

Centre for Advanced Materials and Industrial Chemistry

Annual Report

2023-2024





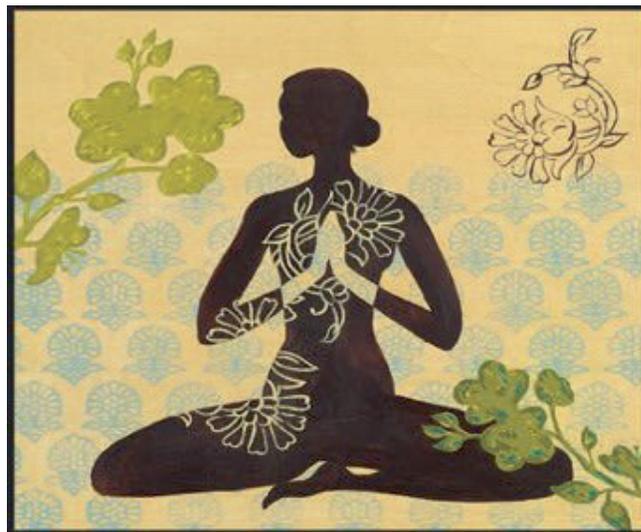
About RMIT

RMIT is a multi-sector university of technology, design and enterprise, with 96,277 students and close to 10,000 staff globally. The University's mission is to help shape the world through research, innovation and engagement, and to create transformative experiences for students to prepare them for life and work. Postgraduate, undergraduate, vocational education, foundation studies, and online programs offer students a variety of work-relevant pathways.

100% Renewable grid electricity on all Australian campuses – on target to become carbon neutral by 2025

#123 in the 2025 QS World University Rankings up 17 places from the previous year

#1 globally for reducing inequalities in Times Higher Education University Impact Rankings 2024



Acknowledgement of Country

RMIT University acknowledges the people of the Woi wurrung and Boon wurrung language groups of the eastern Kulin Nation on whose unceded lands we conduct the business of the University. RMIT University respectfully acknowledges their Ancestors and Elders, past and present. RMIT also acknowledges the Traditional Custodians and their Ancestors of the lands and waters across Australia where we conduct our business.



Artwork 'Luwaytini' by Mark Cleaver, Palawa



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We translate knowledge into action

CAMIC

Centre for Advanced Materials and Industrial Chemistry (CAMIC): A Hub for Multidisciplinary Innovation

Established in 2010, the Centre for Advanced Materials and Industrial Chemistry (CAMIC) is a premier multidisciplinary research facility dedicated to advancing scientific discovery across six key disciplines. Renowned for its state-of-the-art laboratories, CAMIC specializes in industrial chemistry, offering innovative research capabilities in critical minerals, advanced materials, nano-biotechnology, and chemical sensors, among other fields.

CAMIC benefits from diverse funding sources, including competitive government programs such as the National Competitive Grants Program (NCGP), alongside strategic collaborations with industry and international organizations. This broad funding base reflects the Centre's strong commitment to translational research and industry engagement.

At the core of CAMIC's research philosophy is a collaborative approach, fostering partnerships with industries, government agencies, and global research institutions. This multidisciplinary strategy enables the Centre to identify key challenges, develop innovative solutions, and facilitate commercialization, ensuring real-world impact.

With its emphasis on cutting-edge research, strategic partnerships, and a comprehensive research-to-commercialization framework, CAMIC continues to play a pivotal role in advancing industrial chemistry and materials science, positioning itself as a leader in the field.

CAMIC History

2010

Formation of CAMIC

Establishment of a multidisciplinary centre bridging advanced materials & Industrial chemistry

2012

First cohort of PhD graduates

Strengthen Postgraduate research training & mentorship culture

2014

Industry Collaborations expanded

Enhanced partnerships with major Industry stakeholders

2016

Global Research Impact

Recognition through high impact publications, patents, and awards

2020

Resilience during COVID-19

Successfully adapted operations & research during global challenges

2022

Post Pandemic transformation

Continued leadership & Innovation in the new normal

2024

Global Recognition

Secured over \$50 million in research funding: Impactful technology translation

CAMIC year in numbers

2023-2024

Connecting Research Excellence with Relevance

95 HDR



Student Completions

There were 41 higher degree by research completions in 2023, and 54 in 2024

+\$9.2 M



Research Funding

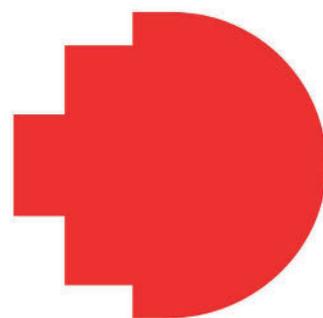
Over \$9.2 million of research funding income. There were 63 of active contracts 2023 and 48 in 2024.

+220



Research Outputs

With more than 220 papers published in 2023 & 2024 from CAMIC's research group, this represent a significant increase of 76% over the average for 2020-2022.



Director's Statement

Distinguished Professor Suresh Bhargava AM

Our members' efforts to strengthen and champion CAMIC are internationally recognised.

The past year has been one of renewed energy, reflection, and remarkable progress for CAMIC. Building on our strong foundation of innovation, collaboration, and excellence, we have continued to advance research that addresses some of the most critical scientific and societal challenges of our time.

Our collective achievements underscore CAMIC's enduring spirit of creativity and impact. From pioneering developments in catalysis, nanomaterials, and energy transformation to transformative partnerships with academia and industry, we continue to expand the frontiers of discovery and innovation. The steady rise in high-impact publications, major external funding successes, and the promotion of Associate Professor Hamid Arandiyani and Dr Selvakannan Periasamy reflect the strength of our collaborative ecosystem and the quality of leadership within our Centre.

This year also marked several milestones that reaffirm CAMIC's growing influence in the resource and clean energy sectors — including our strategic partnership with Queensland Pacific Metals (QPM), success in ARC Linkage and Industry PhD programs, and ARENA-funded projects in clean energy. Notably, CAMIC played a national leadership role in advancing Australia's mission within the global Green Hydrogen initiative, underscoring our commitment to a sustainable, low-carbon future.

Our interdisciplinary entrepreneurship continues to flourish. The success of our book, *Interlinking Additive Manufacturing in Chemical Sciences*

and Engineering — now translated into German and with over 20,000 copies sold worldwide—exemplifies CAMIC's global impact in science, engineering, and education. Equally, the recognition of academic leaders emerging from CAMIC — at RMIT, across Australia, and internationally — demonstrates how our vision continues to inspire change far beyond our walls.

At CAMIC, we believe our most valuable product is people — we make leaders in science and engineering for tomorrow. Our PhD graduates, now leading across academia, industry, and policy, embody the essence of impactful research, mentorship, and purpose-driven innovation.

On a personal note, I was deeply honoured to be conferred the Doctor of Science (DSc) by the Academy of Scientific and Innovative Research (AcSIR), India, in 2024 — an honour that I share with the entire CAMIC community, whose collective intelligence, creativity, and unwavering support drive every success.

As we look to the future, our mission is clear: to pioneer impactful research and innovation that create real-world change. With shared purpose and passion, we will continue to shape the future of advanced materials, catalysis, and industrial chemistry.

Together, we shine the brightest.



