SC3DP
Singapore Centre for 3D Printing

JUL – SEP 2026

NEWSLETTER

CHANGING THE WORLD THROUGH ADDITIVE MANUFACTURING



Professor Paulo Bartolo
Executive Director

MESSAGE

The third quarter of 2026 marked another period of remarkable activities and achievements at the Singapore Centre for 3D Printing (SC3DP). A key highlight was an introductory visit by NTU's Vice President (Industry & Global Engagement), Professor Shirley Meng. We were also honoured to welcome H.E. Dr Dana Baschová, Ambassador of the Czech Republic to Singapore, and Professor Michal Pěchouček, Rector of Czech Technical University, and a delegation from the Federation of Indian Chambers of Commerce and Industry (FICCI) comprising 70 senior business leaders representing different sectors such as advanced manufacturing and materials, healthcare, logistics, financial services, and AgriTech.

From 4 to 6 August, we were strongly engaged in the 2nd International Conference on Future of AM (Additive Manufacturing), a world leading event in this field. Chaired by SC3DP member Professor Yeong Wai Yee, the conference brought together global researchers and industry experts to explore innovations across 3D printing, AI, digitalisation, automation, robotics, and sustainable manufacturing while fostering meaningful knowledge exchange and collaboration.

Our research continues to thrive, demonstrated by two newly granted patents, 20 papers published in leading journals, 4 new projects and one new research collaboration agreement signed with the Advanced Biofabrication Laboratory at the University of La Coruna, Spain. We would also like to congratulate two members of SC3DP, Professors Tan Ming Jen and Punit Kumar, on receiving prominent international awards, and Ms Claudia Guerra on receiving the Provost Graduate Award.

These successes highlight SC3DP's commitment to driving research excellence, global partnerships, and industrial impact. Looking ahead, we invite you to join us for our upcoming Open House on 5 November 2026, and we look forward to hosting the 7th International BioManufacturing Conference (CIRP BioM 2027) from 26 to 28 May 2027.

HIGHLIGHTS

Advancing 3D Glass Printing with Nobula®



Provost Graduate Award Recipient: Ms Claudia Guerra



Funtastical World of Fungi – an exhibition at the Singapore Botanic Gardens



Vice President (Industry & Global Engagement) Professor Shirley Meng Visits SC3DP



On 18 August, SC3DP welcomed NTU's Vice President (Industry & Global Engagement) **Professor Shirley Meng** for an introductory visit. During the visit, we had the opportunity to discuss current research activities, key achievements, main industry partnerships, researcher capabilities and future plans. Professor Meng also toured our laboratories to learn more about our research projects, industry collaborations and how SC3DP translates research into real-world solutions. During the visit, she also met with several SC3DP researchers and learned more about their areas of expertise.





As a research centre working closely with NTU's Vice President (Industry & Global Engagement) Office, SC3DP looks forward to working with Professor Meng to broaden our industry partnerships, strengthen industry engagement and continue advancing high-impact research that contributes to Singapore's global leadership in additive manufacturing.



High Level Delegation from the Federation of Indian Chambers of Commerce and Industry



On 20 August, SC3DP hosted a delegation from the **Federation of Indian Chambers of Commerce and Industry (FICCI)** with a team of around 70 senior business leaders representing advanced manufacturing, engineering, metals, chemicals, infrastructure, healthcare, pharmaceuticals, technology, artificial intelligence, logistics, financial services, AgriTech and other priority sectors.



The team was lead by **Ms Navita Myer,** Regional Director – ASEAN of Industry Association. As India's apex business organisation, FICCI represents more than 250,000 companies through its direct and indirect membership and serves as an important bridge between Indian industry, government and international partners. During the Singapore visit, FICCI organised business engagements, knowledge-sharing sessions and visits to leading innovation and advanced-technology institutions like Nanyang Technological University, Singapore (NTU Singapore).

At NTU, the delegates engaged with researchers from NTU spin-off companies, including LAPIS, the latest company to emerge from SC3DP. SC3DP Executive Director Professor Paulo Bartolo also delivered a presentation on SC3DP's knowledge translation activities, highlighting examples in aerospace and building and construction. The delegates also visited several of SC3DP's key laboratories to learn more about its research capabilities and technologies.

SC3DP Welcomes Professor Metin Sitti of Koç University, Istanbul





On 6 July, SC3DP welcomed **Professor Metin Sitti,** President of Koç University, Istanbul, Türkiye. Founded in 1993, Koç University was ranked #1 in Türkiye in the 2026 Research Universities Performance Monitoring Index conducted by the Council of Higher Education (YÖK).

During his visit, Professor Sitti learned more about SC3DP's multidisciplinary research activities and capabilities, engaging with our researchers and exploring the application of our technologies across various industries. The visit also provided an opportunity to exchange knowledge and explore potential areas for future collaboration between SC3DP and Koç University.

Strengthening Research Links with the University of Aveiro, Portugal









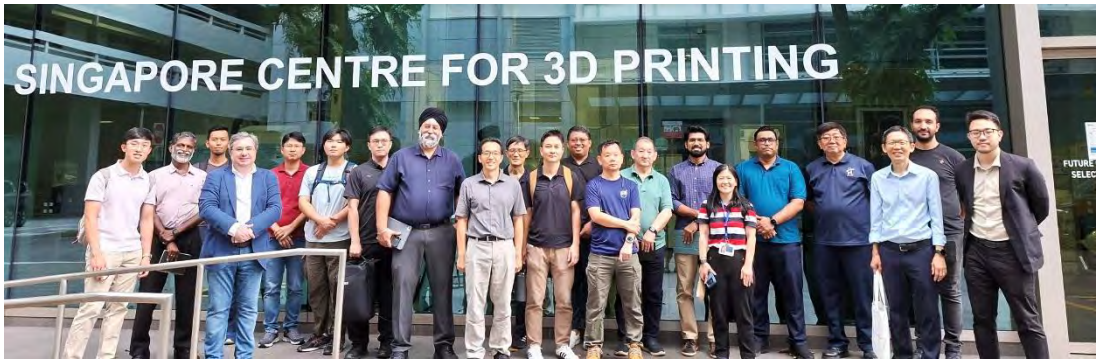
On 10 July, Professor Paulo Bartolo, Executive Director of the Singapore Centre for 3D Printing (SC3DP), visited the University of Aveiro, a leading university in Portugal, where he was hosted by **Rector Professor Artur Silva**. The visit was coordinated by **Professor Paula Vilarinho,** who accompanied Professor Paulo Bartolo on visits to several relevant laboratories at the Department of Mechanical Engineering and the Department of Materials and Ceramic Engineering. The visit marked an important step towards cooperation between the two institutions, with a research collaboration agreement currently in preparation.

Engagement with NAMIC Team



On 28 July, SC3DP hosted **Dr Ho Chaw Sing** and members of the NAMIC Corporate Leadership Panel (CLP) for a meeting at the NAMIC NTU Hub. The SC3DP team shared updates on the Centre's initiatives, additive manufacturing technologies currently available at the centre, and applications across different sectors. Discussions also covered ongoing developments and opportunities for industry collaborations. The session concluded with a guided tour of SC3DP's laboratories and facilities, where NAMIC members had the opportunity to view projects and learn more about the Centre's ongoing activities.

Connecting PUB with SC3DP Research and Innovation







On 28 July, SC3DP hosted a delegation from the Public Utilities Board (PUB), Singapore National Water Agency, led by **Dr Gurdev Singh**, Chief Engineering and Technology Officer, Technology & Engineering. The SC3DP team provided an overview of the Centre's research, initiatives and additive manufacturing capabilities, with discussions on potential applications across different sectors. The meeting also explored potential areas for future research and collaboration between the two organisations.

Exploring Construction, Robotic and Automation (R&A) with Professor Mirosław J. S.



On 31 July, SC3DP was pleased to host **Professor Mirosław J. Skibniewski,** Honorary Editor of Automation in Construction, a leading journal (Impact Factor: 12.6) publishing refereed papers related to the use of Information Technologies in Design, Engineering, Construction Technologies, and Maintenance and Management of Constructed Facilities.

