

FALLING WALLS

LAB

AUSTRALIA

2.00- 5.30pm, 30 August 2024
The Shine Dome, Canberra



Australian
Academy of
Science

CONCEPT

The Falling Walls Foundation founded the Falling Walls Lab in 2011 to:

- ... connect aspiring innovators
- ... discover and develop talents
- ... support interdisciplinary dialogue and international cooperation
- ... develop new ways of scientific communication
- ... build new and strong networks

TIMELINE

- 2.00pm Event commences
Prof. Hans Bachor AM FAA & Dr Emma-Anne Karlsen, MCs
- 2.02pm Opening remarks by Academy President
Prof. Chennupati Jagadish AC PresAA FREng FTSE
- 2.05pm Opening remarks by the Ambassador of the Federal Republic of
Germany to Australia
H.E. Beate Grzeski
- 2.10pm Pitches (1-16)
- 3.45pm Networking break and afternoon tea, jury deliberation
- 4.15pm Address from event partners
Merck Group, EURAXESS Worldwide, Australia and NZ
- 4.20pm Awards ceremony
- 4.30pm Cocktail reception
- 5.30pm Event ends

*all times are AEST

WELCOME MESSAGE

The Australian Academy of Science, in partnership with the Federal Republic of Germany to Australia, Merck, and EURAXESS Worldwide are pleased to host the Falling Walls Lab Australia Finale for 2024.

Falling Walls Lab Australia is providing 16 emerging researchers, academics, entrepreneurs and professionals from across Australia a platform to present their research, business model, innovative project, social initiative or idea to a distinguished jury and diverse audience, amplified by being live streamed.

This is one of many Falling Walls Labs taking place globally throughout the year. Many of this year's 100 winners from around the world, including three from Australia, will travel to Berlin to participate in the [Falling Walls Lab Global Finale](#) on 7 November. On the anniversary of the fall of the Berlin Wall, these young researchers will propose solutions to the greatest challenges of our time, contributing towards a better world.

In Berlin, one presenter will be selected as the winner in the Emerging Talents category for the next generation of outstanding innovators. They will present alongside nine other luminaries on the grand stage in front of a distinguished audience of industry leaders, decision-makers, investors, and international media representatives.

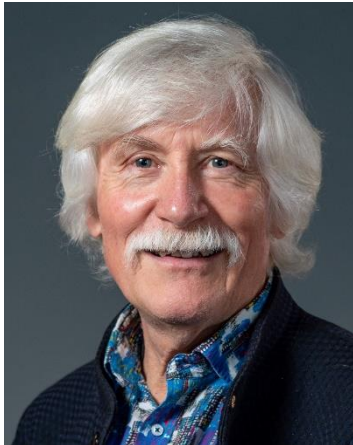
We thank the eminent members of the jury for giving their time to select the winners of today's event. We thank everyone in the audience for their support and wish the participants great success with their presentations today.

We are proud to present Falling Walls Lab Australia, an annual Academy activity that helps ensure the continuation of excellent and innovative scientific research in Australia.



Professor Chennupati Jagadish AC
PresAA FREng FTSE
President, Australian Academy of Science

MCs



Professor Hans Bachor AO FAA
Australian Academy of Science Fellow

Prof. Hans Bachor arrived in Australia in 1981 with a PhD from the University of Hannover, Germany. Based at the Australian National University, he pioneered experimental quantum optics in Australia and created a widely known research team. As a Federation Fellow he founded ACQAO, a national centre of excellence to study atoms and light at the quantum level and to explore options for future quantum technologies. As an Emeritus Professor since 2012 he focusses on science communication, mentoring of early career colleagues and strategic advice. He is active at Questacon and in the Academy of Science

and an initiator of Falling Walls Lab Australia. For these contributions he was awarded the honour of Member of the Order of Australia and with a Bundesverdienstkreuz of Germany.