Distinguished Professor Suresh Bhargava AM

Director of Centre for Advanced Materials and Industrial Chemistry

FTSE, FNAE, FAAAS, FRSC, FRACI, FNASI, FTWAS-UNESCO

KIA Laureate and QPM Chair

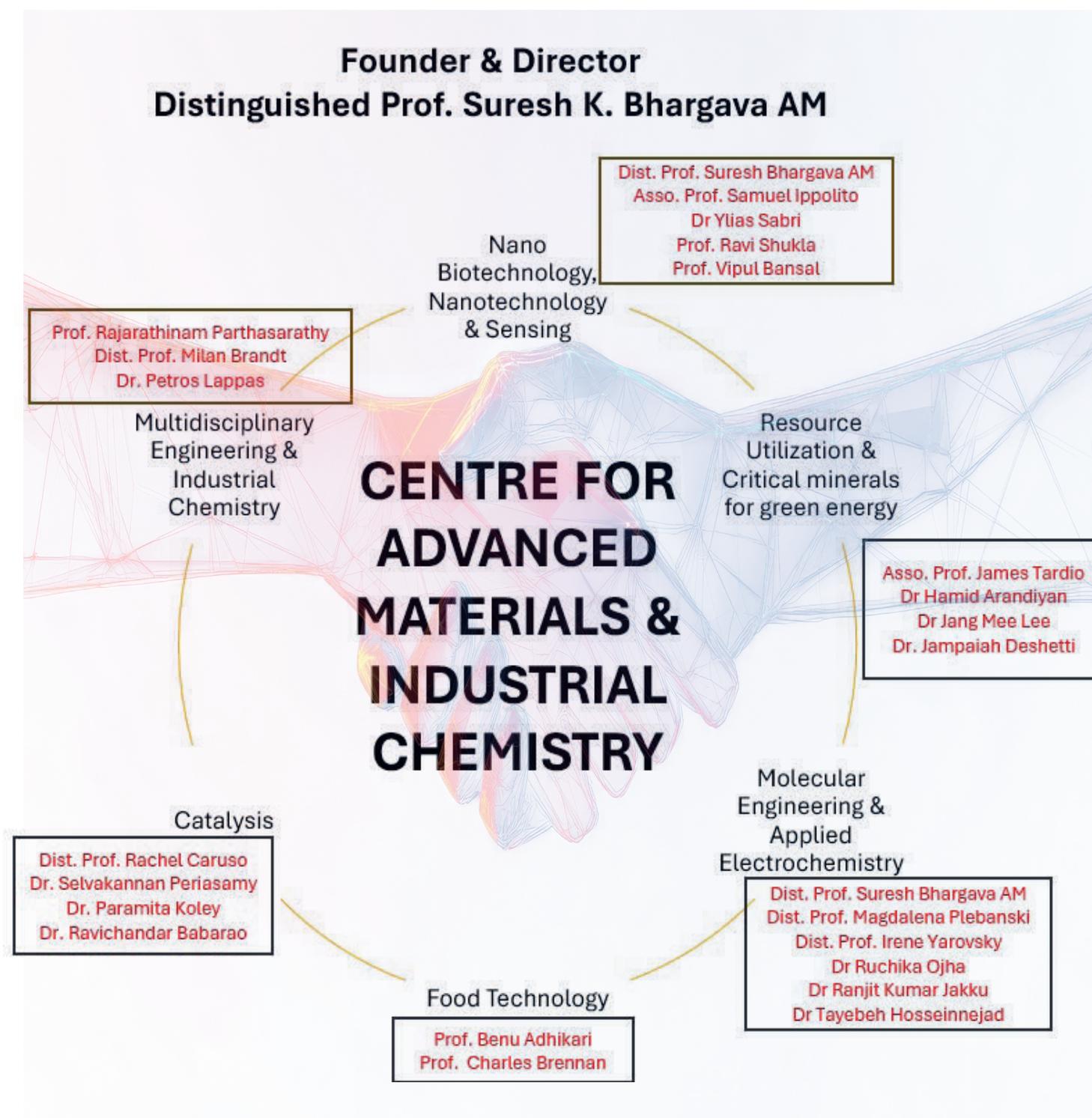
Research Partnerships (India), STEM College, RMIT University



CAMIC Structure



2023-2024

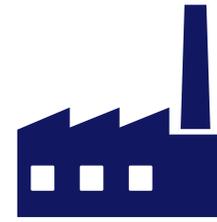


We provide solution engineering



CAMIC

Bridging Academia & Industry



CAMIC leaders and members are highly recognised researchers driven to create positive impact

CAMIC is rapidly growing both nationally and internationally, with companies worldwide approaching the Centre to engage in partnerships and collaborations. The Centre actively contributes to RMIT's international reputation and global ranking. Our research philosophy revolves around working in collaboration with both industry and government bodies to achieve the most impact. Together, with the diverse scientific backgrounds of our members,

we take a multidisciplinary and holistic solution-focused approach. Despite the challenges of the last few years, CAMIC has continued to be an active, world-class research centre.

Our diverse composition provides an inclusive and engaging environment across eight disciplines, promoting innovative problem solving, entrepreneurial thinking, and cross-disciplinary, global collaboration. Since 2022, due to demand and the rapid growth of the Centre, we have included a new discipline, Food technology, introducing new members and approaches to the Centre. We are looking forward to expanding our horizons and exploring new pathways.



CAMIC team, August 2024

Our Vision Your Future

CAMIC Redefining Innovation

The Centre's goal is to translate research excellence in sustainable industrial technologies into innovations that solve real-world problems. The Centre has a multidisciplinary approach to research, uniting researchers from chemistry, physics, biology, and engineering on one platform. It has strong ties with academic and industrial partners worldwide.

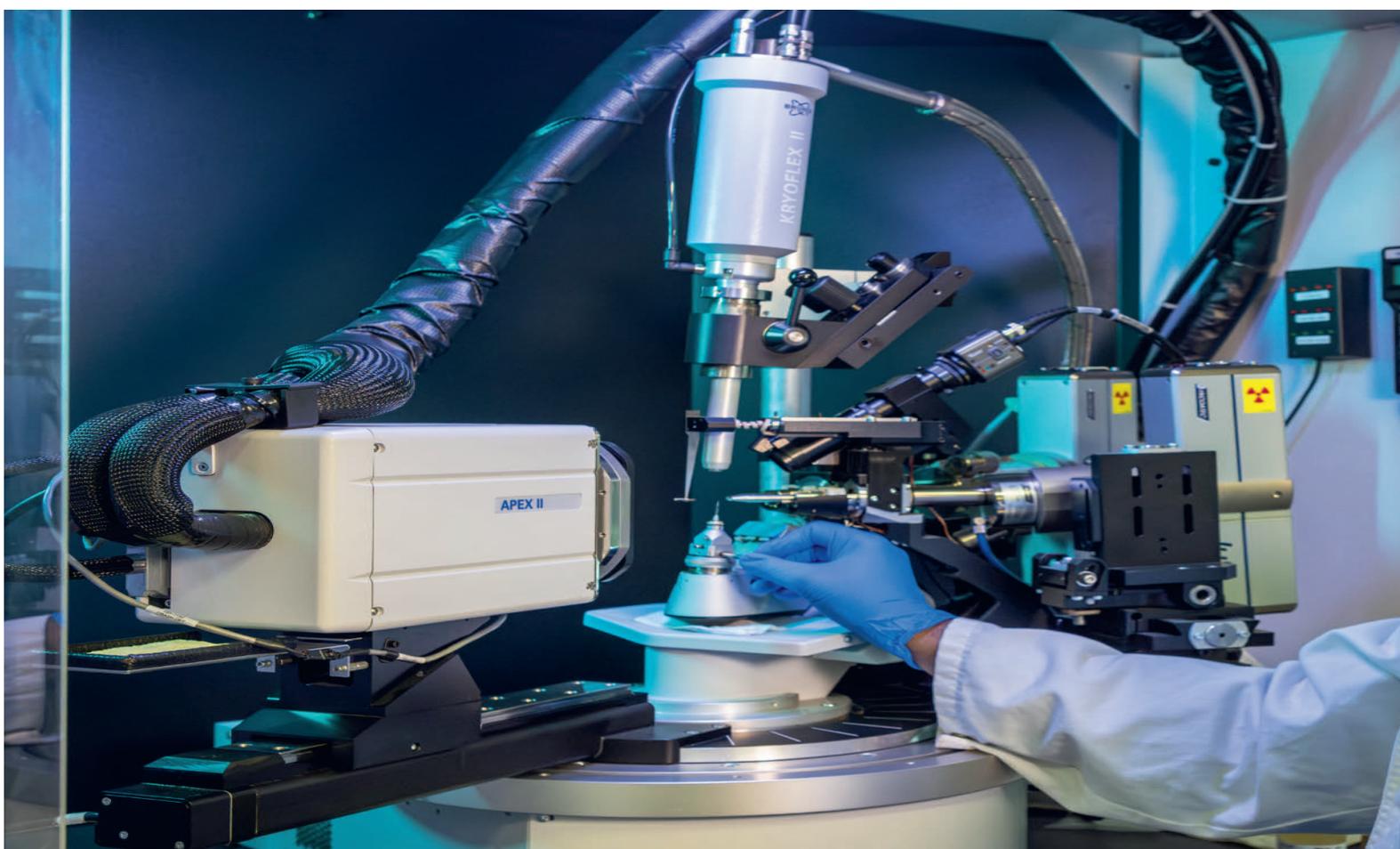
CAMIC is an international research Centre. Our students, associates, and collaborators come from over 25 countries globally. Diversity and inclusivity are the key pillar of our success, creating an environment that is dynamic, challenging, and innovative.

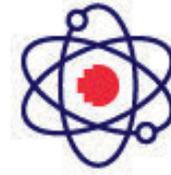
Despite the global challenges over the last few years, CAMIC has demonstrated its ability to adapt and thrive in the face of hardship.

Distinguished Professor Suresh Bhargava AM mentors the teams across the six disciplines as the Founding Director of CAMIC. Each discipline has its own laboratory platform, led by its own group leader(s).

CAMIC fosters a dynamic environment where each research group functions in its field of expertise and collaborates with other disciplines to form multidisciplinary approaches to innovation, research and enterprise.

In addition to the six disciplines, CAMIC maintains close ties with other departments within the School of Science and the STEM College at RMIT University, as well as external collaborators in other universities, industry and government, nationally and worldwide.





> 14 YEARS

RESULTS

For over 14 years CAMIC has been driving positive impact in research on an academic platform.

- Several awards have been received by our members in recognition of outstanding achievements.
- The external funding secured is a reflection of the recognition and prestige that CAMIC has been building over the last decade.
- CAMIC's members have managed to land and secure new projects in all 8 disciplines due to the high demand for partnerships and collaborations.
- Without a doubt, CAMIC has demonstrated its efficiency and ability to create unprecedented global solutions which has attracted media attention over the years.

