

**THE AUSTRALIAN
NATIONAL
FABRICATION
FACILITY**



> ANFF >> NEX>T >>>

CASEBOOK 2025



ENABLED BY
NCRIS
National Research
Infrastructure for Australia
An Australian Government Initiative

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> CONTENTS >

ANFF NEXT	03
ANFF snapshot	04
ANFF 2024-25	05
Research excellence	06
Innovation & translation	12
Commercialisation	16
ANFF, NCRIS and Research Infrastructure Connected	22
Industry	24
Global connections	28
ANFF equipment	30
Accessing ANFF	31

ANFF NEXT captures the momentum of forward-thinking innovation, representing the Australian National Fabrication Facility’s strategic vision for growth, evolution and excellence. Built on 18 years of stability and high performance, ANFF now looks ahead to what’s next for its clients, its network and the nation.

In 2025, ANFF is focused on expanding its capabilities to enable transformative research, development, translation and commercialisation, supporting its clients’ journeys from idea to impact. New equipment, processes and skills across ANFF’s national network ensure that services will remain cutting-edge and relevant, supporting advanced manufacturing and enabling breakthroughs across disciplines.

As ANFF moves forward, it remains focused on delivering excellence in core services while meeting emerging needs. The organisation’s strategic initiatives prioritise infrastructure excellence, commercialisation outcomes and deeper engagement with government and industry. As it prepares for the NCRIS 2025 Investment round and the 2026 National Research Infrastructure (NRI) Roadmap, which reflect the Australian Government policies that guide investment and planning in RI across Australia, ANFF will work closely with its communities to shape this future.

ANFF NEXT is not just about the organisation’s future but also about the futures ANFF helps create. ANFF is a critical enabler of innovation – supporting researchers, entrepreneurs and industry partners to move from concept to commercialisation, from discovery to development. What comes next for ANFF contributes to its clients’ next discoveries and innovations, and ultimately, to Australia’s ‘NEXT’.

Throughout the 2025 Casebook, ANFF showcases the success of its clients, celebrating their accomplishments and highlighting the impacts they are now making across Australian society – and the impacts they are poised to make next. Their stories demonstrate how ANFF’s expansive network of tools, facilities and expertise empowers breakthroughs in micro- and nanofabrication, accelerates commercial success and contributes to national capability.

ANFF NEXT stands as a beacon for the future, symbolising ANFF’s relentless pursuit of progress, the staff’s readiness to push boundaries and the organisation’s dedication to elevating Australia’s research and innovation ecosystem – from idea to impact.

>> > ANFF >> NEXT >>>



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Cover Photo: Glass 3D-printed brain coral
Credit: Andrew Beveridge / ANFF

RESEARCH THEMES



HEALTH & MEDTECH



ENVIRONMENT & CLIMATE



RECYCLING & CLEAN ENERGY



SPACE



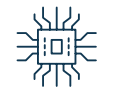
AGTECH



DEFENCE



QUANTUM



SENSORS



FRONTIER TECH & MODERN MANUFACTURING

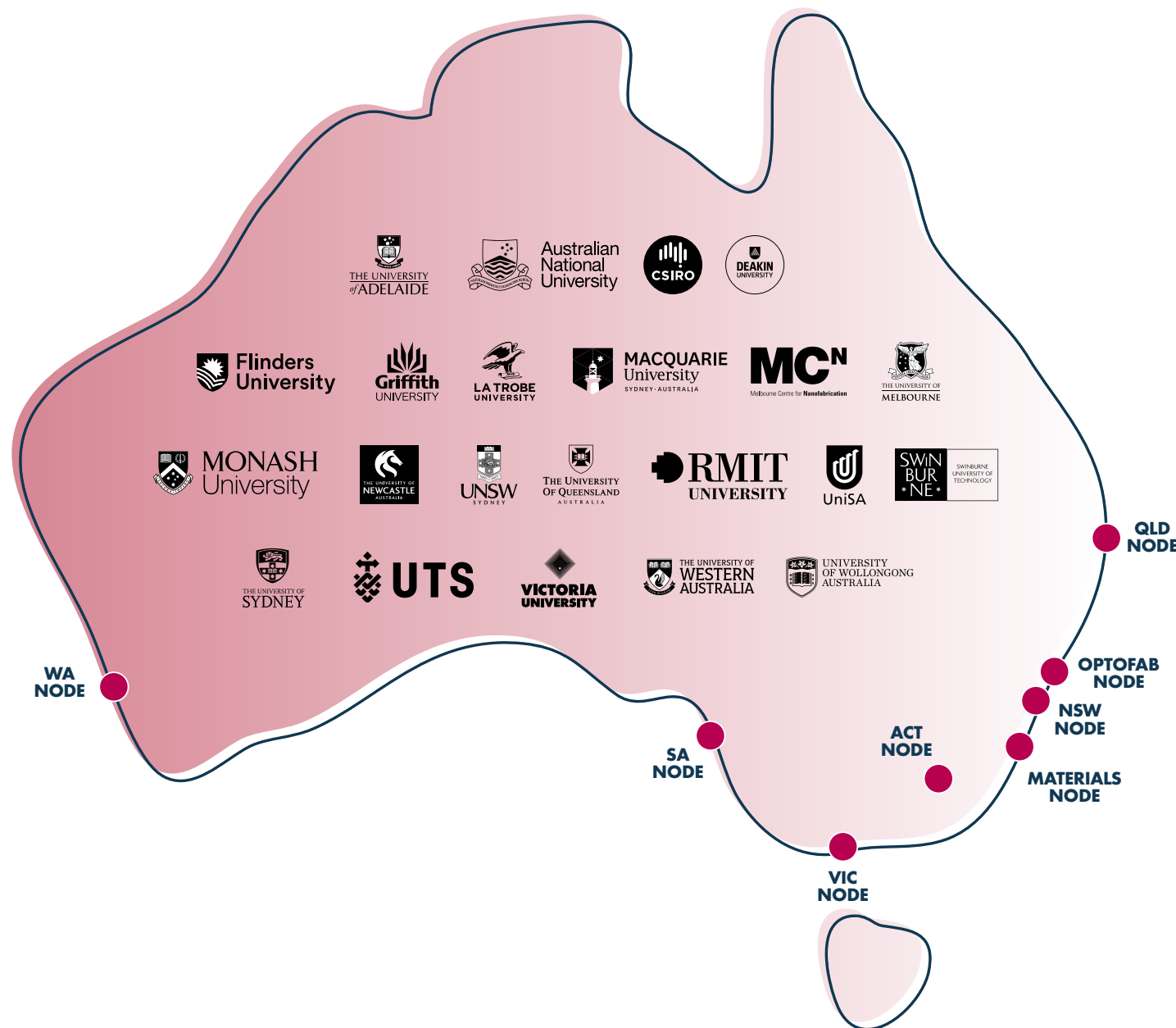


RESOURCE TECH & CRITICAL MINERALS PROCESSING

› ANFF SNAPSHOT

› ANFF offers affordable solutions to reduce barriers in undertaking R&D and commercialisation by providing open access to research infrastructure for micro- and nanofabrication. ANFF owns and provides access to capabilities that support innovative research, the development of new products and improvements to current production methods. Distributed across 22 institutional Hubs organised into 8 Nodes, more than 500 tools are available across our network, with each Hub offering complementary, specialised manufacturing facilities supported by our exceptional staff.

Following extensive consultation with clients and other providers over many years, ANFF identified and integrated into its facilities the critical infrastructure required to work at the forefront of science and accelerate the commercialisation of novel technology. These capabilities include tools for initial prototyping and provide complete, industry-relevant process trains within the national research infrastructure landscape. Together, these resources provide extensive value across the innovation ecosystem.



› ANFF 2024–25



› **ANFF NEXT** spotlights innovation, technology development and commercial impact. It looks ahead while drawing on ANFF's 18-year history of supporting world-class research and empowering tomorrow's solutions for today's knotty problems. Inside, numerous examples show the depth of research, development and commercialisation across our network. These stories highlight how our people, facilities and national initiatives foster a connected research community that accelerates discovery and delivers industry impact.

ANFF's Strategic Goals – ANFF is focused on securing sustainable funding, enhancing service delivery and demonstrating national impact. Key priorities include support from funding partners, alignment with the Australian Government's 'A Future Made in Australia' agenda and new ways to provide critical services for our community. Through various activities, we will boost industry use, expand international partnerships and sustain research excellence – with impact already surpassing Go8 benchmarks – while investing in open-access manufacturing projects to support the later stages of technology development.

ANFF-C: Enabling Commercial Potential – Our pre-seed fund, ANFF-C, continues to grow its impact in unlocking the commercial potential of technologies developed using ANFF infrastructure. ANFF-C has approved 19 projects in FY25. Several program alumni, including Entromat, Praxis and Haemograph, successfully raised capital in FY25, contributing to an all-time total of \$19M for all ANFF-C supported entities. You can read more about ANFF-C and its supported game-changing technologies in this Casebook.