Dr Emma-Anne Karlsen
Falling Walls Lab Australia Winner 2023

Dr Emma-Anne Karlsen is a junior doctor and PhD Candidate at the University of Queensland Frazer Institute, where she recently submitted her PhD on novel biomarkers and treatment strategies for cancer, with a focus on improving the efficacy of monoclonal antibody therapy. Her innovative research, which explores repurposing existing medications to enhance cancer treatment, earned her 3rd place at the prestigious Falling Walls Lab in Berlin. This achievement led to many opportunities such as speaking the ABC Science Show and being named one of "50 Remarkable and Inspirational

Women in Australian Science" by Cosmos Magazine. Dr Karlsen's journey is marked by a deep commitment to translational research, aiming to bridge the gap between laboratory discoveries and clinical applications. With a passion for improving patient outcomes, she aspires to integrate her research with her clinical practice to provide exceptional care and contribute to the future of cancer therapy.

JURY

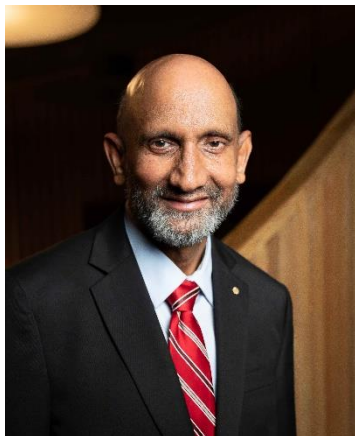


Dr Cathy Foley AO PSM

Australia's Chief Scientist and Jury Chair

Dr Cathy Foley became Australia's ninth Chief Scientist in January 2021 after an extensive career at Australia's national science agency, the CSIRO, including as the agency's Chief Scientist. Dr Foley is an internationally recognised physicist with major research achievements in superconductors and sensors which lead to the development of the LANDTEM sensor system to locate valuable deposits of minerals deep underground. Dr

Foley's scientific excellence and influential leadership have been recognised with numerous awards and fellowships, including election to the Australian Academy of Science in 2020, and an Order of Australia for service to research science and to the advancement of women in physics. She received the Australian Institute of Physics Medal for Outstanding Service to Physics in 2016. She is a Fellow of Australian Academy of Technological Science and Engineering (2008) and an honorary Fellow of the Australian Institute of Physics (2019). Dr Foley is an inspiration to women in STEM across the globe and focused strongly on equality and diversity in the science sector.



Professor Chennupati Jagadish AC PresAA FEng FTSE

President, Australian Academy of Science

Professor Chennupati Jagadish is a Distinguished Professor and Head of Semiconductor Optoelectronics and Nanotechnology Group in the Research School of Physics, at The Australian National University. He has published widely in semiconductor physics, materials science, optoelectronics and nanotechnology. Professor Jagadish is the Editor-in-Chief of Applied Physics Reviews, editor of 2 book series and serves on editorial boards of 19 other journals. He is a fellow of 11 science and engineering

academies in Australia, the US, Europe and India, and 14 professional societies. He has received many Australian and international awards, including a UNESCO medal for his contributions to the development of nanoscience and nanotechnologies, and has been an Australian Research Council (ARC) Federation Fellow and an ARC Laureate Fellow. He became President of the Academy in May 2022.



Her Excellency Beate Grzeski

Ambassador of the Federal Republic of Germany to Australia

Beate Grzeski is the German Ambassador to Australia since October 2023, also responsible for the Pacific Island States of Papua New Guinea, Solomon Islands, Vanuatu and Nauru. Prior to this she was the German Special Envoy for the Pacific Island States since 2022. After studying law at Munich University, she began her career in the Foreign Ministry in 1998. Her extensive diplomatic career includes her role as Deputy Head of Mission at the German Embassy in Moscow from 2017 to 2022 and as Minister / Head of Economic Department at the German Embassy in Beijing from 2011 to 2014. She held key positions at the Federal Foreign Office such as Commissioner for Refugees and Migration (2015 – 2017) and as Director for International Academic Relations and Public Diplomacy, Dialogue among Civilizations and as Head of Division EU Justice and Home Affairs and Advisor on European Law. Other engagements included the role as Private Secretary to the President of the German Bundestag and as Advisor for the Chairman of the EPP-Group in the European Convention in 2002-2003. Previously she also worked as Private Secretary to the Special Coordinator of the Stability Pact for South-Eastern Europe (SPSC 1999 – 2002).