Automation in Construction is an international journal in which SC3DP researchers regularly publish work related to the Centre's Building and Construction research. During his visit, Professor Skibniewski toured selected SC3DP laboratories and exchanged views on current research activities and future directions, including Construction 4.0, and robotics and automation (R&A).

2nd International Conference on Future of AM 2026





From 4 to 6 August, the 2nd International Conference on Future of AM (Additive Manufacturing), chaired by **Professor Yeong Wai Yee** brought together researchers and industry experts to explore innovations in advanced manufacturing, including 3D printing, AI, digitalisation, automation, robotics and sustainable manufacturing, while fostering knowledge exchange and collaboration. The conference took place at the Sands Expo and Convention Centre, Marina Bay Sands (MBS).







Assistant Professor Marvin Carl May received the Meiban Spark Award, while **Dr Goh Guo Liang** received the Best Paper Award. The next conference, the 3rd International Conference on Future of AM, will be held in Wuhan, China, from 26 to 28 March 2027. As with previous editions, SC3DP will support the conference. For more information, please visit https://futuream.sg/.

JEOL Japan visit SC3DP



On 14 August, the **JEOL team**, a major developer and manufacturer of electron microscopes, scientific instruments, industrial equipment and medical equipment, visited SC3DP. The SC3DP team provided an introduction to the Centre's research, initiatives and additive manufacturing capabilities, highlighting potential applications across different sectors. Discussions also explored opportunities for knowledge sharing and future engagement with the JEOL team. The session concluded with a guided tour of SC3DP's laboratories and facilities.



Strengthening Academic Connections with Washington State University

In September, SC3DP had the pleasure of welcoming Professor Susmita Bose and Professor Amit Bandyopadhyay from Washington State University, USA, two internationally recognised researchers whose pioneering contributions have significantly advanced the fields of additive manufacturing, biomaterials, and biomedical engineering.

During their visit, Professors Bose and Bandyopadhyay toured several SC3DP laboratories, exploring the Centre's research infrastructure, advanced manufacturing capabilities, and ongoing scientific activities. The visit provided an excellent opportunity to showcase some of the Centre's research development and exchange perspectives on emerging technologies and future directions in additive manufacturing.

Exploring New Frontiers in Advanced Materials: SC3DP welcomes EmTDLab



In September, the Singapore Centre for 3D Printing had the pleasure of welcoming **Mr Cedric Thirty**, CEO & CTO of EmTDLab (Luxembourg), a deep-tech company specialising in the development of advanced materials through proprietary artificial intelligence (AI) technologies.

EmTDLab is at the forefront of developing next-generation radiation shielding materials, targeting demanding applications in space systems, nuclear energy, healthcare, and critical infrastructure. By leveraging AI-driven materials discovery and optimisation, the company aims to accelerate the development of innovative material solutions capable of addressing complex technological challenges and stringed performance requirements.

The visit provided an excellent opportunity to exchange perspectives on emerging developments in advanced materials, discuss complementary research capabilities, and explore potential mechanisms for collaboration.

Particular attention was given to the opportunities arising from the convergence of **artificial intelligence, advanced materials development, and additive manufacturing**, where innovative material formulations and advanced manufacturing technologies could enable new generations of high-performance, application-specific components.

This engagement reflects **SC3DP's commitment to strengthening partnerships with innovative deep-tech companies** and exploring emerging research opportunities at the intersection of materials science, artificial intelligence, and advanced manufacturing.

Advancing AI-driven materials innovation



On 2 September, the Singapore Centre for 3D Printing had the pleasure of welcoming **Mr Henning Fehrmann, CEO, and Mr Mahendran Reddy, Senior Vice President Global Ecosystems**, of Fehrmann Tech Group (Germany), for a meeting aimed at strengthening our ongoing research collaboration and exploring new opportunities for technological innovation. The visit built upon the existing Research Collaboration Agreement between SC3DP and Fehrmann Tech Group, under which both organisations are engaged in a joint research project focusing on the application of AI for materials design and the optimisation of processing conditions for metal Laser Powder Bed Fusion.

Provost Graduate Award Recipient: Ms Claudia Guerra





On 10 September, Ms **Claudia Guerra,** an MAE PhD student conducting her research at SC3DP, received the Provost Graduate Award (PGA). The prestigious award recognises PhD students who demonstrate outstanding academic achievement and strong research potential in their respective fields. Claudia's PhD research focuses on advanced materials and bioprinting strategies for the fabrication of a vascularised pancreatic model, contributing to research at the intersection of additive manufacturing and biomedical applications.

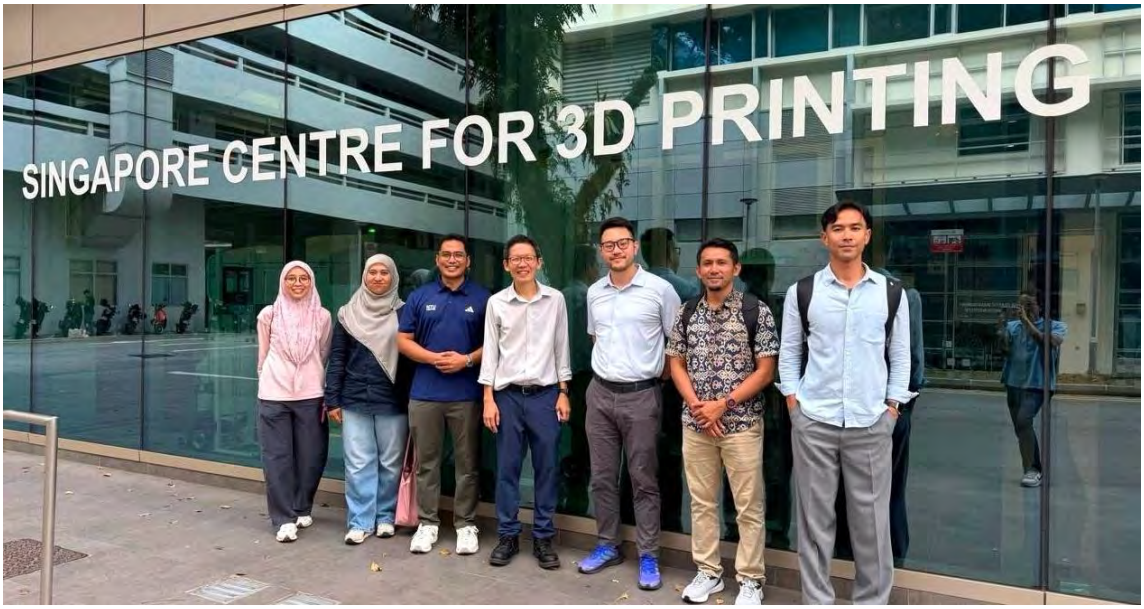
Congratulations to Claudia on this well-deserved recognition, and we wish her continued success in her research journey.

SC3DP host H.E. Dr Dana Baschová, Ambassador of the Czech Republic to Singapore



On 22 September, SC3DP had the honour of hosting **H.E. Dr Dana Baschová, Ambassador** of the **Czech Republic to Singapore,** and **Professor Michal Pěchouček, Rector** of **Czech Technical University.** SC3DP introduced the Centre's research capabilities and provided an overview of selected laboratories and facilities. The visit also offered an opportunity to exchange insights on additive manufacturing and advanced technologies, with discussions exploring potential areas for future collaboration.

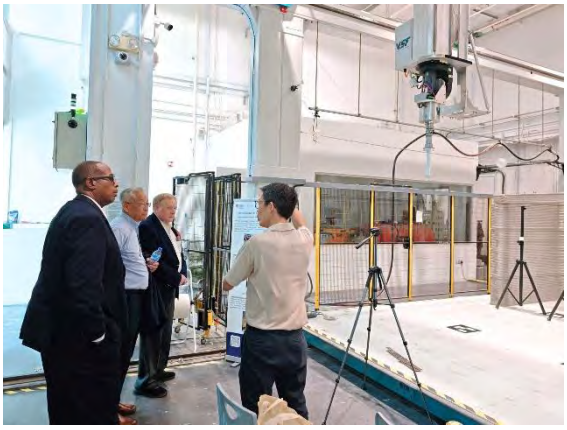
SC3DP Welcomed Delegates from Universiti Teknologi MARA (UiTM)



On 16 September, SC3DP welcomed delegates from Universiti Teknologi MARA (UiTM), including **Associate Professor Nurhashimah Alias,** Deputy Dean (Research & Industrial Linkages), Faculty of Chemical Engineering; **Associate Professor Mohd Lokman Ibrahim**, Faculty of Applied Sciences; and **Dr Meor Hafiz,** Research Coordinator, Faculty of Chemical Engineering. The visit provided an opportunity for the UiTM delegation to gain a better understanding of SC3DP's capabilities in additive manufacturing and to explore potential areas for research collaboration. UiTM will consider potential project opportunities arising from the visit and discuss them internally.

