

Collaboration in Responsible and Equitable AI US National Science Foundation (NSF) and the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO)

NSF—CSIRO Responsible and Equitable AI

NSF 22-086 <https://www.nsf.gov/pubs/2022/nsf22086/nsf22086.jsp>

Program Information Webinar

August 8 and 10 2022



CSIRO

Australia's National
Science Agency

Todd Leen, PhD, NSF – CISE-IIS

Alex Cooke, Missions Director, CSIRO

Olivier Salvado, AI for Missions, CSIRO

Julie Noblitt, Director of Strategic Partnerships, CSIRO

Thanks To

NSF

- Margaret Martonosi - Assistant Director, Computer and Information Science and Engineering (CISE)
- Kendra Sharp - Office of International Science and Engineering (OISE)
- Michael Littman, (Henry Kautz) – Director (former Director), Division of Information and Intelligent Systems (CISE-IIS)
- Wendy Nilsen - Deputy Division Director, IIS
- Keith Chanon - OISE

CSIRO

- Jon Whittle – Director, Data61
- Alex Cooke – Director, Missions
- Wilma James - Executive Manager, Data61
- Alex Blauensteiner - Manager, Data61
- Margaret Donoghue – Country Head, CSIRO US
- Prerana Mehta - Executive Manager, Global

Housekeeping

- The webinar is broadcast only – all participants are on mute.
- Please enter your questions in the Q&A.
- The webinar is being recorded.

Why Responsible and Ethical AI ?

AI algorithms touch millions everyday, some in high-stakes arenas (e.g. criminal justice, medicine, credit evaluation), sometimes with adverse affects, often across international boundaries.



Researchers are addressing computational, statistical, and sociotechnical questions in AI.

Government agencies (such as the US National Science & Technology Council and the Australian Department of Industry, Science, Energy and Resources) work towards establishing ethical frameworks, and ultimately guidelines, to ensure AI algorithms and their deployments are safe, fair, and offer benefits to all their citizens.

Responsible and Ethical AI

Responsible AI:

- Ethical development of AI to benefit individuals, society, and the environment.
- Adherence to AI Ethical Principles as defined by Australia's AI Ethics Framework and the US National AI Research and Development Strategic Plan: 2019 Update
- Includes design, data, and algorithmic aspects as they relate to ethical principles (fairness, accountability, transparency, inclusion, promotion of the general welfare, and sustainability)
- Includes systems and software engineering aspects of responsibility in AI systems (e.g. auditing and monitoring, privacy, and impact of deployments)

Responsible and Ethical AI

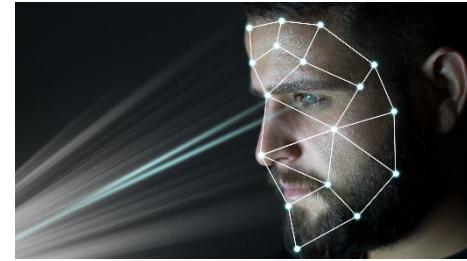
Ethical AI:

- Eliminating discrimination
- Avoiding misuse
- Preventing unintentional harms
- Protecting individual rights

Means to achieve all these may include

- Involvement of those potentially affected by AI systems (stakeholders) in the creation, use, and monitoring to ensure sensitivity to varying cultural norms and expectations
- Efforts to increase number of people from disadvantaged and under-represented groups in AI research and development

Project Requirements



NSF will fund U.S. researchers

CSIRO will fund Australian Researchers

- Proposals must present a unified research project describing innovative approaches to responsible and ethical AI collaboratively pursued by U.S. and Australian team members.
- Project Description must contain a section “US-Australian Team” describing the US and Australian team members and their contributions to the project. Contributions of the US and Australian teams must be complementary.
- Project Description must contain a section “Alignment with CSIRO Missions” which describes how the project aligns with one or more of the strategic priorities listed in the CSIRO Missions program. (See below).
- Proposals must describe the Intellectual Merit and Broader Impacts in accordance with standard NSF proposal preparation. Broader Impacts can include societal benefits to the U.S. or Australia, or both.