Commitment

We are committed to striving for high impact research outcomes through active collaboration between our researchers, global network, students and industry.

Mission

We aim to provide an inclusive and engaging environment which promotes scientific and innovative thinking, producing research excellence with relevance, and enterprise-ready research graduates.

Vision

With an emphasis on strong industrial engagement and networks, CAMIC strives to produce excellent research and a new generation of globally trained graduates equipped with the tools to create disruptive innovations.



Disciplines

Food Technology

Novel food ingredients, biodegradable food packaging, alternative proteins, food for infants and elderly. Foods for dysphagia and diabetic sufferers.

Catalysis

Heterogeneous catalysis with industrial applications and computational materials design.

Molecular Engineering & Applied Electrochemistry

Complexes of gold, palladium & platinum for catalysis, sensing applications & anti-cancer drug development. New materials by electrochemical methods, fundamental and applied electrochemistry of metal surfaces, electrodeposition, inorganic materials & the surface chemistry of minerals.

Nano Biotechnology, Nanotechnology & Sensing

Industrial sensors for analytes of global environmental and health significance, such as mercury and hydrogen sensors.

Multidisciplinary Engineering & Industrial Chemistry

Process intensification, industrial catalysis, polymer composites & hybrids, dense gas/hydrothermal processing, & surface functionalisation and immobilisation.

Resource Utilization & Critical minerals for green energy

Chemical technologies related to mining, including environmental concerns, uranium, copper and ore leaching/processing and remediation



Advisory Board



Dr Karl Föger
FRACI
Board Chair
Ceramic Fuel
Cells, Australia

Dr Karl Föger is the Chair of the Centre for Advanced Materials & Industrial Chemistry (CAMIC) and an Adjunct Professor at RMIT University. As one of the initiators of solid oxide fuel cell (SOFC) technology in Australia, he has an international reputation in research and development in the energy and environmental fields and has published a number of papers on SOFC technology.



**Professor
Lakshmi
Kantam**
FNA, FNASC, FRSC
Committee
Member
Institute of Chem-
ical Technology
(ICT), India

Prof Kantam is the Dr B.P. Godrej Distinguished Professor of Green Chemistry and Sustainability Engineering at the Institute of Chemical Technology, Mumbai. She is the former Director of CSIR-IICT, Hyderabad. She is also a recipient of the RMIT International Visiting Foundation.



**Dr Stephen
Grocott**
FRACI, FAUSIMM
Committee
Member

Group Head, Processing & Legacy
NEWMONT, Australia

Dr Stephen Grocott has 40 years of experience in minerals processing, process development and industrial chemistry. Before joining NEWMONT, he was the Chief Technical Development Officer with Clean TeQ. He is an Adjunct Professor in Applied Sciences at RMIT University. He has worked extensively with and continues to work with CSIRO, CRCs, and international universities.

The Board provides independent strategic advice to CAMIC about its goals and focus. Its members include eminent scientists and industry leaders



Distinguished Professor Rachel Caruso

Deputy Director RMIT University

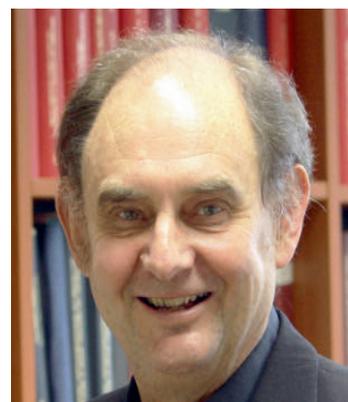
Distinguished Professor Rachel Caruso was previously an Australian Research Council funded research fellowship at The University of Melbourne. She moved to RMIT University in 2017 as Director of the Advanced Materials Enabling Capability Platform and is now a Distinguished Professor in the Applied Chemistry and Environmental Science discipline and Deputy Director of an Australian Research Council Centre of Excellence on Green Electrochemical Reduction of Carbon Dioxide.



Professor Rajarathinam Parthasarathy

Deputy Director RMIT University

Professor Rajarathinam Parthasarathy is a Professor of Chemical Engineering in the School of Engineering at RMIT. He obtained his PhD in Chemical Engineering from the University of Newcastle and has over 30 years of academic experience in overseas and Australian universities and over four years of experience in the oil and gas industry. He has authored 210 publications in journals and conferences and supervised forty-two graduate students (PhD and Research Masters degree). He is a Fellow of the Institution of Chemical Engineers (IChemE) UK.



Professor Alan Bond FAA, FRSC

Monash University

Emeritus Professor Alan Bond was the R. L. Martin Distinguished Professor of Chemistry at Monash University. His research has provided the basis for developments in the theory, instrumentation and applications of cyclic alternating-current voltammetry; He held a Federation Fellowship and was the Deputy Director of the ARC Special Centre for Green Chemistry, in which he is still active.



Distinguished Professor Suresh Bhargava AM FTSE, FNAE, FAAAS, FRSC, FRACI, FNASI, FTWAS-UNESCO, KIA LAUREATE Founder and Director

Distinguished Professor Suresh Bhargava is a world-renowned interdisciplinary scientist. He is among the top 1% scientists in the resources sector and has supervised over 75 PhD students at RMIT. He has passionately strived over the years to create solid and sustainable global research partnerships to improve and advance Science and Technology.

CAMIC members



**Distinguished
Professor Milan
Brandt**

RMIT University

Distinguished Professor Milan Brandt is the Director of RMIT's Advanced Manufacturing Precinct and the Centre for Additive Manufacturing, which he established in 2013. A leading Australian researcher in laser-based macro machining and additive manufacturing, he has made significant contributions to laser cladding, cutting, drilling, welding, and additive manufacturing over the past 14 years. His research has led to technological advancements, patents, commercial products, and international recognition.

Prof. Brandt is a Fellow of the Laser Institute of America, an Honorary Fellow of Weld Australia, and holds affiliations with Melbourne University and the University of Waterloo. He served as President of the Laser Institute of America in 2018 and was named Engineers Australia Centenary Hero for his role in developing Australia's first 3D-printed spinal implant. In 2020, he received the prestigious Arthur L. Schawlow Award for his contributions to laser applications.



**Distinguished
Professor
Magdalena
Plebanski**

RMIT University

Distinguished Professor Magdalena Plebanski is a globally recognized immunologist and leader in translational immunology and bioengineering. She heads the Cancer, Ageing, and Vaccines Laboratory at RMIT and directs the Biomedical & Health Innovation Enabling Impact Platform. Her pioneering work on malaria immunology and nanoparticle-based vaccines led to 40 patents and two commercialized biotech companies. Currently, she focuses on ovarian cancer diagnostics and gold-based immunotherapies. With over 200 publications in top journals and \$30M in research funding, she also mentors researchers, fosters multidisciplinary collaborations, and advances mental health initiatives. Her impactful leadership drives innovation in immunology, ageing, and personalized medicine.



**Distinguished
Professor Irene
Yarovsky**

RMIT University

Distinguished Professor Irene Yarovsky leads the Materials Modelling and Simulation research group at RMIT University and serves as a Visiting Professor in the Department of Materials at Imperial College London.

Her research specializes in computational modeling to understand the interactions between biological molecules and nanomaterials, aiming to design innovative materials for engineering and biomedical applications.

Her work has contributed to the development of more effective drug delivery systems, tissue regeneration scaffolds, and contamination-resistant surfaces.

She is a Fellow of the Australian Academy of Technological Sciences and Engineering, the Royal Society of Chemistry (UK), and the Royal Australian Chemical Institute.



Group Leaders



Dr Selvakannan Periasamy

CATALYSIS

Dr Periasamy has been a Group Leader for the Catalysis Group at RMIT University since 2010. He is keenly interested in heterogeneous catalysis, CO₂ utilisation, methane activation, endothermic fuels for high-speed flight vehicles, nanostructured catalysts, surface-enhanced Raman scattering, and additive manufacturing practices in catalysis. He has published 81 papers in international peer-reviewed journals, edited a book, and authored three book chapters. His h-index is 37, and his publications have been cited 5400 times. Before joining RMIT, he worked as a Research Fellow at the University of Paris-Sud, France, from 2007 to 2009 and as a Research Scientist at the Innovation Centre, Tata Chemicals Ltd, India, from 2005 to 2007. He earned his PhD from the National Chemical Laboratory in India in 2005. Also holds a master's and bachelor's degree in chemistry from the American College, India.



Dr Ravichandar Babarao

CATALYSIS

Associate Professor Ravichandar Babarao leads the Molecular Modelling Team at RMIT University and is a visiting scientist at CSIRO. Recognized for his contributions to energy and environmental sustainability, he has received numerous awards, including the 2015 Prosper.net Scopus Young Scientist Award, the Alexander von Humboldt Fellowship, the 2016 RACI Rennie Memorial Medal, the Victoria Fellowship, and the 2019 Peter Schwedtfeger Award. He was named among the 2020 Class of Influential Researchers by Industrial Engineering and Chemistry Research and won the 2023 RMIT School of Science Established Researcher Award – Mid-Career Researcher. In 2023 and 2024, he secured eight grants and published 22 papers (14 in 2024 and 8 in 2023). His research focuses on computational discovery of novel porous materials, particularly metal-organic frameworks, for sustainable energy & environmental applications.



