



Australia's National
Science Agency



Highlights 2022



We strive to be an employer of choice, building Australia's future talent pipeline and attracting the world's best to work in a place that unleashes their full potential.

Research Technician Virginia Mwape, with a liquid handling robot that dispenses a selected quantity of reagent, samples or other liquid to a designated container.

Chief Executive foreword

For more than a century, your national science agency, CSIRO, has been solving the greatest challenges through innovative science and technology. We work with research and industry to turn science into real-world solutions, we deliver impartial science to inform government policy, and we invest in Australia's future – from the breakthrough research that will reinvent our country to inspiring the next generation with the power of science.

As Chief Executive, I'm so proud of everything Team CSIRO and our partners achieved together in 2022. This short collection of highlights is just a small snapshot of that incredible work.

CSIRO has been there as Australia has faced new challenges like recent record floods and transitioning to net zero amid geopolitical disruption, as well as continuing to invest in long-term challenges like strengthening our national innovation performance and talent pipeline. We've launched new collaborative missions to bring broad coalitions together around ambitious goals, and we've grown investment in initiatives like the ON Accelerator and Main Sequence, established to manage the CSIRO Innovation Fund, to help create more companies and jobs from Australia's great science. Our 2022 Annual Report at csiro.au/annualreport2022 contains many more examples of our impact.



Australia can only solve its greatest challenges by working together, and CSIRO stands ready with the full force of the national science agency to help you achieve our mutual vision of making life better for all Australians. In 2023 and beyond, CSIRO will continue to be your partner in developing and delivering the solutions from science that will benefit our society, environment and economy today and into the future.

Dr Larry Marshall
Chief Executive, CSIRO

In 2022

5,672 people delivering across 53 sites throughout Australia and globally.

For every \$1 invested in CSIRO, at least **\$8.40 in value is returned to the Australian people.**

Considering CSIRO's 2021–22 budget, this equates to **\$10.2 billion of benefit to the nation.**

160,000 students took part in our education programs.

We engaged with over **4,000 industry and government entities**, including nearly 1,600 small- to medium-sized businesses (SMEs).

We worked with **550 international collaborators and customers** across 69 countries.

Solving the greatest challenges

As Australia's national science agency, CSIRO solves the greatest challenges through innovative science and technology.

Towards Net Zero mission

To support Australia's move towards a low emissions economy, in 2022 we launched our Towards Net Zero mission.

The mission, which has initial co-investment of \$90 million, is designed to help Australia's regions and hard-to-abate industries transform and accelerate towards a low emissions economy. This large-scale scientific and collaborative research initiative is helping Australia's hardest to abate sectors – including steel and agriculture – halve their emissions by 2035.

The mission brings together CSIRO with government along with industry partners and collaborators and a number of universities and research organisations.



Plantation farm forestry.

Six challenges we are working with partners to solve:

Health and wellbeing

Enhance the health of Australians through preventative, personalised, biomedical, and digital health services.

- Supporting healthier lives
- Preparing for, and prevention against, infectious diseases
- Enabling transformation of the health care system
- Advancing manufactured products and technologies to support health

Food security and quality

Achieve sustainable security through new AgriFood products, technology and innovation for Australia.

- Agricultural productivity
- High value foods
- Trusted value chains
- Sustainable farm systems

Secure Australia and region

Help safeguard Australia from threats (terrorism, regional instability, pandemics, biosecurity, disasters, and cyber-attacks).

- Biosecurity
- Defence and security
- Sovereign resilience

National Vaccine and Therapeutics Lab

To support the health and wellbeing of Australians, in 2022 we opened our \$23.1 million National Vaccine and Therapeutics Lab in Melbourne.

The lab is the 'missing link' in the Australian vaccine development pipeline, supercharging Australia's ability to produce vaccines and therapeutics locally. Researchers at the lab will turn vaccine and drug candidates into products that can be manufactured in large quantities for clinical trials, which has previously had to be done overseas.

The new lab follows a successful pilot facility in the early stages of the COVID-19 pandemic, when CSIRO scaled up vaccine candidates that had been developed onshore as part of a national strategy to combat this emerging threat.



CSIRO's new National Vaccine and Therapeutics Lab follows a successful pilot facility in the early stages of the COVID-19 pandemic.