CSIRO

A mission is

a portfolio
of **coordinated science and technology** projects
and socio-technical initiatives directed at
meeting a **concrete** and **timebound** objective
helping to solve a societal challenge



Mission-driven science

CSIRO Missions are bringing the ecosystem together to accelerate the pace and scale at which we solve national challenges, leveraging science and technology for impact.

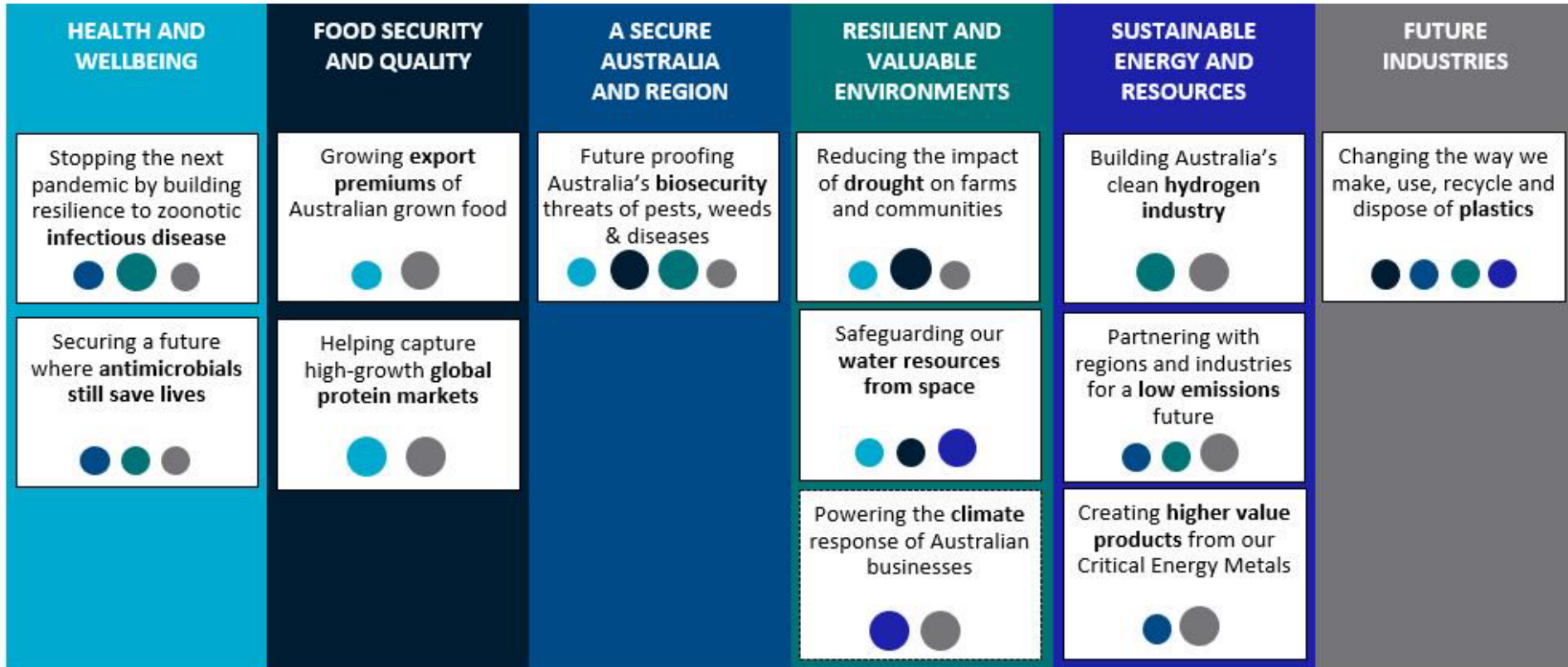
Launched Missions

Drought Resilience
Ending Plastic Waste
Future Protein
Hydrogen Industry
Trusted Agrifood Exports

Developing Missions

Antimicrobial Resistance
AquaWatch Australia
Biosecurity
Critical Energy Metals
Infectious Disease Resilience
Towards Net Zero

Missions portfolio



Examples of key AI technologies supporting CSIRO Missions relevant to Equitable and Responsible AI risks

