

# APICAM2023

## THE UNIVERSITY OF SYDNEY 21ST - 23RD JUNE 2023 CONFERENCE PROGRAM



THE UNIVERSITY OF  
SYDNEY

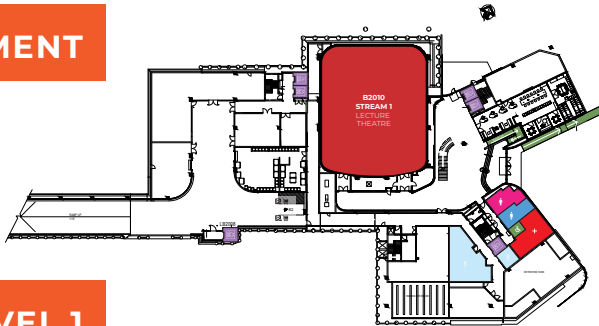


Materials  
Australia

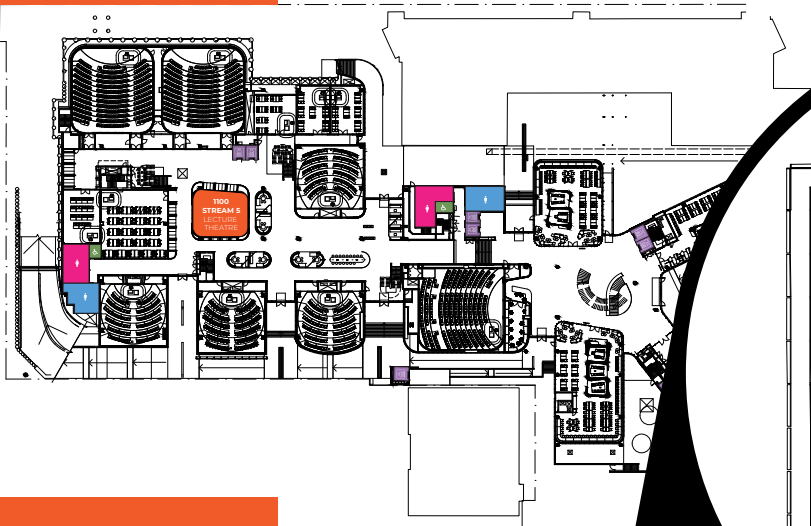


# UNIVERSITY MAP

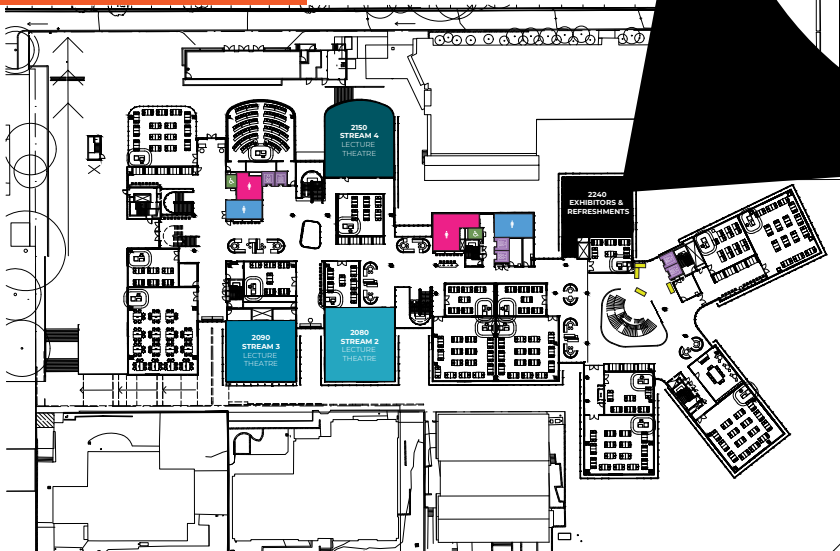
## BASEMENT



## LEVEL 1

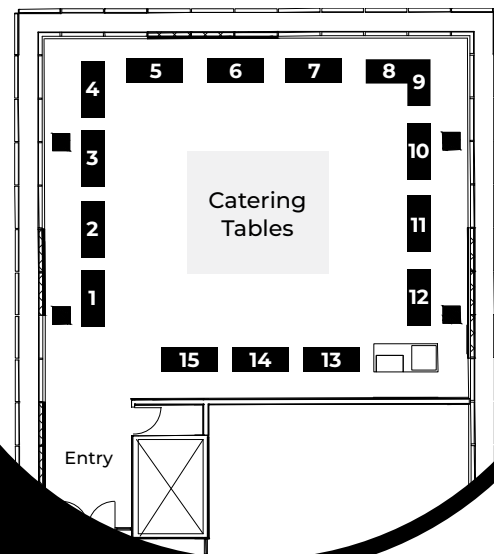


## LEVEL 2



### EXHIBITOR POSITIONS

- |                    |                        |
|--------------------|------------------------|
| 1. Trumpf          | 8. ATA Scientific      |
| 2. AXT             | 9. ATA Scientific      |
| 3. Sinto   3DCERAM | 10. Camesa   Ametek    |
| 4. MSC Software    | 11. Merck              |
| 5. Bruker          | 12. Warsash Scientific |
| 6. Evident         | 13. Emona Instruments  |
| 7. Lithoz          | 14. Nano Dimension     |
|                    | 15. Quintus            |



- |  |                                     |
|--|-------------------------------------|
|  | Reception (Level 2)                 |
|  | Stream 1 (Basement)                 |
|  | Stream 2 (Level 2)                  |
|  | Stream 3 (Level 2)                  |
|  | Stream 4 (Level 2)                  |
|  | Stream 5 (Level 1)                  |
|  | Exhibitors & Refreshments (Level 2) |
|  | Lifts                               |

# CONTENTS

UNIVERSITY MAP	2
HOSTS/SPONSORS	4
WELCOME	5
THE VENUE	6
GETTING THERE	7
CONFERENCE CHAIRS	8
INVITED SPEAKERS	9
PLENARY SPEAKERS	10
KEYNOTE SPEAKERS	12
SYMPOSIA CHAIRS	18
POSTER SESSION	19
<b>APICAM2023 PROGRAM</b>	
> Symposium Themes	21
> Day 1 - Wednesday 21.06.22	22 - 27
> Day 2 - Thursday 22.06.22	28 - 35
> Day 3 - Friday 23.06.22	36 - 39

# HOSTS/SPONSORS

## CONFERENCE HOST



## CONFERENCE PARTNER



## PLATINUM SPONSOR



## GOLD SPONSORS



## DINNER SPONSOR



## CONFERENCE EXHIBITORS



## NOTEPAD SPONSOR



## LANYARD SPONSOR



## MEDIA SPONSOR



## PEN SPONSOR



## USB SPONSOR



## SUPPORTED BY



# WELCOME TO THE ASIA-PACIFIC INTERNATIONAL CONFERENCE ON ADDITIVE MANUFACTURING - APICAM 2023.

APICAM was created to provide an opportunity for industry professionals, academics and thought-leaders to come together, share knowledge and engage in the type of networking that is vital to furthering the additive manufacturing industry.

Attendees will hear from some of the leading minds in the industry, who will present highly informative and engaging presentations on pressing issues, as well as the ways in which innovations can navigate challenges. Important areas such as 3D printing and additive manufacturing in the clean energy, sustainability, biomedical, defence and aerospace industries will be covered by experts from each respective field.

Just some of the keynote presentations include:

*3D Bioprinting: Making Stuff that Makes Stuff using Biology* by Distinguished Professor Gordon Wallace (University of Wollongong); *3D Printing Hierarchical Porous Ceramics* by Professor George Franks (University of Melbourne); *Addressing AM Sustainability of Polymer Use* by Professor Ian Gibson (University of Twente); *Burn the Boats: A Strategy to Accelerate Adoption of Advanced Manufacturing* by Dr Lonnie Love (Sandia); and *Crystallographic Texture Control by Metal Powder Bed Fusion* by Professor Takuya Ishimoto (University of Toyama).

The keynote addresses will be complemented by countless other presentations, across a variety of subject areas, including metal, polymer, ceramic and concrete additive manufacturing, bioprinting and biomaterials, digital manufacturing, modelling and simulations, and emerging additive manufacturing technologies.

The Conference Dinner at Rydges World Square is

sure to be a highlight. The Dinner is an opportunity for industry professionals and academics to get together in a more relaxed setting and to forge friendships that might otherwise be impossible. On behalf of Materials Australia, I encourage all attendees to take advantage of this unique opportunity to connect with colleagues from around the globe and share your thoughts on issues raised during the conference, as well as broader industry developments.

Of course, none of this would be possible without our conference sponsors. Materials Australia would like to extend our gratitude to Trumpf, our Platinum Sponsor; Quintus Technologies and Nano Dimension, our Gold Sponsors; the CSIRO, our Dinner Sponsor; American Elements, our Lanyard Sponsors; Zeiss, our Notepad Sponsors; AML3D, our USB Sponsors; and Struers, our Pen Sponsors.

We would also like to thank our exhibitors, including 3D Ceram, AXT, ATA Scientific, Bruker, Cameca, Emona Instruments, Evident, Hexagon, Objective3D, Merck, and Warsash Scientific.

We hope you enjoy the Asia-Pacific International Conference on Additive Manufacturing.

Regards,

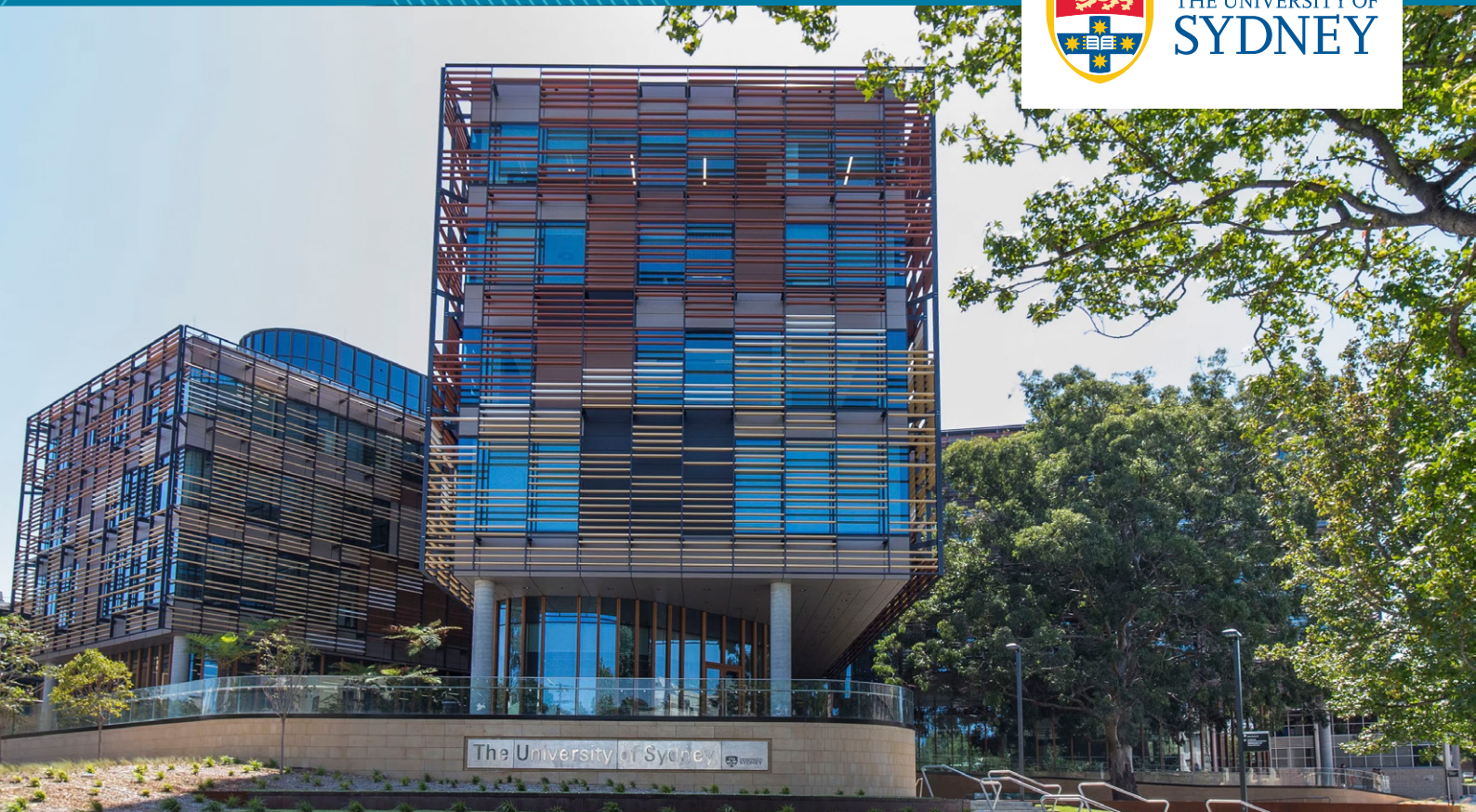
**National President Materials Australia**

Roger Lumley

# VENUE



THE UNIVERSITY OF  
SYDNEY



**APICAM2023 will be held in the state-of-the-art Abercrombie Building at the University of Sydney's main campus.**

This is the University's biggest campus, featuring 72 hectares of state-of-the-art teaching and learning technology, including six libraries, art galleries, historical museums and perfectly manicured lawns. The Camperdown campus is also home to the following faculties and schools: Architecture, Design and Planning; Arts and Social Sciences; Business; Engineering; Law; Medicine and Health; and Science.

