

# SPACE TIMES

March 2026

## OzGrav in the Media

Twin Black Hole Mergers  
Reveal Secrets of  
Cosmic Evolution.

A cosmic explosion with  
the force of a billion suns  
went unseen.

## Featured stories

Jocelyn Bell at the  
University of Sydney

## Outreach stories

OzGrav  
Ambassadors at  
Work



## Welcome to the March edition of Space Times!

This issue captures a broad cross-section of activity across the Centre, from recent results in gravitational-wave astronomy to outreach, mentoring, and community initiatives. The featured work on twin black hole mergers is a good example of how the field is evolving from detections to astrophysics. With an increasing number of detections, the emphasis is shifting toward extracting more detailed information from these events and using them to test our models of how compact objects form and evolve.

Ongoing observing runs continue to provide a steady stream of events, and with that comes the need for careful, methodical analysis, which OzGrav and our global partners are providing.

Across OzGrav, there has also been consistent engagement beyond research. Outreach activities over the summer, mentoring through programs such as Mentorloop, and participation in Centre-wide initiatives all contribute to the strength of the community. These efforts are not always front and centre, but they remain an important part of how the Centre operates. For instance, Lachlan McGuinness from ANU organised the first Australian Astronomy Olympiad team supported by OzGrav.

Looking ahead, planning is underway for several upcoming events, including the 2026 ECR School in Japan in collaboration with our colleagues at KAGRA. This is a valuable opportunity for early-career researchers to engage more directly with instrumentation and strengthen international connections. We invite you to submit an Expression of Interest or an abstract to attend, as this event is expected to be a distinctive and worthwhile experience.

Finally, I would like to acknowledge the many contributions that sustain the Centre beyond what is captured in these pages. Thank you to those who contributed to the recent ARC reporting process by preparing material, compiling data, and responding to requests, often under time pressure. OzGrav relies on the many small, consistent contributions that keep things moving: sharing knowledge, supporting colleagues, and staying engaged. That collective effort is what keeps the network active and working as intended. I'm also grateful to Ari Hernandez for putting together this newsletter.

**Professor Matthew Bailes, Director, ARC Centre of Excellence for Gravitational Wave Discovery (OzGrav)**

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## Twin Black Hole Mergers Reveal Secrets of Cosmic Evolution

**An international team of scientists from the LIGO, Virgo, and KAGRA collaborations, including researchers from the ARC Centre of Excellence for Gravitational Wave Discovery (OzGrav), has detected two remarkable black hole collisions that are offering new insights into both the evolution of the cosmos and the nature of dark matter.**

The pair of gravitational-wave events, named GW241011 and GW241110, were detected in late 2024, just one month apart, during the O4b observing run of the global detector network. Each signal was produced by the violent merger of two black holes, forming an even more massive remnant and sending ripples through space-time, each travelling for hundreds of millions to billions of years before reaching Earth.



GW241011 and GW241110 infographic. Credit: Shanika Galaladage / @astronerдика

Both events involved unequal-mass, rapidly spinning black holes, an unusual combination that provides a window into how black holes form and evolve, and how they can be used to test new physics. Using these signals, researchers from OzGrav and the Australian National University (ANU) investigated whether the black holes' spins could reveal hints of previously undiscovered particles.

OzGrav PhD student Aswathi Pampurayath Subhash from the Australian National University led the analysis focusing on ultralight bosons, hypothetical particles that could make up dark matter. Certain theories suggest these particles might gradually drain rotational energy from black holes over time. But since the black holes in GW241011 and GW241110 were still spinning rapidly when they merged, scientists were able to rule out a wide range of possible boson masses, tightening the constraints on dark matter theories.



By remaining highly spinning over their long lifetimes, they allow us to rule out a wide range of possible ultralight boson masses, placing new constraints on dark matter and theories beyond the Standard Model.



Each detection adds a new piece to the puzzle of how the most extreme objects in our universe come to be.

“These two black hole mergers give us a remarkable glimpse into how black holes grow and evolve,” said Dr Ling (Lilli) Sun from the Australian National University and Chief Investigator at OzGrav. “Their high spins and unequal masses suggest that they may be second-generation black holes, the products of earlier mergers in dense stellar environments, such as star clusters. Each detection adds a new piece to the puzzle of how the most extreme objects in our universe come to be.”

The detections highlight the extraordinary sensitivity of the LIGO, Virgo, and KAGRA observatories, which continue to uncover the hidden stories of the Universe’s most extreme objects. “Each new discovery not only deepens our understanding of black hole formation but also transforms these cosmic collisions into laboratories for fundamental physics,” says OzGrav Chief Investigator Professor Eric Thrane from Monash University.

