CSIRO Science Leader

Digital Disruption and the minerals value chain – *Minerals 4D*

Information for applicants

At CSIRO, we solve the greatest challenges through innovative science and technology.

Introduction

**CSIRO’s Chief Executive**

***Larry Marshall***

I’ve spent a lifetime believing in the power of science to transform economies, countries and lives for the better, and there’s no better place in Australia to see that in action than at CSIRO.

Our Science Leader program is a significant investment and commitment to solving today’s challenges by imagining tomorrow’s solutions.

As Australia’s national science agency, we’re also securing Australia’s future by developing the next generation of STEM leaders, who will reinvent and create new industries for Australia and the world.

To solve the greatest challenges today and into the future, we recruit not only the best and brightest, but also those who are passionate, creative and driven to make a difference with their science and mentor the next generation.

We build teams of talented individuals whose diversity of experience, expertise and perspectives are the compass to guide us through the ambiguity of innovation.

At CSIRO, your knowledge, expertise, relationships and novel capabilities can develop the breakthrough science and cutting-edge technology platforms that will deliver unique value to Australia.

We look forward to welcoming you to the team.

**CSIRO’s Chief Scientist**

***Cathy Foley***

Australia’s future prosperity will be fuelled by science. Science that solves the greatest challenges while creating new industries, new jobs and shapes the minds and aspirations of our future leaders.

As Chief Scientist at CSIRO, I’m passionate about the brilliant science done by our world-class researchers, enabled by collaboration across disciplines and with industry, government and academia.

As a CSIRO Science Leader, you’ll share my passion for developing new relationships and mentoring our future science leaders.

I’m excited to work with you on bringing new capability and expertise into CSIRO to further grow our culture of science excellence.

Collaborate with talented people to solve the world’s biggest challenges

**Our purpose:** At CSIRO we provide innovative science and technology solutions to national challenges and opportunities that benefit industry, the environment and the community.

You can make a real difference, in an environment where we spark off each other, learn from each other, trust each other and collaborate to achieve more than we could individually - in a supportive, rewarding, inclusive and truly flexible environment.

Be proud of what you do - be part of a better tomorrow.

Grow your skills. Apply your talent. Broaden your horizons.

Join the CSIRO team

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is one of the world’s largest and most successful publicly funded research and development organisations and is committed to complementing its world-class science and engineering capabilities with outcome-focused research that will generate economic, environmental and social benefits for Australia in a global context. We maximise the impact we deliver for the country by focusing on solving the greatest challenges.

As Australia’s national science and engineering agency our innovation and excellence places us in the top ten applied research agencies in the world. We’re the people behind Wi-Fi, soft contact lenses and the Hendra virus vaccine – and we’re Australia’s leading patent holder.

**Vision:** Australia’s innovation catalyst, collaborating to boost Australia’s innovation performance.

**Mission:** Create benefit for Australia through impactful science, engineering and innovation

Our facilities and physical infrastructure

Doing excellent science and engineering, and delivering services to the benefit of Australia requires appropriate physical and cyber-physical infrastructure.  We have over 50 locations Australia-wide in metropolitan and regional areas as well as internationally. We continue to explore advancements in technological solutions to improve operations.

Our leaders and their careers

‘The things that we do (at CSIRO) are captivating and continue to amaze every day; the people are so passionate and are here for the right reasons and the Australian public want us to be here to do the things we do.’

‘We have everything you need to bring ideas to life.’

‘It is a place where you can dare to dream.’

Benefits our staff value

* Continuous career development
* CSIRO specific experienced leadership skills development
* [Balance](https://www.csiro.au/en/Careers/The-CSIRO-Experience/Balance) in their lives via flexible work practices
* [Diversity](https://www.csiro.au/en/About/Policies-guidelines/Working-at-CSIRO/Diversity-strategy) and inclusion of ideas, individuals and cultures
* Generous leave conditions

Where are our staff?

We have more than 5,000 staff spread over 50 sites across Australia’s cities and regions and internationally.

What do we do?

We do research from the bottom of the ocean to deep space, from a micro to a mega scale from agriculture to digital. And we are custodians of some of Australia’s most valuable facilities and collections.

The breadth of our research allows us to tackle issues from a multi-discipline perspective.

CSIRO Science Leader Program

At CSIRO, we solve the greatest challenges through innovative science and technology by harnessing the incredible intellectual power and expertise of our people, collaborators and partners

The CSIRO Science Leader program attracts the best researchers from across the globe to deliver outstanding translational science and engineering impact. The purpose of the CSIRO Science Leader Program is to capture new capability and technology into areas which have been identified as strategic, and to assist our business units to manage and develop their capability for the future.