High-Performance Communication Program – ANFF's High-Performance Communication initiative is strengthening engagement across teams and with stakeholders by addressing common communication barriers. Staff are using tailored tools for effective discussions, and leaders are receiving coaching to foster inclusive and strategic dialogue. These efforts support a respectful, collaborative and high-performing culture across our network.

ANFF Enlightened: Empowering Nanofabrication Knowledge – ANFF's learning management system, ANFF Enlightened, offers a collection of free nanofabrication courses, equipping learners with essential knowledge to maximise training and project efficiency.

ANFF NEXT 2025 showcases the creativity, determination and collaboration that drive ANFF forward. From breakthrough fabrication to transformative partnerships, these stories highlight our commitment to turning great ideas into real-world impacts.

Warmest regards from the ANFF Board and Team,

Andrew Brawley, ANFF Chair



› The past year has been incredibly full, but it has seemed to go by in the blink of an eye. I really enjoy the time that the preparation of the Casebook gives me to reflect on what has occurred in our community and how ANFF is achieving its goals. Throughout this Casebook, you will see examples of incredible discovery and innovation across many of Australia's critical sectors.

This year, we have continued our theme of **ANFF NEXT** to embed our new strategic plan with our stakeholders and work closely with various Commonwealth entities to build a comprehensive Research Infrastructure Roadmap to serve Australia for the coming 5 years. We are also working on new funding applications to expand our capability and bring extra services to our communities, including everything from floorspace to virtual training environments. Our strategic plan provides a clear vision of where we want to have impact and how we plan to achieve it.

ANFF has also seen lots of client success in the various translation and commercialisation programs now in place, such as Australia's Economic Accelerator. These projects and spinouts are well on their way to getting to their **NEXT** milestone, and we look forward to seeing how many more of our clients join them in the future. This is just one pathway to impact that coordinated and well-funded research infrastructure can smooth for our innovators.

With the number of spinouts and companies working with ANFF and using the ANFF-C program growing, we see a bright future for ANFF-enabled intellectual property to add value to Australia's **NEXT** productivity and advanced manufacturing boom.

Ultimately, ANFF's strength comes from its people. As always, we should recognise that the team at ANFF is the driving force behind all of our achievements. At our Annual Staff Forum late in 2024, I had the honour of recognising 54 of our staff who had been with us for either 10 or 15 years. The amount of talent that ANFF can bring to assist our clients is truly enormous.

So, what comes **NEXT**? ANFF will continue cementing our place as a critical platform where Australia's innovators transform their ideas into real-world impact, improving our productivity, our prosperity and our nation for all.

Jane Fitzpatrick, CEO

RESEARCH EXCELLENCE

ANFF's comprehensive network of resources, processes and equipment enables Australia's researchers to operate at the forefront of global R&D. Co-location with universities throughout the country provides convenient open access to ANFF's world-class micro- and nanofabrication capabilities, allowing research teams to develop cutting-edge knowledge and innovation.

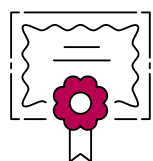
The network's impact extends beyond facilities through active collaboration with the research community, enabling the identification of emerging trends and the development of new capabilities in anticipation of future needs. ANFF's specialist staff deliver targeted training and expert technical support, building advanced fabrication skills among graduate students, early- and mid-career researchers and other innovators.

ANFF's capabilities underpin research excellence and produce measurable outcomes – highly skilled professionals, research published in high-impact journals and breakthrough discoveries across disciplines. Building on these foundations, ANFF is positioned to help transform the next generation of research ideas into tangible outcomes for Australia.

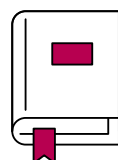


ANFF-supported publications have received

147,498
citations
(2018–2024)



4,685
instances of
process training



62%
of publications are in
the top 10% tier of
journals (2024).

DWL EXPERT WORKING GROUP

ANFF's Direct Write Lithography (DWL) Expert Working Group fosters knowledge exchange in micro- and nanofabrication through workshops and webinars, including the 3rd DWL Workshop at RMIT. With international speakers and collaborations with U.S. peer groups, the DWL EWG offers researchers and engineers deep insights into cutting-edge lithography tools, resists and fabrication.

INTERNATIONAL CONFERENCE ON NANOSCIENCE AND NANOTECHNOLOGY

Planning is underway for the 2026 International Conference of Nanoscience and Nanotechnology (ICONN) in Sydney. Since 2006, the conference has brought together top scientists, students, engineers, industry experts and entrepreneurs to share breakthroughs in nanoscience and nanotechnology, encouraging global collaboration and innovation in this rapidly evolving field.



CIRCUITS THAT REMEMBER



Australian National University researchers are advancing neuromorphic computing by creating solid-state electronics that mimic the way the brain works. Charged Trap Transistors (CTT) combine memory and switching capabilities within a single nanoscale component, retaining information even without power – a vital feature for memory. The team's CTT technology holds electrons in isolated insulator regions that influence the transistor's conductivity. Supported by ANFF-ACT, these transistors will enable faster, more energy-efficient computing systems that mimic brain-like information handling, pushing the boundaries of how future systems will store and process information.

👤 **Sanjoy Nandi:** sanjoy.nandi@anu.edu.au



ATOMIC POCKET WATCH

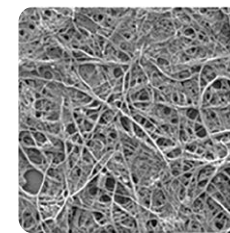


Adelaide University's Portable Atomic Clocks team, in partnership with the Defence Science and Technology Group, is developing compact optical atomic clocks for field deployment. By locking a stable laser to the precise frequency of an atomic transition, the device uses the energy difference between two atomic levels as a reference for extraordinarily accurate timekeeping – up to 200 times more precise than current standards. Custom components for the clocks were fabricated at ANFF-OptoFab Adelaide, including work with challenging materials like quartz and glass-ceramics, delivering cutting-edge performance where precision matters most.

👤 **Ashby Hilton:** ashby.hilton@adelaide.edu.au



WASTE TO WONDER

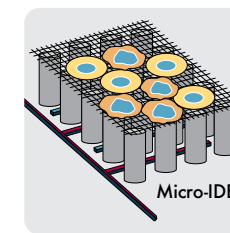


What if fibres from old clothes or agricultural waste could become the raw material for advanced products? Deakin University's Rangam Rajkhowa is making that possible by producing micro- and nanofibrils from waste natural fibres and textiles. Using only water and mechanical force, his fibre-splitting technology transforms cotton, hemp and silk fibres into tiny fibrils for advanced applications. With support from ANFF, which enabled high-pressure processing, the team is refining the fibrillation methods and scaling up production. This sustainable input material is opening new possibilities in filtration, biomedical products and more.

👤 **Rangam Rajkhowa:** rangam.rajkhowa@deakin.edu.au



KEEPING YOUR SENSORS CLEAN



A major challenge in biosensing is reliable detection in complex biological environments, such as real-time monitoring of live cells. University of South Australia's Bin Guan addresses this by using 3D printing to build precise micro- and nanostructures on electrochemical sensors. With fabrication support from ANFF-SA, her team created an array of micropillars and nanomesh that supports cell growth while shielding electrodes from direct contact. This design preserves accuracy by preventing fouling by the cells, offering a powerful strategy for improving real-time sensing in diagnostics, drug testing and biomedical research.

👤 **Bin Guan:** bin.guan@unisa.edu.au



SELF-HEALING SEWERS

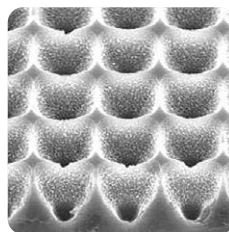


In sewer systems, microbial activity generates elevated levels of CO₂, which accelerates the corrosion of concrete sewer pipes. Researchers at the University of South Australia are enhancing concrete durability by improving its self-healing capability. The team engineered capsules from water treatment sludge combined with calcium hydroxide and expansive agents and incorporated them into cement mixtures. ANFF-SA assisted with characterisation analyses. The capsules triggered crack closure through carbonation and chemical reactions, closing cracks over 90% within 28 days and significantly improving water tightness, demonstrating strengthened performance for sewer environments.

👤 **Hossein Sanaei Ataabadi:** sanhy012@mymail.unisa.edu.au



NANOPYRAMIDS WORSHIP THE SUN

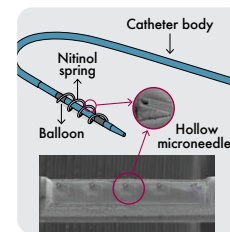


As silicon solar cells get thinner to save materials and boost voltage, smarter ways are needed to capture more sunlight. One promising method uses photonic crystal structures – tiny patterns that bend and trap light using wave effects. A Swinburne University team led by Saulius Juodkazis is using laser techniques to create inverted pyramid patterns on high-performance solar cells, showing that these methods work with advanced designs. Supported by a Melbourne Centre for Nanofabrication Nanotech Ambassador project, this research is helping shape the future of solar technology.