Together, GW241011 and GW241110 showcase the remarkable progress of gravitational-wave astronomy in revealing the hidden lives of merging black holes. Each detection brings us closer to understanding how these cosmic giants form and evolve, while offering a powerful way to test the fundamental laws that govern the Universe itself.

Watch the explainer video below on these twin black hole mergers:



OzGrav. Twin Black Hole Mergers Reveal Secrets of Cosmic Evolution, [ozgrav.org](https://ozgrav.org), 2026.



# Jocelyn Bell visits the University of Sydney



In October 2025 the School of Physics at the University of Sydney hosted Dame Jocelyn Bell Burnell, one of the most influential astrophysicists of our time and the discoverer of pulsars. Her visit celebrated a career that has shaped modern astrophysics and continues to inspire the next generation of scientists. During the visit Dame Jocelyn received an Honorary Doctorate from the University and took part in a series of events supported by the Physics Foundation and the Hunstead Fund. These included the annual Stibbs Public Lecture, which attracted more than 300 attendees, a Citizen Science knowledge exchange and workshop with school teachers from around Australia sponsored by the STEM Teacher Enrichment Academy, and a Q&A session with undergraduate students. She also participated in public events at the Powerhouse Museum and Sydney Observatory. Alongside the formal program she recorded two interviews, one with Dr Karl Kruszelnicki for the *Shirtloads of Science* podcast and another with Rami Mandow from CSIRO, who later wrote about the visit for *Space Australia*.

On **Monday 20 October** an **OzGrav** sponsored Science Symposium was held at the *Chau Chak Wing Museum* at the University of Sydney, attended by 60 guests. The symposium brought together early career researchers and students to reflect on the legacy of the discovery of pulsars and to consider the future directions it continues to open in astronomy and astrophysics.

The event was organised by OzGrav Associate Investigator **Manisha Caleb** and postdoctoral affiliate **Laura Driessen**. Talks were delivered by OzGrav members **Kirsten Banks**, **Diana Haikal** and **Jackie Bondell**, alongside PhD student **Kavya Shaji**.

Throughout the visit, **Dame Jocelyn** was generous with her time, sharing insights into the discovery of pulsars and the chain of events that led to it. She also spoke about the moments when the signals were nearly overlooked, offering a candid reflection on how scientific discoveries unfold in practice.

Her remarks provided perspective not only on a landmark moment in astrophysics but also on the broader process through which knowledge advances.

Photos of the different events are below:



Article written by Marie Partridge USyd/OzGrav (2025)



## A cosmic explosion with the force of a billion suns went unseen – until we caught its echo

***Some of the universe’s most extreme explosions leave behind almost no trace. The original explosion is unseen, but our observations can capture the long-lived echo it leaves behind as the shock front ploughs into its surrounding environment.***

In new research accepted for publication in The Astrophysical Journal, we report what may be the clearest example yet of one of these hidden explosions: the radio afterglow of a powerful gamma-ray burst whose initial blast went unnoticed. The only other viable explanation is a rare event in which a star is torn apart by an intermediate-mass black hole. Either way, we’re observing the aftermath of one of the most extreme events the cosmos can produce.

### **The explosions we usually miss**

Gamma-ray bursts are brief but powerful jets of high-energy radiation. Within seconds, they release as much energy as the Sun will emit over its lifetime. They are caused when massive stars die and form black holes. While these jets are launched in all directions, we only observe the small fraction whose emission is directed towards us. When it is directed away, the initial flash goes unseen, and all we can observe is the slowly fading afterglow.

Although these so-called “orphan afterglows” of gamma-ray bursts have been predicted for decades, finding them has proven difficult. Without a high-energy flash to announce their arrival, astronomers must search thousands of square degrees of sky.

### **A cosmic ghost appears**

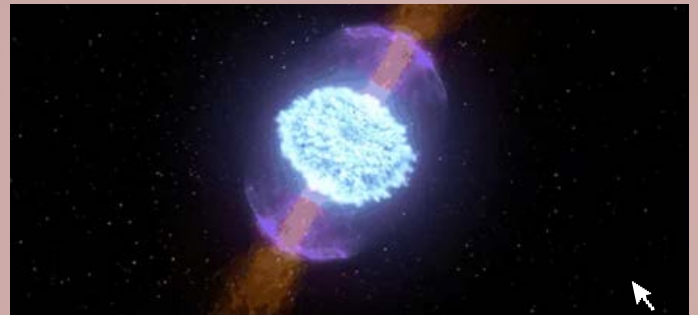
In Western Australia, we scanned large areas of sky for long-lived radio transients. We were trying to catch rare events that reveal themselves only through their fading radio emission.