Key technologies	Mission related use cases	Missions
Geospatial data analytics. Data at the region/country level will be safely and ethically managed and visualised allowing AI layers to provide next generation analytics	AI for health surveillance. Monitoring health data to detect emergence or infectious diseases, antimicrobial resistance, or pest	Antimicrobial Resistance Infectious Disease Resilience Biosecurity
	Cost effective agriculture data collection. Tracking of agricultural products to guarantee provenance.	Trusted Agrifood Exports
	Water quality forecasting. Monitoring of land based water station to track and predict water quality	AquaWatch Australia
Digital twin of production unit. Manufacturing plants, farms, or any building with human activity will deliver privacy aware analytics in real time to increase productivity and safety	AI for flexible electricity systems. Analytics and monitoring of power distribution at the individual house level.	Towards net zero
	Warehouse management. Tracking and analytics of goods stored in warehouses.	Trusted Agrifood Exports
	Meat processing compliance. Monitor meat processing stations for compliance and supply chain management.	Trusted Agrifood Exports
AI-based Market Intelligence. Information will be extracted from sensors, regulatory databases, company transactions, news/communication to build a dynamic knowledge graph enabling AI based analytics	Technology forecasting. Analyse and predict technology trends to inform Missions.	All Missions
	Food supply chain analytics. Mine data and build knowledge based graph that could provide analytics about flow of food and agriculture goods.	Trusted Agrifood Exports
Next generation pheno-genotyping. The phenotype and genome of insect, plants, mammals, livestock, and humans will be characterised with new AI technologies to advance science, and support diagnosis and wellbeing	Wound care management. Use AI to for telehealth remote consultation of wound related injuries.	Antimicrobial Resistance
	Phenotyping platform for farms. Monitor water stress using for farms affected by drought.	Drought resilience AquaWatch Australia
	Animal Health and Wellbeing Inspection for Export Compliance. Monitor livestock wellbeing and regulation compliance	Trusted Agrifood Exports

For information about these internal CSIRO projects, contact Dr Olivier Salvado – olivier.salvado@csiro.au

Alignment with missions

- Could be case study or part of evaluation
- Must be discussed in section of Project Description with heading “Alignment with CSIRO Missions”.

More information:

W: csiro.au/missions

E: missions@csiro.au

Submission Mechanics



1. Submitting US organization sends:

Cover Page, Project Summary, Project Description , References Cited, list of PIs, co-PIs and all Senior Personnel, and Australia Budget and Justification to

Alapplications@csiro.au

by close of business September 1, 2022

2. CSIRO reviews proposal for alignment with mission and replies to US PI with letter indicating whether proposal is acceptable or not. **Only proposals deemed acceptable by CSIRO should be submitted to NSF.** CSIRO letter affirming mission alignment must be uploaded with proposal as Supplementary Document.

Submission Mechanics



3. Only US expenses on NSF budget form. Australian expenses (in Australian dollars, with justification) submitted with **NSF proposal as Supplementary Document** – budget template at <https://www.csiro.au/en/research/technology-space/ai/NSF-AI-Research>.
4. Budget Justification section of NSF proposal must clearly differentiate activities under US budget from activities under Australian budget, and must justify the full US project budget.
5. Budget Justification section of Australian budget (item 3 above) must clearly differentiate activities under the US budget from activities under the Australian budget, and must justify the full Australian budget. Proposals that request funding for duplicated activities may be returned without review (RWR).

Submission Mechanics



5. Proposals submitted to NSF by US organization to CISE, Small project in Information and Intelligent Systems / Human-Centered Computing (IIS/HCC).
Submission either through Research.gov or Grants.gov.
Proposals must meet standard requirements of NSF PAPPG and additional requirement in the CISE Core Program Solicitation (NSF 21-616).

Proposal title must have prefix “NSF-CSIRO:”
or if part of a set of proposals from multiple US organizations
“Collaborative Research: NSF-CSIRO:”
(See DCL for special instructions on submission of proposals from multiple US organizations in Research.gov.)
6. Involvement in a proposal responding to this DCL counts towards the limit on number of proposal one may participate in under CISE Core Program solicitation NSF 21-616.