👤 **Saulius Juodkazis:** sjuodkazis@swin.edu.au



SPRING-LOADED PLAQUE BUSTER

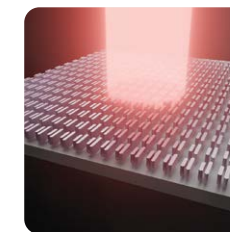


Cardiovascular disease remains Australia's leading cause of death, often triggered by ruptured atherosclerotic plaques. However, no current device can effectively deliver drugs locally to treat them. To address this challenge, RMIT and WSU researchers are developing a nitinol microneedle spring/balloon catheter capable of delivering targeted therapy directly into vulnerable plaques. ANFF-OptoFab Macquarie and ANFF-VIC Swinburne supported the design of 100 µm hollow microneedles on a nitinol straight tube. The next step is adapting this design to a spring, enabling drug delivery around the entire inner surface of the diseased vessel.

👤 **Gary Rosengarten:** gary.rosengarten@rmit.edu.au



BOTTOM-UP BRIGHTNESS

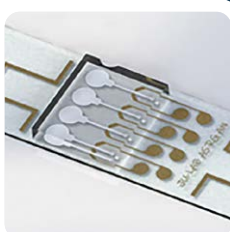


Conventional methods to make nanoscale lasers rely on etching, which damages surfaces, reduces efficiency and limits reliability. With support from ANFF-ACT, the Australian National University's Wei Wen Wong is growing arrays of atomically smooth indium phosphide nanosheets. These nanosheets self-assemble into precise shapes and sizes with nanoscale accuracy and act both as light-emitting material and as optical cavities that shape the light into a laser. This bottom-up approach avoids fabrication damage. By harnessing nanoscale crystal design, the method offers a scalable path to high-performance light sources for future photonic chips.

👤 **Wei Wen Wong:** weiwen.wong@anu.edu.au



ON-THE-SPOT CLOT CHECK



When injury or inflammation occurs, platelets activate and bind with fibrin to form a mesh-like clot that stops bleeding. As platelets interact and pull on fibrin strands, the clot contracts. Impaired contraction can block vessels and increase the risk of thromboembolism, especially in patients on mechanical circulatory support. A novel point-of-care microfluidic sensor to rapidly assess clot contraction is being developed by University of Sydney researchers, with fabrication support from ANFF-NSW. The sensor delivers fast and reliable data to help clinicians catch dangerous embolisms early and tailor medications for successful treatment.

👤 **Allan Sun:** Asun3672@uni.sydney.edu.au



SCANNING WITH CONFIDENCE

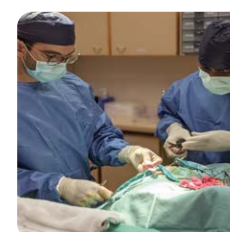


Can image features extracted from medical PET scans be trusted even when scan settings vary? Joel Poder at St George Hospital used ANFF-Materials' 3D-printed phantoms – transparent structures filled with a radioactive tracer that simulate the shapes and textures of real tumours – to perform PET scans under varied acquisition and processing conditions. The realistic tumour-like structures in the phantoms were reliably scanned even when instrument settings changed. Custom-designed phantoms can test conditions across multiple hospitals before running large studies, ensuring that the advanced data pulled from PET scans is trustworthy.

👤 **Joel Poder:** Joel.Poder@health.nsw.gov.au



SMART HEALING FOR HER

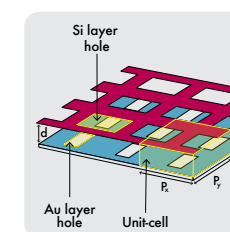


Pelvic organ prolapse (POP) affects half of women over 50, often linked to childbirth injuries. Unfortunately, surgical mesh treatments were non-degradable and caused serious complications, prompting their ban. With no ideal alternatives available, Shayanti Mukherjee of the Hudson Institute, working with ANFF-VIC Swinburne's Biointerface Engineering Hub, is developing degradable scaffolds made from 3D-printed and electrospun materials to support the healing of pelvic tissues. Plasma polymerisation coats these scaffolds with thin films that improve immune compatibility. This innovation could transform POP care, restoring quality of life for millions of women.

👤 **Shayanti Mukherjee:** Shayanti.Mukherjee@hudson.org.au



TUNING LIGHT WITH A GAP



Scientists at the University of Western Australia have developed a new infrared filter that could make thermal imaging devices smaller, cheaper and more energy efficient. The compact design uses two ultra-thin layers, gold and silicon, separated by a tiny adjustable air gap. By changing this gap, the filter tunes which infrared wavelengths pass through. This innovation opens the door to smaller, smarter infrared sensors for environmental monitoring, remote sensing and medical diagnostics. Supported by ANFF-WA, the work marks a major step toward chip-integrated infrared optics.

👤 **Oleg Bannik:** oleg.bannik@research.uwa.edu.au

ENGINEERED FOR EXPRESSION

Artists working with ANFF transform science history, lenses, light and glass into evocative works, where scientific materials and methods are reimagined as instruments of vision and wonder.

THE JOURNEY OF LIGHT: WHERE ART MEETS PHOTONICS

The *Journey of Light* exhibition transformed Adelaide's Museum of Economic Botany into a space where glass became both medium and message. Presented by ANFF-OptoFab Adelaide and the Institute for Photonics and Advanced Sensing (IPAS), this exhibition showcased how glass and light are at the heart of transformative technologies, including quantum sensors, advanced medical diagnostics and ultra-fast internet connectivity.

Karen Cunningham's *A ZBLAN ODYSSEY* glass sculpture was the exhibit's centrepiece. The stunning artwork highlights ZBLAN glass – a next-gen candidate for ultra-high-speed internet cables – which needs the zero gravity of space to reach its full potential when drawn into fibre.

When erbium is added to glass, the doped glass amplifies light and shifts from pink to fluorescent green under UV. Cunningham encased the glowing ZBLAN rod in a hand-blown and sculpted glass form. Drawing inspiration from 2024's intense solar activity, her work conveys the sun's light and energy translated into the purple and vivid green of the Aurora Borealis and speaks to her fascination with the interplay between light and glass.

Cunningham's collaboration with IPAS brings photonics into the realm of visual storytelling, revealing how scientific materials can inspire new ways of seeing.



Credit: Karen Cunningham

PLATEAU'S DREAM: INTERCONNECTIONS BETWEEN ART, ENGINEERING AND FABRICATION

University of South Australia's Deirdre Feeney is a cross-disciplinary artist and researcher who explores the materiality of image-making and creates optical image system artworks based on optical histories and contemporary making methods. *Plateau's Dream* contains a series of three artworks featuring bespoke lenses and translucent LCD screens. Each system projects a video-animation based on colour perception experiments by the 19th-century physicist Joseph Plateau. For this project, Deirdre created speculative re-enactments of Plateau's experiments using his hand-painted colour discs.

Plateau's colour experiments explored the concept of persistence of vision, where different wavelengths of light remain on the retina for different durations. For decades, this phenomenon was attributed to how we see moving images, but it is now superseded by contemporary understanding of critical flicker frequency and temporal integration in the brain. Plateau's experiments, however, remain an important part of moving image and visual perception histories.

The bespoke components of *Plateau's Dream* were designed by Deirdre in collaboration with a mechatronics engineer and optical physicist and were fabricated by ANFF-SA. This collaboration merges artistic inquiry with scientific precision, resulting in artworks that reimagine historical experiments in vision through contemporary fabrication.



Credit: Deirdre Feeney



CHIPS FOR HEALTHIER PREGNANCIES



Preeclampsia is a severe pregnancy complication linked to placental dysfunction that affects up to 8% of pregnancies. Placental villi, essential for maternal-foetal exchange, are increasingly implicated but challenging to study over gestational timeframes with traditional culture methods. To overcome this hurdle, RMIT researchers led by Crispin Szydzik, with support from ANFF-VIC, have developed a microfluidic platform that sustains placental tissue long-term under controlled conditions. By simulating normal and pathological pregnancy environments, the system offers a physiologically relevant model to investigate the development of preeclampsia and evaluate potential therapeutic strategies.

Crispin Szydzik: crispin.szydzik@rmit.edu.au



HIDDEN IN EVERY DROP

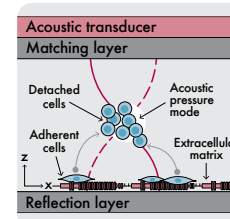


Plastic pollution in oceans is a growing concern, with microplastics posing serious environmental risks. Understanding their sources and prevalence is vital to protect ecosystems and food chains. Flinders University's Sophie Leterme, in collaboration with SARDI and EPA SA, studied microplastic accumulation in the Gulf of St Vincent. Using a confocal Raman microscope at ANFF-SA Flinders, her team quantified particles and identified polymer types. Findings of polypropylene, polyethylene, nylon, polyurethane and various copolymers confirm microplastic contamination in the Gulf and contribute to a growing polymer spectroscopy database for future research.