In data from one of these surveys, we noticed a radio source (ASKAP J005512-255834) that hadn’t been there before. It brightened rapidly, releasing  $10^{32}$  joules of energy each second – comparable to the total radio energy output of billions of Suns – and then faded.

This behaviour immediately set it apart. Most radio transients evolve quickly or flare repeatedly. This source did neither. Instead, it behaved like the lingering echo of a single, immensely powerful explosion.

Although ASKAP J005512-255834 was bright at radio wavelengths, it left almost no signal at other wavelengths.

We could not see a counterpart in visible light or X-rays. This is exactly what astronomers expect from an orphan afterglow: the fading, widening glow of a tightly focused cosmic jet not initially pointed towards Earth, becoming visible only after it slows and spreads.



Animation of a gamma-ray burst showing the narrow, high-energy jets. NASA

[Click to see animation](#)

### **A busy neighbourhood, billions of light-years away**

This rare transient is located in a small but bright galaxy around 1.7 billion light-years from Earth. The galaxy has an irregular structure and is actively forming stars, making it a natural environment for extreme stellar events such as stellar collapse or violent disruption. The position of the explosion is off to one side, not aligned with the galaxy’s nucleus, appearing within a compact star-forming region, possibly a nuclear star cluster.

### **Could it be something else?**

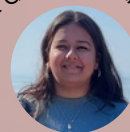
Because ASKAP J005512-255834 is unusual, we had to do detective work to figure out what it might be. We carefully examined (and ruled out) alternative explanations, including stars, pulsars and supernovae.

The only other scenario reproducing the observed radio behaviour involves a star being torn apart by an intermediate-mass black hole. These rare black holes sit between stellar remnants and the supermassive giants in galaxy centres. Such events are extremely rare at radio wavelengths, but cannot be completely ruled out. Confirming it would make this the first example of its kind, a discovery just as interesting as an orphan gamma-ray burst.

### **A hidden universe revealed by radio waves**

ASKAP J005512-255834 is the most convincing orphan gamma-ray burst afterglow identified, found by detecting the long-lived echo of an unseen explosion. Using this approach, we hope to uncover more orphan afterglows and give them a place in our cosmic story, building a fuller picture of the gamma-ray burst population, including those that never flashed but lingered quietly as radio ghosts.

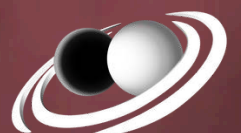
Ashna Gulati, USyd/OzGrav



Tara Murphy, USyd/OzGrav



Ashna Gulati and Tamara Murphy. A cosmic explosion with the force of a billion Suns went unseen – until we caught its echo. The Conversation, 2025. [Condensed for newsletter]



## How far away from their host galaxies can binary neutron stars merge?

Gamma-ray bursts are among the brightest explosions in the Universe, producing intense flashes of radiation when ultra-relativistic jets are launched into space. Many short gamma-ray bursts (lasting less than two seconds), and possibly some longer ones, are thought to occur when two neutron stars merge.

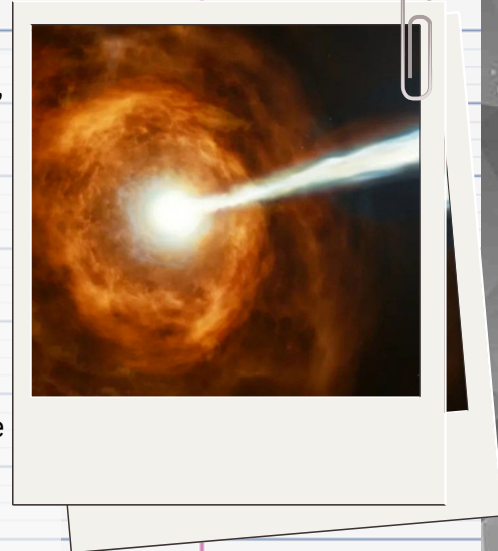
These neutron-star mergers do not always happen where the stars originally formed. When neutron stars are created in supernova explosions, the system can receive a "kick" that sends the binary moving through its host galaxy. As a result, gamma-ray bursts produced by these mergers are often observed far from regions where new stars are forming. In some cases, they even appear to occur "offset" from any known galaxy. Determining which galaxy a burst came from is important for understanding how neutron-star binaries form and evolve, and may also help with cosmological studies.