Michael Swanson

Director Market Access and Government Affairs at Merck Healthcare Australia and New Zealand

Michael was appointed Director of Market Access and Government Affairs at Merck Healthcare ANZ, in 2022. He brings over 30 years of industry experience across several global European and American pharmaceutical companies including Abbott Laboratories, Merck & Co. and Eli Lilly and Sanofi, where he had a range of responsibilities that included Market Access, Public Affairs, Policy, Pricing and Communications. Michael's geographical responsibilities included both the Asia Pacific Region and domestic markets.

Previously he worked for the Federal Government for 10 years in an operation capacity with the Civil Aviation Authority and with the Western Australian Department of Health. He holds a Master of Business Administration from Macquarie University, Bachelor of Science degree from the University of Western Australia and a Diploma of Teaching from the University of South Australia.

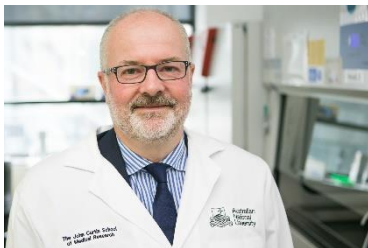


Professor Peta Ashworth

Director of the Curtin Institute for Energy Transition

Professor Ashworth is a renowned expert in energy, communication, stakeholder engagement, and technology assessment. She has researched public attitudes towards climate and energy technologies, including wind, carbon capture and storage (CCS), solar photovoltaic, storage, geothermal and hydrogen, for almost two decades. An accomplished speaker and educator, she actively promotes energy literacy globally and contributes to policy briefings and educational events.

Prior to joining Curtin University, Professor Ashworth was the Director of the Andrew N. Liveris Academy for Innovation and Leadership, and Chair in Sustainable Energy Futures at The University of Queensland (UQ). She was also Chair of the Queensland Hydrogen Taskforce and is a member of CSIRO Hydrogen Mission Advisory Board. Professor Ashworth brings over thirty years' experience working in a range of senior management, consulting and research roles.



Professor Ross Hannan

Deputy Dean Research, ANU College of Health & Medicine

Professor Hannan's career spans over 30 years of internationally competitive research in Australia and the US, during which he has published over 200 articles focusing on targeting ribosomal gene transcription to treat cancer and inherited blood disorders. His work has brought together multi-disciplinary teams of laboratory and clinician researchers and industry collaborators to devise 'first in class' cancer therapies targeting the ribosome. These drugs are now in phase 1 and 2 clinical trials for a range of human cancers. He graduated with a PhD in Chromatin Biology from the University of Tasmania in 1994 and undertook postdoctoral training in the USA at the Weis Centre for Researcher and Penn State before returning to Australia in 1999 on a NHMRC fellowship to run his own research laboratory first at the Baker Medical Research Institute and then as Program Lead in the Peter MacCallum Cancer Center. In 2015 he was recruited to John Curtin School of Medical Research, ANU as the Centenary Chaired Professor in Cancer Biology where he founded and was the inaugural head of the Department of Cancer Biology in Therapeutics (2015-2019). In 2017 he took up additional roles as the Executive Director of Medical Research, ACT Health Directorate. In 2022 he was appointed the Deputy Dean of Research in the College of Health and Medicine at ANU. His work was recently recognised by appointment in 2017 as a Fellow of the Australian Academy of Health and Medical Sciences. He continues to lead an internationally competitive research program at the JCSMR funded through an NHMRC Investigator Leadership Fellowship.