Anastasiia Snigirova: anastasiia.snigirova@flinders.edu.au



SEEING WITH SOUND

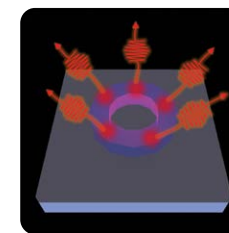


As part of an ANFF-NSW RPF Kickstarter Project, University of Sydney researchers have developed Mini-Acoustic Force Spectroscopy (Mini-AFS), a compact system that uses acoustic waves to measure cellular interactions and responses to mechanical force. Built on a thin glass chip and requiring only microlitre-scale sample volumes, the device enables real-time, high-resolution imaging of cell behaviour under applied acoustic force. Featuring tuneable force delivery and cell-based calibration, Mini-AFS provides a simple and low-volume alternative to traditional force measurement tools and is designed to study interactions between cancer and immune system cells.

Mingxin Xu: mingxin.xu@sydney.edu.au



QUANTUM ROUNDABOUT

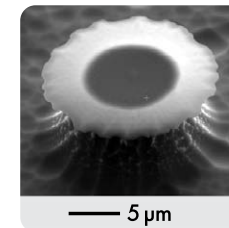


Quantum devices need light sources that emit single photons, but making them efficient and chip-compatible is challenging. An Australian National University team led by Xiaoying Huang and supported by ANFF-ACT grew InAsP quantum dots (QDs) directly inside InP micro-ring resonators that trap and enhance light emitted by the QDs. By adjusting ring size and QD number, they coupled the emitted light to the cavity, producing fast and high-purity single-photon emission. This scalable bottom-up approach offers a powerful route to integrate quantum light sources directly onto photonic integrated circuit chips.

Xiaoying Huang: xiaoying.huang@anu.edu.au



STAYING DRY BY DESIGN



Griffith University's Navid Kashaninejad is unlocking new ways to control how liquids move across microscopic surfaces, an advance with wide-reaching potential, from self-cleaning materials to medical devices. His SUMMIT Lab team explored how the shape and spacing of silicon carbide and silicon dioxide surface microstructures, fabricated at ANFF-QLD Griffith, could repel water and other liquids. These tiny 'cap-like' forms and their spacing had more impact on liquid behaviour than material type. The findings offer a fresh design strategy for creating surfaces that resist wetting, blending material science with microengineering innovation.

Navid Kashaninejad: n.kashaninejad@griffith.edu.au



GEOLOGY MEETS PHOTONICS



Adelaide University's Institute for Photonics and Advanced Sensing and its Earth Sciences Department are collaborating with Adelaide Microscopy to develop a doped glass reference material for in-situ mineral dating. Fabricated at ANFF-OptoFab Adelaide, the glass contains precise concentrations of 4 elements: K, Rb, Ca and Sr. This glass enables a new technique for simultaneous Rb-Sr and K-Ca isotope analysis by combining laser sampling with mass spectrometry. Measuring these two isotope systems together can determine igneous rock cooling ages and improve the understanding of changes that occur during early rock formation.

Mingze Yang: mingze.yang@adelaide.edu.au

INNOVATION & TRANSLATION

Ideas often start small. With the right support, they can become transformative. ANFF offers the specialised tools and guidance that allow innovators to take their first steps toward prototyping and process development.

ANFF facilities provide critical infrastructure for transforming concepts into tangible prototypes, including ANFF-OPTOFAB's Multi-axis Laser Microfabrication Facility, ANFF-NSW's Advanced Fibre Bragg Grating capabilities, ANFF-SA's Precision Engineering Centre and ANFF-QLD's expanded cleanroom facility at UQ. World-class experts available at each site provide innovators with technical guidance alongside access to state-of-the-art equipment. Whether developing a proof-of-concept device or refining a manufacturing process, clients benefit from an integrated environment that supports both initial prototyping and complete, industry-relevant process trains, adding immense value to early innovations.

ANFF fosters innovation and translation by training researchers in the micro- and nanofabrication skills necessary to make materials, devices and systems. By enabling researchers to develop new ideas that have long-term impact, ANFF can help turn these devices and prototypes into societal benefits.

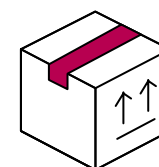


AEA IGNITE GRANTS

The Australia's Economic Accelerator Ignite grant program fast-tracks research from lab to impact by helping university researchers prove their ideas can work in practical, industry-like settings. ANFF-supported researchers excelled, with 20% of recipients using ANFF facilities, highlighting the value of ANFF's infrastructure and expertise in accelerating research translation.

CRITICAL TECHNOLOGIES CHALLENGE PROGRAM

CTCP is a federal funding program under the National Quantum Strategy that supports market-led quantum solutions to national challenges (e.g. energy networks, medical imaging, logistics, biosecurity). ANFF supports several CTCP projects by providing specialised fabrication infrastructure, technical expertise and collaborative pathways that are essential for developing quantum technologies.



13,078
supplies
manufactured



135
experts

INDUSTRY-LED INNOVATION

In 2025, Cooperative Research Centres Projects (CRC-P) Grants supported ANFF alumni with projects totalling \$49.5M, including matching funds from project partners. These industry–academic collaborations focus on applied R&D to help technologies reach the market faster, including product development, process improvements and prototype testing. CRC-P Grants strengthen Australia’s competitiveness and sustainability. Meet 5 awardees driving innovation and shaping Australia’s future.



PREVENTING AIR BUBBLES TO SOLVE PERVASIVE HEALTH AND INDUSTRIAL CHALLENGES

From drug delivery failures causing air embolisms to energy-intensive nitrogen purging in wine bottling, air contamination and bubbles compromise safety, reduce efficiency and increase costs across industries. Haemograph’s Autovalve prevents air bubbles by allowing air to flow freely until the valve contacts fluid, then sealing automatically to block air flow in both directions. This valve innovation enables transformative products, including an air-free evacuation syringe and a precision rheometer. Haemograph’s technology will eliminate manual purging and improve control over fluid movement in medical and industrial settings.

www.haemograph.com.au



A WEARABLE AI-ENABLED DEVICE FOR BETTER ACCESS TO PREGNANCY MONITORING

Annually, more than 2,000 families in Australia experience the heartbreak of stillbirth. Current pregnancy monitoring technology is restrictive, intermittent and outdated. Kali Healthcare is developing a novel wearable device integrated with an internet-based portal for clinicians to monitor foetal heart rate in hospitals, clinics and homes. The wearable device can be self-applied at home and transmits data to clinicians in real time. This technology will help enable early detection of pregnancy complications, supporting better outcomes for mothers and babies across Australia.

www.kalihealthcare.com

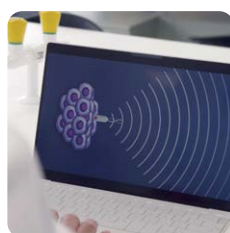


Credit: AIBN

BUILDING A SCALABLE INDIGENOUS-LED BIOMATERIALS SUPPLY CHAIN

Led by Indigenous company Bulugudu Ltd, Trioda Wilingi is developing medical gels from spinifex cellulose nanofibres (SCNFs) harvested in north-west Queensland. Stronger, thinner and more flexible than other plant-derived fibres, SCNFs form gels that retain water well, flow easily through fine needles and re-form after injection – offering a potentially longer-lasting, easier-to-inject and safer medical gel for the \$10B hyaluronic acid market. This CRC-P project will establish quality-controlled manufacturing of SCNFs, facilitate research translation and support Indigenous jobs, with the community the primary beneficiary of commercialisation outcomes.