Current methods used to associate these "offset" gamma-ray bursts with host galaxies tend to favour rare, bright, massive galaxies as likely origins. However, in a paper recently published in *The Astrophysical Journal Letters*, "The maximum offsets of binary neutron star mergers from host galaxies" (<https://iopscience.iop.org>), OzGrav Chief Investigator **Ilya Mandel** and collaborators **Om Salafia, Andrew Levan, and Paul Disberg** (PhD student, Monash/OzGrav) argue that this approach is flawed and large offsets from massive hosts can be ruled out on theoretical grounds.

The authors point out that the systemic kick that a neutron star binary can receive is limited to approximately the pre-supernova orbital velocity, as larger kicks will typically destroy the binary. This maximum systemic kick therefore scales as the inverse square root of the binary's separation. But the timescale before the binary merges due to the emission of gravitational waves scales more strongly with binary separation, as the fourth power. Therefore, wider binaries can travel further than tighter binaries before merging, despite receiving lower systemic velocities.

However, there is a minimum kick that a binary must receive to form a hostless gamma ray burst: the escape velocity from the host galaxy. If the kick is weaker, the binary will remain inside the host. This means that for massive hosts which have high escape velocities, only very tight binaries can escape. But these must also merge promptly and so cannot travel too far from the host.

The authors conclude that the maximum offsets of gamma-ray bursts are below 20 kiloparsecs for host galaxies with a stellar mass above 100 billion solar masses. They argue that at least some claimed associations of offset gamma-ray bursts with hosts, such as GRB 050509B, can be confidently ruled out. In the future, constraints from this paper can be used to improve the searches for host galaxies of offset gamma-ray bursts.



Article written by Prof. Ilya Mandel,  
Monash/OzGrav (2026),





## Hugh McDougall

UQ



Readers within OzGrav might recognise me from last year's travels or the last two retreats, either as "That Nested Sampling Guy" or "That Guy Who Brings Home-Made Fudge to Every Meeting". For the friends I haven't met yet: hi, I'm Hugh. I'm a Bayesian numerical astro-statistician. That means I turn measurements into physics, juicing as much information as we can out of those precious gravitational wave detections.

I started my undergraduate studies at the University of Queensland in 2013, more or less contemporaneous with Macklemore's "Thrift Shop". For six years, I chipped away at a dual degree in Aerospace Engineering and Physics, always orbiting as close as I could to the astrophysics department. Custom demands an anecdote about where my childhood love of space came from. I can blame my hard sci-fi-loving dad and a VHS of Star Wars rewatched so many times that I literally burned through the magnetic tape.

My crop of undergrad projects, mostly with DES data, covering supernovae and an initial foray into the aliasing problem of reverberation mapping, were cut short when I made the mistake of finally graduating. Entering the real world, I tossed a coin on which of the two diverging roads to explore and tried my hand at engineering in Melbourne. In short order, the COVID pandemic rapped me on the knuckles and told me, "Wrong answer, try again." Realising that astrophysics was the right and only place for me, this short misadventure brought me back to UQ, where I took up my old work for Honours and now a two-thirds complete PhD. For the last four years, I've been combining the cosmology of Tamara Davis and the computational statistics know-how of Ben Pope, now at Macquarie University, in the field of reverberation mapping, a technique that uses the way light echoes around supermassive black holes to measure how heavy they are.

About a year ago, I made the pivot from supermassive black holes to their smaller stellar-mass cousins, taking my Bayesian methods and joining the fast-moving frontier science of OzGrav. Working under Paul Lasky and Eric Thrane, I'm plugging away at a project using novel calculation methods to wring the Hubble constant out of merger detections and galaxy catalogues. For those in the know, it is a combination of the spectral and catalogue siren methods via importance sampling. I've been incredibly lucky to work at Monash University in person for three months last winter as part of the OzGrav inter-node visit program. It was an absolute joy to meet and work with the incredible scientists there, as well as colleagues at Swinburne and the University of Melbourne.

It's a rare and lucky few who get to know they are in the right place, and the joy of this field is that a great many of us rank in that number. I don't think there's anyone in OzGrav who doesn't get a little kick out of saying what they do for work, but the great and persisting joy has been in meeting other scientists in the collaboration. Everyone is excited and energised. Everyone knows something you don't. Best of all, every person and every project is a chance to share knowledge and move one another's work forward.