Dr. James Tardio

RESOURCE UTILISATION

James has been a member of CAMIC for over ten years, with research interests in minerals/ores characterization, hydrometallurgy, catalysis, and water treatment, and has supervised over 25 PhD and Master's students. He has secured grants such as the 50k funding for the Phosphorus project from Rio Tinto in 2024, Synchrotron EXAFS funding with Paramita Koley as the lead CI, and an ARC Linkage grant with Suresh and Hamid.



Prof. Charles Brennan
FOOD TECHNOLOGY

Professor Charles Brennan is a distinguished academic at RMIT University, serving as the Chief Scientific Director of the Food & Nutrition Innovation Hub. His research focuses on the interface between food science and human nutrition, with a particular interest in how bio-active ingredients and processing affect the nutritional quality of foods, especially the role of plant dietary fiber in managing the glycemic response.

In 2023 and 2024, Professor Brennan published a total of 112 scholarly works, reflecting his active engagement in advancing knowledge in his field. He also hosts a series titled “Coffee with the Editor,” which is available on YouTube and has been adapted into podcast form on platforms such as Spotify.

His contributions continue to influence both academic and industry practices globally, making him a leading figure in food science and human nutrition.



Prof. Vipul Bansal
NANO-BIOTECHNOLOGY

Professor Vipul Bansal is the Director of the Sir Ian Potter NanoBioSensing Facility, and the Group Leader of the RMIT Nano-Biotechnology Research Laboratory (NBRL). He leads a trans-disciplinary research team that collaborates across the intersection of chemistry, biology, physics, engineering and design to provide nanotechnology solutions for health, environment and energy issues that have industrial importance and high social impact. Professor Bansal is leading the development of a nano-diagnostic hub which will play a critical role in the early diagnosis of a variety of diseases, food and environmental problems. This includes a product, currently in clinical trials, that will aid cancer diagnoses and development of next-generation cellular immunotherapies. His work has received over 14,613 citations with an h-index of 66, along with a host of awards and media coverage for advances made by his team.



Prof. Benu Adhikari
FOOD TECHNOLOGY

Professor Adhikari, a research-teaching professor at RMIT University, has a strong educational and professional background in food material science. He obtained his bachelor’s and master’s degrees in food engineering from Jiangnan University, China, and AIT, Thailand, respectively, and his PhD in Chemical Engineering, focusing on Food Engineering at UQ, Australia. He was awarded prestigious fellowships by the Australian Research Council. His research focuses on material science, engineering, and processing aspects of food, covering proteins, phytochemicals, packaging, powders, and new ingredients. He has authored more than 400 refereed journal papers and 15 book chapters, with over 30,000 citations and an H-index of 97. He serves on Editorial Boards of several journals in the Food Science/Engineering discipline and has an impressive record of supervising and mentoring PhD scholars and postdoctoral fellows.

Group Leaders



Dr Hamid Arandiyani
CRITICAL MINERALS
FOR CLEAN ENERGY

Dr. Hamid Arandiyani leads the Critical Minerals for Clean Energy (CMCE) Research Group at CAMIC and is a Senior Industry Research Fellow at RMIT University. His research focuses on resource recovery, environmental remediation, energy applications, hydrometallurgy, and solid-state chemistry. He is a Fellow of the Royal Society of Chemistry (FRSC) and a Chartered Chemist (MRACI CChem). His accolades include the Dean's Research Excellence Award at RMIT and election as a Fellow of the Royal Society of Chemistry, London.



Dr Jang Mee Lee
CRITICAL MINERALS & RE-
SOURCE UTILISATION

Dr Jang Mee Lee has been working on the synthesis and characterisation of low-dimensional nanomaterial based nanohybrids for diverse energy applications such as photocatalysis, Li/Na/K-ion batteries, supercapacitor and electrocatalysis. In addition, for a mechanism understanding, she is passionate about in-situ characterizations of high-performing nanomaterials when they are at catalytic function, such as in-situ x-ray absorption spectroscopy (XAS) with EXAFS fitting to gain the critical insight in terms of local structural alteration or physicochemical properties. After moving to RMIT University, she is expanding her research area to critical metal extraction through a collaboration with Queensland Pacific Metals (QPM) industry partner.



Prof. Ravi Shukla
NANOBIOTECHNOLOGY

Dr Ravi Shukla is an Professor of Bioscience & Food Technology at RMIT University, leading the Targeted Theranostics and NanoBiotechnology research program and coordinating the Biotechnology teaching program. With a PhD in Cell Biology and experience as a post-doctoral researcher at NIH's Cancer Nanotechnology Platform, his research focus on understanding materials-biomolecular interactions and designing targeted theragnostic, molecular biosensors, non-viral nucleic acid delivery, and tissue-engineered materials for diseases. Dr Shukla is a co-editor in chief of Current Research in Nutrition & Food Science and an Associate Editor for Frontiers in Bioscience & Bioengineering. He has supervised 15 PhD, 5 Masters, and over 50 undergraduate researchers, with over 8000 citations and an h-index of 40.



Dr Ruchika Ojha
MOLECULAR ENGINEERING

Dr. Ruchika Ojha, a Vice-Chancellor's Research Fellow at RMIT University's School of Science, is a synthetic chemist and electrochemist specializing in cancer therapeutics and energy storage. She leads the Molecular Engineering Group (MEG) at CAMIC with Prof. Suresh Bhargava, focusing on gold and bimetallic (gold-platinum) anticancer drugs. Her research extends to metal complexes, activated carbon materials, and hydrogen storage.

Dr. Ojha has received significant grants, including support from ABC Bullion and the Australian Synchrotron. Her work has gained global media coverage, reaching 97 million people. She has attended and organized major conferences, including leading the 2024 Diwali event with a team of four.



Dr Ylias Sabri
NANOTECHNOLOGY & SENSING

Dr Ylias Sabri is a Senior Lecturer in the School of Engineering at RMIT University. He is also a Group Co-Leader for Nanotechnology and Sensing within CAMIC, where he leads research in waste management and pollution control. Dr Sabri has published one book chapter, over 90 journal articles and four major patents, and has worked on several industrial research projects over the past 12 years with companies such as Cement Australia, Agilent Technologies, Rio Tinto, ExxonMobil, Alcoa World Alumina, and BHP Billiton Worsley Alumina. He has received several awards, including the Megan Clark award at the RACI Centenary Congress in 2017, the RMIT Invention Disclosure award, AINSE travel awards, and Surface Science awards. He is constantly seeking to develop long-term collaborations in chemical sensor technology developments for pollution control and waste upcycling to value-added products.



Dr. Samuel Ippolito
NANOTECHNOLOGY & SENSING

Dr Samuel Ippolito is an Associate Professor at RMIT University in the School of Engineering, responsible for teaching courses in embedded C++ programming, advanced software engineering design, and real-time operating systems. His research interests include machine learning for chemical classification, development of chemical sensors for industrial sensing applications, and mercury removal technologies for coal-fired power generation and alumina refinery effluent control. He has been involved in several large joint industrial research projects and has helped commercialize chemical sensing technology. He has over 120 publications and has supervised 17 PhD students and 1 MSc graduate, currently supervising 6 PhD and 1 Master's students.

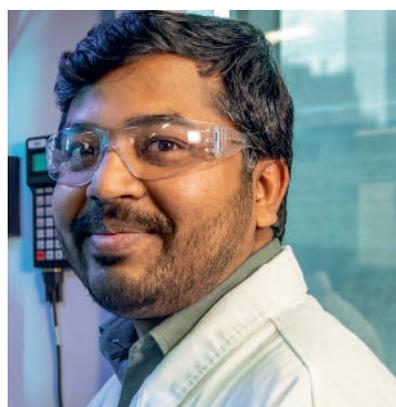


Research Fellows



Dr Paramita Koley

Dr Paramita Koley received her PhD in Applied Chemistry in 2020 from CAMIC, where she focused on developing catalysts for converting biomass-derived molecules into valuable chemicals. She is now a Post-Doctoral Research Fellow in CAMIC. She has expertise in synthesizing various materials, including metal-organic frameworks and metal oxides, for catalytic purposes and in handling instrumental techniques. Her research interests include converting biomass-derived chemicals into fuel/fuel additives, glycerol conversion into value added chemicals, photocatalytic water splitting, and CO₂ reduction. She has published her research in reputed journals and continues on carbon dioxide conversion into advantageous chemicals such as acetic acid, formic acid, methanol, and ethers. She aims to achieve a carbon-neutral environment and reduce the adverse effects of global warming.



Dr Ranjithkumar Jakku

Dr Ranjithkumar Jakku received his Ph.D. in Applied Chemistry from RMIT University, Australia, and completed a Master of Science degree in Chemistry at Osmania University, India. Currently, he is working as a Postdoctoral Researcher under the supervision of Prof. Suresh K Bhargava at the Centre for Advanced Materials and Industrial Chemistry (CAMIC), RMIT. His research interests are developing organic fluorophores for the ultra-sensitive detection of toxic metal ions. He has also explored his research on the preparation and characterisation of organometallic complexes, focusing on their reactivity and medicinal applications. Dr Jakku has multiple publications in international peer-reviewed journals with 1,221 reads.