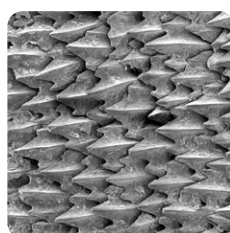
[Tim Case: tim.case@triodawilingi.com](mailto:tim.case@triodawilingi.com)



NANOROBOTICS FOR PANCREATIC DUCTAL ADENOCARCINOMA DIAGNOSIS

Pancreatic cancer is often diagnosed too late for effective treatment, leading to poor survival rates and reduced quality of life. NanoCube Health is collaborating with leading research institutions and manufacturers to develop its award-winning technology for early cancer detection. NanoCube’s technology detects cancer at the cellular level and analyses treatment response in real time, using a biopsy-free, minimally invasive design. Powered by AI platforms and boron nitride nanotubes, NanoCube Health aims to shift pancreatic cancer diagnosis earlier – giving patients better options, better outcomes and a better chance at survival.

www.nanocube.health



SHARK SCALES: SCALE MANUFACTURE OF SHARK SKIN FOR CLEAN AVIATION

The Australian commercial aviation sector burns \$7.5B in fuel and produces 22 megatonnes of carbon every year. MicroTau’s ‘shark skin’ drag-reduction product reduces fuel burn and emissions of commercial and defence aircraft. The riblet film mimics the microscopic ridges of shark skin to smooth turbulent flow across its surface. Utilising the project consortium’s expertise in roll-to-roll lithography, MicroTau will solve key product design and manufacturing challenges. These advances will cut aviation emissions and create new jobs through expanded local manufacturing.

www.microtau.com.au



CRAFTED FROM CASTOFFS



At Habitat for Humanity’s ReStore in Austin, Texas (US), discarded plastics are finding a second life thanks to the ReCreateIt Gigalab. This mobile net-zero workshop transforms shredded local plastic waste into useful household goods with the help of a large-format Fused Granular Fabrication 3D printer. Drawing on ANFF-Materials’ expertise in digital design and polymer development, the international project shows how advanced fabrication can meet community needs. By bringing manufacturing power directly into communities, ReCreateIt is proving how plastic waste can be reshaped into lasting social and environmental value.

[Aziz Ahmed: aziza@uow.edu.au](mailto:aziza@uow.edu.au)



SEEING HIDDEN DANGER



ANFF-NSW and PhaseSlides have developed an innovative nanotech test slide to help standardise airborne asbestos analysis. Traditional HSE/NPL slides offer limited visual guidance and durability, making consistent use difficult. The new stainless-steel/quartz Pickford Phase Contrast Test Slide is rugged and user-friendly. Each slide contains a fused quartz chip with 4 sets of etched nanoscale grooves – down to 5 nm, the limit of fabrication technology – plus circular and radial guidelines that help microscopists locate visual targets with ease. The slide promises greater reliability and usability in asbestos analysis worldwide.

www.phaseslides.com.au



WASHING FOR THE PLANET

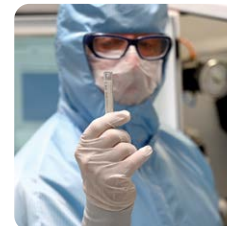


Every clothes wash sends microplastic fibres into rivers and oceans, threatening marine life and water quality. The Goodside Project, an Australian social enterprise, is tackling this with The Good Catch – a simple, easy-to-install filter for washing machines that captures up to 90% of microplastics before they enter the environment. ANFF-SA’s Jason Gascooke and Flinders University’s Anastasiia Snigirova worked closely with the team, testing and validating the filters to ensure they effectively reduce microplastic pollution. Made from recycled and recyclable materials, The Good Catch turns everyday laundry into a positive environmental action.

[Karen Jones Hauser: karen@thegoodside.com.au](mailto:karen@thegoodside.com.au)



VENOM POWERED CLOTTING

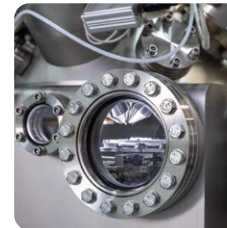


Q-Sera’s RAPClot serum tubes produce high-quality serum in under 5 minutes, even from blood containing anticoagulants like heparin. This breakthrough improves diagnostic speed and reliability, especially for patients on blood thinners. RAPClot uses pro-coagulant surface coatings inspired by snake venom to overcome clotting challenges. Q-Sera worked with ANFF-VIC’s Biomedical Materials Translational Facility at CSIRO to refine the coating processes for the inner tube surface. With manufacturing now underway in Japan through an exclusive partnership with Terumo Corporation, RAPClot is poised to reshape global blood testing standards.

[Michael Grant: michael.grant@q-sera.com](mailto:michael.grant@q-sera.com)



PATTERNS THAT SAVE LIVES



An ANFF-VIC La Trobe collaboration with the Olivia Newton-John Cancer Research Institute (ONJCRI), funded by the Office of National Intelligence (ONI), is combining cutting-edge mass spectrometry (ToF-SIMS) imaging and machine learning to tackle breast cancer. Mass spectrometry imaging provides molecular maps of tumours at incredible detail, generating massive and complex data sets. Machine learning helps make sense of this information, spotting hidden patterns that would be impossible to see by eye. This approach will identify cancer biomarkers and distinguish similar tumour types, supporting smarter and more personalised treatment decisions.

[Wil Gardner: w.gardner@latrobe.edu.au](mailto:w.gardner@latrobe.edu.au)



MICROFLUIDIC PARTICLE MAKER



SA Nano creates compact, user-friendly microfluidic devices to produce nanoparticles, which are essential in modern drug delivery. Developed at ANFF-SA using advanced 3D printing, its handheld system precisely mixes liquids in tiny channels to produce nanoparticles with consistent size and structure, ensuring stability and delivery efficiency. Compared to complex commercial systems, this microfluidic approach is simpler and more affordable, supporting early-stage research and rapid testing of drug combinations. Prototype results match commercial systems in particle quality and performance at a fraction of the cost, making high-quality nanoparticle production more accessible.

[Vincent Linden: contact@sanano.com.au](mailto:contact@sanano.com.au)

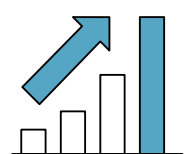
COMMERCIALISATION

ANFF supports the journey from validated prototypes to market-ready products by providing the tools, expertise and networks that small market entities need to succeed. Commercialisation goes beyond technical validation – it is about building the evidence, securing investment and reaching first customers.

ANFF facilities offer industry-relevant manufacturing environments and pilot-scale process trains, bridging the gap between research and scalable production. ANFF's understanding of quality frameworks and regulatory requirements, and how they relate to the sectors with which ANFF engages, enables clients to generate data for clinical trials and early sales.

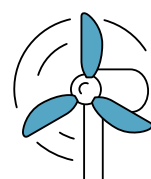
The ANFF-C platform delivers pre-seed support for market analysis, IP strategy and investor readiness, helping ventures de-risk and attract capital. In addition, partnerships with initiatives like the Defence Trailblazer, S3B and Medical Device Partnering Program open pathways to procurement pipelines and scale manufacturing.

By combining technical capability with commercial insight, ANFF helps innovators secure investment, develop a manufacturing plan, meet compliance requirements and launch successful products.



19x

ANFF-C
investment
multiplier



47

Technologies
supported
by ANFF-C

CREDIBLE TO CAPITAL

Solentropy enhances ANFF-C's support for MedTech startups by addressing critical commercialisation challenges. Specialising in regulatory strategy, quality systems, clinical validation, reimbursement, commercial strategy and PMF, and investor readiness, Solentropy equips ventures with the evidence and credibility to secure partners and capital. This expertise accelerates the journey from ANFF-enabled prototypes to globally competitive, market-ready products.

QUANTUM STRATEGY, COMMERCIAL OUTCOMES

Through Queensland's Quantum and Advanced Technologies Commercialisation Infrastructure Program, the ANFF-QLD hubs at Griffith University and the University of Queensland are expanding world-class capabilities in semiconductors, cryogenics, quantum sensing and photonics. These facilities will drive Queensland's quantum strategy, foster academia-industry collaboration and establish new commercial pathways in advanced manufacturing and emerging technologies.

IDEAS TO IMPACTS

ANFF-C helps turn breakthrough ideas into commercial success, backing early-stage ventures with funding and hands-on support.

ANFF's technology platforms have enabled many Australian research breakthroughs, but too often these discoveries remain in the lab. Moving ideas beyond proof-of-concept requires more than technical expertise. It demands funding, market insight and regulatory planning that most research teams cannot access alone.

ANFF-C was created to close this gap. The fund provides pre-seed capital and practical guidance that reduces risk and helps innovators take the early steps toward commercialisation. This funding helps teams answer fundamental business questions around their innovation, improving the likelihood of follow-on investment. The program offers researchers a pathway to show the value of their breakthrough as a potential business and build confidence among potential partners.

ANFF-supported research teams use Gate 1 funding, up to \$35,000, to test early feasibility. They often use this stage to confirm a market, talk with potential users and explore options for scaling up. Gate 2 provides up to \$125,000 for projects moving closer to market. Teams at this stage use the funds for regulatory planning, manufacturing strategies or performance studies that compare their technology to existing solutions. The two stages can also be combined. In addition, the fund can co-invest with universities or industry partners to extend impact and accelerate progress.



ANFF-C's role goes beyond money. The fund draws on networks and sector knowledge to connect research teams with expertise, infrastructure and opportunities. These connections help new companies prepare credible strategies, demonstrate progress and attract professional investors or secure support from other programs.

The fund builds its pipeline by engaging with projects well before capital is needed. Early discussions prepare teams for investment and create opportunities that are ready to advance. By uniting funding, expertise and networks, ANFF-C ensures more Australian discoveries become products, companies and solutions with lasting impact.