High Level Delegation from the University of Maryland Visited SC3DP





On 19 September, SC3DP hosted a delegation from the University of Maryland (USA) comprising **Professor Samuel Graham**, Dean of the A. James Clark School of Engineering, **Professor Patrick McCluskey**, Interim Chair and Leader of the Electronics and Product Systems Division, and **Professor Jay Lee**, Director of the Industrial Artificial Intelligence Center.

The University of Maryland, founded in 1856, is a leading research university comprising 12 academic colleges and schools and offering more than 200-degree programs to more than 40,000 students. During their visit, the delegation toured SC3DP's concrete printing and bioprinting facilities and shared knowledge and expertise in advanced manufacturing.

Advancing Biomanufacturing with BICO Life Sciences Singapore



On 25 September, SC3DP welcomed **Mr Edmund Yap**, Managing Director, Director of Sales, Applications & Support Biosciences Asia Pacific of **BICO Life Sciences Singapore**, and his team for a discussion on ongoing activities and future opportunities for collaboration. As an important industry partner supporting SC3DP's Biomanufacturing Research Pillar, BICO Group AB plays a key role in strengthening the connection between academic research and industry. The meeting provided an opportunity to exchange updates, discuss the next steps of the collaboration and identify areas for future engagement.

Strengthening International Collaboration in Advanced Bioprinting

From 29 September to 2 October, the Singapore Centre for 3D Printing (SC3DP) had the pleasure of hosting **Professor Daniel Nieto**, Director of DNIETOLAB – Advanced Biofabrication Laboratory, part of CICA – Advanced Scientific Research Center at the University of La Coruña, Spain.

During his week-long visit, we engaged in fruitful discussions on ongoing research activities at both institutions, explored opportunities for future collaboration, and identified areas of mutual scientific interest. A key highlight of the visit was the **signing of a research collaboration agreement**, establishing a framework for joint research activities focusing on the development of multi-material osteochondral scaffolds and advanced wound dressings for skin regeneration.

As part of his visit, Professor Nieto also delivered an informative seminar to our research community entitled **"From Light to Life: Advanced Light-Based Technologies for Precision Bioprinting".** The seminar highlighted cutting-edge research and technological advances developed by his group, including multi-material **Digital Light Processing (DLP) bioprinting**, enabling precise spatial and temporal control over the distribution of multiple biomaterials and cells, **volumetric bioprinting**, offering new opportunities for the rapid fabrication of complex three-dimensional biological constructs; and **handheld light-based Biopen** technologies designed for minimally invasive and in situ tissue regeneration.

Particular attention was given to **holographic bioprinting**, including advanced optical approaches for the precise manipulation and organisation of cells and biomaterials, opening new possibilities for the fabrication of highly complex tissue architectures and microenvironments.

This visit represents another important step in strengthening SC3DP's international research network and advancing collaborative research at the intersection of additive manufacturing, biomaterials, and regenerative medicine. We look forward to translating this partnership into impactful scientific outcomes and innovative solutions addressing important healthcare challenges.







Funtastical World of Fungi

The vegetative roots of fungi, known as mycelium, can transform waste lignocellulosic substrates into lightweight composites. Importantly, mycelium-based materials are fully biodegradable. Researchers from **Associate Professor Hortense Le Ferrand's** group at SC3DP have 3D printed wood and bioplastic scaffolds to support mycelium growth, enabling the development of composites with complex shapes and controllable properties. This work highlights the potential of 3D printing to bridge materials science, biotechnology and sustainable design.

3D printed samples are currently on display at the CDL Green Gallery in the Singapore Botanic Gardens, as a part of the exhibition "Funtastical World of Fungi." Registration Link



AWARDS

During the period reported in this newsletter, two members of SC3DP received important awards:





Professor Tan Ming Jen, was presented with the 2026 ASTM (American Society for the Testing of Materials) International Additive Manufacturing, Award of Excellence in Education, during the 11th edition of the ASTM International Conference on Advanced Manufacturing (ICAM 2026) in Orlando (USA).



SC3DP extends its congratulations to **Assistant Professor Punit Kumar** on being named one of MIT Technology Review Asia Pacific's 35 Innovators Under 35.

Recognised for his contributions to advanced materials research, he has developed innovative approaches to enhancing both the strength and toughness of refractory alloys. These materials play a vital role in extreme-environment applications, including aircraft engines, nuclear reactors, and spacecraft, where reliability and performance are critical.

INTELLECTUAL PROPERTY

2 New Patents

- Beifang Deng, Jeremy Keck, Mingyang Li, Emiko Lim, Kok Yong Lim, Bee Leng Liow, Zhenbang Liu, Ming Jen Tan, Sze Tiong Tan, Bak Koon Teoh, Hui San Tey, Sizhe Wang, Xiangyu Wang, Chuen Long Wong, Teck Neng Wong - In An Automated Reinforcement Strategy For 3D Printed Concrete Using Continuous Fiber Cables With In-Process Impregnation, Singapore Provisional Patent Application, 10202603185T
- Chandra Shubham, Paulo Jorge da Silva Bartolo - Localised Controlled-Atmosphere Chamber for Directed Energy Deposition, Singapore Provisional Patent Application, 10202603327V

PUBLICATIONS

In the period reported by this newsletter**, SC3DP's researchers published 20 papers in leading journals** such as **Progress in Materials Science** (Impact Factor: 42.9), **Military Medical Research** (IF: 29.0), **Advanced Materials** (IF: 29.1), **International Journal of Extreme Manufacturing** (25.1), **Materials Today** (IF: 24.1), **NPJ Flexible Electronics** (IF: 15.4) and **Chemical Engineering Journal** (IF: 12.5).

New Book



Title: Sustainable Innovation: Smart Strategies for Resilient Infrastructure
By (author): Peerzada Danish, Anil Sagar Srinivasa, Jasir Mushtaq, Mohan Ganesh G., A.S. Santhi
Publisher: CRC Press

Dr Suvash Chandra Paul, Assistant Professor Yi Wei Daniel Tay, and **Professor Ming Jen Tan** have contributed with a chapter titled "Rheological and Topological Optimisation Behaviour of Concrete Using Lightweight Green Aggregate (LiGra)", highlighting approaches for developing more sustainable concrete solutions.

Publication Date: 30 September 2026
Link to purchase book: Taylor & Francis website

This book explores the convergence of cutting-edge engineering techniques, innovative design approaches, and fundamental ecological principles to address the challenges associated with sustainable infrastructure, including green construction, resilient urban planning, integration of smart systems, low-carbon emissions, and waste reduction. Each chapter focuses on a specific aspect of sustainable infrastructure, such as eco-friendly building materials, energy-efficient systems, and waste management practices, supported by case studies, illustrated processes, and detailed technical explanations.