Dr Tayebbeh Hosseinnejad

Tayebbeh Hosseinnejad earned her PhD in Physical Chemistry from the University of Tehran. She is a dedicated and skilled physical chemist with extensive expertise in various professional computational chemistry packages. With 53 publications in international peer-reviewed journals and an h-index of 20, Tayebbeh has made significant contributions to the field. She spent 12 years as an academic in the Department of Chemistry at Alzahra University, Iran, and is currently a postdoctoral researcher with the Molecular Engineering Group and Catalysis Group at CAMIC. Her current research centers on the structure and properties of gold-based compounds, their anticancer bioactivities, and the catalytic activity of MOF-based materials. Tayebbeh's primary research interests include Density Functional Theory (DFT), computational organic and inorganic chemistry, and catalysis design.



Dr. Sampath (Jampaiah) Deshetti completed his master's in chemistry from IIT Madras in 2010 and his PhD in Applied Chemistry in 2016. He worked as a postdoctoral researcher at CAMIC, RMIT, and the University of Antwerp. With 60 publications and an h-index of 33, his research focuses on nanomaterials for energy and environmental applications, including CO₂ reduction, biomass valorization, and ammonia synthesis. During his PhD, he was awarded the prestigious Dr. Megan Clark Excellence Award in 2014 for being the best postgraduate research student in the field of Australian minerals, resources, science, and technology.

Dr Jampaiah Deshetti



Dr. Uzma Malik is a Postdoctoral Research Fellow at RMIT University, specializing in advanced sensor fabrication on additively manufactured metal structures. She focuses on nanomaterials, carbon materials, and porous materials for applications in Raman sensing, pollutant detection, and catalysis. Her research includes metal deposition on 3D-printed structures for enhanced sensing, hydrogen production from eucalyptus oil decomposition, and bio-sensing for malaria detection. With expertise in electrochemistry, catalysis, photocatalysis, and material characterization, she is dedicated to advancing sensor technology and sustainable energy solutions.

Dr Uzma Malik



Dr. Sunil Mehla is a senior experimentalist at Scimita Ventures, NSW, leading the CRC Round 16 project on lithium-ion battery recycling. He holds degrees in chemistry from IIT Kanpur and chemical engineering (catalysis) from IIT Madras. From 2012–2018, he worked as a scientist at Hindustan Petroleum R&D Centre, developing catalysts for fluid catalytic cracking, hydroisomerization, & hydrotreating. He completed his PhD at RMIT (2018–2022) on gold microelectrode arrays for SERS-based sensing and was a postdoctoral researcher (2023–2024) under Prof. Bhargava, exploring additive manufacturing in critical mineral production. His research focuses on advanced manufacturing, nanofabrication, electrochemistry, porous nanomaterials, and thin films.

Dr Sunil Mehla



Higher Degree Research Students

2023 and 2024

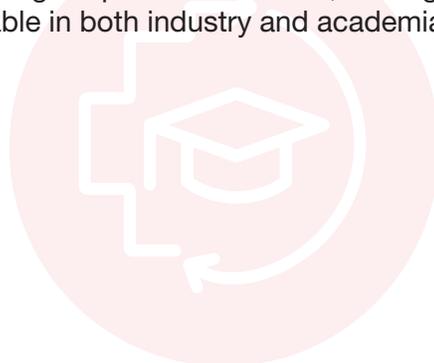
CAMIC's mentorship and HDR supervision foster student growth by providing a high-quality learning environment and promoting lifelong learning opportunities for academic and professional success.

Over the past decade, the Centre for Advanced Materials and Industrial Chemistry (CAMIC) has mentored and supervised more than **150** Higher Degree by Research (HDR) students, contributing significantly to RMIT University and the broader academic and research community in Australia. Recognizing the profound responsibility that comes with mentorship, we are committed to fostering resilience in our students, equipping them to navigate future challenges, and ensuring their research and intellectual growth continue to thrive.

At CAMIC, we prioritize providing a safe, supportive, and inclusive environment for our students, particularly those new to the field or working in unfamiliar research settings. We strive to cultivate a strong sense of community and trust, enabling students to focus on their research with confidence, free from the fear of failure or judgment.

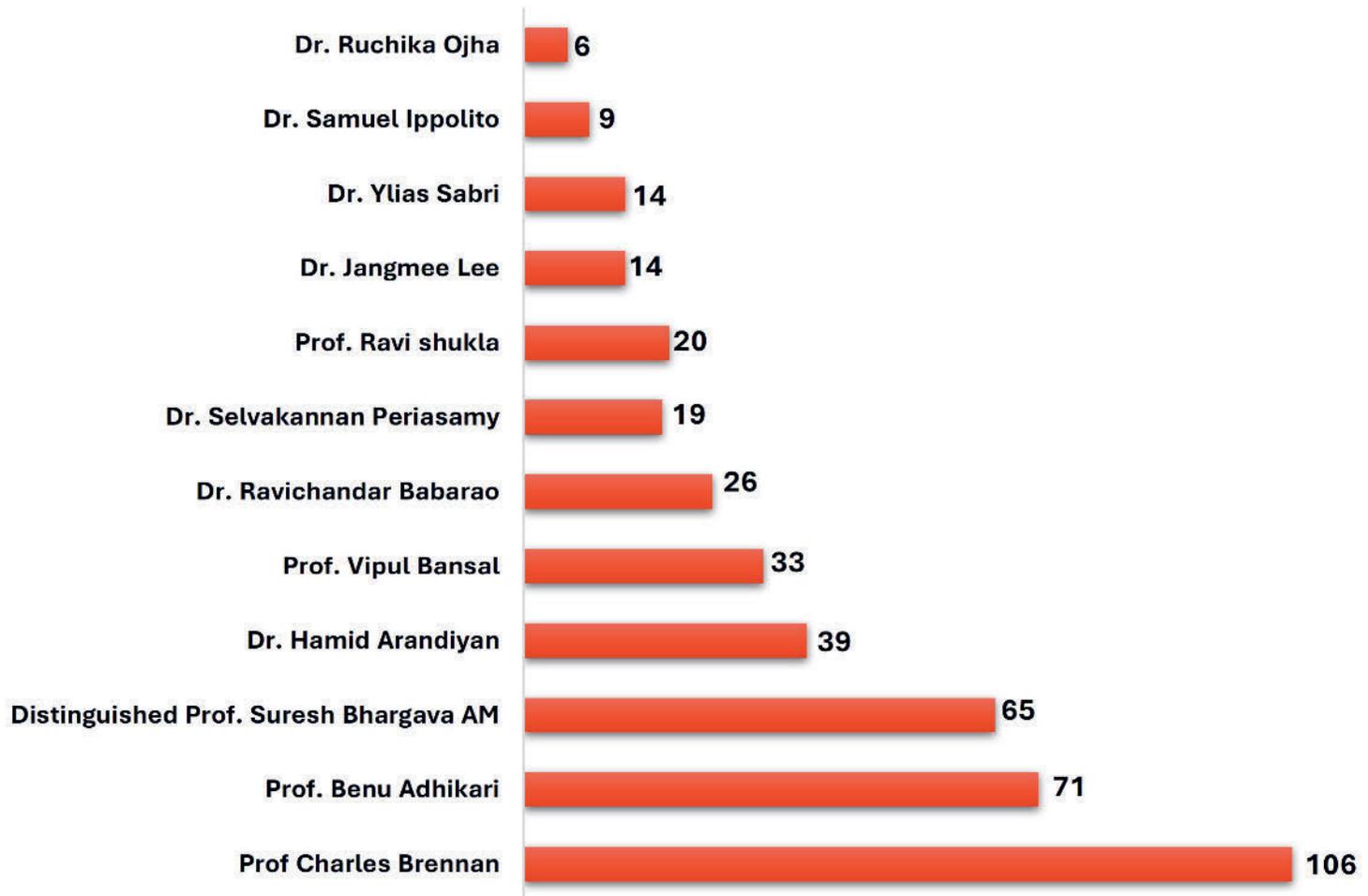
We acknowledge the demanding nature of research and the challenges it presents. As such, we are dedicated to offering continuous support throughout our students' academic journeys. Our approach emphasizes creativity, innovation, and collaboration, while also ensuring that students develop the skills and resilience required for long-term success in their respective fields.

As of the end of 2024, we had **95** HDR graduate students who were being equipped with a diverse range of professional skills, making them employable in both industry and academia.



Publications (2023-2024)

Individual Contribution Summary



Testimonies



Navya P. Nagaraju

Being part of the CAMIC lab under the supervision of Prof. Suresh Bhargava has been an enriching and inspiring experience. The lab's interdisciplinary environment and collaborative spirit provide an ideal setting to explore new ideas and strengthen my research capabilities.