If you're interested in my work, you can find transcripts of my colloquia and public outreach talks on my website: <https://hughmcdougall.github.io/> as well as a handy guide to some inside-baseball statsy stuff, namely the Python-based statistics language NumPyro.



## Summer Highlights from OzGrav Outreach

It's been a busy and rewarding summer for OzGrav's outreach teams, bringing gravitational-wave science to students, teachers, and communities across Australia. Highlights include high school programs, International Women's Day events, and the development of new accessible resources.

### Kicking Off 2026 with the Outreach Ambassadors

The year began with the **2026 OzGrav Outreach Ambassadors** kickoff meeting, bringing together early-career researchers who lead outreach activities across the OzGrav network.

A highlight of the meeting was an ambassador-led discussion about professional development priorities for the year ahead. By inviting ambassadors to shape the program themselves, the initiative ensures the training and opportunities offered are meaningful and valuable for those delivering programs on the ground and building their own professional outreach and engagement capacity.



### Summer Science Experiences for Students

In December and January, OzGrav hosted hands-on workshops at Swinburne University of Technology and the University of Melbourne as part of Summer Science Experience programs for Indigenous secondary students. These sessions introduced Year 9 and 10 students to key ideas in astrophysics through interactive demonstrations and discussions with scientists.

At the University of Melbourne, ambassadors also delivered four workshops for over 100 Year 9 students participating in the broader Science Experience program, giving students the chance to explore black holes, gravitational waves, and the tools researchers use to study the universe.



### Expanding OzGrav Outreach Resources

Behind the scenes, the team has also been developing new materials for OzGrav outreach kits used across our nodes. New VR headsets will help ensure flagship programs such as Mission Gravity and Blast Off to the Virtual Universe remain cornerstone activities in OzGrav 2.

At the same time, the team is working to expand accessible outreach resources. In collaboration with the Tactile Universe initiative, ambassadors are developing 3D-printed tactile representations of gravity and gravitational waves, including versions that incorporate sonification of gravitational-wave signals. **Outreach Ambassador Simon Ho** from Swinburne/ANU has been leading this project.



# OUTREACH STORIES

## Launching Australia's Space and Astronomy Olympiad

OzGrav supported the launch of **Australia's first national Space and Astronomy Olympiad**, with around **300 students participating from across the country**. Students completed a one-hour exam at their schools, tackling challenging astrophysics problems, with volunteers from **Mount Stromlo Observatory** supporting the grading.

Following the competition, **50 high-performing students** have been invited to an **online training program** covering first-year astrophysics topics such as binary stars, black holes, and general relativity. From this group, **20-25 students will attend the Astronomy & Astrophysics Winter Camp in Melbourne in July 2026**, featuring workshops, observations, and visits to leading research institutions.

## Join the Outreach Ambassadors

None of these initiatives would be achievable without the dedication and leadership of the OzGrav Outreach Ambassadors.

If you are a PhD student or postdoctoral researcher affiliated with OzGrav and are eager to enhance your science communication skills while motivating the next generation of scientists, we invite you to reach out to us. Discover more about becoming a part of the Outreach Ambassador program:

[JOIN NOW >](#)

## Meet the OZGRAV OUTREACH AMBASSADOR

We asked OzGrav Outreach Ambassador **Olivia Vidal Velázquez** a few quick questions about her perspective on science communication and inspiring the next generation of physicists. Here is what she had to say:

### What inspired you to become an OzGrav Outreach Ambassador?

Being able to share my passion for science and my favourite mysteries of the Universe with students and the public. Seeing others get excited reminds me of why I chose this path in the first place.

### What's your favourite thing to share with students or the public?

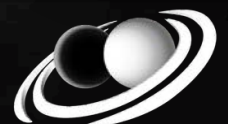
I love sharing facts about "zombie stars", how a star can be dead but still alive at the same time, or how some stars "eat" their companions until they explode. But what I treasure most is conveying that we still know so little about the Universe, and there are so many things yet to be discovered. My heart is full of excitement about being a kind of "Universe detective" and sharing that feeling with inquisitive and bright students.

### What's something people might be surprised to learn about you outside of science?

This year, I've made an extra effort to do that by joining the Hoop Army in Melbourne! We're a group of girls who dress up and dance with hula hoops, and of course, we have a captain!

### If you could bring one space or physics concept to every classroom, what would it be?

I love the concept that when we look at the sky, we are seeing the past because of the finite speed of light. I learnt about this too late, in my opinion, and I find it absolutely fascinating.