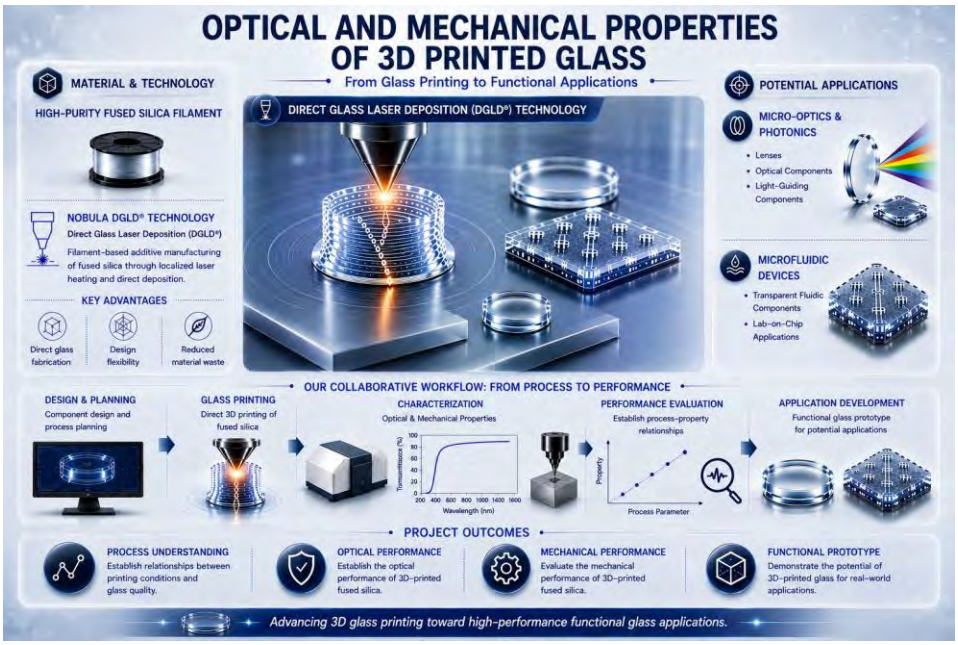
Key Features

- Alignment with the central theme of eco-smart infrastructure, emphasising sustainability, innovative technologies, and global best practices
- Discussion of critical aspects of climate-resilient infrastructure
- Coverage of essential topics such as eco-friendly materials, waste management, and life cycle assessment to address key challenges in sustainable infrastructure
- Exploration of smart waste management systems
- Review of real-world case studies supported by detailed technical explanations

This book is intended for graduate students and researchers in civil engineering, infrastructure development, sustainability, and urban planning.

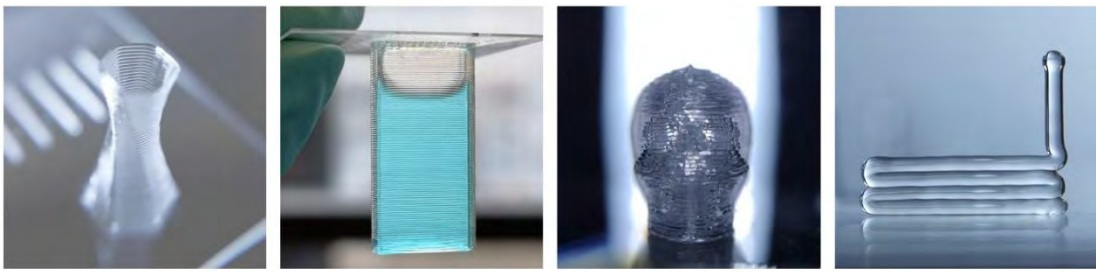
RESEARCH PROJECTS

Advancing 3D Glass Printing with Nobula®



The Singapore Centre for 3D Printing and **NOBULA (Sweden)** collaborated on a **new project titled "Optical and mechanical properties of 3D printed glass" funded by NAMIC** (National Additive Manufacturing Innovation Cluster) Singapore. The primary goal of this project is to evaluate the performance of glass fabricated using the Nobula 3D glass printer. This study will provide fundamental insights into the material and process capabilities of the printing technology, supporting its potential applications in optical fibres, electric light sources, lasers, and other photonic and electronic systems.

Silica glass is a material of critical importance across a broad spectrum of scientific and industrial applications, owing to its exceptional optical transparency, thermal stability, low thermal expansion, and strong chemical resistance. These properties make it an ideal choice for high-precision applications. However, despite its outstanding performance, silica glass remains extremely difficult to process due to its high softening temperature (1,000 C) and inherent brittleness.



To address these limitations, our team is exploring the **Direct Glass Laser Deposition technology** developed by NOBULA, which enables the fabrication of complex silica glass geometries through filament-based deposition and localised laser heating.

The potential economic impact of this project is significant. The 3D printing ceramic market, which includes fused silica and glass, is emerging rapidly. Valued at USD 187.78 million in 2023, it is projected to reach USD 784.15 million by 2030, growing at a CAGR of 22.65%. This increase reflects a strong global interest in advanced AM solutions in glass for high-value applications.

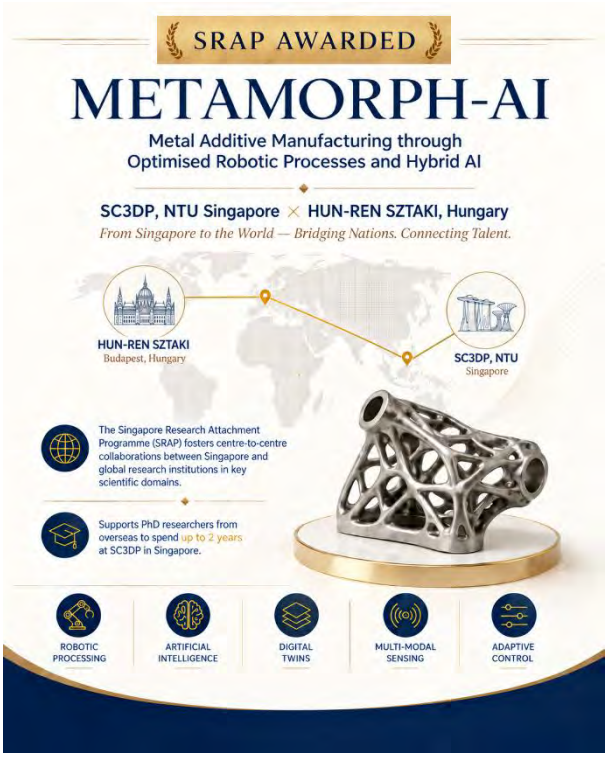
ARDEX-QUICSEAL Singapore Collaboration



SC3DP has established a research collaboration with **ARDEX-QUICSEAL Singapore,** a leading company in the building and construction industry, to support the industrial scale-up and manufacturing validation of an NTU-developed sustainable cementitious material. The collaboration aims to bridge the gap between laboratory research and industrial application through technical exchange, manufacturability assessment and industrial validation. By working closely with an industry partner, the project will explore how the material can be further developed and adapted for real-world manufacturing requirements. This partnership marks an important step towards translating research in sustainable construction materials into practical applications, while exploring future pathways for technology deployment and commercialisation.

METAMORPH-AI for the Singapore Research Attachment Programme

The Agency for Science, Technology and Research (A*STAR), Singapore's lead public research and development agency, has just announced the approval of the project "Metal Additive Manufacturing through Optimised Robotic Processes and Hybrid AI (METAMORPH-AI)" for the Singapore Research Attachment Programme (SRAP). This initiative funds international PhD students for advanced research attachments in Singapore. The Singapore Centre for 3D Printing (SC3DP) at Nanyang Technological University (NTU) is proud to be hosting six PhD researchers from the HUN-REN Institute for Computer Science and Control (SZTAKI) for 1–2 year research placements in Singapore.



This strategic partnership will accelerate interdisciplinary research in additive manufacturing, spanning advanced materials, process engineering, automation, AI, and robotics, whilst giving students access to world-class laboratories and joint international supervision.

Importantly, this programme also strengthens scientific and innovation ties between Hungary and Singapore, creating a long-term bridge for talent, research, and technology transfer between the two ecosystems. We are proud to partner with **HUN-REN SZTAKI** and A*STAR to train the next generation of additive manufacturing researchers and to deepen industry-academia and international collaboration.