Resilient and valuable environments

Enhancing the resilience, sustainable use, and value of our natural and built environments, including by mitigating and adapting to the impacts of climate and global change.

- Climate resilience
- Water security
- Healthy ecosystems and biodiversity

Sustainable energy and resources

Build competitiveness, sustainability and security, nationally and regionally, of our energy and minerals systems and resources while lowering emissions to Net Zero.

- Electricity transition
- Industry and transport decarbonisation
- Unlock resources for a sustainable future

Future industries

Help create Australia's future industries and jobs by collaborating to boost innovation performance and promote Science, Technology, Engineering and Mathematics (STEM) skills.

- Future manufacturing
- Future digital industries
- Circular economy
- Innovation services

Missions

Our Missions program draws on our multidisciplinary science and research, and our track record of taking research through to impact, ensuring we focus on the issues that matter the most and affect our quality of life, our economy and our environment.

Missions tackle big, multi-faceted problems by bringing together research agencies, universities, industry, government and community to work collaboratively on outcomes that lead to positive benefit, new jobs and economic growth.

They are explicitly directed at solving the most urgent and complex aspects of our national challenges, guided by big, bold and inspiring goals.

They begin as CSIRO Missions but due to their scale, ambition and collaborative nature, these missions are being co-developed with partners in Australia and overseas to achieve impact well beyond our organisation.

We are directing \$100 million annually to the co-creation of missions, working with the brightest minds across the research sector and industry to help Australia achieve these outcomes.

Since 2020

6

missions launched

\$359m

co-investment funding leveraged in support of launched missions

571

mission originated projects



Future Science Platforms

Our Future Science Platforms (FSPs) are investments in cutting-edge research. They explore the future science that will reinvent and create new industries for Australia and develop capabilities in tomorrow's researchers. Since 2016, we have invested \$425 million and recruited more than 200 early career researchers to work on our FSPs.

Round

1

Deep Earth Imaging
Environomics

Round

2

Responsible Innovation
Precision Health
Hydrogen Energy Systems

Round

3

Space Technology
**Artificial Intelligence
and Machine Learning**

Round

4

Quantum Technologies
Microbiomes
Valuing Sustainability
Autonomous Sensing
Collaborative Intelligence

Round

5

**Revolutionary Energy
Storage Systems**
Permanent Carbon Locking
Immune Resilience
Advanced Engineering Biology



Adam Best is the Principal Research Scientist working on the Revolutionary Energy Storage Systems FSP.

Matured FSPs

The technology and outputs of these FSPs have transitioned to a new phase outside the FSP program.

Active Integrated Matter | 2017–22

Synthetic Biology | 2017–22

Probing Biosystems | 2017–22

Digiscape | 2017–22

Driving innovation

Solving Australia's greatest challenges takes collaboration and innovation, which is why CSIRO has a range of programs to support the translation of Australia's world-class science into real-world solutions. These are just a few of those programs.

The ON Program

In 2022, we celebrated the return of our successful ON Program. Since the program commenced in 2015, ON has helped more than 3,000 people from 52 Australian research organisations turn their science into real-world solutions.

In December we announced the 10 teams from Australia's universities and research institutes that will form the next cohort of ON Accelerate alumni.

Working with industry mentors, coaches, and investors from Australia's deep-tech venture capital community, ON Accelerate teams will develop the skills they need to launch research-driven companies into market.



Thaum, a startup team from the ANU Research School of Physics deep-tech incubator Momentum, in one of 10 teams chosen to prove their innovative venture WhalePOD through the ON Accelerate program.

SME Connect

In 2022, CSIRO's SME Connect team facilitated more than 200 projects to pair small- to medium-sized enterprises (SMEs) with research and development (R&D) support.

One of these businesses was Coffee Roasters Australia, who were eager for the postbiotic coffee blend they had developed to have its health benefits assessed by independent research.

Through Innovation Connections, CSIRO connected the small, Gold Coast-based business with immunology and infectious disease researchers at Griffith University, as well as providing matched funding to support the project.

To encourage more SMEs to seek R&D partnerships, this year CSIRO published Australia's largest-ever survey about R&D collaboration, the Enablers and Barriers to Industry R&D Collaboration report, which found that businesses that collaborate with research institutions have higher levels of innovation, can better deal with uncertainty, and are more profitable.