Dr Li Gao

Deputy Chair, Academy's Early and Mid-Career Researcher Forum and Strategic Research Manager at South East Water

Dr Li Gao is an industry-based research leader with a unique joint appointment at South East Water and RMIT University. He works as the Strategic Research Manager at South East Water, where he oversees a substantial portfolio of industry-based strategic research initiatives. In this capacity, he not only leads research endeavours but also fosters valuable research partnerships aimed at delivering benefits to the community. He has won the prestigious inaugural ARC Industry Fellowship and secured a tenured part-time position at RMIT University with the aims of bridging 'blue-skies' research with 'real-world' applications and transferring excellent research into real industry and community benefits. Due to Li's industry-based research excellence, he has been appointed as the Chair of Victorian Water Panel at Engineers Australia and Deputy Chair of Early- and Mid-Career Researcher Forum at the Australian Academy of Science. Li has won more than 30 national and international awards and recognitions. He is a Fellow and Chartered Engineer of Engineers Australia and a Fellow of the Royal Society of Chemistry (UK).

PRESENTERS



BREAKING THE WALL OF Sustainable Plastics

Dr Stephanie Allison-Logan, CEO & Co-Founder of Sprout Materials

Stephanie is the CEO & Co-Founder of Sprout Materials, an early-stage startup producing home compostable foams from renewable, bio-based materials. She obtained her PhD in Chemical Engineering from the University of Melbourne and pursued postdoctoral research at the Massachusetts Institute of Technology. Stephanie was an early hire at Boston biotech startup Robigo, where she established their bioprocessing team. Stephanie is passionate about the

commercialisation of academic research and developing scalable solutions to global challenges.



BREAKING THE WALL OF Endometriosis Treatment

Isaac Kyei Barffour, University of Queensland, Institute for Molecular Bioscience

@kyeibari

Isaac has BSc. (Hons) Human Biology (System Physiology and Systems Pharmacology) and MPhil. Drug Discovery and Toxicology (in vitro disease modelling for therapeutics) from the University of Cape Coast in Ghana. He is now a University of Queensland International Student Research

Training Scholar in the Genomics of Reproductive Disorders Group at the Institute for Molecular Bioscience. Isaac is currently researching the application of molecular signatures for classification and treatment stratification of endometriosis using complex patient-derived in vitro models and genetic perturbation. In the past eighteen months, Isaac has catalogued Germline variants and somatic mutations in endometriosis, developed a 3D image analysis pipeline for assessing subtle changes in 3D culture models and a CRISPR-based genome engineering protocol in endometrial organoids (novel). Isaac is using these tools to develop a repository of endometrial organoids that can be used to study the molecular phenotyping of endometriosis for better endometriosis classification diagnosis and treatment.



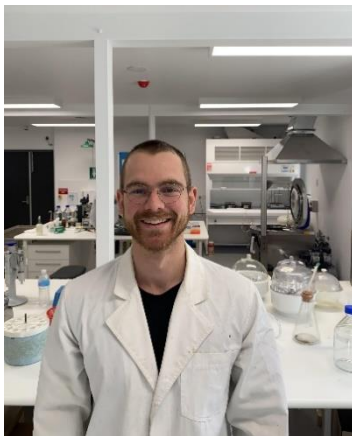
BREAKING THE WALL OF Irreversible Vision Loss

Nicholas Bariesheff, The Australian National University

@NickBariesheff

Nick is a final-year PhD candidate in the Clear Vision Research Group, focusing on the physiological mechanisms of aging in the retina. His groundbreaking research explores how aging leads to retinal degeneration and investigates how physical exercise can prevent the leading cause of blindness in Australia. Nick's innovative work involves harnessing the molecular mechanisms of physical exercise to prevent vision loss, which will overall enhance the quality of life for the aging population. Nick's passion for biomedical research is equalled only by his fascination with the visual system. His dedication is driven

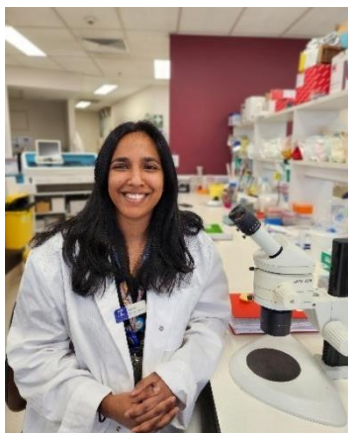
by the unique opportunity to merge his two passions: exercise and vision loss, which is what fuels his daily commitment to his research. Nick is also passionate about discussing his awesome findings in the lab and seizing every opportunity to communicate complex scientific data with a broader audience.