ANFF-C ALUMNI COMPANIES



STEADY AS SHE GOES



Deneb Space is making satellites smarter from the moment they reach orbit. Its autonomous system combines flight-proven magnetic torquers (Deneb eMag), sensors and control algorithms to detect unstable motion and stabilise spacecraft instantly. Rapid response means antennas and solar panels deploy faster and allow missions to start without delay. ANFF-NSW's advanced PCB printing played a key role in early hardware prototyping, and its magnetic materials expertise helped refine the eMag hardware supply chain. The tech has already proven itself in space on two Australian CubeSat missions: CUAVA-2 and Waratah Seed-1.

Anne Bettens: info@deneb.space.com.au



MIMICRY FOR FERTILITY



DNA-damaged sperm can cause poor or abnormal fertilisation, failed implantation and miscarriage. In IVF, sperm are typically selected based on motility. However, some damaged sperm have normal appearance and motility, escaping detection. University of Adelaide spinout Affinix has developed a microfluidic device that combines motility and immunological sorting, using specialised surface chemistry to mimic the female immune system. With support from the Medical Device Partnering Program and ANFF-SA facilities for soft polymer component development, Affinix's unique sperm capture method offers a new way to improve IVF outcomes.

Stephen Blakeney: stephen@affinix.com



FROM WASTE TO SUPER POWDER



Swinburne University spinout EntroMat is transforming the metal powder industry through its High Entropy Material (HEM) powders. These advanced powders are made by combining multiple principal elements in equal atomic ratios using recycled industrial feedstocks – creating super-strong, heat- and wear-resistant materials that outperform current products in extreme conditions. HEM powders can be turned into metal parts using modern manufacturing methods like 3D printing, surface coating and powder-based processes. Targeting industries such as mining, aerospace, energy and healthcare, EntroMat is helping Australia produce advanced materials sustainably while boosting sovereign capability.

Greg Lindsay: www.entromat.com



SMARTER CARE FOR SUPPORT ANIMALS



iQ Sense is transforming care for companion animals with a biosensor chip that monitors health continuously. The implant uses a photonic sensing circuit to detect biomarker changes in real time, while a wearable tracks movement and behaviour. The system helps vets and owners spot health changes early, safeguarding animals whose well-being is vital to human health. ANFF-NSW facilitated chip encapsulation, identifying a bioresin compatible with the Nanoscribe 3D-printing system and advising on micropore fabrication. Validated prototypes demonstrate the promise of this monitoring device to improve health outcomes for support animals.

Madhu Jambunathan: www.iqsense.tech



GLASS FOR QUANTUM FUTURES

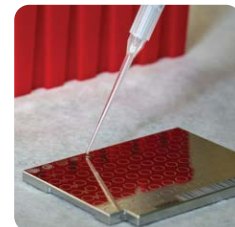


Modular Photonics' Aldente Glass is a cutting-edge material purpose-engineered for ultra-low loss photonics and ultra-fast laser inscription. ANFF-OptoFab Macquarie facilities have been used to fabricate and characterise waveguides written inside the glass. This new glass has already gained attention from European groups developing quantum photonic devices, with the signing of a license agreement with SCHOTT (Germany), a company known for its innovation in specialty glasses for packaging, electronics, optics and communications technology. The exceptionally low optical loss of Aldente Glass unlocks new potential across quantum communications and next-gen telecommunications.

Michael Withford: www.modularphotonics.com



CHEMICAL CLARITY FAST

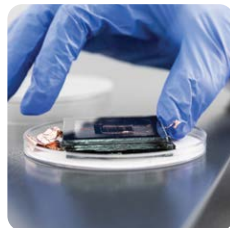


NanoFynd is transforming chemical detection with its lab-on-a-chip technology. Patented nanostructured silicon chips form the platform's core. These chips were developed with support from ANFF-VIC's Melbourne Centre for Nanofabrication, and early prototypes were created at ANFF-SA. The system detects trace levels of small molecules in biological and environmental samples within minutes, including sample preparation. Paired with MALDI-TOF mass spectrometry, the platform delivers rapid point-of-collection confirmatory testing. This non-invasive, high-throughput approach helps professionals quickly and reliably analyse samples across a range of real-world settings.

Aditi Dhawan: info@nanofynd.com

➤ AEA INNOVATE GRANT AWARDEES

Australia's Economic Accelerator (AEA) Innovate grants back university–industry teams working to commercialise research. Funding supports prototype development, pilot testing and scaling activities that help researchers prove their innovations work in the real world and are ready for investment, adoption and market impact.



SOLAR ENERGY FOR SPACE

Led by Anita Ho-Baillie, University of Sydney researchers are developing space-grade perovskite solar cells with high power-to-weight ratios and space radiation resistance. Significant progress has already been made, with the successful integration of solar cells onto satellites launched into space in 2024.

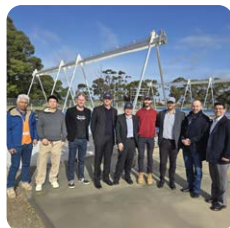
👤 **Anita Ho-Baillie:** anita.ho-baillie@sydney.edu.au



QUANTUM SENSORS FOR AUSTRALIA'S FUTURE

Partnering with QuantX Labs, University of Adelaide's Andre Luiten is advancing Australia's quantum sensor technology. The aim is to make sensors smaller, more affordable and more robust, ensuring they are ready for sovereign manufacturing and deployment in critical sectors such as defence, resources and navigation.

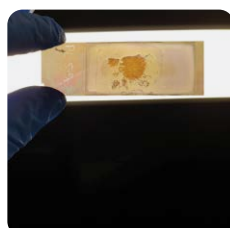
🌐 www.quantxlabs.com



SUN-POWERED GREEN HYDROGEN

Sparc Hydrogen is developing a solar hydrogen reactor, producing green hydrogen using only sunlight, water and a photocatalyst. Photocatalytic water splitting does not require electricity or produce carbon emissions. Its SPARC-H₂ AEA award will accelerate the development of this breakthrough technology as an alternative to producing green hydrogen via electrolysis.

🌐 www.sparchydrogen.com



NANOMSLIDE: NEXT-GEN DIAGNOSTICS

NanoMslide transforms standard microscope slides into advanced biosensors using a multilayered, nanostructured coating. Developed at La Trobe University and commercialised by AlleSense, this cancer diagnostic tool produces high-contrast, label-free images of biological samples, enabling instant visualisation of abnormal or diseased cells.

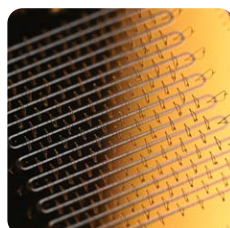
🌐 www.allesense.com



AI SCANNER FOR PREMIUM AUSSIE MEAT

University of Adelaide's Robert McLaughlin, working with spin-out Miniprobes, is developing a device using optical fibre, near-infrared imaging and AI to assess meat quality during production – enhancing the global competitiveness and premium value of Australian sheep and beef products.

🌐 www.miniprobes.com



QUANTUM AMPLIFIER BREAKTHROUGH

The University of Sydney, in partnership with Emergence Quantum, is pioneering advanced quantum amplifiers that detect and boost weak quantum signals. Led by Cassandra Chua, the project advances research, builds workforce capacity and strengthens Australia's quantum supply chain.

👤 **Cassandra Chua:** cassandra.chua@sydney.edu.au



PRINTING THE FUTURE OF IVF



Fertilis is reshaping assisted reproduction with its microICSI device, designed to ease pressure on fertility clinics struggling to meet demand. Traditional intracytoplasmic sperm injection (ICSI) requires expert operators who stress oocytes by holding them with suction pipettes. microICSI simplifies the process by immobilising the oocyte in a precision 3D-printed structure. Fertilis partnered with ANFF-SA to acquire an UpNano 3D printer capable of producing intricate designs that interface with both sperm and oocytes. By streamlining procedures and minimising cell stress, Fertilis offers a promising step toward more successful and scalable fertility care.

👤 **Roger Yerramsetti:** info@fertilis.is



RAPID RELIEF FROM KIDNEY STONE PAIN

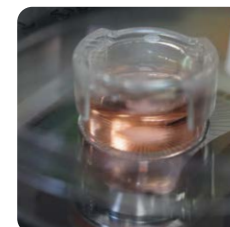


When kidney stones block urine flow, the ensuing severe pain often requires urgent stent insertion, typically done under general anaesthesia. Akeeko Medical (Akeeko™) is the first to develop an all-in-one device for this procedure with its flagship product – the Akeeko™ Stent Inserter (ASI). Combining a guidewire, stent pusher and a tip-mounted camera that streams images to a screen, the ASI is designed to allow use outside the operating room, providing faster pain relief and freeing up hospital resources. The ASI is for use by Healthcare Professionals and is not yet registered.