Over their five year appointment, CSIRO Science Leaders play an active role within and across business units and contribute to business goals through both scientific excellence and the translation of research outcomes into impact. They foster a culture of excellence in their teams and peers and have sufficient experience to supervise and mentor early-career researchers.

**In addition to the Science Leader’s salary,** **the Science Leader has generous operating funds, and support for two three-year Postdoctoral Fellowships and two three-year Postgraduate Students top-up scholarships.**

Approved CSIRO science leader priority areas will be externally advertised as competitive positions on [CSIRO’s Vacancies site](https://jobs.csiro.au) in consultation with the CSIRO Science Council and business unit.

Eligibility and essential selection criteria

The program is directed towards mid-career researchers who have between 10 to 15 years post-doctoral experience.

CSIRO Science Leaders need to:

* have established expertise and knowledge aligned to the strategic priority areas;
* bring novel capability into CSIRO; and
* develop cutting edge technology platforms not already in CSIRO.

*CSIRO policy states that to be appointed to a position in CSIRO you must meet all the essential selection criteria.*

Essential Criteria:

A successful science leader will:

* be recognised by their peers as making a significant contribution in their field of science or engineering;
* have a track record of translating scientific outcomes into impact;
* demonstrate the ability to collaborate at the intersection of disciplines;
* bring an extensive network which they will actively share across the whole organisation, engaging and satisfying multiple stakeholders; and
* have the ability to mentor a team of talented postdoctoral fellows and postgraduate students and attract distinguished visiting researchers.

Priority area and duties

Huge steps are being made in the ability to collect, deal with, and extract information from Big Data. However, utilisation and adoption of this approach by the minerals industry from its potential data streams is far behind. We are looking for a “rising star” Science Leader to lead CSIRO’s research and innovation in digital disruption within the minerals value chain – Minerals 4D. You will have a deep knowledge of applied mathematics to mineral resource data streams, machine learning modelling and the application of Bayesian-based statistics to measure uncertainty in simulation and predictions of 3D and 4D (time series) mineralogy in the value chain. Specifically, you will have the opportunity to take a leading role and be an inspirational mentor in building a team brought together from across CSIRO. With your colleagues, you will develop a mineral data analytics platform that will examine ways in which applied mathematics can be combined with data streams from sensors in mineral analysis and mapping, as well as develop tipping point transition models of dynamic systems with applications to performance behaviour. As Science Leader, you will communicate and champion the outputs of the team’s research to our customers, research partners and our broader network. You will form the nucleus in our work with partners in this focus area, particularly representation at senior levels in new initiatives such as the CORE skills hub in data literacy and the new ‘ARC research centre for predictive maintenance for the resource industry’.

Priority area:

A future aspiration for our mining industry, already a world-leader in exploration and mining, is for fully autonomous, completely digitally-sensed and controlled operations, that deliver the vision of the ‘invisible mine’. Achieving that goal requires a level of data collection, management, integration and fusion that challenges the status quo. Consequently, industry leaders and global futures advisors are advocating and looking to that future state and envisaging how they might position their businesses towards it. Our METS Industry Growth Centre Roadmap ([CSIRO, 2017](https://www.csiro.au/~/media/Do-Business/Files/Futures/METSRoadmap.pdf?la=en&hash=DDDFFA37409C84571F22DA3FED16EA66C346C816)[[1]](#footnote-1)) highlights this vision of the future and the opportunity for a new wave of technology exports and companies as a result. Our objective then, is to position Australia for digital transformation of the mining value chain.

A critical part of the mining operation that is not currently digitised, sensed or predicted, is the makeup of minerals of the ore body and its surrounds. These characteristics directly impact the quality and value of material being released, how it is processed, manufactured and sold as a final product, and the social footprint of the mining operation. This integrated sensing of mineralogy through the value chain and a series of derived predictions of value add, risk quantification and scenarios based on simulation (including towards remediation): **Minerals 4D,** presents a large research opportunity to build a new data-driven platform to deliver value to the industry. This Science Leader will bring advances in mathematical geosciences, data science, provenance and uncertainty analysis, which will enable coupling of deep domain knowledge of quantified mineralogy to the latest in data science. Ultimately the research allows us to more accurately predict how ore body mineralogy affects value creation and destruction through the mining, sorting and beneficiation processes.