BREAKING THE WALL OF Agriculture Waste

Benjamin Camer-Pesci, Murdoch University

Ben is a PhD student with a passion for marine science and the great outdoors in general. Specifically, he is captivated by the field of Physcology due to its untapped potential across a vast range of disciplines. When not in the Lab, Ben enjoys exploring the natural wonders around Australia and spending time camping out the back of my car. He currently works outside of his PhD teaching undergraduate marine scientists and feels extremely privileged to be able to educate and inspire future generations of scientists through a career in academia.



BREAKING THE WALL OF Therapies in Pregnancy

Dr Natasha de Alwis, The University of Melbourne

@AlwisNatasha

Natasha is an early-career Postdoctoral Researcher in the Therapeutics Discovery & Vascular Function in Pregnancy group at the University of Melbourne. Her dedicated research focus is in understanding the development of pregnancy complications, particularly preeclampsia and fetal growth restriction, and in developing novel therapeutic strategies to prevent and treat them. She has a strong commitment to ensuring equity of access to therapies during pregnancy.



BREAKING THE WALL OF Green Graphite
Dr Jacob Martin, Curtin University

@nzjakemartin

Jacob is a lecturer in Physics and Astronomy at Curtin University. His research is focused on carbon materials science for energy storage materials and decarbonisation. He has a passion for communicating science through articles and podcasts with the ABC and COSMOS magazine, public lectures including TEDx and an art exhibition at the Science Art Gallery Bengaluru. He also completed an ABC TOP5 Science Media Residency in 2022. He received his PhD in 2019 at the University of Cambridge studying air pollution reduction and decarbonisation. In 2020 he was a research fellow at the Cambridge Centre for Carbon Reduction in Chemical Technology in Singapore. In 2021 he took up a Forrest Fellowship to study energy storage materials at Curtin University.



BREAKING THE WALL OF RNA in Agriculture
Dr Donovan Garcia Ceron, La Trobe University

@donovangarcia

Donovan is a caring friend, a weekend woodworker and, inside the laboratory, a researcher interested in how pathogens communicate with their hosts. He completed a PhD in Biochemistry at La Trobe University, where he has studied how tiny plant proteins protect humans from fungi, how fungi produce microscopic “virulence bags” to support infections, and how we could spray plants with RNA to protect them from pests. He believes that communicating science is as important as executing it, and he hopes to share the results of his research with enthusiasm and clarity, so that more people get involved and enjoy the privilege of doing science.



BREAKING THE WALL OF GHG Emissions with Algae
Kira Picknell, The University of Technology Sydney

@KJP_Science

Kira is a PhD candidate at the Climate Change Cluster, University of Technology Sydney, where she is pioneering research on transforming brewery waste streams and microalgae into sustainable feed for cattle and sheep. Her work focuses on reducing methane emissions while enhancing animal productivity. She earned her Bachelor of Animal and Veterinary Bioscience (Honours I) from the University of Sydney in 2022. She is passionate about developing sustainable industry practices and finding innovative ways to utilize industry waste within agriculture.



BREAKING THE WALL OF Anti-parasitic Drug Resistance

Saishyam Ramesh, The Australian National University's Research School of Biology

Saishyam's project explores the source and mechanism of cholesterol uptake in Plasmodium falciparum, the parasite responsible for malaria. Additionally, his work is trying to overcome antiparasitic drug resistance in apicomplexan parasites by conjugating antiparasitic drugs to various sterols that these parasites require.



BREAKING THE WALL OF Polymer Waste

Dr Harshal Patel, Flinders University

Harshal studied at University College London before moving to The University of Adelaide, where he completed his PhD under the supervision of Dr Thomas Fallon in 2022. There he developed new synthetic methodology towards the unusual shape-shifting molecule bullvalene, and bicyclo[4.2.0]octadiene derived natural products such as the endiandric acids. He is currently conducting his postdoctoral research at Flinders University under Prof. Justin Chalker, where he is developing methods to chemically recycle electronic waste, upscaling polymer lens fabrication for infrared imaging, and creating new circular materials for a sustainable future. Harshal was

awarded the prestigious Cornforth medal in 2022.