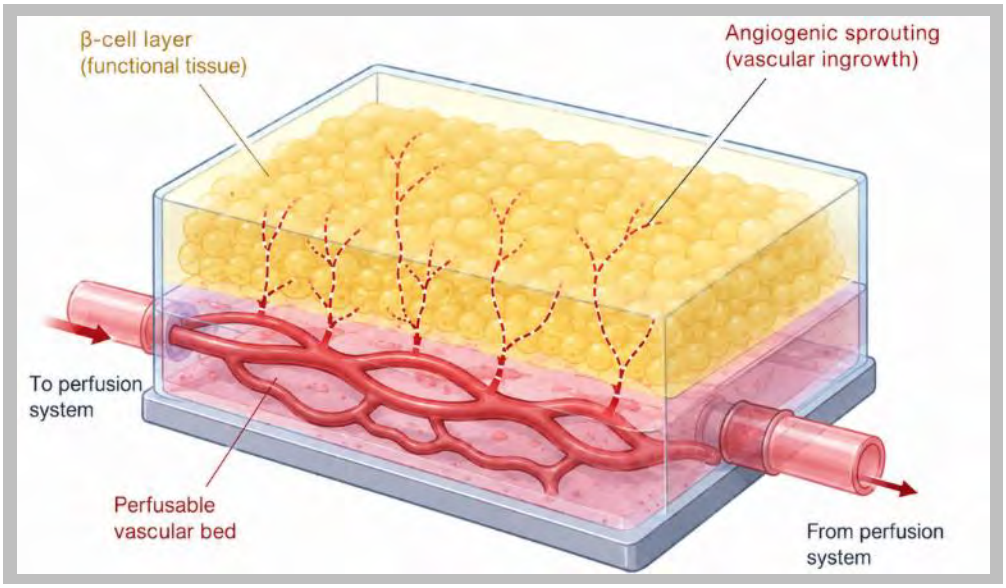
A Vascularised Islet Bioprinting Platform for Anti-Diabetic Screening



In September, we had the pleasure of welcoming **Professor Lifeng Kang from the University of Sydney** for the kick-off meeting of the project, **"A Vascularised Islet Bioprinting Platform for Anti-Diabetic Drug Screening".**

Diabetes mellitus affects more than 537 million adults worldwide, with this figure projected to rise to 783 million by 2045. Drug development remains challenging due to limitations in existing preclinical models. Two-dimensional (2D) monolayer cultures of MIN6 and INS1E cells, as well as primary human islet cells, do not adequately replicate the three-dimensional (3D) vascular architecture, oxygen gradients and paracrine interactions found in native islets.

These limitations highlight the urgent need for a physiologically accurate, human-relevant islet tissue model that enables systematic screening of drug compounds.

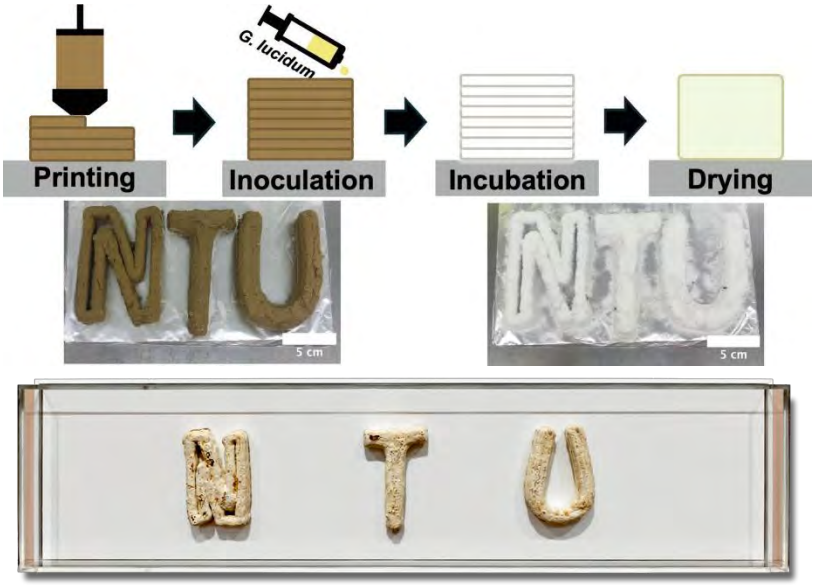


However, existing platforms do not combine macro-channel perfusability with capillary-scale microvascular networks in a β-cell-derived, pancreatic tissue-scale model suitable for systematic drug screening. To address this gap, the project aims to develop and validate a perfusable, vascularised pancreatic tissue construct and establish its potential as a pharmacodynamically responsive platform for drug screening.

RESEARCH HIGHLIGHTS

3D Printed Functional, Scalable, and Sustainable Mycelium-based Wood-nanoclay Composites

Dr Jia Heng Teoh, Charmaine Yeo, Adriana LaVopa and Associate Professor Hortense Le Ferrand



Introduction:
Wood flour is an abundant, low-value waste that currently has limited applications and that has potential environmental and health concerns. In turn, mycelium, the vegetative roots of fungi, grows on lignocellulosic substrates like wood flour to yield lightweight composite materials. Developing a 3D printing ink based on wood flour and growing mycelium could be one approach to valorise such waste into a product with tailored properties and shapes.

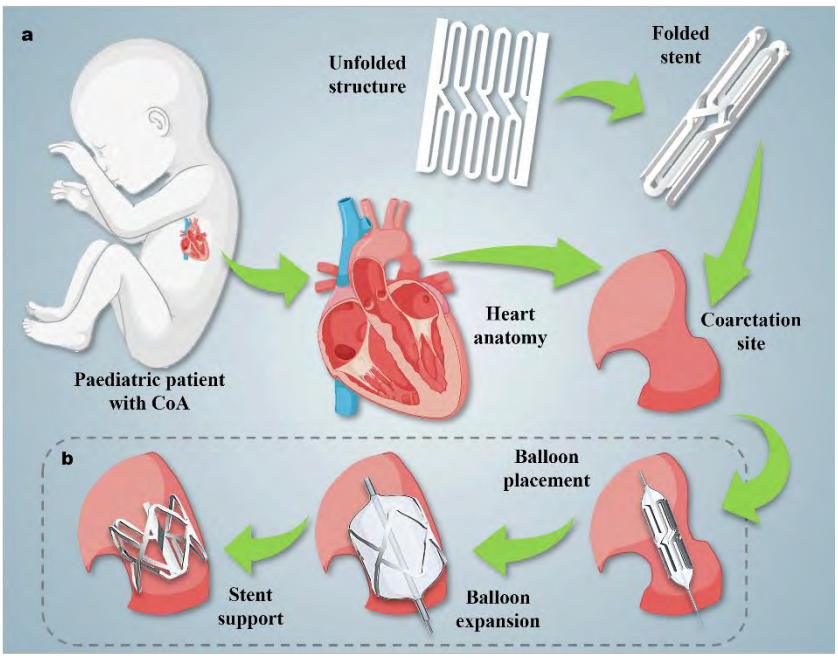
Key Highlights:
- Developed an optimised ink containing 35% bamboo wood flour and 30% bentonite that can be extruded and 3D printed into structures up to 10cm heights with millimetres resolution, ensuring good shape fidelity.
- After growing mycelium on the surface of the 3D printed parts, water resistance, stiffness and ultimate strength of the construct increased significantly by more than doubling.
- The mycelium layer has a thermally insulating effect, but 3D printing geometries with air gaps through its design has a greater influence on the thermal insulation, underlining the need for 3D printing designs.
- While being entirely biodegradable, the mycelium layer enables the structures to maintain their shapes better than structures without mycelium, when submitted to natural tropical weathering for 1 month.

Conclusion:
This study demonstrates that bamboo wood flour-bentonite ink is a scalable approach for 3 printing complex structures while mycelium surface layer improved the mechanical strength, hydrophobicity, and resistance to weathering. Overall, the approach demonstrates the potential to upcycle wood waste into sustainable, functional and shape-tailored bio-based composites.

Source: https://www.sciencedirect.com/science/article/pii/S2772397626000584

Geometry-driven Near-zero Foreshortening Foldable 3D-printed PLA Stent for Paediatric Coarctation of the Aorta

Dr Yi Huang, Dr Zhipeng Deng, Dr Yan Xu, Dr Rixiang Quan, Weiting Xu, Dr Xiaolong Chen, Professor Massimo Caputo, Dr Cian Vyas, Professor Paulo Bartolo, Associate Professor James P. K. Armstrong, Dr Fengyuan Liu, Associate Professor Giovanni Biglino



Introduction:
Stent implantation is an established treatment for paediatric coarctation of the aorta (CoA), but conventional metallic stents are non-degradable and offer limited design flexibility. Here, a foldable polylactide (PLA) stent fabricated by fused deposition modelling (FDM) is proposed with a geometry-driven design enabling near-zero foreshortening through rotation-dominated deformation. The optimised stent expanded from 4.5 to 12 mm with negligible axial shortening and controlled recoil to 8.7–8.9 mm, while providing approximately 0.05 N/mm radial support. Preliminary studies further demonstrated short-term endothelial cytocompatibility and controlled degradation, supporting its potential for temporary paediatric vascular applications.