👤 **Olivia Passmore:** support@akeeko.com



MICROBRAIN MAGIC



University of Melbourne's Bram Servais is pushing the boundaries of biocomputing by improving how living human neurons communicate with electronics. Through an APR Internship at Cortical Labs, an Australian start-up harnessing neuron-driven computing, he tackled the challenges of building brain-on-a-chip systems from human-derived tissue. Using ANFF-VIC's Melbourne Centre for Nanofabrication, scalable microfabricated platforms were created to interface neurons with electronic devices. These microscale systems allow precise control, stimulation and measurement of human brain tissue, opening new possibilities for drug testing, neural research and next-generation biocomputing technologies.

👤 **Bram Servais:** bservais@student.unimelb.edu.au



HIGH-TECH GREEN THUMBS

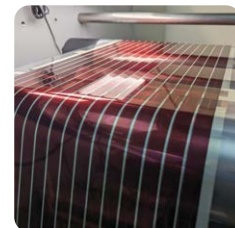


AgTech company Magic Wavelength develops compact, low-cost light-reflection sensors for non-invasive plant health monitoring via drones or handheld devices. Its drone-based AgTell enables remote spectral sensing of farmland, while PlantTell's handheld device provides direct leaf-level insights for gardeners both indoors and outdoors. In partnership with the University of Western Australia, Magic Wavelength recently received an Australia's Economic Accelerator grant to advance its technology. These tools help farmers and gardeners make smarter decisions, reducing fertiliser and water use while boosting yields and driving more sustainable food production.

👤 **Kevin Fynn:** k.fynn@magicwavelength.com



SOLAR IS ON A ROLL



Kardinia Energy's printed solar technology is purpose-built for locations where traditional PV panels are impractical or uneconomical. Produced using a roll-to-roll (R2R) printing process, Kardinia's recyclable solar modules utilise ultra-thin organic PV layers on PET plastic, are lightweight and are flexible enough to be rolled up. These panels are currently produced using the ANFF-Materials Newcastle R2R print facility. Over \$2M in funding from the New South Wales government's Net Zero Manufacturing Initiative will enable Kardinia to fast-track the world's first commercial printed solar manufacturing facility in Newcastle.

👤 **Benjamin Vaughan:** info@kardiniaenergy.com



SPACE-MADE SUPER FIBRES



Flawless Photonics is pioneering the production of ZBLAN optical fibres in microgravity, fabricating nearly 12 kilometres aboard the International Space Station (ISS). Valued for its low signal loss and wide transmission range, ZBLAN will revolutionise telecommunications, sensing and laser technologies. Central to this effort, ANFF-OptoFab Adelaide manufactures radially layered ZBLAN preforms that are drawn into fibres on the ISS. By merging expertise in glass fabrication with space-based fibre drawing, the partnership is deepening insight into how microgravity improves ZBLAN's quality and performance for future photonics and communications applications.

👤 **Heike Ebendorff-Heidepriem:** heike.ebendorff@adelaide.edu.au

› ANFF, NCRIS AND RESEARCH INFRASTRUCTURE CONNECTED



Founded in 2007, ANFF was one of 9 projects established under the Commonwealth's National Collaborative Research Infrastructure Strategy (NCRIS).

NCRIS gives researchers and industry access to equipment, data, services and expertise to enable world-leading research and development for the benefit of all Australians.

At present, 28 interconnected NCRIS Providers encompass a wide range of scientific and research capabilities, including equipment, laboratories, data repositories and services across various disciplines. This network of Providers plays a pivotal role in advancing Australia's research landscape and driving innovation by enabling researchers and institutions to address complex questions in fields such as health, environmental science, technology and more.



The breadth and diversity of research infrastructure available through NCRIS can feel overwhelming. Research Infrastructure Connected (RIC), an NCRIS collaborative initiative, helps potential users find the most suitable NCRIS Provider, even when they are unsure of what services they need or who to approach.

The RIC website's advanced search allows visitors to use keywords and filters to explore NCRIS Providers, case studies and contact details. And when searching is not enough, they can contact RIC directly to connect with the right expert faster.

Over the past year, the RIC team has consolidated its early projects and begun coordinating cross-NCRIS initiatives, such as state-based staff gatherings and joint exhibitions at big events. These efforts are raising national awareness of NCRIS as a powerful resource, helping Australia's researchers and innovators overcome barriers and accelerate their work.



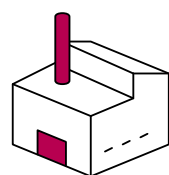
INDUSTRY

ANFF continues to demonstrate leadership in helping industry turn bold concepts into practical outcomes. Operating in an IP-neutral environment, clients have the freedom to innovate without disrupting core operations.

Among them is Vaxxas, which is scaling up manufacturing of its needle-free vaccine patch in its new Brisbane biomedical facility, having expanded its global IP portfolio to 42 patents. Also, backed by NSW's Net Zero Manufacturing Initiative, ANFF-Materials is supporting the development of the world's first commercial printed solar manufacturing facility, showcasing how advanced fabrication accelerates clean energy innovation.

By aligning with Australia's National Quantum Strategy, ANFF will foster sovereign capabilities in quantum technology and its adoption in other industries. ANFF's infrastructure and expertise will ensure that Australian businesses can leverage quantum advancements for competitive advantage.

ANFF offers services at low cost to make development affordable and faster. These foundations ensure ANFF clients can turn their boldest ideas into tomorrow's productivity gains.



341

Direct
industry users



123

Industry referrals
to potential solutions
in FY25

WORKFORCE DEVELOPMENT

ANFF is building in-house talent to tackle technical workforce shortages. Izak Lorton, ANFF's first mechanical engineering apprentice, is completing a Certificate III in Engineering – Mechanical Trade through ANFF-SA with Ai Group support. His success has led to plans for a second apprentice, reinforcing ANFF's commitment to workforce development and advanced manufacturing capability.

LAB TO LABEL

ANFF and Deakin University's Future Fibres Facility (FFF) are building sovereign onshore textile manufacturing capability, from fibre and yarn production to textile construction and deconstruction, which enables garment-to-garment recycling. FFF's pilot-scale, industry-driven prototyping transforms ideas into composite and sustainable fibre products to rejuvenate Australia's textile manufacturing sector.



SIGNALS BENEATH THE SKIN

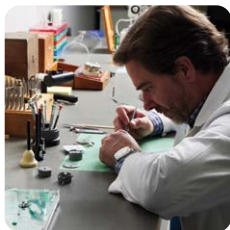


WearOptimo's Microwearable sensors enable minimally invasive access to the user's bio-signals through electrodes that penetrate just a hair's width beneath the skin, detecting hydration and physiological markers that traditional wearables cannot reach. Using advanced nanoimprint lithography (NIL), WearOptimo manufactures sensors rapidly and cost-effectively, enabling scalability and affordability. ANFF-QLD provides the silicon microfabrication infrastructure to support their NIL fabrication process. Designed for continuous hydration monitoring, the Microwearable sensor provides timely data to support peak performance and monitoring of emerging health issues.

Vignesh Suresh: vsuresh@wearoptimo.com



TIME FOR PRECISION



Adelaide master watchmaker Richard McMahon is one of the few, globally, who personally designs and manufactures nearly every component of his timepieces, including movements, cases, enamel dials and hands. An official restoration expert for Rolex, Cartier and Breitling, R. McMahon Watchmakers has expanded to prototyping for medical and defence projects in Australia and Europe. Supplementing its micromachining facility, McMahon Micro, the company works with ANFF-SA to produce prototypes and high-grade watches. Richard also contributes to ANFF-SA's Microengineering School, sharing knowledge in the art and science of making precision timekeeping instruments.

Richard McMahon: www.rmcmahon.com.au



GREEN HYDROGEN GOES GLOBAL

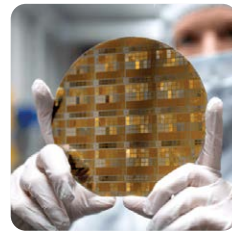


Hysata is taking green hydrogen global with its high-efficiency, capillary-fed electrolyzers. A \$172M Series B raise, the largest for an Australian clean tech company, will expand Hysata's electrolyser manufacturing capacity at its Port Kembla site. The company is backed by a global alliance of strategic investors and partners, such as South Korea's POSCO, a steelmaking giant, and Saudi Arabia's ACWA Power, a renewable energy pioneer. These collaborations will accelerate deployment of Hysata's breakthrough technology and position green hydrogen to decarbonise hard-to-abate sectors like steel production worldwide.

Prachi Agrawal: info@hysata.com



DIRAQ AT THE QUANTUM EDGE



Diraq advances silicon-based spin qubit technology toward scalable, fault-tolerant quantum processors. Through DARPA's Quantum Benchmarking Initiative, this ANFF-NSW alumnus leads an international consortium spanning Australia, the US and the UK to set practical performance targets and pathways for future quantum systems. At the same time, participation in Quandarum – a US Department of Energy project led by Fermilab – leverages Diraq's technology to develop ultrasensitive quantum sensors with the potential to shed light on dark matter. Together, these projects highlight Diraq's dual focus on quantum technology and fundamental discovery.