## OzGrav ECR Workshop & Annual Retreat 2025

In November 2025, OzGrav members gathered in Melbourne for the Early Career Researcher (ECR) Workshop and Annual Retreat, held at the **Pullman Melbourne Albert Park**, located on the traditional lands of the **Wurundjeri and Bunurong people of the Kulin Nation**. The events brought together researchers from across the Centre for several days of scientific exchange, collaboration and community engagement.

The **ECR Workshop**, held on 24 and 25 November. The program focused on interactive sessions, networking opportunities and team-building activities, providing a space for early career researchers to connect, share experiences and develop collaborations within the OzGrav community.

The **Annual Retreat** followed from 26 to 28 November and brought together the wider OzGrav membership, with 160 attendees in total. The program included scientific talks, keynote presentations, professional development sessions and small group discussions, alongside opportunities for informal interaction between members from across the Centre.

The Retreat opened with a Welcome to Country by **Uncle Shane Clarke**, followed by a **didgeridoo performance by Ganga Giri**.

The performance was both moving and memorable, setting a reflective tone for the meeting. The opening session also marked the launch of the new OzGrav t-shirt featuring First Nations artwork by Indigenous artist **Colin Hunter**.



Across the three days, members presented updates on research activities and future directions. A keynote presentation on Cosmic Explorer by Mike Landry provided insight into the development of next-generation gravitational-wave observatories and the broader international context of the field. Lightning talks offered short presentations of emerging results and ideas, while breakout sessions created space for focused discussion and collaborative planning.



Interactive sessions ranged from scientific brainstorming to creative collaboration through LEGO® SERIOUS PLAY®, as well as expert roundtables.

Our conference dinner was incredibly fun. We first celebrated our outstanding members by awarding them for their efforts and work within the Centre, followed by a karaoke session, which demonstrated that quite a few members have impressive singing talents.

We look forward to seeing you again at our 2026 ECR workshop and Retreat which will take place in beautiful Sydney.



## Directorate visits 2025

The OzGrav Directorate – Matthew Bailes, Tamara Davis, David McClelland and COO Yeshe Femmer – visited OzGrav nodes across the country during the year, meeting with members and collaborators at each institution. All members were invited to attend, speak with the Directorate and discuss their work and experiences within the Centre.

At each visit, the Directorate presented an overview of OzGrav’s activities over the past year, including updates on research across the Centre and any organisational developments. With representatives from different research areas present, the meetings provided an opportunity to share progress, discuss future directions and hear directly from members at every career stage. The visits also allowed time for informal conversations and even photographs, capturing moments from across the OzGrav community.



## Welcome to OzGrav Booklet

We are excited to introduce the “Welcome to OzGrav” booklet, designed for both new and existing members.

- Discover the various research initiatives we undertake
- Understand our governance structure
- Explore available resources and funding opportunities

Learn about how to get involved in our community through specific committees or by engaging in outreach with your peers!



Click on the image to check it out!

## ECR School, Japan 2026



The rumours are true!

OzGrav will travel to Japan for the 2026 ECR School, to be held in July 2026. This opportunity has come together thanks to the efforts of our colleagues at KAGRA and OzGrav’s Senior Communications and Engagement Advisor, Diana Haikal.

As part of the program, OzGrav members will visit the KAGRA gravitational-wave detector facilities before taking part in a three-day ECR School alongside OzGrav researchers and Japanese collaborators. The workshop will focus strongly on instrumentation research and hands-on discussion with experts in the field.

**Please note** that spots are limited.

To learn more, visit:  
<https://www.ozgrav.org/events/ozgrav-ecr-school-japan-2026/>



## OzGrav Associate Investigator Matt Dodds awarded the 2025 Prime Minister's Prize for Excellence in Science Teaching in Secondary Schools

Congratulations to OzGrav Associate Investigator Matt Dodds, recipient of the 2025 Prime Minister's Prize for Excellence in Science Teaching in Secondary Schools.

OzGrav proudly celebrates Matt's national recognition for his creative, hands-on approach to science teaching, bringing physics to life for students in regional and remote communities.

"I'm passionate about teaching in regional Australia," Matt says. "Just because we're in rural areas doesn't mean students shouldn't have access to high-quality STEM experiences."

Since 2018, Matt has worked closely with OzGrav's Education and Outreach team, helping translate complex astrophysical concepts into engaging, real-world classroom experiences. Collaborating with OzGrav's Senior Education and Outreach Manager, Jackie Bondell, he has co-developed national teacher workshops, student outreach programs, and public events that have reached thousands of participants across Australia.