Key Highlights:
- A geometry-driven stent design enabling near-zero foreshortening via rotation-dominated deformation.
- Analytical framework reveals Poisson's ratio governed by structural parameters rather than material properties.
- The 3D-printed PLA stent expands from 4.5 mm to 12 mm with negligible axial shortening and controlled recoil.
- A foldable planar-to-cylindrical fabrication strategy provides a scalable approach for deployable biomedical structures.

Conclusion:
This study demonstrates that geometry-driven design enables foldable PLA stents to achieve large radial expansion with near-zero axial foreshortening and controlled mechanical behaviour. Overall, the approach demonstrates the potential of structural deformation control to develop deployable, biodegradable stents with tailored properties for paediatric vascular applications.

Source: https://www.sciencedirect.com/science/article/pii/S2772397626000584

Physicochemical-informed Predictive Modelling on Small Datasets for Designing Conductive Polymer Inks in Soft Bioelectronics

Dr Jia Min Lee, Dr Xinchao Gao and Professor Wai Yee Yeong

1. Initial dataset

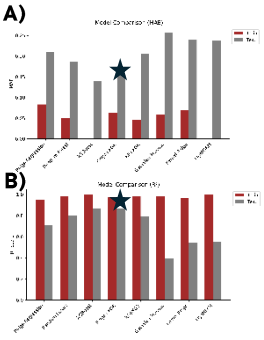
EIS data

Formulation_ID	PA	PEGDA	PEDOT:PSS	HEC	Rct	Fitting R^2	Conductivity @1000 Hz (S/m)	log 1000 Hz
Ink1	2.5	2.5	0	0	6602.499	0.998871	38.58843	1.58657
Ink2	2.5	2.5	0.5	0	6527.412	0.998309	82.49804	1.91623
Ink3	3	2	0	0	1057.183	0.991114	60.31309	1.78041
Ink4	3	2	0.5	0	5009.813	0.999784	86.94132	1.93229

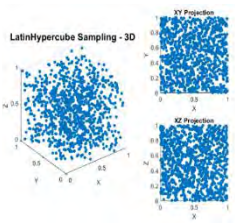
Descriptors

Formulation_ID	num__MW	num__HBP	num__I	cat__PEDOT:PSS	cat__PEGDA	cat__HEC	cat__PA	log 1000 Hz
Ink1	-4.6268995	-0.5915685	-2.5355339	0	2.5	0		1.5865696
Ink2	-4.4610234	-1.2106811	-2.8284271	0.5	2.5	0		1.9162382
Ink3	-5.112384	-0.2285919	-4.2426407	0	2	0		1.7804115
Ink4	-4.7465079	-0.8477184	-3.5355339	0.5	2	0		1.9322902

2. Surrogate model

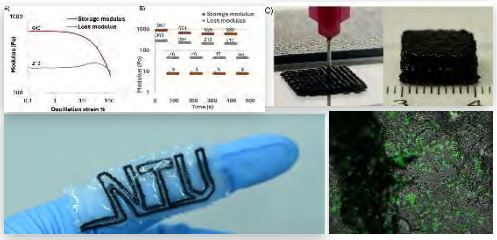


3. Virtual dataspace



>800 formulations screened

4. Candidate selection & printing



Encapsulated in a hydrogel matrix by multi-material printing, conformal to a curved surface

Introduction:

In conductive bioink design, small composition changes cause non-linear properties, making optimisation slow and expensive. Bioprinting datasets rarely exceed a few dozen samples. Instead, the model uses physicochemical descriptors derived from SMILES, including hydrogen-bonding potential, and ionic interaction. The workflow prints a predicted formulation and tests its biocompatibility.

Key Highlights:

- We developed a pipeline that screens data by fitting impedance spectroscopy results to a modified Randles circuit. Only fits with R^2 above 0.9 enter training. It then log-transforms conductivity and molecular weight, which span several orders of magnitude.
- A stacked ensemble of Ridge and XGBoost regression models gave the best balance, with a test R^2 of 0.865 and an MAE of 0.154. SHAP analysis showed the ensemble relies about 59% on Ridge and 41% on XGBoost. HEC, added mainly to control viscosity, also helps build the conductive network through hydroxyl–sulfonate interactions.
- Over 800 virtual formulations screened for high-conductivity candidates. The selected ink showed shear recovery suitable for multi-material extrusion. Embedded in hydrogel, it conformed to curved surfaces. Printed alongside C2C12-laden hydrogel, it kept cell viability above 95%.

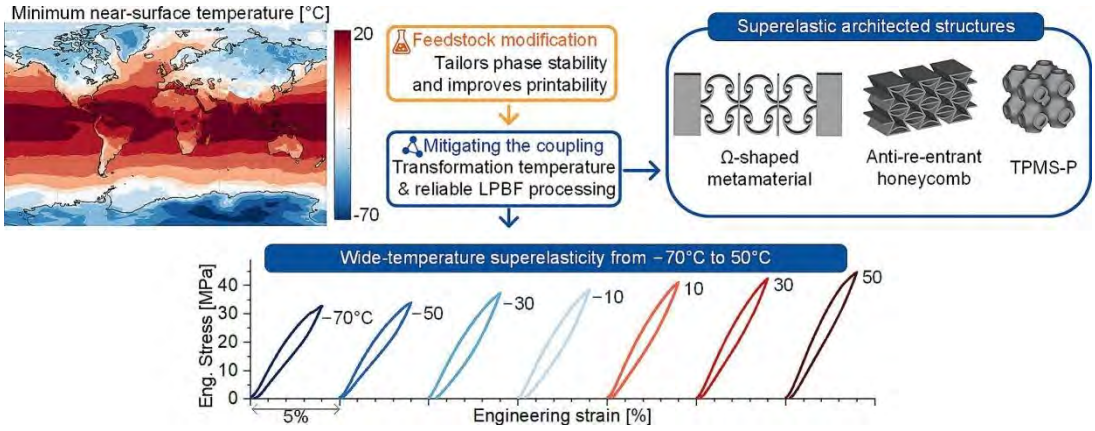
Conclusion:

This study shows that descriptor design, an ensemble model, and bootstrapped evaluation can produce a useful surrogate model from a small dataset of soft materials. The authors hope to integrate this closed-loop approach towards automating material pre-selection with language models or knowledge graphs, and moving the ink into in vitro electrophysiology models and wearable bioelectronics.

Source: https://www.nature.com/articles/s41528-026-00587-9

Wide-Temperature-Range Superelasticity in an Additively Manufactured Shape Memory Alloy

Dr Kang Jingtao, Dr Niu Pengda, Dr Li Ruidi, Dr Ji Weiming, Dr Zheng Dan, Dr Xiao Junfeng, Dr Wang Minbo, Dr Gan Kefu, Dr Chen Huaican, Dr Yin Wen, Dr Yuan Tiechui, Dr Xu Sheng, Professor Zhou Kun



Introduction:

Additively manufactured superelastic components that operate across wide temperature ranges are attractive for aerospace, robotics and reusable energy-absorbing systems. However, achieving tensile superelasticity over a broad sub-ambient temperature range while maintaining robust additive manufacturability remains challenging. This challenge limits the use of additively manufactured shape-memory alloys in applications involving substantial temperature variations below room temperature.