With 9100 square metres of light-filled flexible teaching and learning space, the latest technology and prime position near the University's historic main campus, the purpose-built Abercrombie Building will inspire generations of business leaders to come at the University of Sydney on City Road, Camperdown.

#### **About the University of Sydney**

The University of Sydney was founded in 1850 as a public institution of higher education. It is Australia's

oldest university. The University was founded on two main principles — religious tolerance and the admission of students on academic merit. The first principle ensured students were admitted regardless of religious belief. The second, that students 'matriculated' to university by passing an academic examination. In 1881, the University became one of the first in the world to admit female students.

The University's famous alumni include names such as Gough Whitlam and pioneer heart transplant surgeon Victor Chang, but also people who improve lives and contribute to change out of the spotlight. Their alumni include lawmaker Michael Kirby, journalist and broadcaster Mary Kostakidis, writer Clive James, opera singer Dame Joan Sutherland, activist Charles Perkin, and seven Australian prime ministers including Edmund Barton who, in 1901, won the country's inaugural federal election.

Today, the University has over 73,000 students and 8,100 continuing and fixed-term staff, as well as 380,000 alumni living in more than 170 countries.

## WIFI DETAILS

**Username:**  
apicam2023

**Password:**  
31865667

## EXHIBITION LEVEL 2 (ROOM 2240)

# GETTING THERE

## GETTING TO THE UNIVERSITY OF SYDNEY

Travelling to the University of Sydney campus couldn't be easier. With its central location and a range of public transport options, travel will be a breeze throughout the APICAM2023 Conference. Travel options are outlined below.

There are two main entrances, one on Parramatta Road and one on City Road. As the campus is quite large, the best transport option will depend on your destination.

### Trains

Redfern Train Station is a 10 minute walk to the campus. Many students walk this route, and a free shuttle bus runs between Fisher Library and Redfern Station in the evening during semester.

Central Train Station is a 15 minute walk along City Road and George Street. There are frequent buses from Railway Square to Parramatta Road and City Road.

### Buses

If you are arriving by bus, there are stops at the main entrances on Parramatta Road and City Road.

### Campus Buses

Fisher Library to Redfern train station: A free shuttle bus runs in the evenings between Fisher Library (Camperdown campus) and Redfern train station. It operates from 4pm–10.30pm all year, apart from weekends, public holidays and the Christmas shut down period. Regular and express services run frequently. View the bus timetable and the bus route.

Camperdown to Australia Technology Park: Free inter-campus bus service during semesters only, view the timetable. You can track the bus on the app Transport Me, by selecting Big Bus Co. as the operator.



# CONFERENCE CHAIRS



## CO CHAIR

### PROFESSOR GWÉNAËLLE PROUST

UNIVERSITY OF SYDNEY

Gwénaëlle Proust is a Professor of Materials Engineering in the School of Civil Engineering and the Director of the Sydney Manufacturing Hub at the University of Sydney.

She received her Diplôme d'ingénieur (eq. BE) in Materials Science in 1999 from the Institut des Sciences de l'Ingénieur en Thermique Energétique et Matériaux (present name: Ecole Polytechnique de Nantes) in Nantes, France. She was awarded her MPhil in 2002 and her PhD in 2005 from the Department of Materials Science and Engineering at Drexel University, Philadelphia, PA, USA. She then did a two-year post-doc at Los Alamos National Laboratory in New Mexico, USA. She joined the University of Sydney in 2008.

Her research aims at understanding the relationships between material properties and their microstructure and to improve material performance, ultimately leading to energy savings and to safer, more efficient devices. Her research projects encompass investigating and modelling manufacturing processes of materials. She also looks at the effects of mechanical deformation on the microstructure evolution of metals, understanding the effects of complex loading on the mechanical response of materials. The experimental aspect of her work is carried out using manufacturing techniques such as additive manufacturing and characterisation techniques such as optical microscopy, scanning electron microscopy and electron backscatter diffraction.

She has published over 100 papers to date and has attracted funding via the ARC Linkage and Discovery schemes.



## CO CHAIR

### PROFESSOR SOPHIE PRIMIG

UNSW SYDNEY

Sophie Primig currently is a Professor in the School of Materials Science & Engineering at UNSW Sydney. She was awarded both her MEng (2008) and PhD (2012) in Materials Science & Engineering from Montanuniversitaet Leoben, Austria. Following a short period as Post-Doctoral Researcher and an academic position at the same University, she moved to UNSW Sydney in 2015, initially as Lecturer. She was an Australian Research Council (ARC) DECRA Fellow from 2018-2020.

Her research interests are in Physical Metallurgy. She has a track record in both fundamental and applied research. Her research goal is to develop an advanced capability in structure-property relationships across the processing routes of structural metallic materials via additive manufacturing and advanced thermo-mechanical routes. The focus of her applied research is aerospace alloys, and this has often been linked closely to the needs of industrial partners. She has published >100 papers to date.

Sophie has attracted funding via the ARC Linkage and Discovery schemes, industry collaborations, and the Australia-US Multidisciplinary University Research Initiative Program. She is an Editor of Journal of Materials Science, Vice Chair of the TMS Phase Transformations Committee, and former President of the Materials Australia NSW Branch.

# INVITED SPEAKERS

**Prof. Dr.-Ing Frank Brückner**

TU Dresden/Fraunhofer IWS, Germany

**Abstract:** Increased process stability and efficiency by digitalization in laser-based additive manufacturing

**Prof. Thomas Niendorf** University of Kassel, Germany

**Abstract:** Metastable austenitic steels - Pathways to tackle recent challenges in additive manufacturing

**Dr. Nazli Ezlamirad** ANSTO, Australia

**Abstract:** HIPing and Characterisation of Cold Spray additive manufactured Titanium

**Dr. Kun Yang** CSIRO, Australia

**Abstract:** Additive manufacturing of shape memory alloys for space applications

**Dr. Dayalan Gunasegaram** Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia

**Abstract:** Real-time autonomous control of Additive Manufacturing processes in the Industry 4.0 era

**Dr. David Howard** Data 61, CSIRO, Australia

**Abstract:** Additive Manufacture for Soft Robotics

**Prof. Zengxi Pan** University of Wollongong, Australia

**Abstract:** MIMO Model Predictive Control of Bead Geometry in Wire Arc Additive Manufacturing

**Prof. Chien-Fang Ding** National Taiwan University

**Abstract:** Laser Induced forward transfer for printing metallic structures on flexible substrates

**Group Captain Ravinder Singh**

Defence Aviation Safety Authority

**Abstract:** Defence's Aviation Safety Policy on the use of Additive Manufacturing

**Dr. Micaela degli Esposti** University of Bologna, Italy

**Abstract:** Can emerging renewable printable polymers empower a more sustainable additive manufacturing?

**Distinguished Prof. Suresh Bhargava** RMIT University, Australia

**Abstract:** Additive Manufacturing in Chemical Sciences and Engineering

**Dr. Baozhi Yui** Frontier Materials, Deakin University, Australia

**Abstract:** Design and structure optimization of 3D-printed electrodes for high-performance lithium batteries

**Dr. Dylan Agius** DSTO

(Defence Science and Technology), Australia

**Abstract:** A Computationally Efficient Multi-Scale Modelling Tool to Aid in EBM Build Strategy Selection

**Associate Prof. Zachary Cordero** Massachusetts Institute of Technology, USA

**Abstract:** Directional Recrystallization of Additively Manufactured Ni-base Superalloys

**Dr. Wengui Li** University of Technology Sydney, Australia

**Abstract:** Effect of inorganic PCM/expanded perlite composite on cement hydration and inner temperature regulation of mortar

**A/Prof. Giang Nguyen** University of Adelaide, Australia

**Abstract:** Controlling fracturing process in indirect tensile testing of 3D-printed cement-based materials

**Prof. Matthew Barnett** Deakin University, Australia

**Abstract:** Additive Friction Stir Deposition: microstructures, recycling and energy consumption

**A/Prof. Khoon Lim** University of Sydney, Australia

**Abstract:** High resolution 3D bioprinting of light-activated bioinks

**Dr. Chun Xu** University of Queensland, Australia

**Abstract:** 3D printed porous nanomaterials for bone regeneration

**Prof. Craig Brice** Colorado School of Mines, USA

**Abstract:** Addressing the high dimensionality and associated data challenges in metal additive manufacturing

**Prof. Ma Ninshu** Osaka University, Japan

**Abstract:** Analysis of residual stress in additive manufactured functionally graded layers

**A/Prof. Michael Heitzmann**

University of Queensland, Australia

**Abstract:** Additive Manufacture of Ceramic Matrix Composites: Opportunities, challenges, and an approach

**Mr. Khan Sharp** DST

(Defence Science and Technology Group), Australia

**Abstract:** Additive S&T for Defence

**Prof. Anna Paradowska** ANSTO |

University of Sydney, Australia

**Abstract:** Non-destructive neutron base characterisation techniques for additive manufacturing

**Prof. Graham Schaffer** University of Melbourne, Australia

**Abstract:** A Computational Framework for Designing Sintered Materials

**Prof. Jennifer Loy** Griffith University, Australia

**Abstract:** Additive Manufacturing: Keep it Real, Make it Work

**Prof. Joerg Jinschek** DTU Nanolab National Centre for Nano Fabrication and Characterization Technical University of Denmark (DTU)

**Abstract:** Investigation of the impact of far-from-equilibrium process conditions on metal AM microstructure

**Prof. Aijun Huang** Monash University, Australia

**Abstract:** Creep performance of additively manufactured Ni-based superalloy

**Prof. Mingxing Zhang** University of Queensland, Australia

**Abstract:** Laser additively manufacturing of steels

**Dr. Yogambha Ramaswamy** University of Sydney, Australia

**Abstract:** Custom-built bioprinting system and synthetic polypeptide based bioresin for biomedical applications

**Prof. Peter Collins** Iowa State University, USA

**Abstract:** On New Methods to Predict Local Properties in Additively Manufactured Ti-6Al-4V and the Possibilities for Gradient Materials

**Prof. Jian-Feng Nie** Monash University, Australia

**Abstract:** Additively manufacturing from Al-Mg-Ti(-Sc-Zr) alloy wires

# PLENARY SPEAKERS



## PLENARY SPEAKER **ASSOC. PROF ALLISON BEESE**

*Additive Manufacturing: Machine Learning, Mechanics, and Metallurgy*

Allison Beese is an Associate Professor in the Department of Materials Science and Engineering at Penn State University. She also serves as Director of Penn State's Additive Manufacturing and Design graduate program. Her multiscale mechanics of materials research group focuses on using experimental and computational methods to identify and model the links between microstructural features and deformation and failure of materials, with a focus on additively manufactured metallic materials.



## PLENARY SPEAKER **PROF. AMY CLARKE**

*Visualizing and Controlling Microstructural Evolution in Metals Under Additive Manufacturing Conditions*

Amy J. Clarke is the John Henry Moore Distinguished Professor of Metallurgical and Materials Engineering, Co-Director of the Center for Advanced Non-Ferrous Structural Alloys, and with the Advanced Steel Processing and Products Research Center in the George S. Ansell Department of Metallurgical and Materials Engineering at the Colorado School of Mines. She holds joint appointments with Pacific Northwest National Laboratory and Los Alamos National Laboratory. Her research focuses on physical metallurgy and making, measuring, and modeling of metallic alloys during processing to realize advanced manufacturing.