Prof. Bhargava's emphasis on innovation, integrity, and real-world impact has significantly influenced the way I approach my research.

The supportive atmosphere within the CAMIC lab fosters open communication, teamwork, and mutual learning. Interactions with talented and motivated colleagues have greatly contributed to both my professional growth and personal development. My journey at the CAMIC Lab continues to be highly rewarding, offering valuable opportunities to learn, innovate, and contribute meaningfully to the group's research goals.



Neha Nandal

As a final-year PhD student at the Centre for Advanced Materials and Industrial Chemistry (CAMIC), RMIT University, I work under the supervision of Dist. Prof. Suresh Bhargava, Dr James Tardio, and Dr Selvakannan Periasamy. CAMIC provides a highly collaborative and multidisciplinary research environment that integrates industrial chemistry, materials science, and chemical engineering to address real-world challenges. My research, supported by CAMIC's strong industry partnerships, focuses on the thermal decomposition of magnesium nitrate hexahydrate using a lab-scale fluidized bed reactor, in collaboration with Queensland Pacific Metals (QPM) Energy. This project applies CAMIC's interdisciplinary approach to developing sustainable industrial processes and contributes to the Centre's mission of translating advanced materials research into impactful real-world solutions. Being part of CAMIC has provided an exceptional platform for growth as a researcher and contributed to advancing innovative, industry-relevant science.

CAMIC's constant dedication to provide HDR students a transformative experience to develop skills, opportunities and innovation outcomes



HDR Students

Graduation 2023-2024

Venkatakrishnan Balasubramanian
Doctor of Philosophy



College of Science,
Technology,
Engineering and
Mathematics
School of Engineering

C25

Techno-economic Evaluation of Integrated Green Hydrogen System



Ongoing HDR Candidates (Selected)

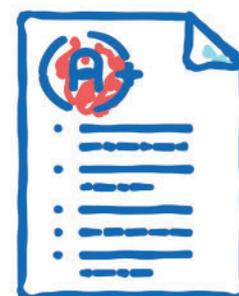
Candidate Name	Expected Submission Year
Jamila Nisar (Australia)	2025
Udari Fernando (Australia)	2025
Neha Nandal (India)	2026
Amrin Begum (Bangladesh)	2026
Sapna Srivastava (India)	2026
Jyotishman Kaishyop (India)	2026
Navya Nagaraju (India)	2026
Nikita Ram (India)	2027
Pooran Kumar (India)	2027
Shailza Sharma (India)	2027
Pallavi Saini (India)	2027
Malik Ali Saggu (Pakistan)	2027
Deus Msumange (Kenya)	2027
Sabrina Mostofa (Iran)	2028
Momene Rezaee (Afghanistan)	2028
Diana Gomez (Mexico)	2028
Arthur Hentschel (Germany)	2028

Alumni

Job -ready Graduates



Selected 2023-24 Graduates



Md Khairul Islam
Passing Year: 2023
Scientist
BCSIR, Bangladesh



Uzma Malik
Passing Year: 2023
Postdoctoral Research Fellow
RMIT University, Australia



Ankit Bhoriya
Passing Year: 2024
Researcher
NPL, India



Zeeshan Arif
Passing Year: 2024
Researcher
CSIR-IITR, India



Shakil Ahmed Polash, PhD
Passing Year: 2024
Postdoctoral Research Assistant,
Applied Chemistry
RMIT University, Australia



Venkatakrisnhan Balasubramanian
Passing Year: 2024
Postdoctoral Researcher
RMIT University, Australia



Research & Innovation

Adjunct Professors, Associates and Visitors

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Adjunct Professors

- Prof. Alan Bond (FAA, FRACI), Monash University
- Prof. Jochen Petersen, University of Cape Town, South Africa
- Prof. Kazunari Domen, The University of Tokyo, Japan
- Prof. Paul Weiss, University of California, USA
- Dr. Karl Föger (FRACI), Ceramic Fuel Cells
- Prof. Lakshmi Kantam (FNA), Institute of Chemical Technology, Mumbai, India
- Dr Stephen Grocott, Queensland Pacific Metals
- Dr Andrew Hind, Agilent Technologies
- Dr Mark Pownceby, CSIRO
- Dr Patrick Hartley, CSIRO
- Dr. Lathe Jones, CSIC (Spain)

Distinguished Visitors

- Prof. Richard Kaner, University of California, USA



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- Jahangirnagar University
- University of Tokyo
- Osaka University
- University of Tsukuba
- Kyushu University
- University of Malaya
- Bangladesh Council of Scientific and Industrial Research

INDIA

- NRLBB
- King Saud University
- Institute of Chemical Technology (ICT)
- Indian Institute of Technology Bombay (IITB)
- Council of Scientific and Industrial Research (CSIR)
- Amity University
- Central University of Gujarat
- Indian Institute of Petroleum (IIP)

Australia

- Queensland Pacific Metals
- Rio Tinto
- Monash University
- Flinders University
- Clean TeQ Limited
- University of Melbourne
- Australian National University
- University of Sydney
- CSIRO
- Bioelektra
- Regain Materials, Australia
- University of New South Wales
- University of Queensland

AFRICA,
of Cape Town

- Countries

2023 and 2024 Achievements



Honours Awarded

Congratulations to Dist. Professor Suresh Bhargava AM, who was honoured with the SASTRA-CNR Rao Award from SASTRA Deemed University (India)

Innovative Testing for Infections

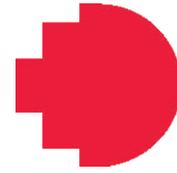
Congratulations to the Nanobiotechnology group leader, Professor Vipul Bansal who is leading RMIT in a consortium awarded \$3 million in funding in the latest Cooperative Research Centres Projects (CRC-P) round for StrepSure®, a sensor technology that's anticipated to be able to identify GBS bacteria within minutes.

RMIT has already filed a provisional patent application to protect the key intellectual property underpinning the GBS sensor technology.



ARC funding awarded

Congratulations to Dist. Prof Suresh Bhargava, Assoc. Prof James Tardio, and Dr Hamid Arandiyan for their successfully funded ARC Linkage Project partnering with QPM. Revolutionising critical metals refining for EV batteries production: Teaming up with Queensland Pacific Metals (QPM), we're developing a ground-breaking method to extract Nickel and Cobalt from laterite resources at atmospheric pressure. This eco-friendly approach aims to bolster the global Lithium-Ion battery market and support electric vehicle innovation.



Partnership Extension

IICT extension of contract.



AcSIR/RMIT Graduation

Congratulations to recent graduates of the RMIT-AcSIR Joint Research Program. Distinguished Professor Suresh Bhargava was the Special Guest at the 7th AcSIR Convocation in Delhi, November 2023.

Visit to Max Healthcare

In November 2023, a collaborative visit between Dist. Prof Magdalena Plebanski and oncologists from Max HealthCare, facilitated by partnerships with ICMR, expanded the program's medical research scope and integrated medical innovation into its core achievements. RMIT is now connected with the prestigious Indian Council of Medical Research (ICMR) laboratories under a new agreement, paving the way for future collaborations. ICMR operates 26 national institutes, each specializing in critical health research areas including tuberculosis, leprosy, cholera, diarrheal diseases, viral diseases (such as AIDS), malaria, kala-azar, vector control, nutrition, food and drug toxicology, reproduction, immunohematology, oncology, medical statistics, and more.



Agilent funding

Prof. Bhargava honored with the ACT-UR Award. This ACT-UR award is valued at \$49,600 (USD). This recognition highlights exceptional research contributions and supports on the topic of “Design and additive manufacturing of reflective grating masters using Two-Photon Direct Write Lithography.”



ARC LIEF

Congratulations to Dr Arandiyan on the successful ARC-LIEF23 bid, which installs the first in-house suite of X-ray Absorption Spectroscopy in Australia. He submitted a Horizon Europe Grant as a Lead CI with >\$8M budget. He was elected as a Fellow of FRSC in Cambridge and attended RACI 2022 National Congress in Brisbane, Australia, and visited CSIR-IMMT in Bhubaneswar and IICT in Hyderabad, India



Donation from ABC Bullion

Pallion subsidiary ABC Bullion committed an annual donation of 250 grams of pure Australian gold – valued at more than AUD \$30,000 – to support the research. This groundbreaking project led by Bhargava and Plebanski brings together a dynamic team of young scientists including Dr Srinivasa Reddy, Dr Steven Priver, Dr Ruchika Ojha, Dr Ranjith Jakku, and Dr Tayebbeh Hosseinnejad.



Highlights



Dr. Ashish Lele, Director of NCL, visited RMIT, touring labs and engaging with staff and students. He explored research initiatives, discussed collaborations, and shared insights on emerging scientific challenges. His visit strengthened ties between NCL and RMIT, fostering future research opportunities.



VIP dinner in recognition of Dr. Ashish Lele



Dr. Kenny Cheung, Head of Laboratory at ABC Refinery, and Clare Deloughery, Head of Philanthropy at Pallion, joined distinguished Prof. Suresh Bhargava (AM), Prof. Magdalena Plebanski, Dr. Ruchika Ojha, and the RMIT Research Team to celebrate their "golden collaboration."