"Matt's passion for physics and astronomy is infectious," says Bondell. "He's taken OzGrav's outreach tools—from VR experiences to LEGO® interferometers—and shared them with students and teachers across Australia. He has an extraordinary gift for making science accessible and exciting."



Among his many innovations, Matt created a LEGO® DUPLO® Interferometer, a hands-on model demonstrating the principles behind gravitational-wave detection. Developed in collaboration with OzGrav, the design has been adopted across OzGrav's eight nodes and even features in outreach programs at LIGO in the United States and KAGRA in Japan.

"It's amazing to see a simple LEGO model spark such curiosity," says Matt. "It helps students visualise how instruments like LIGO detect ripples in spacetime and shows that anyone can explore big scientific questions with the right mindset."

Matt, a Physics and Biology teacher at Glen Innes High School in NSW, has made contributions that extend well beyond his classroom. He established the Astronomy and Astrophysics Depth Study Program at Siding Spring Observatory, now in its seventh year and attended by more than 280 students from regional NSW schools. His inventive lessons—such as using data from NASA's Kepler Space Telescope to calculate stellar masses, or designing solid-fuel rockets using CAD simulations—have been adopted by physics teachers worldwide. He also mentors educators across Australia, sharing creative approaches such as smartphone spectroscopes and Hot Wheels-based demonstrations of projectile motion.

"Students are inspired when they see their teachers still learning," Matt says. "Science is about curiosity that never ends."

Article written by Prof. Ilya Mandel, Monash/OzGrav (2026),



# FUNDING OPPORTUNITIES

Please check out the following funding opportunities OzGrav has available to all members:

## ECR Travel Awards

- Supports OzGrav PhD students, postdocs and Associate Investigators to visit Partner Organisations/Investigators.
- Up to **AUD 4,500** for international travel or **AUD 2,800** for domestic
- At least 1/3 co-investment required
- Focus on research placements

## Research & Innovation Grant

- For projects led by OzGrav PhD students or postdocs.
- Up to **AUD 5,500** for individual projects or **AUD 22,000** for cross-node teams
- Projects should aim to result in a publication

## Professional Development Grant

- Open to all OzGrav Postdocs and students.
- Main objective is to support participation in activities and training to improve professional development skills.
- Up to **AUD 1,700** and, under exceptional circumstances up to **AUD 5,000**

## Research Translation Seed Funding

- Supports early-stage projects applying OzGrav expertise beyond gravitational wave research.
- Must be led by an OzGrav researcher, and can include Partner Investigators as co-investigators
- Up to **AUD 30,000** available per project
- Start with a short Expression of Interest
- Designed to build translational or applied research pathways

## International Visitor Funding

- For overseas researchers (including PIs) to collaborate on OzGrav projects in Australia.
- Minimum 2-week visit and ideally across at least 2 Nodes
- At least 1/3 co-investment required

## Vacation Scholarship Contribution

- Scholarships are available to third-year undergraduate students, honours and masters students
- For vacation scholarships up to 12 weeks per student for a suitable Project.
- OzGrav will provide  $\frac{2}{3}$  of the stipend support. Up to AUD 500 per week.

Other grants:

- **Carers Grant**
- **Hardship Grant**

APPLY NOW

## Testimonials from our members

*I received an OzGrav ECR Travel Grant in 2024, which supported a visit to collaborate with the group at the Max Planck Institute in Hannover while I was attending a conference in Italy. The application process was clear and straightforward, which made it easy to coordinate alongside existing travel plans. The funding allowed me to spend dedicated time with the Hannover team, and that visit has since developed into ongoing collaborations. It has had a meaningful impact on my research and career development by strengthening my international network and creating new opportunities for joint work.*

*I'm very grateful for OzGrav's support of ECRs through programs like this.*



**Valentina Di Marco**  
UoM/OzGrav



# LEARN, SHARE, CONNECT: OZGRAV MENTORING

## Mentoring Opportunities for OzGrav Members

We want to remind you about our mentoring program, which may be a valuable resource for OzGrav members at all career stages.

### Mentorloop

OzGrav participates in a joint mentoring initiative with other ARC Centres of Excellence through the platform Mentorloop.

This program connects members with mentors from across the Australian research landscape, providing opportunities for career guidance, professional development, and networking beyond your immediate research environment.

Members are encouraged to **join** the program either as a **mentor, a mentee, or both**.