## PLENARY SPEAKER **MR. CONOR KELLEHER**

*Additive Manufacturing at Scale*

Conor has over 20 years' experience in the manufacturing industry, with the last seven years working in technology development and new product introduction for Stryker in their state of the art Additive Manufacturing Centre of Excellence in Cork, Ireland. In that time he has worked across Stryker's metal and polymer portfolio of products for their multiple divisions.

# PLENARY SPEAKERS



## PLENARY SPEAKER **PROF. SUONG VAN HOA**

### *4D Printing of Composites*

Dr. Suong Van Hoa is a Professor in the Department of Mechanical Industrial and Aerospace Engineering at Concordia University. He also served as chair of the Department from 1994 till 2000, and again from 2003 till 2006. He formed the Concordia Center for Composites in 1993, and he has been its director since then until now. He conceived and formed the Canadian Association for Composite Structures and Materials (CAC SMA) in 1988. He was its president from 1988 till 1989, and again from 1999 until 2014.



## PLENARY SPEAKER **MS AMBER ANDREACO**

### *Mirror Mirror - A 15-Year Reflection on Metal Additive Manufacturing*

Amber started her career in GE Aviation in 2005 as part of the Edison Engineering Development Program. In 2008, she joined the Materials Behavior organization, taking ownership of the mechanical characterization and analysis for additive materials, including the DMLM Co-Cr characterization in support of the LEAP fuel nozzle as well as follow on GE9X and Catalyst additive alloy programs. She helped define requirements for additive material qualification and certification as well as facilitated introduction new methods for evaluating additive materials.



## PLENARY SPEAKER **DR GLYNN P ADAMS**

### *Additive Manufacturing at Lockheed Martin*

Dr. Adams is a technical fellow at Lockheed Martin Space where he has been employed for 25 years. He led fundamental research in friction stir welding of large aluminum structures for production of NASA's Space Shuttle External Tank, Orion Spacecraft and Space Launch System. He also served as manager for the Orion Environmental Control and Life Support System that encompasses temperature and pressure control, air quality and waste management.

# KEYNOTE SPEAKERS

## Distinguished Prof.

**Gordon Wallace**

**AO FAA FTSE**

University of Wollongong

**Abstract:** *3D Bioprinting: Making Stuff that Makes Stuff using Biology*



An esteemed innovator and educator, Distinguished Professor Gordon Wallace, is a scientist at the forefront of health technologies, where medical devices complement the body's own systems to treat disease and repair injuries. His extensive scientific contributions have broken new ground in every aspect of biomaterials research. These contributions have led to a number of accolades, including an ARC Laureate Fellowship (2011), the Eureka prize for leadership in Innovation and Science (2016), NSW Scientist of the Year (2017), and appointed an Officer in the General Division of the Order of Australia (2017). Professor Wallace is Director of UOW's Intelligent Polymer Research Institute; Director of the Australian National Fabrication Facility – Materials Node; and Director of the Translational Research Initiative for Cellular Engineering and Printing.

## Prof. Ian Gibson

University of Twente,

The Netherlands

**Abstract:** *Addressing AM sustainability of polymer use*



Professor Ian Gibson has two roles at the University of Twente. He is both the Scientific Director of the University's Fraunhofer Project Centre in complex systems engineering, as well as a Professor in Industrial Design Engineering. In the latter role, Professor Gibson provides guidance and mentoring to other professors, based on his extensive knowledge and experience. This can relate to their research, as well as advice on broader subjects, such as career development. His role at the Fraunhofer Project Centre is quite new, like the centre itself. Professor Gibson commenced in this role in July 2018 and was the first Scientific Director to be appointed.

## Prof. Tim Woodfield

University of Otago,

New Zealand

**Abstract:** *Regenerative Manufacturing of Bioactive Implants: From Low Modulus Titanium Implants to Platform Bioinks for Biofabrication*



Tim Woodfield is Professor of Regenerative Medicine in the Department of Orthopaedic Surgery at the University of Otago Christchurch, New Zealand where he leads the Christchurch Regenerative Medicine and Tissue Engineering (CReaTE) Group and is Director of the University of Otago Centre for Bioengineering & Nanomedicine. Prof Woodfield obtained a BEng (Mechanical) from Canterbury University in 1997, MASc (Biomaterials) from University of Toronto in 2000, and PhD/postdoc (Tissue Engineering) from University of Twente/IsoTis Orthobiologics in 2005.

His research platform involves additive manufacturing of medical devices and regenerative medicine of cartilage and bone including: biofabrication and spheroid bioassembly platforms, novel bioink/bioresin design, and advanced 3D in vitro tissue culture models for high throughput screening.

Prof Woodfield was awarded a prestigious Rutherford Discovery Fellowship from the Royal Society of New Zealand Te Apārangi (2015), the Australasian Society for Biomaterials & Tissue Engineering (ASBTE) Research Excellence Award 2020, and the University of Otago Research Gold Medal 2020. He was awarded Fellow in Biomaterials Science & Engineering (FBSE) in 2020.

Prof Woodfield is President of the International Society for Biofabrication (ISBF) and former President of the Australasian Society for Biomaterials & Tissue Engineering (ASBTE). He sits on the Tissue Engineering and Regenerative Medicine International Society Asia Pacific (TERMIS-AP) Council and is an Editorial Board Member for Biofabrication, Advanced Healthcare Materials and APL Bioengineering and Associate Editor for Frontiers in Bioengineering & Biotechnology.

# KEYNOTE SPEAKERS

## Dr. Lonnie Love

Sandia (Fellow of Manufacturing in National Security Programs), USA

**Abstract:** *Burn the Boats: A Strategy to Accelerate Adoption of Advanced Manufacturing*



Dr. Love began his career at ORNL in 1995 as a research staff member. He is a distinguished research scientist in the Energy and Transportation Science Division and group leader of the Manufacturing Systems Research Group. He has made major contributions at ORNL as a researcher, a leader, and an innovator in advanced robotics and additive manufacturing. His research has most recently focused on large-scale and high-speed advanced additive manufacturing and 3D printing. Other research areas include nano-fermentation, mesoscale hydraulics and blending additive manufacturing with fluid-powered systems in research and development directed toward producing lightweight, high-dexterity, and low-cost prosthetic devices. Lonnie J. Love holds a Bachelor of Science (Mechanical Engineering), a Masters of Science (Mechanical Engineering), and a PhD in Mechanical Engineering.

## Prof. Takuya Ishimoto

University of Toyama, Japan

**Abstract:** *Crystallographic texture control by metal powder bed fusion*



Takuya Ishimoto is a Professor of the Aluminium Research Center, University of Toyama, Japan and also is a member of the Anisotropic Design & Additive Manufacturing Research Center, Osaka University, Japan. He obtained his Ph.D. (Engineering) degree from Osaka University in 2008, after which he conducted research on biomaterials and was involved in the establishment of the AM Center in 2013. Since then, he has been involved in research on microstructure control by Additive Manufacturing (Powder Bed Fusion) for ten years, along with the Director of the AM Center, Prof. Takayoshi Nakano.

## A/Prof. Jessica Frith

Monash University, Australia

**Abstract:** *Optimising the cell microenvironment to improve engineered tissue structure and function*



Jess Frith is an Associate Professor in the Department of Materials Science and Engineering at Monash University. She completed her PhD at the University of York (UK) in 2009 before joining the Australian Institute for Bioengineering and Nanotechnology at UQ where she broadened her skillset across biomaterials and tissue-engineering. In 2013 she was awarded an ARC DECRA and in 2017 received a Young Tall Poppy Science Award from the Australian Institute of Policy and Science. She has been at Monash University since 2015, where her interdisciplinary research group spans stem cell biology and tissue-engineering, using bioengineering approaches to understand how stem cells respond to the physical world around them and then apply this to regenerate damaged body tissues.

## Prof. George Franks

University of Melbourne, Australia

**Abstract:** *3D Printing Hierarchical Porous Ceramics*



George Franks is Professor in Chemical Engineering at the University of Melbourne. His degrees are in Materials Science and Engineering (Bachelor MIT, 1985 and PhD UCSB, 1997). His research includes suspension rheology, ceramic powder processing and minerals processing. His work in materials processing is primarily related to processing of complex shaped ceramics and composites with unique microstructures such as 3D printed multi-scale porous ceramics. His work in minerals processing relates to development and application of novel polymeric reagents in solid/liquid separation and froth flotation. He is a member of the ARC COE for Enabling Eco-Efficient Beneficiation of Minerals. He has 130 papers in international peer reviewed journals, 7 book chapters and four patents with 4900 citations and h-index = 41. He is Associate Editor of the Journal of the American Ceramic Society and Editor of Advanced Powder Technology.

# KEYNOTE SPEAKERS

## Prof. Anthony Rollett

Carnegie Mellon University,  
USA

**Abstract:** *Modelling and Simulation in Additive Manufacturing*



Anthony Rollett has been a member of the faculty at Carnegie Mellon University since 1995, including five years as Department Head. He is the Co-Director of the NextManufacturing Center on additive manufacturing. Previously, he worked at the Los Alamos National Laboratory. There, he was Group Leader of Metallurgy and Deputy Division Director of Materials Science and Technology. He received the Cyril Stanley Smith Award from TMS in 2014, and became the US Steel Professor of Metallurgical Engineering and Materials Science in 2017. He received Cyril Stanley Smith Award from the International Conference on Recrystallization and Grain Growth in 2019 and also the International Francqui Professor for 2020-2021, from the Francqui Foundation in Belgium. He is a member of the Basic Energy Science Advisory Committee and the Defence Programs Advisory Committee under the Department of Energy.

## Prof. Zaiping Guo

University of Adelaide,  
Australia

**Abstract:** *3D Printing of Electron/Ion Fluxes Dual-Gradient Anode for Dendrite-free Zinc Batteries*



Professor Zaiping Guo is an Australian Laureate Fellow at School of Chemical Engineering & Advanced Materials, The University of Adelaide. She is also an Associate Editor for Chemical Science, a flagship Journal of RSC. Her research focuses on the design and application of electrode materials and electrolyte for energy storage and conversion, including rechargeable batteries, hydrogen storage, and fuel cells. Her research achievements have been recognized through numerous awards, including an ARC Queen Elizabeth II Fellowship in 2010, an ARC Future Professorial Fellowship in 2015, an ARC Laureate Fellowship (2021), and the Clarivate Analytics Highly Cited Researcher Award in 2018, 2019, 2020, 2021, and 2022. She was also awarded 2020 NSW Premier's Prizes for Science & Engineering for Excellence in Engineering or Information and Communications Technology.

## Prof. Rajarshi Banerjee

University of North Texas,  
USA

**Abstract:** *Additive Manufacturing of Beta Titanium Alloys: Influence of Thermo-Kinetics on Precipitation, Strength, and Strain Hardening Behaviour*



Dr Rajarshi (Raj) Banerjee is a University Presidential Professor and Regents Professor in the department of materials science and engineering at the University of North Texas. His primary research focus is on advanced metallic and functionally-graded composite (or hybrid) materials for aerospace, energy, and biomedical applications. Materials of focus include titanium base alloys, high entropy alloys, nickel (and cobalt) base superalloys, and magnetic alloys, processed via additive manufacturing technologies such as directed energy deposition and laser powder bed fusion. He has over 300 publications in peer-reviewed journals, with over 17000 citations, and an H-index of 74 (Google Scholar). Dr Banerjee is also an adjunct professor in at the Ohio State University in Ohio, and a visiting professor at Nanyang Technological University and the Indian Institute of Technology.

## A/Prof. Joy Gockel

Colorado School of Mines,  
USA

**Abstract:** *Influence of Additive Manufacturing Surface Roughness and Microstructure on Fatigue Failure*



Dr Joy Gockel is an Associate Professor in Mechanical Engineering at Colorado School of Mines, and the Executive Director of the Alliance for the Development of Additive Processing Technology research center and industry consortium. Joy joined Mines from Wright State University where she was an Assistant Professor. Prior to this, she was a Lead Engineer at GE Aviation's Additive Technology Center and earned her PhD in from Carnegie Mellon University. Her work specialises in connecting the additive manufacturing processing-structure-properties-performance relationships and the discovery of next generation AM materials and processes. She was awarded the 2020 ASTM International Young Professional in Additive Manufacturing, 2021 TMS Young Leader, and the 2021 International Outstanding Young Researcher in Freeform and Additive Manufacturing.