Dave Granfield, Kirstie McConnell (reps for Coffee Roasters Australia), Mark Beattie, Alana Beattie (from Coffee Roasters Australia), Innovation Connections Facilitator Mitch McGuire and Griffith University Senior Lecturer Amanda Cox.

Main Sequence

Main Sequence, the deep technology venture fund founded by CSIRO, invests in translating publicly funded Australian research into global companies that create jobs and grow our economy.

Since 2017, Main Sequence has helped to build 50 deep technology companies, which have created over 1,700 technology jobs. Every dollar invested by Main Sequence has attracted over \$4.35 in co-investment from other venture funds, strategic investors and angel investors.

They do this through turning science and research into breakthrough companies like Avarni, a decarbonisation startup working with the University of NSW to solve the challenge of emission target reporting.

Avarni's platform aggregates supply-chain and spending data to dramatically speed up the process of assessing, planning and monitoring carbon emissions across an organisation and its supply chain. It also allows organisations to forecast different decarbonisation scenarios.

Main Sequence invested in Avarni in 2022. To date, Avarni has analysed more than \$100 billion in corporate spending data and 100 million tons of carbon dioxide equivalents in supply chains from public and private markets.



Main Sequence has invested in Avarni, which helps organisations forecast different decarbonisation scenarios, like using solar and wind power.

Industry PhD

In 2022, the CSIRO Industry PhD program (iPhD) progressed from its successful pilot phase to be available nationally, funded under the Australian government's University Research Commercialisation program.

The iPhD program offers a 4-year scholarship for PhD students to undertake a co-designed research project intended to develop their ability to understand industry needs and translate research into commercial outcomes. The scholarship includes a 3-month industry engagement component, plus a professional development and training package. The student is jointly supervised by CSIRO, the industry partner and the host university.

One of the projects developed as part of the iPhD's pilot phase is a partnership with biotechnology company Biosensis and the University of Adelaide. Through this project, a PhD student supported work to develop biosensors for early detection of Alzheimer's disease.

In 2023 the program is offering new projects in collaboration with partners across Australia in areas as diverse as microplastics in wastewater treatment, cyber security, community battery capability and fermented food production.