Sign up:  **Mentorloop**



### Testimonials from our members

*I joined the mentoring programme both as a mentee and as a mentor, and I've really valued the experience on both sides. As a mentee, the conversations with my mentor were incredibly insightful. They went well beyond physics and were especially helpful when I was making bigger career decisions, such as where to start my next postdoc. Having someone experienced to talk things through with made a real difference during that phase. As a mentor, it has been equally rewarding to share my own experiences with a mentee.*

*It feels good to support someone at an earlier stage and hopefully help them avoid some of the uncertainties I faced myself. Seeing how openly ideas and experiences can be exchanged across career stages is one of the most positive aspects of the programme.*



**Jonas Junker,  
Alumni**

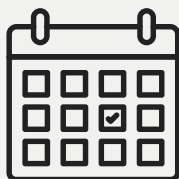


## News and announcements



- We are pleased to announce that the maximum budget levels on all our OzGrav Funding Schemes have increased! Please scroll to **page 10** to know more.
- Australian Gravitational-Wave Observatory (AGWO) Project Office advertising for a Project Director position. Click **here** to know more.
- Spencer Magnall (Monash) has been awarded his PhD! Congratulations Spencer!
- Congratulations to Evgeni Grishin and Bram Slagmolen for being awarded a DECRA and a LIEF grant from the ARC!

## Events



- **OzGrav KP3/KP4 workshop**, April 13-15, Melbourne
- **Orange pulsar meeting**, May 5-7, Sydney
- **Asia-Pacific Regional IAU Meeting (APRIM) 2026**, May 4- 8, Hong Kong
- **CSIRO ATNF Radio School**, Narrabri, June 1-5
- **IPTA Science Meeting**: June 22 - June 26 2026, Drakensburg, South Africa
- **LISA Science Symposium**: June 22 - June 26 2026, College Park, Maryland, USA
- **EAS 2026 LISA&PTAs Symposium (S4)**: July 2 - July 3, 2026, Lausanne, Switzerland
- **International Symposium on Cosmology & Particle Astrophysics 2026**, July 5 - 9, Christchurch, New Zealand.
- **ASA Annual Scientific Meeting**, July 6 - 10, Canberra

## Image Credits

### Front Cover and page 3

Artwork of a pair of merging black holes with differing masses. The gravity of the black holes bends and twists light around them. Credit: Carl Knox, OzGrav, Swinburne University of Technology.

### P.4

Dame Susan Jocelyn Bell Burnell, Art print. Credit: Carl Knox, OzGrav, Swinburne University of Technology.

### P.5

NASA's Goddard Space Flight Center Conceptual Image Lab.

### P.6

**In text:** An illustration of a gamma-ray burst erupting from a dense environment around a collapsing massive star (Image credit: NASA, ESA and M. Kornmesser)

**Background:** Distant shot revealing both particle jets interacting with circumstellar dust and gas. Credit: NASA's Goddard Space Flight Center Conceptual Image Lab

### P.8

Outreach events. Photo credits: Jackie Bondell, Carl Knox and Outreach Ambassadors program, OzGrav/SUT.

### P. 10

ECR Workshop and Retreat 2025. Photo credits: Carl Knox, OzGrav/SUT.

### P.11

Directorate visits. Photo credits: Li Ju, OzGrav/UWA, and Marie Partridge OzGrav/UoSyd

### P. 12

Image Credit: Department of Industry, Science and Resources



## About OzGrav



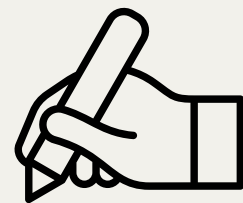
The ARC Centre of Excellence for Gravitational Wave Discovery (OzGrav) is funded by the Australian Government through the Australian Research Council Centres of Excellence funding scheme. OzGrav is a partnership between Swinburne University of Technology (host of OzGrav headquarters), the Australian National University, Monash University, University of Adelaide, University of Melbourne, University of Sydney, University of Queensland and University of Western Australia, along with other collaborating organisations in Australia and overseas.

The mission of the ARC Centre of Excellence for Gravitational Wave Discovery (OzGrav) is to capitalise on the historic first detections of gravitational waves to understand the extreme physics of black holes and warped spacetime, and to inspire the next generation of Australian scientists and engineers through this new window on the Universe. The Centre brings together the Australian pulsar and gravitational-wave communities in a focused national program. Through this centre Australian scientists and students have the opportunity to fully participate in gravitational wave astronomy on an international stage.

For more information, visit: <https://www.ozgrav.org/>

## Want to be featured in *Space Times*?

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