Submission Mechanics

7. Australian investigators should **not** be listed as co-PIs on the NSF Cover Sheet. Instead, they should be listed as **Senior Personnel**. Information for “Current and Pending Support” is required for all Senior Personnel.
8. Biosketches should be provided for both the US and Australian investigators, prepared according to the standard biographic sketch format in the NSF PAPPG (NSF 22-001).
9. Projects involving human subjects or vertebrate animals should follow both the NSF guidelines (in PAPPG) and the Australian Code for responsible Conduct of research (see DCL for URL), along with the requirements of the investigators’ institutions. IRB and IACUC documentation must be submitted as appropriate.

Be sure to read the GUIDELINES and ADDITIONAL DOCUMENTS sections of the DCL (<https://www.nsf.gov/pubs/2022/nsf22086/nsf22086.jsp>) to capture all requirements.

Review Criteria

Standard NSF review criteria --- Intellectual Merit and Broader Impact



- **Intellectual Merit** – Describe potential to advance knowledge. Motivation behind work, specific problems to be solved, challenges, approaches, and evaluation of outcomes.
- **Broader Impacts** - Describe potential to benefit society and contribute to the achievement of specific societal outcomes. May include impact on other research, educational experiences; dissemination of tools, methods, results, and data; broadening participation of underrepresented groups, and benefits to society.

(See NSF PAPPG [NSF 20-1](#))

Further Questions ?

Ask during this Q&A, or privately to

NSF: Todd Leen – tleen@nsf.gov

CSIRO: Alapplications@csiro.au

CSIRO Missions: missions@csiro.au



CSIRO
Australia's National
Science Agency

Proposals due to

CSIRO for mission alignment check Sept. 1, 2022 – submit to Alapplications@csiro.au. (CSIRO plans to send letters to applicants by Sept. 21 indicating if the proposal passed the alignment check or not.)

NSF for standard peer review by c.o.b. (your local time) October 17, 2022.

Frequently Asked Questions

Who can I talk with at CSIRO to confirm alignment of my project with one of CSIRO Missions?

Write missions@csiro.au or Olivier Salvado in the AI for Missions program Olivier.Salvado@csiro.au

Are projects that align with CSIRO's "Developing Missions" eligible for funding?

Yes, please see <https://www.csiro.au/en/about/challenges-missions>.

What is an established collaboration with US researchers? Should the lead US and Australian investigators have existing collaborations? Is it OK if the collaborations are established with non-lead investigators?

The collaboration between the US and Australian teams need not originate with the leads (though such a collaboration may appear strong to reviewers).

Frequently Asked Questions

How complete should the proposal sent to CSIRO for September 1 be, can we revise it before submission to NSF?

The items listed on page 13 should be complete. Minor edits to the project can be made, but the list of PI, co-PI, Senior Personnel should not change. The substantive content of the Project Summary and Project Description must not change to ensure that the alignment to CSIRO mission does not change.

Are there proposal templates available?

No, US investigators (or their Sponsored Research Offices) will be familiar with NSF proposal format. Investigators can also refer to the DCL (NSF 22-086) and the NSF PAPPG mentioned in the slides.

The CSIRO funding guidelines appear to prohibit using funding to hire HDR students (as scholarships). This limitation seems to be different from the eligible activities on the NSF side.

That is correct; CSIRO funding rules for this application do not allow funds to be used for hiring students. NSF funds may be used to support US students of course.

Can CSIRO researchers participate on grant proposals?

Yes.

Frequently Asked Questions

Is the budget cap related to the project scope, or is it determined by whether the collaboration is new or established?

Please use your discretion about the appropriate budget for the program. As in all NSF proposal reviews, the scope of the project and quality of collaboration will be discussed; reviewers often remark positively on established collaborations, but it is not a requirement to win funding.

Will this funding competition be repeated in the future?

There are no immediate plans to repeat the program, but it will be considered.

Will CSIRO participate in the NSF review process?

From the DCL “Proposals will be reviewed by NSF using NSF’s merit review process ... and will include CSIRO representatives as observers.”

Frequently Asked Questions

Will both NSF and CSIRO require progress reports on funded projects?

Standard NSF annual and final reporting is required. CSIRO will require its usual reporting. Since the US and Australian team activities are complementary towards unified project goals, all reports should include progress made by the US and Australian teams.