and supercomputer simulations of molecular clouds, the birthplaces of stars. This involves the physics of turbulence, gravity, magnetic fields, radiation, stellar feedback and chemical evolution.

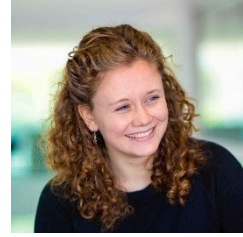
He has compared supercomputer simulations performed on thousands of computer cores to real observations in galactic clouds. His ultimate goal is to establish a model that combines all the relevant physics and chemistry to enable self-consistent comparisons with observations and to provide powerful predictions for how galaxies, stars and planets form in the Universe.

Prof. Christoph Federrath, Australian National University, is joint winner of the Anne Green Prize 2024 for a significant advance or accomplishment by a mid-career scientist.

<https://www.mso.anu.edu.au/~chfeder/>

‘A common language to describe galaxies’

Dr Katherine Harborne, University of Western Australia/ICRAR, is winner of the 2024 Emerging Leaders in Astronomy Software Development Prize – for outstanding contribution to the development of open-source astronomical software by an early career researcher. The prize is sponsored by the Australian Research Data Commons (ARDC).



Katherine’s SimSpin software bridges theoretical and observational astronomy, allowing astronomers to directly compare simulations and real-world observations of galaxies.

Integral field spectrographs (IFS) combine spectroscopy and imaging into 3D image cubes – adding depth to our 2D galaxy “photograph” along the line of sight.

Katherine’s software allows astronomers to create similar 3D image cubes from virtual galaxies. It gives theoretical and observational astronomers a common language in which to describe galaxies.

<https://research-repository.uwa.edu.au/en/persons/kate-harborne>

Highly commended

Tamsyn O’Beirne (formerly UWA now at Swinburne University) was highly commended for the Bok Prize for her research exploring the dark and low surface brightness Universe with WALLABY

Dr Yaguang Li (formerly the University of Sydney and now University of Hawaii) was highly commended for the Charlene Heisler Prize for developing tools for probing stellar interiors with asteroseismology

Dr Sabine Bellstedt (ICRAR-UWA) was highly commended for the Louise Webster Prize for her project on galaxy and mass assembly (GAMA): a forensic SED reconstruction of the cosmic star formation history and metallicity evolution by galaxy type

The 2024 Annual Science Meeting is an “online-first” meeting to bring the community together without the difficulties and costs associated with travel. The prizes will be presented in-person at local hubs around the country, on Wed 26 June. There will be hubs in Perth, Hobart, Brisbane, Melbourne, Sydney, and Canberra. <https://www.icrar.org/conferences/asa2024/>.