Gold beats platinum for chemo drugs in new lab study :RMIT News



From left: Study first author Dr Srinivasa Reddy, Distinguished Professor Magdalena Plebanski, Dr Ranjithkumar Jakkur, Distinguished Professor Suresh Bhargava AM, Dr Ruchika Ojha.

News Code:



CAMIC- A Platform for Disruptive Innovation

Highlights

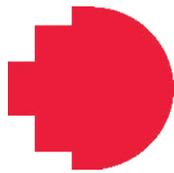


Receiving Doctor of Science

Distinguished Prof. Suresh K. Bhargava Am received have been honoured with the Degree of Doctor of Science, Honoris Causa, by the Academy of Scientific and Innovative Research (AcSIR). This prestigious recognition will be conferred during the 8th Convocation of AcSIR on 23rd November 2024.



Japanese students touring the Civil Engineering Laboratories at RMIT Bundoora Campus – March 2024



Our diversity of expertise and research projects has made CAMIC a highly desirable partner in industrial and academic collaborations

Distinguished Professor Suresh Bhargava AM led the Australian Hydrogen Research Mission in India in November 2023

The Department of Climate Change, Energy the Environment and Water (DCCEEW) funded the CSIRO-led Hydrogen RD&D International Collaboration Program, with the aim to strengthen the emerging Australian Hydrogen Research Network (AHRN). Fostering connections across Australia's hydrogen research community, and now expanding internationally, Dist. Prof Bhargava led the Australian delegation through India, visiting research institutes and universities, potential industry partners, and attending symposiums such as the Symposium on Green Technology (Mumbai & West India), and Indo-Australian Joint Meeting on Green Hydrogen.

Find out more about the Australian Hydrogen Research Network here:



Australian Hydrogen Research Mission to India
19 - 25 November 2023

Developing a global intellectual infrastructure for green hydrogen energy
The Mission's goal is to provide opportunities for scientists from Australia and India to work together and foster collaborative global research networks to develop innovative and sustainable technologies.

Delegates:

- Dist. Prof Suresh Bhargava AM RMIT University
- Dr Patrick Hartley CSIRO
- Mr Dan O'Sullivan CSIRO
- Ms May Liak CSIRO
- Prof Behdad Moghtaderi The University of Newcastle
- Dr Jafar Zanganeh The University of Newcastle
- Mr Breandan Skinner Department of Climate Change, Energy, the Environment and Water
- Prof Ian Macgill University of NSW
- Prof Ken Baldwin Australian National University
- Prof Paul Medwell University of Adelaide
- Prof Sally McArthur Deakin University
- Prof Nolene Byrne Deakin University
- Dr Sarb Giddey CSIRO
- Dr Petros Lappas RMIT University

Mr Dan O'Sullivan, CSIRO CSIRO Coordinator

Ms May Liak, CSIRO CSIRO Coordinator

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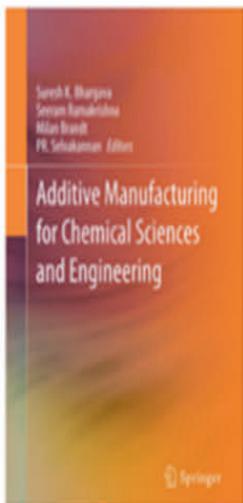




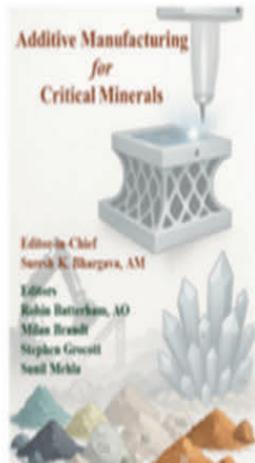
“Always believe and trust in yourself, as you are capable of achieving even more than what someone else has done. At CAMIC, we strive to provide you with the necessary resources, both technical and intellectual, to match your efforts and take your skills to the next level”

Distinguished Professor Suresh Bhargava AM

AM+ - Book on AM for chemical Sciences



Upcoming Book



Upcoming Book



- First book in AM for the Chemical Sciences and Engg. Community
- Originated from RMIT and involved some HDR students





**Mining the intelligent
minds for tomorrow**



Funding Highlights



This diverse range of funding sources reflects CAMIC’s multidisciplinary approach and ongoing efforts to expand its collaborations and partnership initiatives.

Funding Report for the year ending 2023 and 2024



CREDITOR



FINANCIAL GOALS



INCREASE REVENUE



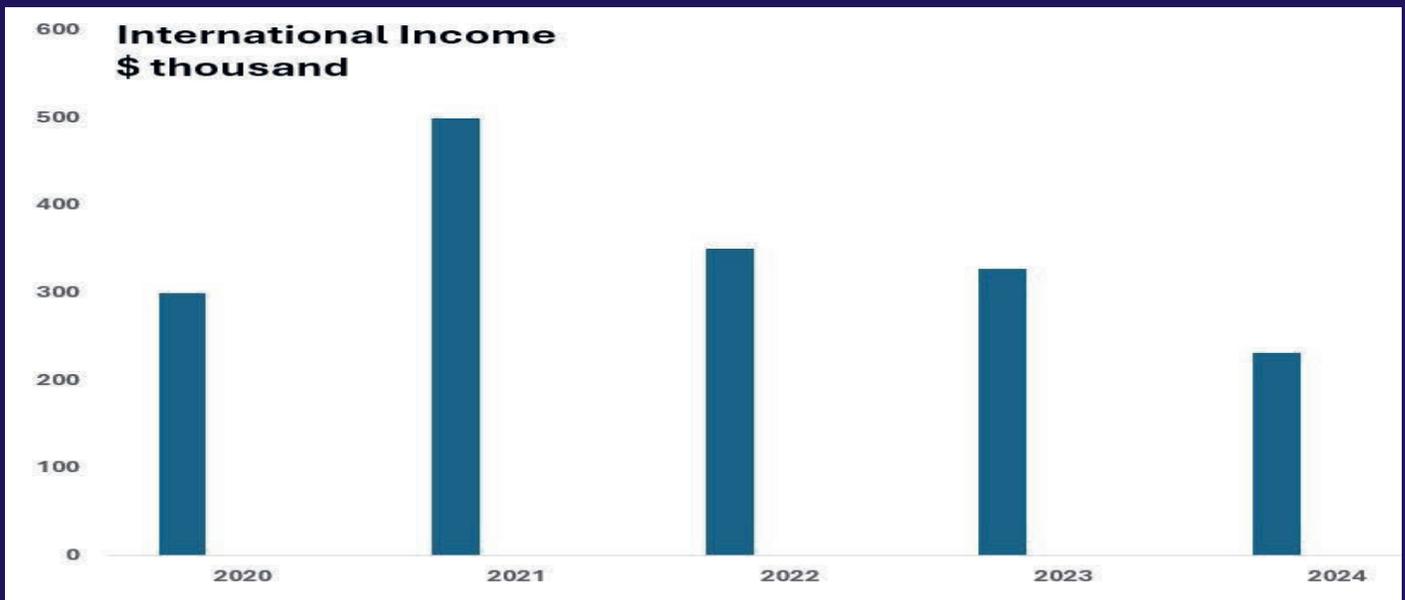
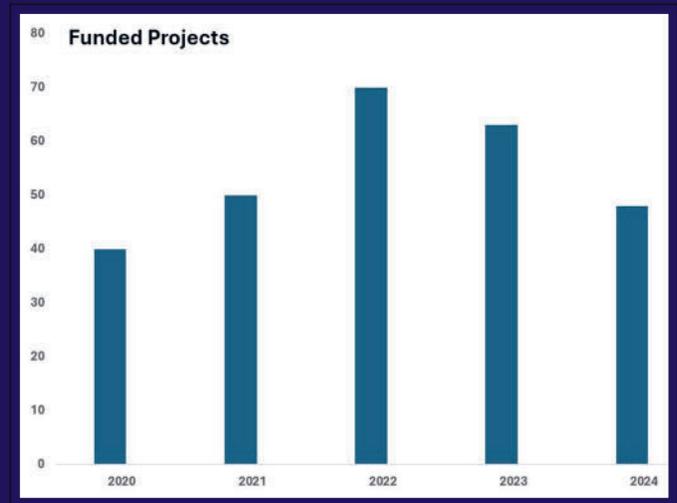
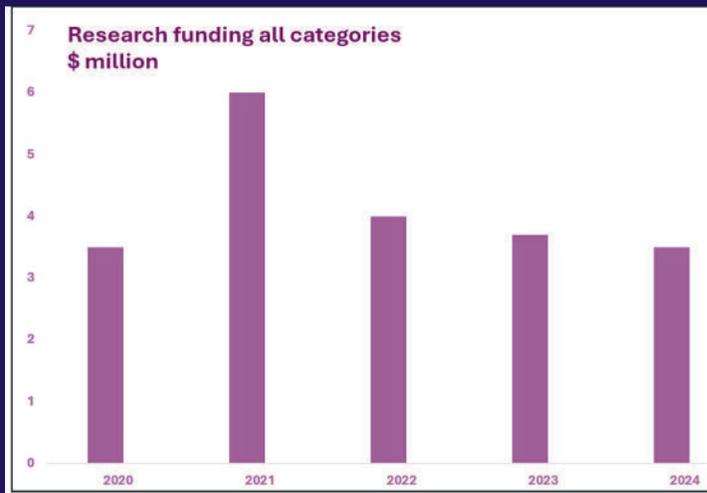
SAFE



FINANCIAL MONITORING



DEPOSIT



Research funding represents the value of funded projects attributed to years within funding period following the current method in the Research Centre Report in powerbi.