# KEYNOTE SPEAKERS

## Prof. Dr. Ing Christoph Leyens

Fraunhofer Institute  
for Material and Beam  
Technology IWS, Germany

**Abstract:** *New Material Developments in Additive Manufacturing*

Prof. Christoph Leyens studied physical metallurgy and materials technology at RWTH Aachen, Germany, where he earned his diploma in 1993 and his Ph.D. in 1997. He is currently a full professor for materials science and engineering at TU Dresden, Germany, and director of the Fraunhofer Institute for Material and Beam Technology, Dresden. Prof. Leyens has covered a wide range of research topics with a focus on high temperature and lightweight materials, surface technology and additive manufacturing.



## Prof. Gangadhara Prusty UNSW, Australia

**Abstract:** *Process controlled automated composite manufacturing: parameter effects on bonding to process monitoring*

Dr Gangadhara Prusty is a Professor at the UNSW School of Mechanical and Manufacturing Engineering. He is recognised as an international leader in the field of nano, micro and macro-mechanics of composites. His interdisciplinary approach to composites research, extends from mechanics of materials through to the implementation of automated manufacturing technologies to complete composite structures/components and biomechanics application. Professor Prusty is the Founding Director of ARC Training Centre for Automated Manufacture of Advanced Composites and the Director of Research for the Sovereign Manufacturing Automation of Composites Cooperative Research Centre. His multi-disciplined ability has seen him secure over 100 research grants, author over 300 referred articles, patent an invention of Dental Composites, and co-found a UNSW company spin-out.



## Prof. Peter Voorhees Northwestern University, USA

**Abstract:** *Additive Manufacturing: From Nonequilibrium Interfaces to Strange Grains*

Frank C. Engelhart Professor of Materials Science and Engineering and (by courtesy) Professor of Engineering Sciences and Applied Mathematics

Chair of Materials Science and Engineering. Co-Director, CHiMaD



## Dr. Ing. Rebecca Murray Herston Biofabrication Institute at Metro North Hospital and Health Service, Australia

**Abstract:** *Design to certification in additive manufacturing - getting good solutions used*

Rebecca drives evidence-based innovation and implementation in the highly regulated medical and defence industries. She is a biomedical and materials engineer with 12 years of industry and research experience in Biomedical Design and Engineering as well as eight years of experience in 3D printing and materials. After receiving a distinction for her Masters in Biomedical Engineering at Oxford University (2010), Rebecca was awarded a European Union Marie Curie Research Fellowship to complete her Doctorate from Hamburg University of Technology (2014). Rebecca's expertise includes point-of-care manufacturing, additive manufacturing, bioactive glass research as well as medical device design. She is the Innovation Advisor to the Australian Defence Innovation Steering Group, and the chair of Standard Australia's MB-028 Additive Manufacturing committee.



# KEYNOTE SPEAKERS

## Prof. Hamish Fraser

Ohio State University, USA

**Abstract:** Optimization of grain morphology in titanium alloys processed using additive manufacturing



Dr Fraser graduated from the University of Birmingham (UK) with a Bachelor of Science and PhD. He was appointed to the faculty of the University of Illinois in 1973 (Assistant, Associate and Full Professor), before moving in 1989 to the Ohio State University (OSU) as Ohio Regents Eminent Scholar and Professor. He was appointed as a Senior Research Scientist at the United Technologies Research Centre from 1979-1980. He has also been a Senior von Humboldt Researcher at the University of Göttingen, a Senior Visitor at the University of Cambridge, and a visiting professor at the University of Liverpool. He has been an Honorary Professor of Materials and Technology at the University of Birmingham since 1988. He is also an Adjunct Professor at Monash University in Australia and at the University of North Texas. He is the Director of the Centre for the Accelerated Maturation of Materials at OSU.

## Distinguished Prof.

## Christopher Berndt

Swinburne University of Technology, Australia

**Abstract:** The Attributes of Microstructural Artifacts in Thermal Spray Coatings



Distinguished Professor Chris Berndt joined Swinburne in early 2008 as the founding Professor of Surface Science and Interface Engineering. This followed his role as founding Professor of Surface and Interface Engineering at James Cook University, a tenured professor position at Stony Brook University (where he remains Adjunct Professor) and appointments at the NASA-Lewis Research Centre in Cleveland as a Fellow of the Institute for Aerospace Propulsion and Power where he worked on thermal barrier coatings. Professor Berndt's professional responsibilities gravitate around the Thermal Spray Society of the ASM of which he has been a member since 1991. He was appointed as the Vice President of ASM in 2000 and President in 2002. He was the Proceedings Editor for the Thermal Spray Conferences in the USA from 1992-2003, and inducted into the Thermal Spray Hall of Fame in 2007.

## Dr. Daniel East

CSIRO, Australia

**Abstract:** CSIRO past successes and future directions of Additive Manufacturing for space applications



Daniel East is a principal research scientist who works in the non-equilibrium processing of metals and metal matrix composites. He has expertise in bulk metallic glasses and additive manufacturing with projects that span multiple sectors such as defence, space, resources and aerospace.

## Dr. Baranchi Panda

Indian Institute of Technology, Guwahati

**Abstract:** Additive Manufacturing of concrete: a paradigm shift toward sustainability



Dr Baranchi Panda is an early-career researcher specialising in extrusion-based 3D printing with special focus on material rheology, process modelling and optimisation. His research expertise lies in the areas of development of low carbon cement-based composites using novel waste materials, machine design, computer-aided manufacturing, and process automation for construction applications. Dr Panda received his PhD from Singapore Centre for 3D Printing, Nanyang Technological University Singapore and joined IIT to continue his research focusing on Sustainable Resources for Additive Manufacturing. He is supervising eight PhD and six postgraduate students in his research projects on concrete materials. Dr Panda is an Associate Editor for Elsevier Additive Manufacturing Journal and ASCE Journal of Materials in Civil Engineering. His current google scholar citation is > 4900 and H- index: 34.

# KEYNOTE SPEAKERS

## A/Prof. Andrey Molotnikov RMIT University, Australia

**Abstract:** *Global efforts on qualification and certification and our research efforts in this area*



Associate Professor and Deputy Director at RMIT Centre for Additive Manufacturing and Cofounder Additive Assurance. Associate Professor Andrey Molotnikov joined RMIT University in 2019 as the Deputy Director of the Centre for Additive Manufacturing. He holds a PhD in Computational Materials Science from Monash University where he also held an academic position as Senior Lecturer. Dr Molotnikov has received the Rod Rickards Fellowship from the Australian Academy of Science, ALMA2016 Award and the Anders Gustaf Ekeberg Tantalum Prize.

## Prof. Reza Moina Princeton University, USA

**Abstract:** *Advanced Manufacturing and Design for Resilient and Sustainable Infrastructure Materials*



Professor Moini's research is focused on bio-inspired design and development of architected materials using novel additive manufacturing processes and automated robotic technologies for applications in civil and energy infrastructure. His work is motivated by the intellectual challenge of understanding the mechanics of intrinsically brittle engineering materials and the development of ductile and flaw-tolerant responses using biomimetic design principles and new material assemblies. Such materials can provide advanced functionality and damage-tolerant behaviours and allow for questions about the interplay between desired materials properties like and strength. Moini's other areas of research include integrated multi-component autonomous manufacturing, early-age deformations of colloidal materials in additive processes, and packing and solidification of particulate systems.

## Ms. Alison Park NESC at NASA - National Aeronautics and Space Administration, USA

**Abstract:** *NASA's Challenges and Opportunities in Spaceflight Certification of Fracture Critical AM Components*



Alison Park is the Deputy Technical Fellow of Materials and Additive Manufacturing at NASA. She is a part of the headquarter group called NASA Engineering and Safety Center (NESC). Alison's roles and responsibilities include working with NASA Tech Authority and Program offices to qualify and certify mission critical AM hardware and design and executing technical assessment and support projects for various NASA programs across the agency.. Prior to her NASA assignment, she was the Technical Program Manager at a leading Rocket propulsion company responsible for capturing and managing R&D projects to mature AM technologies. She holds a B.S in Materials Engineering from Purdue University and a M.S in Aerospace Materials Engineering from University of California, Los Angeles (UCLA).

## Dr. Tony Murphy CSIRO, Australia

**Abstract:** *A Hybrid Multiscale Model of Wire-Arc Additive Manufacturing and Steps toward a Digital Twin*



Dr Tony Murphy is a Chief Research Scientist and leads the Materials and Process Modelling Team in CSIRO Manufacturing, where he has worked since 1989. His main research focus has been the physics, chemistry and applications of thermal plasmas such as welding arcs. He has also worked on modelling of metal additive manufacturing, including wire-arc additive manufacturing. He has carried out R&D projects for several companies, including General Motors, Boeing, LS Electric, Siemens and SRL Plasma. Dr Murphy has published 320 papers in refereed journals, with over 11,000 citations and an h-index of 51 in the Web of Science. He has received several awards for his research, most recently the 2021 Plasma Innovation Prize of the Association of Asia-Pacific Physical Societies Division of Plasma Physics and the 2021 Plasma Chemistry Award of the International Plasma Chemistry Society.

# KEYNOTE SPEAKERS

## Prof. Martin Leary

RMIT University, Australia

**Abstract:** *Prediction of AM lattice behaviour: observations and opportunities*



Martin Leary began his scholarly career as a postgraduate student within the Engineering Design Group at the Mechanical Engineering Department of the University of Melbourne. As a member of the RMIT School of Aerospace Mechanical and Manufacturing Engineering, he proudly continues to engage with industry and develop novel research outcomes within four research fields:

- Engineering design and engineering education
- Systems approaches and optimisation
- Sustainable automotive system design
- Renewable energy

## Ms. Alex Kingsbury

Additive Economics, Australia

**Abstract:** *Speak softly and carry a big stick: how additive manufacturing alliances in defence help us prosper*



Alex Kingsbury is a well-known technical expert and social commentator on all things 3D Printing. Alex has worked in additive manufacturing in technology leadership roles for over ten years, having previously served as a Research Leader of Additive Manufacturing at CSIRO, and as an Additive Manufacturing Industry Fellow at RMIT University. For the last six years Alex has maintained Additive Economics, a private consultancy, to provide expert, strategic advice to investment firms, company boards, and government agencies on the commercialisation of and investment in advanced manufacturing technologies. A regular in the media, Alex co-hosts a live-streamed additive manufacturing news show and co-hosts a podcast on finance in additive manufacturing. Alex is a Graduate of the Australian Institute of Company Directors and holds a Bachelor of Engineering from RMIT University.