Duties

Research Scientists at CSIRO conduct innovative research leading to scientific achievements that are aligned with CSIRO’s strategies. You may be engaged in scientific activities ranging from fundamental research to the investigation of specific industry or community problems. You will have the opportunity to build and maintain networks, play a lead role in securing project funds, provide scientific leadership and pursue new ideas and approaches that create new concepts.

* Leadership of a scientific initiative to develop a mineral data analytics platform to examine ways in which applied mathematics can be combined with data streams from sensors, such as our magnetic resonance detector on conveyor belts, or our world class hyperspectral imaging of mine faces, or mineralogy from drill holes.
* Develop expertise in tipping point transitions to understand system behaviour and dynamical change from data, thus allowing us to predict change in systems from observed data - before the change occurs.
* Create new tools for the minerals industry and to recognise future commercialisation opportunities. For example, how to use magnetic resonance data of mineralogy from a conveyor belt involving material flow in a mine 24 hrs a day, so that changes in material quality can be predicted rather than reacted to (the current situation).
* Anticipate industry and/or community needs and market direction through client liaison/networking, and identify and adapt quickly to changes.
* Communicate openly, effectively and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation.
* Communicate research results to clients and the scientific community through oral and written reports, which may include the preparation of documents for patent applications.
* Produce high quality scientific and/or engineering papers suitable for publication in quality journals and for presentation at national and international conferences.
* Lead research projects of significant size and provide guidance in the execution of projects undertaken by junior team colleagues, including the negotiation of resource requirements.
* Work collaboratively as a leader and active member of a multi-disciplinary, regionally dispersed research team to undertake independent scientific investigations and carry out/delegate associated tasks in support of CSIRO’s scientific objectives.
* Adhere to the spirit and practice of CSIRO’s Code of Conduct, Health, Safety and Environment plans and policies, Diversity initiatives and Zero Harm goals.
* Other duties as directed.

Conditions of employment

**Leave:** Four weeks of annual recreation leave and 15 days of sick/carer’s leave apply.

**Flexibility:** CSIRO’s [Balance](https://www.csiro.au/en/Careers/The-CSIRO-Experience/Balance) initiative offers all employees the opportunity to balance their work and personal lives.

**Diversity:** We are working hard to recruit diverse people and ensure that all our people feel supported to do their best work and feel empowered to let their ideas flourish. [Diversity and Inclusion Strategy](https://www.csiro.au/en/About/Policies-guidelines/Working-at-CSIRO/Diversity-strategy)

**Salary:** An attractive salary package will be oﬀered.

**Reference Number:** 61397

**Tenure**: Indefinite with an initial five years specific science leader funding.

**Location(s):** Perth, Western Australia

Relocation and immigration assistance will be provided to the successful candidate where required.

How to apply

Please apply online at <https://jobs.csiro.au> entering the reference number and uploading in Microsoft Word your CV/resume, and a cover letter outlining your relevant experience and your motivation for applying. Please ensure you address both the eligibility and selection criteria for the CSIRO Science Leader Program as well as any selection criteria listed for the specific priority area. In your CV please include the contact details of three referees. Referees will only be contacted after prior consultation with you at which time please ensure that your referees are willing to provide reports when contacted

Contacts

If you are considering applying for this position please contact Dr Rob Hough, +61 8 6436 8763, Robert.Hough@csiro.au) to discuss the priority area, role and expectations.

Please do not send your application directly to Dr Hough because your application may not be considered by the selection panel.

Should you have difficulty applying please contact careersonline@csiro.au or call 1300 984 220 during Australian business hours.

*NB: As part of the selection process candidates may be asked to do abilities testing and/or a personality questionnaire and/or to give a presentation to staff.*

*On acceptance of an offer of a position with CSIRO the appointee will be need to provide proof of their identity, give permission for verification of their tertiary qualifications and apply for a security check or Australian Federal Police check.*

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| CONTACT USt 1300 984 220 e careersonline@csiro.auw www.csiro.auWE DO THE EXTRAORDINARY EVERY DAYWe innovate for tomorrow and help improve today – for our customers, all Australians and the world. Our innovations contribute billions of dollars to the Australian economy every year. As the largest patent holder in the nation, our vast wealth of intellectual property has led to more than 150 spin-off companies. With more than 5,000 experts and a burning desire to get things done, we are Australia’s catalyst for innovation. WE IMAGINE.WE COLLABORATE. WE INNOVATE. |  |  |

1. CSIRO, 2017. Mining Equipment, Technology and Services. A Roadmap for unlocking future growth opportunities for Australia70pp. [↑](#footnote-ref-1)