BREAKING THE WALL OF Genetic High Cholesterol

Dr Kelly Martinovich, Murdoch University

@KMartinovichPhD

Kelly is an Early Career Research Fellow based within the Centre for Molecular Medicine and Innovative Therapeutics - a joint venture with Murdoch University and the Perron Institute in Perth. Kelly completed her PhD in 2021 at the University of Western Australia. During this time, she won numerous awards and scholarships based on academic merit. As a highly skilled lab-based researcher she has advanced the understanding of many

cell and molecular biology methodologies contributing to novel discoveries in Airway Diseases, Infectious Diseases, and Cardiovascular Diseases. Kelly is focused on developing novel therapeutics and bridging the gap between academia and industry.



BREAKING THE WALL OF RNA-based Fungicides

Pratyush Ravichander, The University of Queensland

Pratyush is a third year PhD candidate at the University of Queensland, where he also obtained his Master of Biotechnology. Following his master's degree, he worked with Biosecurity Queensland at the Department of Agriculture and Fisheries. Through his role in biosecurity, he developed an interest in crop protection. This led him to pursue a PhD on developing RNA-based bio-fungicides for crop protection against fungal diseases. He believes that the demands of global food production can be met while being mindful of the environmental challenges we are currently facing. After his PhD, he hopes to continue to

work in sustainable agriculture and building global food security.



BREAKING THE WALL OF Optical Glucose Sensing

Mingjie Yang, RMIT University

Mingjie is a dedicated researcher with a strong educational foundation in engineering and specialised expertise in optical sensing, biosensors, biomedical devices and wearable electronics. He is enthusiastic about translational research, applying sensing techniques to enhance disease prevention and management. Currently, he is completing his PhD at RMIT University, focusing on the development of non-invasive biomedical devices for diabetes management, aiming to provide pain-free alternative solutions. His most representative

research work is a patented miniaturized device for optical glucose sensing. His innovative contributions to wearable electronics and biosensors are evidenced by nine peer-reviewed research articles.



BREAKING THE WALL OF Nerve Repair

Mehershad Wadia, Queensland Brain Institute, The University of Queensland

@MehershadW

Mehershad is currently working as a research assistant at Prof. Hilliard's lab at the Queensland Brain Institute, The University of Queensland, where he studies nerve regeneration and repair. Passionate about science communication, he has previously presented his research

at the Brisbane Comedy Festival and authored a children's book titled 'Pluto Gets a Vaccine'.



BREAKING THE WALL OF the Grains Industry

Dr Jonathan Richetti, CSIRO

Jonathan is an early-career research scientist at CSIRO's Agriculture & Food research unit with a background in Agricultural Engineering. He holds a Bachelor's degree, a Master's degree, and a PhD from the State University of West Parana, Brazil. His research is about how modelling, from traditional statistics and process-based modelling to data-driven modelling such as AI, can help decision-making in agriculture. He leads projects related to on-farm

performance assessment and technology impact. He investigates how AI algorithms can enhance yield predictions, optimize resource allocation, and mitigate environmental impacts. His work contributes to the development of data-driven solutions for modern agriculture, addressing challenges related to climate variability, soil health, and crop resilience. Dr. Richetti also has a strong interest in science communication, often giving talks at schools and farm field days, as well as non-science publications.



BREAKING THE WALL OF Virus Dominance

Dr Asara Senaratne, Flinders University

Asara is a Lecturer with the College of Science and Engineering at Flinders University, where she specialises in anomaly detection, data visualization, and knowledge representation within the realm of Computer Science.

Her research interests predominantly focus on applying AI, Machine Learning, and Data Science techniques to enhance data quality and knowledge discovery. This includes exploring innovative methods for anomaly

detection in graphs, advancing industrial automation, and improving human-computer interactions. Currently, her research focuses on developing robust models for anomaly detection in diverse domains, including health, the semantic web, cyberspace, and industry 4.0, thereby generating valuable insights for decision-making.

PARTNERS

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