Key Highlights:

- We developed a powder-decoration strategy incorporating 2 at.% Ni into pre-alloyed Cu–Al–Mn powder, improving laser absorption, densification and grain refinement during laser powder bed fusion while stabilizing austenite at sub-ambient temperatures.
- The additively manufactured alloy exhibits bulk tensile superelasticity from –70 °C to 50 °C, together with a tensile strength of ~1.3 GPa, an elongation of 9% and a recoverable tensile strain of ~ 4%.
- In situ neutron diffraction reveals a highly reversible martensitic transformation between $L2_1$ and 6M underlying the superelastic response, with bulk specimens dissipating 15.6 MJ m^{-3} of energy during a tensile loading–unloading cycle to 4.8% strain.
- The superelastic response extends to architected structures: Ω-shaped metamaterials achieve ~ 30% recoverable tensile strain over 10 cycles at room temperature, while TPMS and auxetic lattices retain ~ 4% recoverable compressive strain from –70 °C to 50 °C, enabling reusable energy absorption across a wide temperature range.

Conclusion:

This study demonstrates that decorating Cu–Al–Mn powder with 2 at.% Ni enables reliable additive manufacturing of superelastic components that operate from –70 °C to 50 °C, combining high tensile strength with recoverable deformation. These capabilities extend to complex architected structures, enabling reusable energy absorption across the same temperature range.

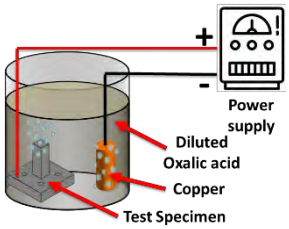
Source: https://www.sciencedirect.com/science/article/abs/pii/S1369702126003226

Chemically Engineered Micro/nanostructures on Additively Manufactured 316L Stainless Steel and CuCrZr Copper Alloys for Enhanced Boiling

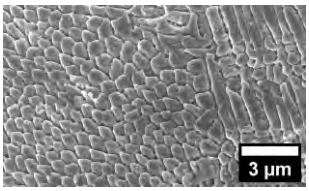
Assistant Professor Jin Yao Ho, Leymus Yong Xiang Lum

AM 316L Stainless Steel

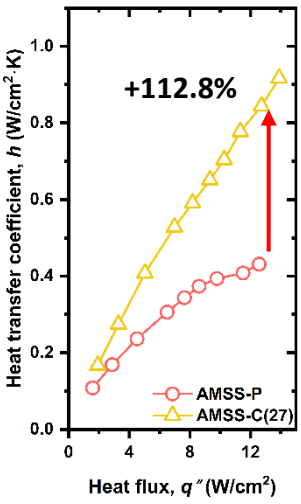
Electroetching



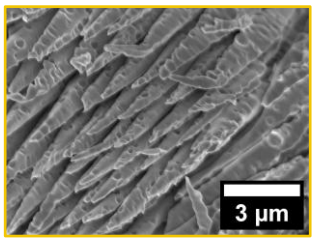
Sub-grain structures



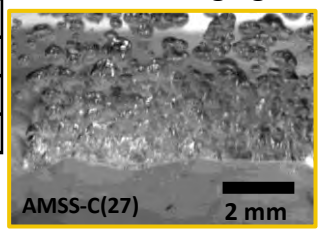
Pool boiling performance



Microneedle microstructures

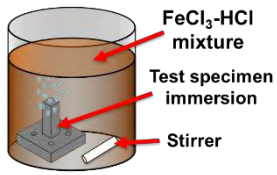


Bubble imaging

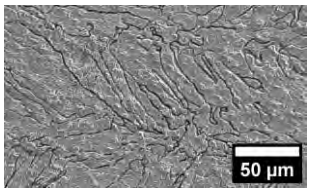


AM CuCrZr Copper Alloy

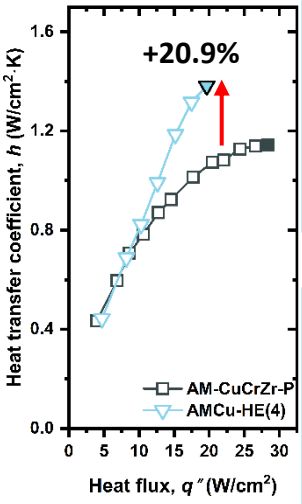
Immersion etching



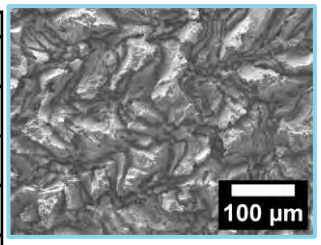
Grain structures



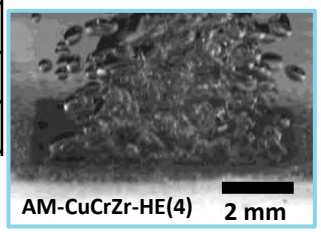
Pool boiling performance



Crevice microstructures



Bubble imaging



Key Highlights:

- Developed and optimised new alloy-specific chemical treatments to exploit intrinsic AM microstructures and enhance pool boiling of dielectric fluids on additively manufactured 316L stainless steel (AMSS) and CuCrZr copper (AM-CuCrZr) alloys.
- For AM stainless steel, electrolytic etching creates microneedle textures and favorable nucleation cavities, achieving a 112.8% increase in maximum heat transfer coefficient (h_{max}) over the plain AMSS surface.
- For AM copper, immersion etching generates 10 - 30 µm crevice-like microstructures on AM CuCrZr, achieving a 20.9% increase in h_{max} over the plain AM-CuCrZr surface.

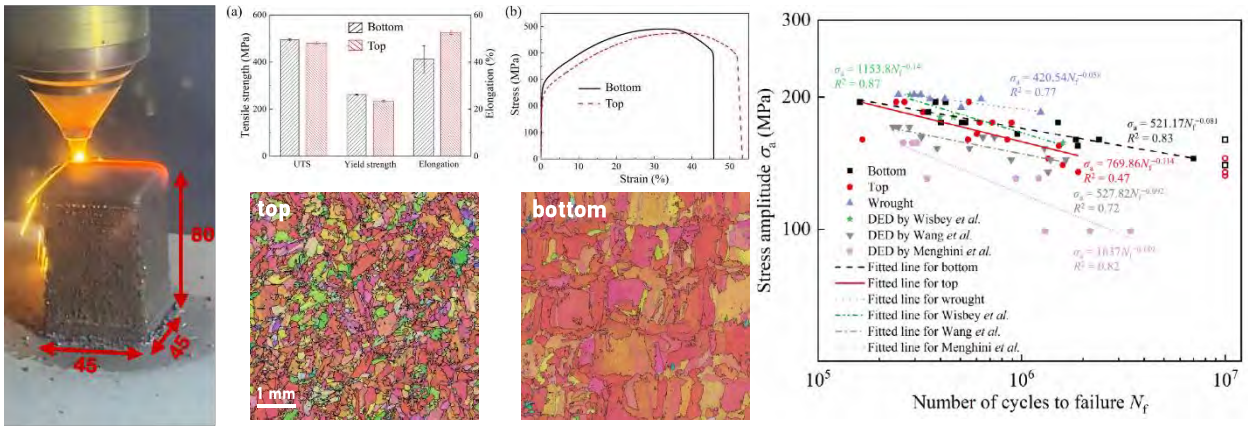
Conclusion:

This work develops and optimizes scalable microstructuring techniques for AM 316L stainless steel and CuCrZr copper to enhance immersion cooling. The dense microneedle structures of AM 316L and crevice microstructures of AM CuCrZr achieved a 112.8% and 20.9% increase in h_{max}, respectively. Overall, the results show that AM-enabled microstructures, when combined with optimized chemical treatments, provides new design insights to high-performance boiling surfaces for next-generation immersion cooling and thermal management systems.

Source: https://doi.org/10.1021/acsami.6c12075

Build-height-dependent Tensile and Fatigue Behavior of DED-fabricated 316L Stainless Steel

Dr Pengfei Tan, Dr Weidong Li, Dr Ho Wee Kiat Desmond, Dr Jingjing Wang, Dr Chenyang Zhu, Dr Zicheng Wu, Dr Zihan Zhang, Dr Ran An, Dr Boyuan Hou, Dr Yi Zhou, Dr Ninian Sing Kok Ho, Professor John Hock Lye Pang, Professor Kun Zhou



Introduction:
Directed energy deposition (DED) enables the fabrication and repair of metallic components, but heat accumulation creates different thermal histories along the build direction. This study combines thermal simulation, microstructural characterization and mechanical testing to explain how build height affects tensile and fatigue behavior in a DED-fabricated 316L stainless steel block.