Stefanie Tardo: www.diraq.com



CHIPS WIRED FOR SPEED

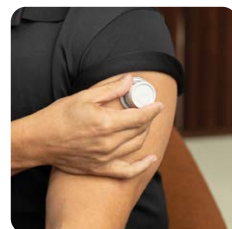


Sydney-based Syenta is tackling performance limits in AI and quantum computing with its Localized Electrochemical Manufacturing (LEM) technology. LEM streamlines electronics production by combining deposition and patterning in a single electrochemical step. This innovation enables high-resolution interconnects – ultra-fine metallic 'highways' thinner than a human hair that link semiconductor chips with fast and efficient connections so they can exchange data far more quickly. By removing slow, complex steps in how chips are linked, Syenta's patented process is poised to become part of semiconductor manufacturing in overseas markets.

www.syenta.com



BACKING A VACCINE BREAKTHROUGH



Australian biotech Vaxxas has secured nearly \$90M to accelerate commercialisation of its needle-free vaccine delivery technology, the high-density microarray patch (HD-MAP). Developed with R&D support from ANFF, the HD-MAP could eliminate needles, reduce cold-chain storage requirements and enable at-home vaccination. The device comes pre-packaged – peel, press, count to ten and you're done. This recent funding round, including Series D equity and investors such as SPRIM Global Investments, LGT Crestone, OneVentures and Brandon Capital-Hostplus, will help Vaxxas continue to scale production, install semi-automated manufacturing lines and advance late-stage clinical trials.

www.vaxxas.com

FUELLING SUCCESS THROUGH CONNECTION

ANFF's Client Engagement Team unlocks opportunities for industry clients, linking them with the right ANFF tools and expertise to ignite innovation and boost success.

ANFF overcomes hurdles to scientific research and technological innovation by providing open access to Australia's world-class micro- and nanofabrication infrastructure. The network's 8 Nodes and 21 locations offer extensive capabilities, but navigating these resources can be complex.

A dedicated facilitator team helps clients connect with the right expertise and facilities across the network. The facilitators work closely with each client to understand their research objectives and commercialisation pathway, then provide tailored guidance on the tools, expertise and facilities that will best advance their work.

Client Engagement Facilitators (CEFs) are the primary contacts for industry clients whose needs extend beyond a single Node or who benefit from strategic guidance. They offer concierge-level support, take responsibility for overcoming challenges and coordinate expertise across the network to deliver effective solutions. Their role is not simply to steer projects toward ANFF but to chart the best course for each company's innovation journey – even if that means connecting clients with other NCRIS Providers or external support opportunities.

'After exhausting the capabilities of our own workshop, we reached out to ANFF for assistance in building our proof of concept. Within a month, we gained access to the necessary resources, enabling us to develop a functional prototype that ultimately helped us secure funding.'

– CEF INDUSTRY CLIENT

The CEFs are increasingly recognised for their expertise across Australia's technology sectors. Their insights are valued by industry, leading to invitations to present at events hosted by MTPConnect, Quantum West, MedTech Actuator, InnovationAus, and the Victorian Medtech Skills and Devices Hub (VMH). Each CEF focuses on a different national priority area:



**MEDICAL
TECHNOLOGIES**
Mr Oded VanHam
(Victoria)



**QUANTUM AND
PHOTONICS**
Dr Marta Sánchez Miranda
(New South Wales)



SPACE AND DEFENCE
Dr Matthew Chong
(South Australia)

ANFF welcomes organisations from all sectors to connect with the CEF team for tailored support and access to advanced manufacturing solutions.



**DR MATTHEW CHONG,
DR MARTA SÁNCHEZ
MIRANDA AND
MR ODED VANHAM**

GLOBAL CONNECTIONS

ANFF's strength lies in its ability to connect. Its individual facilities form a coordinated national network, unified through NCRIS support. This structure not only enables researchers to access tools and expertise across Australia but also creates the foundation for engagement on the global stage.

Leveraging this national network, ANFF is increasingly working with international peers to advance nanofabrication and research infrastructure. Partnerships with organisations such as EuroNanoLab and nanoFabUK provide opportunities for knowledge exchange, alignment of technical standards and strengthened professional pathways for staff working in cleanroom facilities.

This progression of moving from individual tools to national capability to integration with global networks ensures that Australian researchers remain connected to world-leading practice. By bridging these layers, ANFF enables ideas to grow beyond their local origins and ensures that Australia's nanofabrication capability continues to match and contribute to the best in the world.



10

International partnerships

ENRIS

ANFF took centre stage at the 2025 European Nanofabrication Research Infrastructure Symposium (ENRIS) in Bologna, Italy – a key international event for sharing best practices in nanotechnology and advanced manufacturing, organised by EuroNanoLab. The 9-member delegation shared insights on everything from boosting manufacturing capabilities to enhancing client engagement and running world-class, open-access facilities.

SUPPORTING STAFF ON THE WORLD STAGE

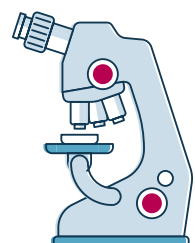
MCN Deputy Facility Manager Ash Dyer represented ANFF at ICRI 2024, pitching bold visions for future research infrastructures. He also attended the UGIM Symposium at MIT (US), sharing insights on ANFF operations. By backing opportunities like these, ANFF not only upskills its staff but also enables them to shine on the world stage.

GLOBAL NANOLAB COLLABORATION

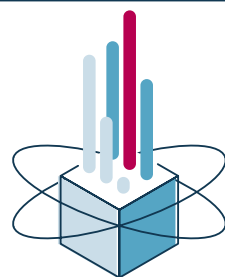
The Global Nanolab Collaboration Workshop held in Bologna in May 2025 aimed to establish a cooperative network of nanolabs and cleanrooms from Europe, the United States, Australia, Japan and Canada. The meeting focused on defining the mission, vision and collaborative programs to enhance technical exchange, training and global impact within the nanofabrication community.

› ANFF EQUIPMENT

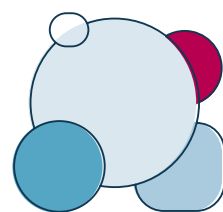
ANFF provides access to micro- and nanofabrication equipment and expertise. These capabilities are used to do anything from making new metamaterials to CNC milling of blood-carrying microchannels.



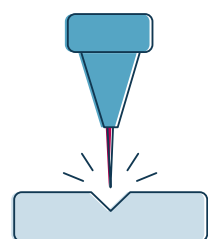
**LABORATORY
INFRASTRUCTURE**



**MODELLING &
DEVICE DESIGN**



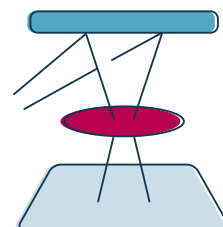
**MATERIALS
SYNTHESIS &
MODIFICATION**



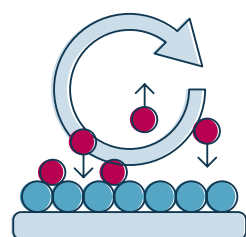
ETCHING



PACKAGING



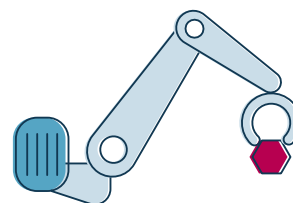
LITHOGRAPHY



DEPOSITION



**TESTING &
VALIDATION**



**MANUFACTURING
& MACHINING**

› ACCESSING ANFF

ACCESS STEPS

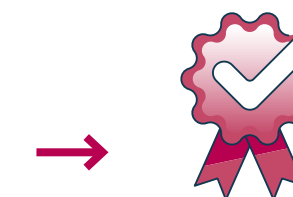
ANFF is committed to exceeding the customer service expectations of our clients.



**CONTACT US AT
INFO@ANFF.ORG.AU**



**DISCUSS PROJECT WITH ANFF
AND ESTABLISH PATHWAY**



**ACHIEVE PROJECT
OBJECTIVE**

RESEARCHERS

For researchers seeking to engage with ANFF, we invite you to contact your local Node with which you can have an initial discussion about how ANFF's capabilities and expertise can align with your research needs.

INDUSTRY

The primary point of contact for industry is the ANFF Client Engagement Facilitator (CEF) team. They can help clients find the best way ANFF can support their projects, particularly for those whose needs transcend a single Node. The CEF can then take ownership of the client's problem and engage the ANFF network to find the best possible solution.

ANFF-C

ANFF-C works with ANFF clients to identify and remove barriers on the commercialisation pathway with dedicated funding for out-of-the-lab services.

Dr John Morrison, Director ANFF-C, would be delighted to discuss with you how the platform can be of assistance.

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VISIT ANFF.ORG.AU



The ANFF team at the 2024 National Staff Forum
at the Adelaide Convention Centre.