# SYMPOSIA CHAIRS

## Sustainability

**Daniel Fabijanic** Deakin Uni, **Ali Abbas** USYD

## Modelling and Simulations

**Christian Brandl** Melbourne Uni, **Fatemeh Azhari** Monash Uni

## Digital Manufacturing

**Olga Zinovieva** UNSW Canberra, **Andrew Ang** Swinburne

## Metal Additive Manufacturing

**Andrey Molotnikov** RMIT, **Michael Bermingham** UQ

## Ceramic and Concrete Additive Manufacturing

**Luming Shen** USYD, **Jonathan Tran** RMIT

## Polymer Additive Manufacturing

**Damia Mawad** UNSW, **Antonella Sola** CSIRO

## Post-Processing

**Nikki Stanford** Uni SA, **Shoujin Sun** Griffith University

## Bioprinting and Biomaterials

**Tushar Kumeria** UNSW, **Khoon Lim** USYD

## Additive Manufacturing - Space Application

**Anna Paradowska** USYD/ANSTO, **Kun Yang** CSIRO

## Additive Manufacturing - Defense Application

**Xiaobo Yu** DSTG, **Kathie McGregor** CSIRO

## Additive Manufacturing - Green/Clean Energy

**Deanna D'Alessandro** USYD, **Ian Chen** Deakin University

## Emerging AM Technologies

**Aijun Huang** Monash Uni, **Xiaopeng Li** UNSW

## Design, Qualification and Certification

**Huijun Li** UoW, **Craig Brice** Colorado School of Mines

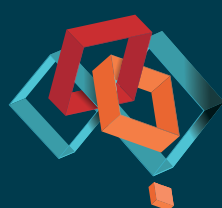
# POSTER SESSION

DAY 1 - WEDNESDAY JUNE 21

**6:15PM - 8:00PM**

Chair: Andrey Molotnikov

1	Oxidation Behaviour of Al <sub>0.3</sub> CrFeNiTi <sub>0.3</sub> High Entropy Alloy Coating Prepared via HVOF	Michael Boschen
2	Gas sensing arrays by LTCC and 3D printing technology	Kun Cao
3	A comparative study on the effects of different polishing techniques on tungsten carbide cutting tools	Minh Nhat Dang
4	Analysis of residual stress measurement for WAAM applications using neutron diffraction and the contour method	Markus Domogala
5	Investigation of the Microstructure and Mechanical Properties of Steels after Laser Cleaning	Jiawei Tu
6	Crystallographic Orientations of Nano-Sized $\beta$ -Phase Precipitates in Aged Additively Manufactured Ti-6Al-2Sn-4Zr-2Mo	Ruiqing Lu
7	Optimizing island scanning strategy for reducing residual stresses and defects in laser powder direct energy deposition (LP-DED) components	Ikram UI Hassan
8	Effect of tungsten doping on the hardness enhancement in a FeCr <sub>2</sub> V-based medium entropy alloy	Yangfan Wang
9	Nanocomposite based dispersion via laser additive manufacturing	Harkirat Singh
10	Additively manufactured steel joints for structural frames: Concept proposal and numerical simulations	Seyed Pouya Afshar Imani
11	Node-reinforced hollow-strut metal lattice materials for higher strength	Jordan Noronha
12	Effect of post-processing isothermal tempering heat treatment on the mechanical properties of additively manufactured 16Cr-2Ni martensitic stainless steel via Directed-energy deposition	Andre Hatem
13	Isolated influence of upward and downward facing surface roughness on fatigue life of laser powder bed fusion Ti-6Al-4V	Jason Rogers
14	Enhancing Ablation Modeling Efficiency: A Novel Real-Time Element Deletion Subroutine for Multi-Material Finite Element Analysis	Yutaka Tsumura
15	Diamond Coatings and Material Characterisation of Additively Manufactured Ti-64 Complex Structure	Kate Fox
16	Pushing the Boundaries of High-resolution 3D Printing and Precision Manufacturing	Jaret Lee
17	Open-source 3D data analysis and visualization cross-platform for quality assurance of additive manufacturing components	Rou Jun Toh
18	Understanding residual stress and texture in additive friction stir deposited aluminium alloy	Vladislav Yakubov
19	Dynamic SEM in-situ studies: A tool to investigate microstructural evolution during metal additive manufacturing?	Joerg Jinschek
20	Study of Phase-Transformation Behavior in Additive Manufacturing of Nitinol Shape Memory Alloys by In Situ TEM Heating	Joerg Jinschek
21	Microstructure, mechanical properties and corrosion behaviour of heat-treatable beta-21S alloy fabricated by selective laser melting	Karl Dahm
22	Design and fabrication of patient-specific surgical plates	Mohammad Saadatfar
23	Understanding the superior mechanical properties of hollow-strut metal lattice materials	Tingting Song
24	The Gibson-Ashby model for additively manufactured metal lattice materials: Its theoretical basis, limitations and new insights from remedies	Tingting Song
25	Alpha-phase variant selections in additively manufactured titanium alloys	Tingting Song
26	Mesoscale numerical simulations for WAAM process for prediction of microstructure and its effect on mechanical properties	Anna Paradowska



APICAM2023

THE UNIVERSITY OF SYDNEY  
21ST - 23RD JUNE 2023  
CONFERENCE PROGRAM



THE UNIVERSITY OF  
SYDNEY



Materials  
Australia

# CONFERENCE PROGRAM

## SYMPOSIUM THEMES

APICAM was created to provide an opportunity for industry professionals and academic researchers to come together, share knowledge and engage in the type of networking that is vital to the furthering of the additive manufacturing industry. Our technical program will cover a range of themes identified by researchers and industry as issues of topical interest.

<b>SYMPOSIUM A</b>	Metal Additive Manufacturing
<b>SYMPOSIUM B</b>	Ceramic and Concrete Additive Manufacturing
<b>SYMPOSIUM C</b>	Polymer Additive Manufacturing
<b>SYMPOSIUM D</b>	Bioprinting and Biomaterials
<b>SYMPOSIUM E</b>	Additive Manufacturing Defence Application
<b>SYMPOSIUM F</b>	Sustainability and Clean Energy
<b>SYMPOSIUM G</b>	Additive Manufacturing Space Application
<b>SYMPOSIUM H</b>	Digital Manufacturing
<b>SYMPOSIUM I</b>	Modelling and Simulations
<b>SYMPOSIUM J</b>	Additive Manufacturing Post-Processing
<b>SYMPOSIUM K</b>	Emerging Additive Manufacturing Technologies
<b>SYMPOSIUM L</b>	Design, Qualification and Certification

The organising committee thank all the Session Chairs for their time and great assistance in undertaking chair duties.

## THANK YOU!

# DAY 1 WEDNESDAY 21.06.23 SESSION 1

7:30	REGISTRATION OPEN IN FOYER - LEVEL 2		
8:45	OPENING OF APICAM2023 IN B2010		
9:30	PLENARY (B2010) DR GLYNN ADAMS <i>Additive Manufacturing at Lockheed Martin</i> SESSION CHAIR: PROFESSOR SIMON RINGER		
10:30	MORNING TEA (30 MINS): NETWORKING OPPORTUNITY – 2240		
11:00	STREAM 1 - B2010	11:00	STREAM 2 - 2080
A1: METAL ADDITIVE MANUFACTURING CHAIR: ANDREY MOLOTNIKOV		I1: MODELLING AND SIMULATIONS CHAIR: FATEMEH AZHARI	
11:00	CHRISTOPH LEYENS New Material Developments in Additive Manufacturing	11:00	PETER VOORHEES Additive Manufacturing: From Nonequilibrium Interfaces to Strange Grains
11:30	KASHMIRA RAGHU A Correlative Microscopy Workflow for Subsurface Sample Analysis	11:30	DYLAN AGIUS A Computationally Efficient Multi-Scale Modelling Tool to Aid in EBM Build Strategy Selection
11:45	XIANGHAI AN Additively manufactured hierarchical multiple-principal element alloys with superior properties	11:50	OLGA ZINOVIEVA Computational Modelling of Process-Structure-Property Relationships in Metal Additive Manufacturing
12:00	MD JONAET ANSARI Detection of Process-Induced Defects Using Acoustic Emission During Laser Metal Deposition Process	12:05	ECIO BOSI Thermal Spray High Entropy Alloy Design using the CALPHAD Scheil Model
12:15	XIAOZHOU LIAO Introducing hierarchical heterogenous structures using additive manufacturing for superior mechanical properties	12:20	WENYI YAN A characteristic time-based heat input model and a thermal simulation strategy for selective laser melting
12:30	LUNCH BREAK (1 H 15 MINS): NETWORKING OPPORTUNITY – 2240		

# DAY 1 WEDNESDAY 21.06.23 SESSION 1

REGISTRATION OPEN IN FOYER - LEVEL 2						7:30		
OPENING OF APICAM2023 IN B2010						8:45		
PLENARY (B2010) DR GLYNN ADAMS <i>Additive Manufacturing at Lockheed Martin</i> SESSION CHAIR: PROFESSOR SIMON RINGER						9:30		
MORNING TEA (30 MINS): NETWORKING OPPORTUNITY – 2240						10:30		
11:00	STREAM 3 - 2090		11:00	STREAM 4 - 2150		11:00	STREAM 5 - 1100	
J1: ADDITIVE MANUFACTURING POST-PROCESSING CHAIR: NIKKI STANFORD			A2: METAL ADDITIVE MANUFACTURING (IRON & STEELS) CHAIR: MICHAEL BERMINGHAM			F1: SUSTANAIBILITY AND CLEAN ENERGY CHAIR: ALI ABBAS		
11:00	JAMES WARNER  The effects of ageing time and temperature on additively manufactured aluminium alloys		11:00	MINGXING ZHANG  Laser additively manufacturing of steels		11:00	ZAIPING GUO  3D Printing of Electron/Ion Fluxes Dual-Gradient Anode for Dendrite- free Zinc Batteries	
11:15	MOHAMMED ABDUL KHALIK  Strengthening and densification of cold sprayed titanium structures using cost-effective open-to-air Electro-Plastic thermomechanical treatment.			THOMAS NIENDORF  Metastable austenitic steels - Pathways to tackle recent challenges in additive manufacturing			11:30	REZA MOINI  Advanced Manufacturing and Design for Resilient and Sustainable Infrastructure Materials
11:30	XIAOCHEN SUN  Reducing voids with an interlaced printing method for material extrusion-based additive manufactured parts		11:20					
11:45	CECILIE FUNCH  Tailored heat treatment of additively manufactured metals		11:40	YUNHUI CHEN  Synchrotron X-ray Hierarchical Imaging of Phase Transformations during Laser Additive Manufacturing				
			11:55	ZIWEI GONG  Deformation kinetics of additively manufactured 304L stainless steel with hierarchical microstructures and superior mechanical properties		12:00	XIN HU  3D-printed thermoplastic polyurethane electrodes for customizable, flexible lithium-ion batteries with an ultra-long lifetime	
			12:10	MICHAEL HAINES  Impact of Changing Thermal History on the Evolution of Copper Precipitates in Laser Powder Bed Fusion 17-4 PH stainless steel		12:15	YANG YU  Development of a novel filament for fused deposition modelling from recycled polypropylene and recovered carbon fiber	
LUNCH BREAK (1 H 15 MINS): NETWORKING OPPORTUNITY – 2240						12:30		

# DAY 1 WEDNESDAY 21.06.23 SESSION 2

13:45	<b>PLENARY (B2010) PROFESSOR AMY CLARKE</b> <i>Visualizing and Controlling Microstructural Evolution in Metals under Additive Manufacturing Conditions</i> <b>SESSION CHAIR: PROFESSOR GWÉNAËLLE PROUST</b>		
14:45	<b>STREAM 1 - B2010</b>	14:45	<b>STREAM 2 - 2080</b>
<b>A3: METAL ADDITIVE MANUFACTURING</b> <b>CHAIR: CECILIE FUNCH</b>		<b>E1: ADDITIVE MANUFACTURING DEFENCE APPLICATION</b> <b>CHAIR: XIAOBO YU</b>	
14:45	<b>TAKUYA ISHIMOTO</b> Crystallographic Texture Control By Metal Powder Bed Fusion	14:45	<b>LONNIE LOVE</b> Burn The Boats: A Strategy To Accelerate Adoption Of Advanced Manufacturing
15:15	<b>ERIN BRODIE</b> Spatially Controlled Mesosstructure Engineering From Random Powder Mixtures In Laser Powder Bed Fusion (LPBF)	15:15	<b>STEPHEN SUN</b> Defect Detectability and Limitations of X-Ray Micro-Computed Tomography in Laser Powder-Bed Fusion of Ti-6Al-4V
15:30	<b>KANGWEI CHEN</b> The Investigation Of Copper Alloy Fabricated By Laser Powder Bed Fusion (LPBF)	15:30	<b>CAMERON BARR</b> Effect Of Residual Heat On Aermet100 Microstructure Produced By Laser Directed Energy Deposition
15:45	<b>WENLIANG CHEN</b> Laser Power Modulated Microstructure Evolution, Phase Transformation And Compression-Compression Fatigue Behavior In Niti Fabricated By Laser Powder Bed Fusion	15:45	<b>DARREN CRAM</b> Environmentally Assisted Cracking And Cavitation Performance Of Nickel Aluminium Bronze In Salt Water: Cast Vs LPBF
16:00	<b>TAYLA DAHMS</b> Conductivity Measurements Of Additively Manufactured Metals Using A Resonator For The K-Band	16:00	<b>JASON BIVIANO</b> Cast Vs Additively Manufactured Nickel Aluminium Bronze (NAB): Effect Of Microstructure On Mechanical Performance
16:15	<b>AFTERNOON TEA (30 MINS): NETWORKING OPPORTUNITY – 2240</b>		