Industry Partners



Our members host visits by industry partners to CAMIC and visit industry partner facilities



Fostering Diversity through Multicultural Engagement

We believe that embracing diversity enriches our community and enhances the educational experience for everyone involved

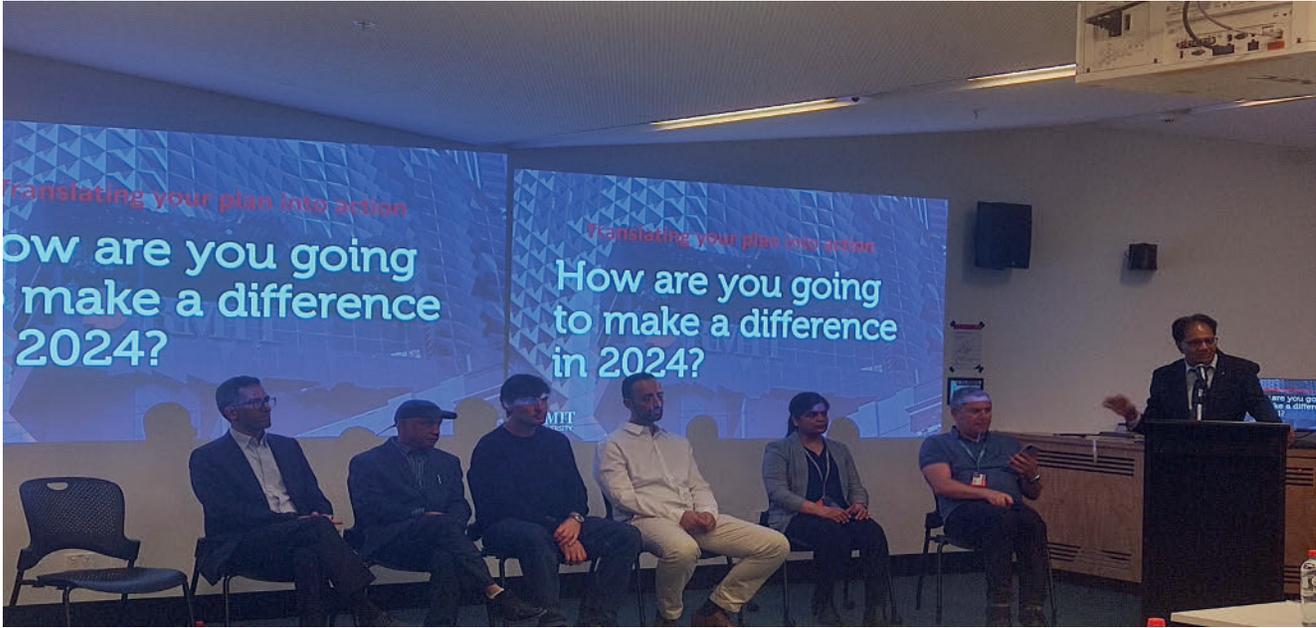
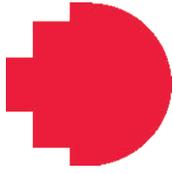
CAMIC holds traditions and values close to its heart. We understand the challenges faced by students who leave their home countries to pursue better opportunities and experiences abroad. That is why we strive to provide our students with a welcoming environment and a sense of home on campus. We organise and participate in cultural events that showcase the diversity of our community, including celebrations of various cultures, religions, and countries.

Through these events, our students have the opportunity to connect with each other and the wider community. They can share their experiences,

learn from each other, and appreciate the different backgrounds and perspectives that they bring to the table. Our goal is to foster an inclusive environment that celebrates diversity and promotes cross-cultural understanding.

Our commitment to supporting our students extends beyond the classroom and academic pursuits. We want our students to thrive and succeed both academically and personally, and we are dedicated to providing them with the support and resources they need to achieve their goals.



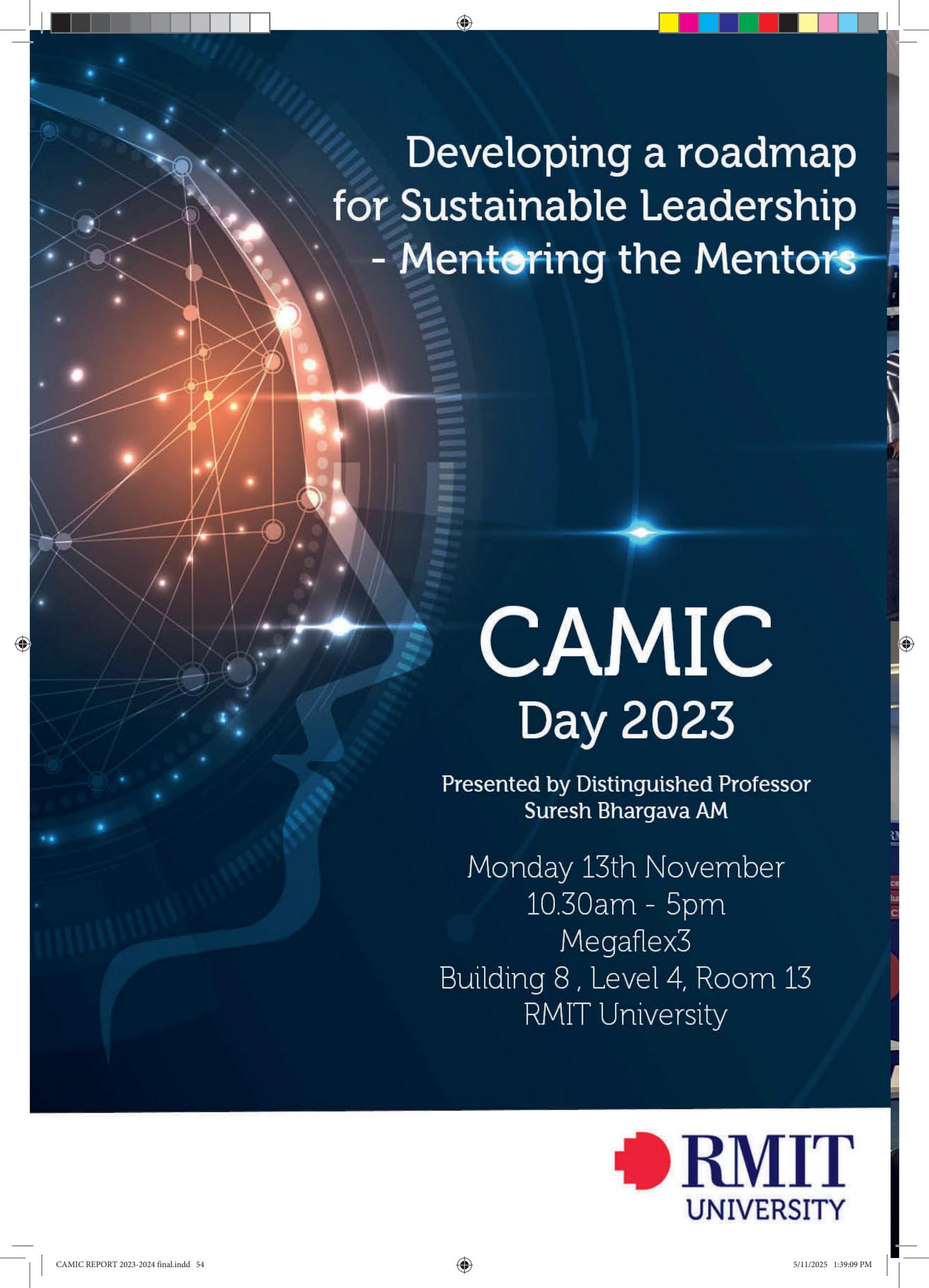


CAMIC Day 2023



Diwali celebration





Developing a roadmap
for Sustainable Leadership
- Mentoring the Mentors

CAMIC Day 2023

Presented by Distinguished Professor
Suresh Bhargava AM

Monday 13th November
10.30am - 5pm
Megaflex3
Building 8 , Level 4, Room 13
RMIT University





At CAMIC, we create impact not only through research, but through people who make a difference for tomorrow."

-Distinguished Prof. Suresh K. Bhargava AM

Contact

Distinguished Professor Suresh Bhargava AM
Dean, Research & Innovation (India), STEM College
Director, Centre for Advanced Materials and Industrial Chemistry
RMIT University
Tel: 03 9925 2330
Email: sureshdpvc@rmit.edu.au

Connect with RMIT