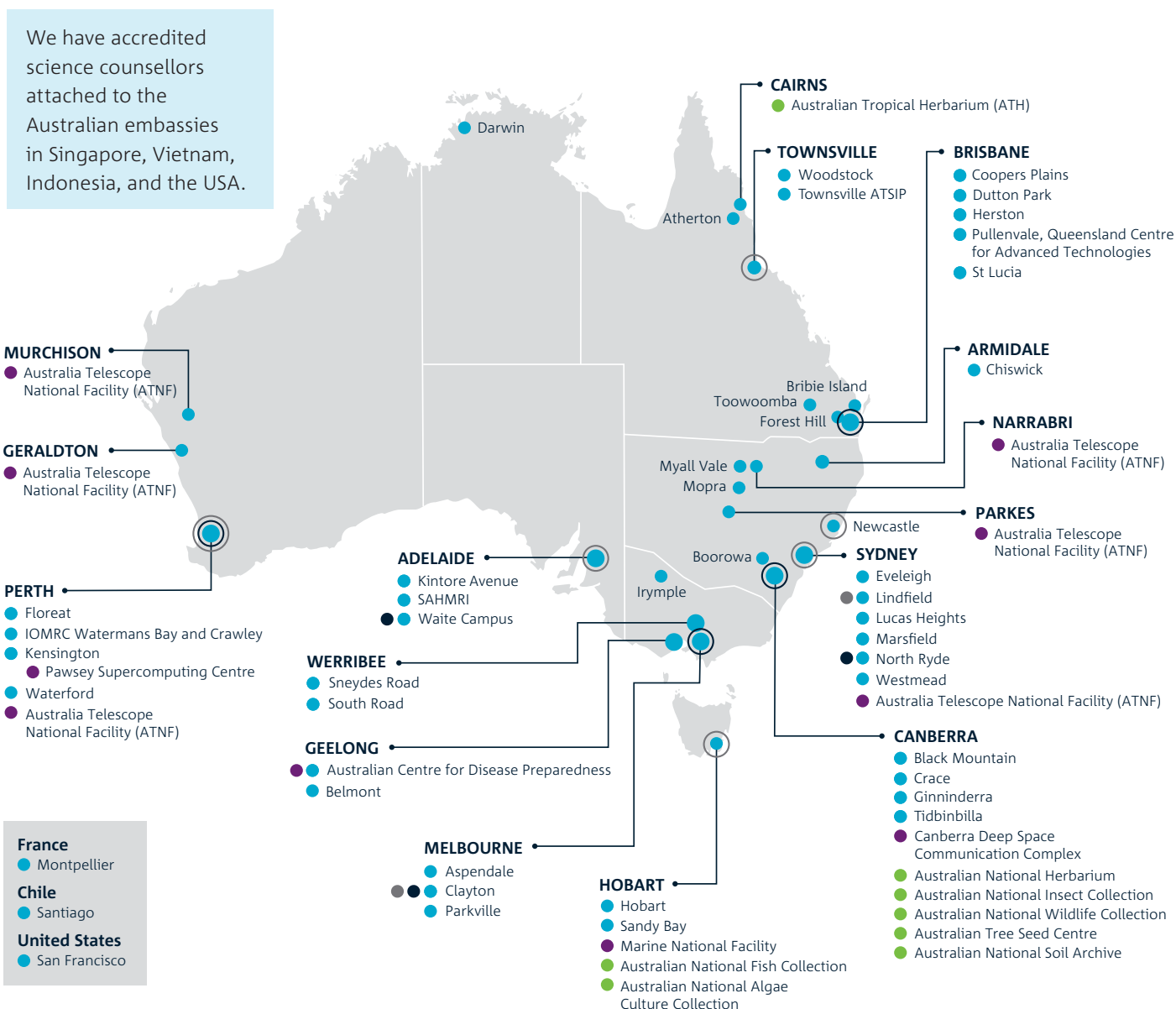


Industry PhD student Kym McNicholas examines nanoparticles for potential biomarkers for Alzheimer's disease.

Where to find us

We operate 50 sites across Australia and 3 sites overseas.

These include the world-class facilities we manage for the Australian research community, collaborative sites where we work closely with partners in industry and universities, and international locations where we facilitate global relationships.



- CSIRO site
- Global precinct
- National centre
- Collaboration Hub
- Testing Services
- National facility
- National collection

CSIRO staff work at **sites** throughout Australia and overseas. Our **global precincts** bring together partners to support research and development of global standing and scale. Our **national centres** are research centres of national standing and scale. CSIRO hosts Australia's national **research facilities** and scientific **collections** that are available to Australian and international users. **Collaboration hubs** are spaces dedicated to translating research outcomes to industry. **Testing service centres** provide testing and certification services for industry.

Global precincts
Canberra – National Agricultural and Environmental Sciences Precinct
Brisbane – Ecosciences Precinct
Perth – National Resource Sciences Precinct
Clayton – Australian Manufacturing and Materials Precinct

National centres
Sydney – Digital Services
Hobart – Marine and Atmospheric Sciences
Adelaide – Food, Health and Nutrition
Perth – Space Sciences
Townsville – Tropical Innovation
Newcastle – Energy Technology

How to work with us

Partner with us

We collaborate with universities, research, and international agencies to deliver innovative science and technology. Organisations, large and small, capitalise on our solutions as catalysts for growth. Spanning a range of scientific disciplines across the various stages of the innovation lifecycle, we apply our research to inform policy, develop new industries and evolve existing sectors ensuring success into the future.

- Industry-focused research and development
- IP and commercialisation
- Funding and programs
- Commercial innovation services
- Accessible labs and facilities
- Global collaboration

Find out more about how to partner with us at: csiro.au/work-with-us

Join Team CSIRO

We're recruiting the next generation of inventors, innovators and change makers. From researchers to support professionals, see what is possible for your career. Find out how to be a part of Team CSIRO at: csiro.au/iwu



CSIRO researchers working on flexible solar panel technology.

Our greatest hits



Fast WiFi



Aerogard



Polymer banknotes

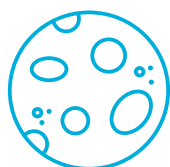


Hendra vaccine

Our latest hits



PhotonAssay™
technology for
gold analysis



Lunar testbed
for space
industry



Bushfire lab
for national
response



Vaccine lab
for Australian
capability



Investment in
50 deep-tech
startups

As Australia's national science agency, CSIRO is solving the greatest challenges through innovative science and technology.

CSIRO. Unlocking a better future for everyone.

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