# DAY 1 WEDNESDAY 21.06.23 SESSION 2

<b>PLENARY (B2010) PROFESSOR AMY CLARKE</b> <i>Visualizing and Controlling Microstructural Evolution in Metals under Additive Manufacturing Conditions</i> <b>SESSION CHAIR: PROFESSOR GWÉNAËLLE PROUST</b>					13:45
14:45	<b>STREAM 3 - 2090</b>	14:45	<b>STREAM 4 - 2150</b>	14:45	<b>STREAM 5 - 1100</b>
<b>A4: METAL ADDITIVE MANUFACTURING</b> <b>CHAIR: XIANGHAI AN</b>		<b>A5: METAL ADDITIVE MANUFACTURING (IRON &amp; STEELS)</b> <b>CHAIR: MINGXING ZHANG</b>		<b>F2: SUSTANAIBILITY AND CLEAN ENERGY</b> <b>CHAIR: IAN CHEN</b>	
14:45	<b>ZENGXI PAN</b> Layer-By-Layer Model-Based Adaptive Control For Wire Arc Additive Manufacturing Of Thin-Wall Structures	14:45	<b>XINYI HE</b> Microstructure And Mechanical Properties Of Duplex Stainless Steels Manufactured By Laser Powder Bed Fusion	14:45	<b>IAN GIBSON</b> Addressing AM Sustainability Of Polymer Use
15:05	<b>PETER COLLINS</b> On New Methods To Predict Local Properties In Additively Manufactured Ti-6Al-4V And The Possibilities For Gradient Materials	15:00	<b>JINQIAO LIU</b> In-Situ Observation Of The Deformation Behaviour Of Dislocation Cellular Structures In Additively Manufactured Metals	15:15	<b>ELEANOR KEARNS</b> 3D Printing Of Metal-Organic Framework Composite Materials For Electrochemical And Direct Air Capture Applications
15:25	<b>SARUKKALIGE TIRUNIKA TANUSHI DE SILVA</b> The Characterisation Of A Novel Irregularly Shaped Ta And Spherical Ti Powder Blend On The Powder Spreading Process In Powder Bed Fusion Systems	15:30	<b>TRI DUNG PHAN</b> Application Of Metal Additive Manufacturing To Manufacturing Of Aluminium Extrusion Dies	15:30	<b>SUNIL MEHLA</b> Additive Manufacturing In Sustainable Critical Minerals Processing
15:40	<b>MICHAEL LEO DELA CRUZ</b> Microstructure Evolution In Laser Powder Bed Fusion-Built Fe-Mn-Si Shape Memory Alloy	15:45	<b>ZEFENG WU</b> New Insights Into The Melt Pool Dynamics In The Cladding Process By An In-Situ Monitoring Approach	15:45	<b>MD MOKHLESUR RAHMAN</b> Fabricating High Performance-Lightweight-Low-cost Batteries
15:55	<b>HUGO ROIRAND</b> Investigations On The Impact Of The Microstructure Generated By Additive Manufacturing On The Fatigue Crack Initiation Behaviour	16:00	<b>C.X. REN</b> High-Strength Antibacterial Cu-Bearing 316L Stainless Steel Fabricated By Laser Powder Bed Fusion		
<b>AFTERNOON TEA (30 MINS): NETWORKING OPPORTUNITY – 2240</b>					16:15

# DAY 1 WEDNESDAY 21.06.23 SESSION 3

16:45	STREAM 1 - B2010	16:45	STREAM 2 - 2080
<b>A6: METAL ADDITIVE MANUFACTURING (AL AND ALLOYS)</b> <b>CHAIR: MEHDI EIZADJOU</b>		<b>K1: EMERGING ADDITIVE MANUFACTURING TECHNOLOGIES</b> <b>CHAIR: AIJUN HUANG</b>	
16:45	<b>THOMAS DORIN</b> New Aluminium-Scandium welding wires for Additive Manufacturing	16:45	<b>CHRISTOPHER BERNDT</b> The Attributes of Microstructural Artifacts in Thermal Spray Coatings
17:00	<b>MOSES JAMES PAUL</b> Resistance curve behavior of AISi10Mg fabricated by laser powder bed fusion		
17:15	<b>QIAN LIU</b> Interpretable prediction approach for exploring process window of additive manufacturing	17:15	<b>SURESH BHARGAVA</b> Additive Manufacturing in Chemical Sciences and Engineering
17:30	<b>EDWARD LUI</b> Effect of build geometry and parts spacing on mechanical properties of additively manufactured high strength aluminium A205 alloy	17:35	<b>MUHAMMED ALSUBHI</b> The Influence of Ultrasound on Laser Metal Powder Deposition: Melt Pool Characteristics and Formation of Equiaxed Grains
17:45	<b>SAURABH GAIROLA</b> Effect of annealing treatment on mechanical behaviour and microstructural evolution of additively manufactured, titanium-modified Al 2024 alloy	17:50	<b>BRIAN POST</b> From Neutron Diffraction to Tool Repair: How Fundamental Scientific Research Translates to Industrial Impact for Hybrid AM Processes
		18:05	<b>JAMES BOTT</b> Additive Manufacturing of Carbon Fibre Reinforced Polymer Brick-and-Mortar Structures
18:15	<b>EVENING RECEPTION, POSTER SESSION, AWARDS</b>		

# DAY 1 WEDNESDAY 21.06.23 SESSION 3

16:45	STREAM 3 - 2090	16:45	STREAM 4 - 2150	16:45	STREAM 5 - 1100
A7: METAL ADDITIVE MANUFACTURING (Ti AND ALLOYS) CHAIR: PROFESSOR SOPHIE PRIMIG		A8: METAL ADDITIVE MANUFACTURING CHAIR: TINGTING SONG		H1: DIGITAL MANUFACTURING CHAIR: OLGA ZINOVIEVA	
16:45	<b>RAJARSHI BANERJEE</b> Additive Manufacturing of Beta Titanium Alloys: Influence of Thermo-Kinetics on Precipitation, Strength, and Strain Hardening Behaviour	16:45	<b>JOY GOCKEL</b> Influence of Additive Manufacturing Surface Roughness and Microstructure on Fatigue Failure	16:45	<b>MARTIN LEARY</b> Prediction of AM lattice behaviour: observations and opportunities
17:15	<b>JOERG JINSCHKE</b> Investigation of the impact of far-from-equilibrium process conditions on metal AM microstructure	17:15	<b>NIMA HAGHDADI</b> In-situ Microstructure Engineering During Additive Manufacturing	17:15	<b>JENNIFER LOY</b> Additive Manufacturing: Keep it Real, Make it Work
17:35	<b>MICHAEL BERMINGHAM</b> Challenges and opportunities in the application of metastable $\beta$ -Ti alloys produced by wire Directed Energy Deposition	17:30	<b>FENGYANG HE</b> Wire arc additive manufacturing parts with complex geometries using surface tension transfer: a comparative study with cold metal transfer	17:35	<b>SUBASH GAUTAM</b> On-the-fly 3D geometry monitoring approach for cold spray additive manufacturing
17:50	<b>YI RYE CHOI</b> Defect Morphology and Fatigue Life in Additively Manufactured Ti-6Al-4V	17:45	<b>NAJMEH SAMADIANI</b> Machine Learning Models for the Optimisation of Powder-Bed Fusion Metal Additive Manufacturing	17:50	<b>DAYALAN GUNASEGARAM</b> Real-time autonomous control of Additive Manufacturing processes in the Industry 4.0 era
18:05	<b>CHRISTIAN LAUHOFF</b> Additive Manufacturing of Ti-Ta based High-Temperature Shape Memory Alloys - Microstructure and Functional Properties	18:00	<b>CHENZE LI</b> In-situ observation of deformation mechanisms in an additive manufactured CoCrNi medium entropy alloy	18:05	<b>TONY DONG</b> Build Virtual AM Process To Support First Time Right Printing And Material Testing
EVENING RECEPTION, POSTER SESSION, AWARDS					18:15

# DAY 2 THURSDAY 22.06.23 SESSION 1

7:30	REGISTRATION OPEN IN FOYER - LEVEL 2		
8:15	UPDATES AND NOTICES - B2010		
8:30	PLENARY (B2010) MS AMBER ANDREACO <i>Mirror Mirror – A 15-year Reflection on Metal Additive Manufacturing</i> SESSION CHAIR: PROFESSOR JIAN-FENG NIE		
9:30	STREAM 1 - B2010	9:30	STREAM 2 - 2080
J2: ADDITIVE MANUFACTURING POST-PROCESSING CHAIR: MILAN BRANDT		E2: ADDITIVE MANUFACTURING DEFENCE APPLICATION CHAIR: KATHIE MCGREGOR	
9:30	AIJUN HUANG Creep performance of additively manufactured Ni-based superalloy	9:30	BRENDAN FUNNELL Business-as-Usual: Operationalising Additive Manufacturing in Defence
9:50	ANNA PARADOWSKA Non-destructive neutron base characterisation techniques for additive manufacturing	9:50	KHAN SHARP Additive S&T for Defence
10:10	BJORN BACKMAN Latest Developments in the Use of HIP for Additive Manufacturing	10:10	CHRISTOS DIONYSSOPOULOS Topology optimisation of a flight-critical aircraft component for metal additive manufacturing
10:30	MORNING TEA (30 MINS): NETWORKING OPPORTUNITY – 2240		

# DAY 2 THURSDAY 22.06.23 SESSION 1

REGISTRATION OPEN IN FOYER - LEVEL 2					7:30
UPDATES AND NOTICES - B2010					8:45
PLENARY (B2010) MS AMBER ANDREACO <i>Mirror Mirror – A 15-year Reflection on Metal Additive Manufacturing</i> SESSION CHAIR: PROFESSOR JIAN-FENG NIE					8:30
9:30	STREAM 3 - 2090	9:30	STREAM 4 - 2150	9:30	STREAM 5 - 1100
K2: EMERGING ADDITIVE MANUFACTURING TECHNOLOGIES CHAIR: XIAOPENG LI		G1: ADDITIVE MANUFACTURING SPACE APPLICATION CHAIR: KUN YANG		H2: DIGITAL MANUFACTURING CHAIR: ANDREW ANG	
9:30	ZACHARY CORDERO Directional Recrystallization of Additively Manufactured Ni-base Superalloys	9:30	DANIEL EAST CSIRO past successes and future directions of Additive Manufacturing for space applications	9:30	PETER KING Continuous3D Software for Robotic Additive Manufacturing
9:50	MALAIKA INGRAM Functional Polymer Development for Additive Manufacturing and Advanced Manufacturing Technologies			9:45	HANS LOHR A voxel-based framework for nonplanar robotic 3D printing
10:05	DONALD CHEN 2µm PµSL Based 3D Printing and its application in Metamaterial, Biomedicine, Ceramics, etc.	10:00	CHUN KIT SIT Formation of the first layer 0 degree overhang of IN718 by Laser Powder Bed Fusion	10:00	ALEJANDRO VARGAS USCATEGUI How 3D sensing can enhance cold spray for additive manufacturing and repair
10:20	BRIAN POST Moonshots: The Art and Science of Large-Scale Additive Manufacturing (Metals, Composites, Concrete)	10:15	DAVID DOWNING Feasibility Study of an Additively Manufactured Payload System for Space Application	10:15	JASON DASH Functional Grading of Strut Elements in Additively Manufactured Lattice Structures
MORNING TEA (30 MINS): NETWORKING OPPORTUNITY – 2240					10:30

11:00	STREAM 1 - B2010	11:00	STREAM 2 - 2080
A9: METAL ADDITIVE MANUFACTURING CHAIR: GRAHAM SCHAFER		A10: METAL ADDITIVE MANUFACTURING (Ni & ALLOYS) CHAIR: JOERG JINSCHKE	
11:00	<b>CHIEN-FANG DING</b> Laser-induced forward transfer for printing metallic structures on flexible substrates	11:00	<b>MING LUO</b> Effect of Scanning Strategy on the Microstructure and Grain Boundary Network of Additively Manufactured Nickel-based Superalloy Inconel 738
11:20	<b>VLADISLAV YAKUBOV</b> Heat-tolerant and crack-free additively manufactured Ce modified Al6061 with exceptional ductility	11:15	<b>MARC PETERS</b> The role of nano-oxides in the fracture of Ni-based alloys fabricated by laser-powder bed fusion (LPBF)
11:35	<b>TIMOTHY HERZOG</b> Defect detection by multi-axis infrared process monitoring of Laser Directed Energy Deposition	11:30	<b>ZHIJUN QIU</b> Stabilised mechanical properties in Ni-based Hastelloy C276 alloy by wire arc additive manufacturing through interlayer control
11:50	<b>ADRIANA ERES-CASTELLANOS</b> Refinement mechanisms of tantalum-inoculated aluminum subjected to simulated laser powder bed fusion	11:45	<b>FELIX THESKA</b> Impact of atomic-scale solute clustering on the high-temperature mechanical properties of additively manufactured Inconel 718
12:05	<b>BRUNO FELIPE ANDRADE BEZERRA</b> WC-12Co addition in an Inconel 625 metallic matrix deposited through high-speed laser cladding as an alternative for hard chrome plating	12:00	<b>CHENGXUN ZHANG</b> Fabrication of bulk-wall Inconel 625 alloy components using wire arc additive manufacturing
12:20	<b>THOMAS WEGENER</b> On the structural integrity of Fe-36Ni Invar alloy processed by different additive manufacturing techniques	12:15	
12:30	<b>LUNCH BREAK (1 H 15 MINS): NETWORKING OPPORTUNITY – 2240</b>		

# DAY 2 THURSDAY 22.06.23 SESSION 2

11:00	STREAM 3 - 2090	11:00	STREAM 4 - 2150	11:00	STREAM 5 - 1100
A11: METAL ADDITIVE MANUFACTURING CHAIR: GWÉNAËLLE PROUST		G2: ADDITIVE MANUFACTURING SPACE APPLICATION CHAIR: ANNA PARADOWSKA		C1: POLYMER ADDITIVE MANUFACTURING CHAIR: MICAELA DEGLI ESPOSTI	
11:00	ANTHONY ROLLETT Modelling and Simulation in Additive Manufacturing	11:00	NAZLI ESLAMIRAD HIPing and Characterisation of Cold Spray additive manufactured Titanium	11:00	DAVID HOWARD Additive Manufacture for Soft Robotics
11:30	IAN GIBSON Current developments and future prospects around industrial additive manufacturing of metal products	11:20	MICHAEL HEITZMANN Additive Manufacture of Ceramic Matrix Composites: Opportunities, challenges, and an approach	11:20	TUSHARBHAI MAHESHKUMAR GAJJAR Fused Deposition Modelling of Fibre Reinforced Polylactic Acid with Heating Techniques
11:45	RICHARD WILLIAMS A deep learning model for the analysis of high-speed melt pool videos in powder bed fusion	11:40	KUN YANG Additively manufacturing of shape memory alloys for space applications	11:35	JONATHAN TRAN Nature's Lessons and Inspiration for Fracture-Tolerant Design
12:00	CHRISTIANE SCHULZ Challenges in powder production for Additive Manufacturing	12:00	EHSAN FARABI Microstructural Refinement via High Deposition Rate Wire-Arc Directed Energy Deposited Ti-6Al-4V Using Cold Metal Transfer Technology	11:50	SMRUTI PARIMITA Bidirectional shape-morphing of pH-responsive 4D printed hydrogels
12:15	RYAN BROOKE Beyond global energy density for additive manufacturing: machine learning for modelling and optimizing process parameters	12:15	ANTHONY ROCCISANO Sliding Wear of Bulk vs Laser Deposited Inconel 625 and 718	12:05	PREMKUMAR KOTHAVADE Luminescent 3D printed PLA nanocomposites with enhanced mechanical properties
LUNCH BREAK (1 H 15 MINS): NETWORKING OPPORTUNITY – 2240					12:30
					YI XIONG Additive Manufacturing and Design of Continuous Fiber Reinforced Polymer Composites

# DAY 2 THURSDAY 22.06.23 SESSION 3

13:45	<b>PLENARY (B2010) PROFESSOR SUONG VAN HOA</b> <i>4D printing of composites</i> <b>SESSION CHAIR: PROFESSOR KATE FOX</b>		
14:45	<b>STREAM 1 - B2010</b>	14:45	<b>STREAM 2 - 2080</b>
<b>A12: METAL ADDITIVE MANUFACTURING</b> <b>CHAIR: IAN GIBSON</b>		<b>A13: METAL ADDITIVE MANUFACTURING (Ti &amp; ALLOYS)</b> <b>CHAIR: ZIBIN CHEN</b>	
14:45	<b>JIAN-FENG NIE</b> Additively manufacturing from Al-Mg-Ti(-Sc-Zr) alloy wires	14:45	<b>HAMISH FRASER</b> Optimization of grain morphology in titanium alloys processed using additive manufacturing
15:05	<b>NANA KWABENA ADOMAKO</b> Thermal cycle induced phase evolution in IN718 during additive manufacturing: Gleeble and thermo-kinetic modelling study		
15:20	<b>PHILIPP KROOSS</b> Thermal cycle induced phase evolution in IN718 during additive manufacturing: Gleeble and thermo-kinetic modelling study	15:15	<b>DONG QIU</b> Additively Manufactured, Ultrafine-grained Titanium-copper Alloys Tailored for Marine Environments: Antibacterial and Anti-Microbial Corrosion Studies
15:35	<b>ANNA PARADOWSKA</b> Residual Stresses in Multi-layer Laser Clad Light Rail Components	15:30	<b>WEN HAO KAN</b> Enhancing tribological properties of titanium alloys through laser powder bed fusion
15:50	<b>HANK LLOYD</b> Extended microstructural evolution of cast iron laser cladding interfaces	15:45	<b>FELIX NUGRAHA LOMO</b> Titanium metal matrix composite fabrication via cold spray additive manufacturing
16:05	<b>IRENE FERRETTO</b> Microstructure and property manipulation of Fe-based shape memory alloys fabricated by additive manufacturing	16:00	<b>LABANI MUSTAFI</b> Laser surface modification of Ti40Zr25Nb25Ta10O0.5 high entropy alloy
16:15	<b>AFTERNOON TEA (30 MINS): NETWORKING OPPORTUNITY – 2240</b>		

# DAY 2 THURSDAY 22.06.23 SESSION 3

PLENARY (B2010) PROFESSOR SUONG VAN HOA <i>4D printing of composites</i> SESSION CHAIR: PROFESSOR KATE FOX					13:45
14:45	STREAM 3 - 2090	14:45	STREAM 4 - 2150	14:45	STREAM 5 - 1100
C2: POLYMER ADDITIVE MANUFACTURING CHAIR: DAMIA MAWAD		G3: ADDITIVE MANUFACTURING SPACE APPLICATION CHAIR: DANIEL EAST		I2: MODELLING AND SIMULATIONS CHAIR: CHRISTIAN BRANDL	
14:45	GORDON WALLACE 3D Bioprinting: Making Stuff that Makes Stuff using Biology	14:45	NINSHU MA Analysis of residual stress in additive manufactured functionally graded layers for joining dissimilar materials in space applications	14:45	DAYALAN GUNASEGARAM Multiscale modelling of additively manufactured parts
		15:05	HAOPENG SHEN Towards Additive Manufacturing of Metallic Wheels for Mars Rovers	15:05	ZHUOHAN CAO A generative machine learning method for microstructures prediction in additively manufactured Ti6Al4V alloy
15:15	WEI JUENE CHONG 3D Printing of Antibacterial PLA-ZnO Nanocomposites for Biomedical Applications	15:20	CONRAD SAMUEL Laser-based additive manufacturing of a large-scale optical bench for space application	15:20	ALBAN DE VAUCORBEIL Challenges and progress in the modelling of Additive Friction Stir Deposition
15:30	DEJANA PEJAK SIMUNEC Increasing electrical anisotropy and current waveform response of soft, flexible 3D printed sensors through material formulation	15:35	KAIFUR RASHED Polyaryl ether ketone (PAEK) matrix composites for material extrusion additive manufacturing	15:35	ALI EBRAHIMZADEH DEHAGHANI Designing and manufacturing of TPMS-structured paediatric metal bone plates
15:45	CHAMINI RODRIGO Crushing behaviour of functionally graded hybrid lattices fabricated by additive manufacturing			15:50	YUN HWAN KIM Hybrid modelling of the Wire Arc Additive Manufacturing Process
16:00	CALLUM VIDLER Low-cost single digit scalable microprinting			16:05	KARISMA MOHAPATRA A numerical investigation of artificial reefs design on flow field effect considering 3D printing criteria
AFTERNOON TEA (30 MINS): NETWORKING OPPORTUNITY – 2240					16:15

# DAY 2 THURSDAY 22.06.23 SESSION 4

14:45	STREAM 1 - B2010	14:45	STREAM 2 - 2080
A14: METAL ADDITIVE MANUFACTURING CHAIR: THOMAS DORIN		B1: CERAMIC AND CONCRETE ADDITIVE MANUFACTURING CHAIR: JONATHAN TRAN	
14:45	<b>CRAIG BRICE</b> Addressing the high dimensionality and associated data challenges in metal additive manufacturing	14:45	<b>GEORGE FRANKS</b> 3D Printing Hierarchical Porous Ceramics
17:05	<b>KEITA NOMOTO</b> Toward high strength and high conductivity copper-based alloys via additive manufacturing		
17:20	<b>JORDAN NORONHA</b> Reinforced Hollow-Strut Lattices For High Load Bearing Applications	17:15	<b>BIRANCHI PANDA</b> Additive Manufacturing of concrete: a paradigm shift toward sustainability
17:35	<b>ALI RAMEZANNEJAD</b> Towards Successful Additive Manufacturing of NiMnGa Magnetic Shape Memory Alloys		
17:50	<b>SAMIA RAZZAQ</b> Microstructure and hardness evolutions of stainless steel 316L-nimonic 90 bimetallic components along the build direction	17:45	<b>SEBASTIAN LANNER</b> Ceramic 3D Printing: Technology and Applications Presented by a Market Leader
18:05	<b>HEND A. ALQAYDI</b> A novel approach for the mechanical performance prediction of as-manufactured Inconel 718 latticed structures	18:00	<b>CHARLIE CLARK</b> Innovative zirconia-based material shaped by SLA 3D printing
18:45	CONFERENCE DINNER		

# DAY 2 THURSDAY 22.06.23 SESSION 4

14:45	STREAM 3 - 2090	14:45	STREAM 4 - 2150	14:45	STREAM 5 - 1100
I3: MODELLING AND SIMULATIONS CHAIR: DAYALAN GUNASEGARAM		A15: METAL ADDITIVE MANUFACTURING (Ti & ALLOYS) CHAIR: MARTIN LEARY		E3: ADDITIVE MANUFACTURING DEFENCE APPLICATION CHAIR: XIAOZHOU LIAO	
14:45	<b>GRAHAM SCHAFER</b> A Computational Framework for Designing Sintered Materials	14:45	<b>MARKUS LINDEMANN</b> Titanium AM Parts Built with Preheating	14:45	<b>KRITKASEM KHANTISOPON</b> Development of Environmental Barrier Coatings for Boiler Tubes using Suspension Plasma Spray
17:05	<b>NATHAN MARCH</b> Prediction of Mechanical Properties from the Microstructures of Additively Manufactured Parts	17:00	<b>MARIA POPOVSKI</b> The effect of processing parameters on the microstructure and tensile properties of additively manufactured Ti-Cu alloys	17:00	<b>HAO WANG</b> An Oxygen-Stabilized Face- Centred Cubic Phase With Superior Mechanical Properties In Additively Manufactured Ti-6Al-4V
17:20	<b>VU NGUYEN</b> Advances in Multiscale Modelling of Metal Additive Manufacturing	17:15	<b>JASON ROGERS</b> Isolated influence of upward and downward facing surface roughness of fatigue life of laser powder bed fusion Ti-6Al-4V	17:15	<b>XIAOBO YU</b> Design for Acceptance of Additively Manufactured Components
17:35	<b>ANDREY MOLOTNIKOV</b> Qualification of DED metal additive manufacturing by Artificial Intelligence monitoring and Digital Twin analysis	17:30	<b>TINGTING SONG</b> Directed energy deposition of Ti- 6Al-4V for desired microstructures and tensile properties based on process simulation		
17:50	<b>CHRISTIAN BRANDL</b> Grain boundary mobility regimes in fcc metals	17:45	<b>DUYAO ZHANG</b> A Novel $\alpha+\beta$ Ti Alloy Designed for Additive Manufacturing		
		18:00	<b>KUN ZHANG</b> Rapid Achieving Ultra-high Strength in Ti-3Al-8V-6Cr-4Mo-4Zr Alloy Processed by Directed Energy Deposition		
CONFERENCE DINNER					

# DAY 3 FRIDAY 23.06.23 MORNING

7:30	REGISTRATION OPEN IN FOYER - LEVEL 2		
8:15	UPDATES AND NOTICES - B2010		
8:30	PLENARY (B2010) MR. CONOR KELLEHER <i>Additive Manufacturing at Scale</i> SESSION CHAIR: PROFESSOR MA QIAN		
9:30	STREAM 1 - B2010	9:30	STREAM 2 - 2080
L1: DESIGN, QUALIFICATION AND CERTIFICATION CHAIR: HUIJUN LI		E4: ADDITIVE MANUFACTURING DEFENCE APPLICATION CHAIR: GANGADHARA PRUSTY	
9:30	ANDREY MOLOTNIKOV Global efforts on the development of standards for additive manufacturing	9:30	ALEX KINGSBURY Speak softly and carry a big stick: how additive manufacturing alliances in defence help us prosper
10:00	DUANN SCOTT The State of Design Software in Additive Manufacturing	10:00	REBECCA MURRAY Can additive manufacturing be integrated into defence? Importance of the end-user and risks around innovating
10:15	KATE FOX Design of a Lightweight Mobile Stroke Unit CT Scanner	10:15	PETER KING Titanium Cold Spray of WAAM Components for Corrosion Protection in Naval Applications
10:30	MORNING TEA (30 MINS): NETWORKING OPPORTUNITY – 2240		
11:00	STREAM 1 - B2010	11:00	STREAM 2 - 2080
L2: DESIGN, QUALIFICATION AND CERTIFICATION CHAIR: CRAIG BRICE		C3: POLYMER ADDITIVE MANUFACTURING CHAIR: ANTONELLA SOLA	
11:00	CYNTHIA WATERS Quality Metal Additive Manufacturing (Quality Made) Program Transition for Accelerated Qualification	11:00	GANGADHARA PRUSTY Process controlled automated composite manufacturing: parameter effects on bonding to process monitoring
11:20	QIANCHU LIU Defect Categories, Assessment and Mitigation in Metal Additive Manufacturing		
11:35	BRUCE MCLEAN The Fear of Qualification [FOQ]	11:30	MICAELA DEGLI ESPOSTI Can emerging renewable printable polymers empower a more sustainable additive manufacturing?
11:50	ABHISHEK MALIK Enhancing Design Confidence: FEA Validation of 3D Printed Composites	11:50	ZIYUAN WANG Effects of process parameters in 3D printing of short carbon fiber reinforced polymer filaments based on Micro-CT analysis
		12:05	JOHNSON JACOB Polymer/metal composite filaments for fused filament fabrication (FFF)
		12:20	JIAHUI LI Investigating the Effect of Processing Parameters on the Flexural Properties of 3D Printed Continuous Fibre Reinforced Composites
12:30	LUNCH BREAK (1 H 15 MINS): NETWORKING OPPORTUNITY – 2240		

# DAY 3 FRIDAY 23.06.23 MORNING

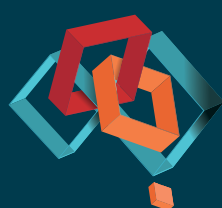
REGISTRATION OPEN IN FOYER - LEVEL 2				7:30
UPDATES AND NOTICES - B2010				8:45
PLENARY (B2010) MR. CONOR KELLEHER <i>Additive Manufacturing at Scale</i> SESSION CHAIR: PROFESSOR MA QIAN				8:30
9:30	STREAM 3 - 2090	9:30	STREAM 4 - 2150	
H3: DIGITAL MANUFACTURING CHAIR: KATJA EDER		F3: SUSTAINABILITY AND CLEAN ENERGY CHAIR: DANIEL FABIJANIC		
9:30	TONY MURPHY A Hybrid Multiscale Model of Wire-Arc Additive Manufacturing and Steps toward a Digital Twin	9:30	BAOZHI YU Design and structure optimization of 3D-printed electrodes for high-performance lithium batteries	
10:00	FRANK BRUECKNER Increased process stability and efficiency by digitalization in laser-based additive manufacturing	9:50	MATTHEW BARNETT Additive Friction Stir Deposition: microstructures, recycling and energy consumption	
		10:10	RIDDHI SARKAR Additive Manufacturing-Based Repair of IN718 Superalloy and High-Cycle Fatigue Assessment of the Joint	
		10:25	ALI ABBAS Reuse of waste resources in concrete 3D printing	
MORNING TEA (30 MINS): NETWORKING OPPORTUNITY – 2240				10:30
11:00	STREAM 3 - 2090	11:00	STREAM 4 - 2150	
D1: BIOPRINTING AND BIOMATERIALS CHAIR: TUSHAR KUMERIA		A16: METAL ADDITIVE MANUFACTURING CHAIR: MATTHEW BARNETT		
11:00	JESS FRITH Optimising the cell microenvironment to improve engineered tissue structure and function	11:00	ZIBIN CHEN Interstitial oxygen in additively manufactured titanium alloys	
		11:15	KARL DAHM Characterisation of 316L(Si) stainless steel parts made by arc Direct Energy Deposition (DED)	
11:30	KHOON LIM High resolution 3D bioprinting of light-activated bioinks	11:30	CHAO VOON SAMUEL LIM Mechanical Properties and Process Viability of Hybrid AM and HIP of Ti-6Al-4V Parts	
11:50	YOGAMBHA RAMASWAMY Custom-built bioprinting system and synthetic polypeptide based bioresin for biomedical applications	11:45	SRIKANTH MATETI Additively manufactured Ti-6Al-4V alloy via directed energy deposition of boron nitride nanotubes (BNNT)	
12:10	CHUN XU 3D printed porous nanomaterials for bone regeneration	12:00	CHI-HO NG Achieving porosity-free and grain-refined structures in additively manufactured metastable $\beta$ -Ti alloys via super-transus hot isostatic pressing	
		12:15	ALEXANDER MEDVEDEV Generating multi-directional compositional inhomogeneity via LMD-integrated rapid powder switch functionality	
LUNCH BREAK (1 H 15 MINS): NETWORKING OPPORTUNITY – 2240				12:30

# DAY 3 FRIDAY 23.06.23 AFTERNOON

13:45	<b>PLENARY (B2010) ASSOCIATE PROFESSOR ALLISON BEESE</b> <i>Additive Manufacturing: Machine Learning, Mechanics, and Metallurgy</i> <b>SESSION CHAIR: PROFESSOR SOPHIE PRIMIG</b>		
14:45	<b>STREAM 1 - B2010</b>	14:45	<b>STREAM 2 - 2080</b>
<b>L3: DESIGN, QUALIFICATION AND CERTIFICATION</b> <b>CHAIR: CHRISTOPHER BERNDT</b>		<b>A17: METAL ADDITIVE MANUFACTURING</b> <b>CHAIR: BRIAN POST</b>	
14:45	<b>REBECCA MURRAY</b> Design to certification in additive manufacturing: Getting good solutions used	14:45	<b>MINGSHI SONG</b> Direct fabrication of porous Mg alloy WE43 using Laser Engineered Net Shaping
		15:00	<b>CORNELIS VAN NIEKERK</b> From Challenges to Rewards with HDR SWIR Imaging in Metal AM
15:15	<b>ALISON PARK</b> NASA's Challenges and Opportunities in Spaceflight Certification of Fracture Critical AM Components	15:15	<b>QI LIU</b> Additive manufacturing of high-strength and high-conductivity Cu alloy
		15:30	<b>BHUPESH VERMA</b> Methodology for the integration of Fiber Bragg Grating (FBG) sensors in an additively manufactured component
15:45	<b>SHARON CHI</b> The present and future of DED-Arc	15:45	<b>VENKATESH PANDIAN NARAYANA SAMY</b> Design of novel dispersoid strengthened (DS) alloys for additive manufacturing using an integrated computational materials engineering (ICME) framework.
16:00	<b>MONIQUE ENGLISH &amp; REBECCA MURRAY</b> Standards in an additive manufacturing world	16:00	<b>LING YIN</b> Wire Arc Additive Manufacturing of Titanium Alloy
16:15	<b>AFTERNOON TEA (15 MINS): NETWORKING OPPORTUNITY – 2240</b>		
<b>L4: DESIGN, QUALIFICATION AND CERTIFICATION - PANEL DISCUSSION</b> <b>CHAIR: DANIEL EAST</b>		<b>K3: EMERGING ADDITIVE MANUFACTURING TECHNOLOGIES</b> <b>CHAIR: KEITA NOMOTO</b>	
16:30	Panel Discussion with: <b>BRUCE MCLEAN</b> University of Sydney <b>MONIQUE ENGLISH</b> Standards Australia <b>CINDY WATERS</b> US naval research <b>GLYNN ADAMS</b> Lockheed Martin <b>STEVE MILANOSKI</b> Western Sydney Parklands Authority	16:30	<b>PATRICK O'TOOLE</b> Process design and refinement of high-speed laser directed energy deposition through fluid dynamics and statistical modelling
		16:45	<b>PHILIPP SAUBERZWEIG</b> Unlocking the Potential of Grain Engineering: Novel Approaches to Part Design
		17:00	<b>ABHISHEK MALIK</b> Introducing Binder Jetting Additive Manufacturing: A Revolutionary Approach to 3D Printing
17:35	<b>CLOSING REMARKS FOR APICAM2023 (B2010)</b>		
17:45	<b>INDUSTRIAL NETWORKING EVENT</b>		

# DAY 3 FRIDAY 23.06.23 AFTERNOON

PLENARY (B2010) ASSOCIATE PROFESSOR ALLISON BEESE Additive Manufacturing: Machine Learning, Mechanics, and Metallurgy SESSION CHAIR: PROFESSOR SOPHIE PRIMIG				13:45
14:45	STREAM 3 - 2090		14:45	STREAM 4 - 2150
D2: BIOPRINTING AND BIOMATERIALS CHAIR: KHOON LIM			B2: CERAMIC AND CONCRETE ADDITIVE MANUFACTURING CHAIR: LUMING SHEN	
14:45	TIM WOODFIELD Regenerative Manufacturing of Bioactive Implants: From Low Modulus Titanium Implants to Platform Bioinks for Biofabrication		14:45	WENGUI LI Effect of inorganic PCM/expanded perlite composite on cement hydration and inner temperature regulation of mortar
			15:05	GIANG NGUYEN Controlling fracturing process in indirect tensile testing of 3D-printed cement-based materials
15:15	NASIM SABAHI 4D printing of self-expandable scaffolds for bone tissue engineering		15:25	JONATHAN TRAN 3D printed concrete structures subjected to dynamic impact
15:30	SANJAIRAJ VIJAYAVENKATARAMAN Bioprinting of Soft tissues using bioinks derived from Ecologically-destructive tunicates			
15:45	KATE FOX 3D printing of diamond as a biomaterial using laser metal deposition		15:45	KATJA EDER Challenges associated with printing of Alumina monoliths via lithography-based ceramic manufacturing
16:00	JOHNNY (KUAN UN) WONG Plasma-treated and bio-functional porous scaffolds as mesenchymal stem cell expansion and carrier platforms		16:00	SHAREEN CHAN Hierarchically porous 3D-printed bio-ceramic tissue scaffolds
			16:15	REZA MOINI Tough Architected Concrete Enabled by Extrusion-based Robotic Additive Manufacturing
AFTERNOON TEA (15 MINS): NETWORKING OPPORTUNITY – 2240				16:15
I4: MODELLING AND SIMULATIONS CHAIR: WEN HAO KAN				
16:30	STEPHEN DAYNES Concurrent Optimisation of Additively Manufactured Parts and Support Structures			
16:45	LIENE ZAIKOVSKA Microstructure Modelling And Virtual Testing Of Additive Manufactured Haynes®282 For Predictions Of Homogenized Anisotropic Elastic Properties			
17:00	RUBEN OCHOA Effects of thermal history on solidification microstructure in Ni-Mo-Al single crystals			
17:15	MARZIE GHORBANI Accelerated digital design of magnesium alloys using machine learning			
CLOSING REMARKS FOR APICAM2023 (B2010)				16:15
INDUSTRIAL NETWORKING EVENT				17:45



# APICAM2023



THE UNIVERSITY OF  
SYDNEY



Materials  
Australia