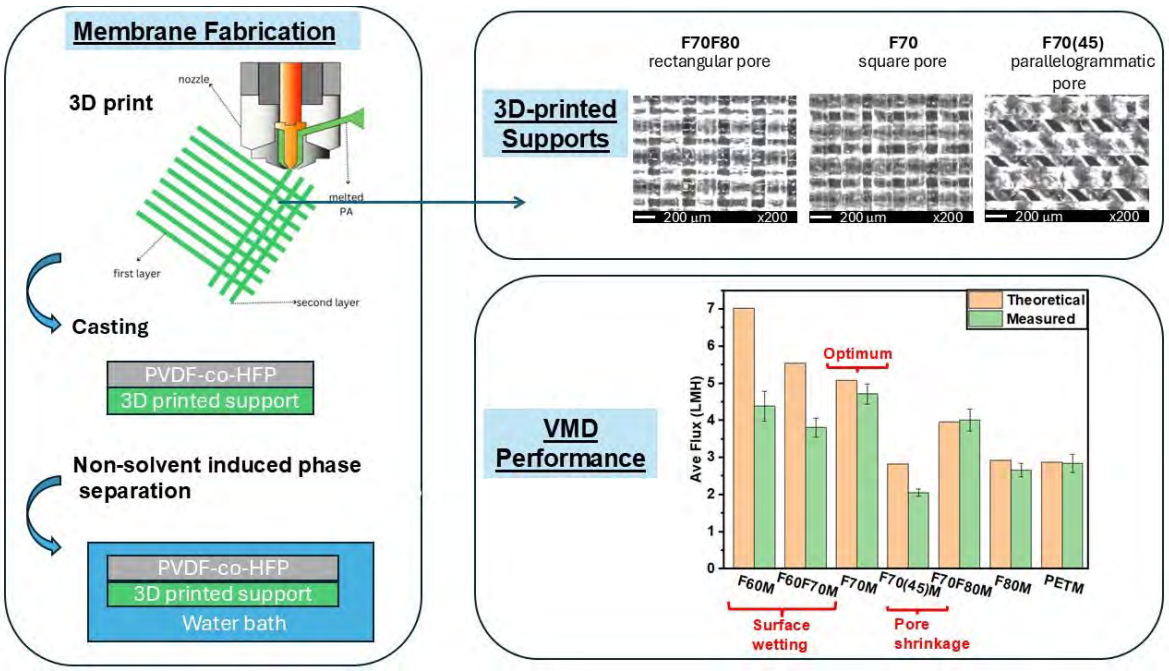
Key Highlights:
- Increasing build height reduces cooling rates and thermal gradients, producing coarser, more elongated grains and a stronger ⟨001⟩ texture. The median grain size on transverse sections increases from 215 to 844 μm.
- Bottom specimens have higher hardness, yield strength and ultimate tensile strength. Top specimens show greater elongation to failure, increasing from 41% at the bottom to 52% at the top.
- Bottom specimens show better fatigue performance at low stress and lower overall life scatter. Fitted fatigue strengths at 2 × 10^6 cycles are 161 MPa (bottom) and 147 MPa (top), at R = 0.1. Fatigue lives are comparable at high stress.
- Cracks initiate at surface or near-surface sites through localized cyclic plasticity or oxide inclusions. Bottom specimens show more tortuous crack paths and greater crack-tip shielding than top specimens.

Conclusion:
The study links thermal accumulation to microstructural heterogeneity and fatigue damage along the build direction. These findings support process optimization, local post-treatment and fatigue design that account for build height in large DED components.

Source: https://www.sciencedirect.com/science/article/abs/pii/S0142112326003981

Effects of 3D-printed Support Properties on Membrane Wetting Resistance and Vacuum Membrane Distillation (VMD) Performance

Dr Bao Lam Nguyen, Professor Paulo Bartolo, Associate Professor Tzyy Haur Chong



Introduction:
Vacuum Membrane distillation (VMD) technology is a thermally-driven membrane separation process suitable for desalinating seawater, as well as treating various types of high-strength wastewater, such as reverse osmosis (RO) brine and shale gas produced water. 3D printing is applied to print the supports for VMD membrane to increase the flux and wetting resistance of the membrane.

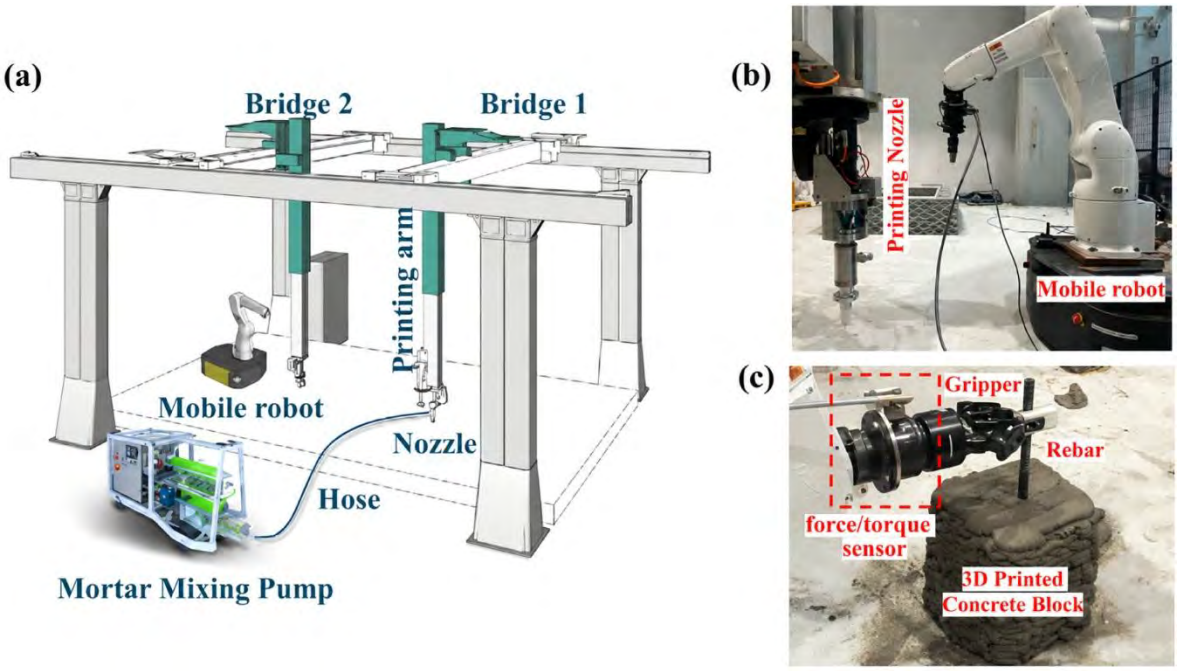
Key Highlights:
- Polyamide supports were printed using a droplet deposition modeling printer from Arburg
- A layer of polyvinylidene fluoride-co-hexafluoropropylene (PVDF-co-HFP) was cast over the 3D-printed supports.
- Increased pore size of support increased pore size of active layer formed.
- Membranes with larger pore size had lower wetting resistance.
- Greater support porosity decreased vapour transfer resistance and increased flux.
- Stable membrane flux and NaCl rejection of >99.9% over 35 hours.

Conclusion:
This study evaluates the potential of 3D printing in designing the desired characteristics of membrane supports to increase efficiency of desalination processes. New insights into the effects of support properties on the wetting resistance of the membrane and the VMD performance are achieved thanks to the customizability of 3D printing.

Source: https://www.sciencedirect.com/science/article/abs/pii/S0011916426006028

Robotic Rebar Insertion in 3D Printed Concrete: Applicability Limits Governed by Coupled Material–Process–Geometry Mechanisms

Dr Xiangyu Wang, Dr Sizhe Wang, Dr Lizhi Zhang, Dr Zhenbang Liu, Dr Beifang Deng, Dr Mingyang Li, Associate Professor Teck Neng Wong, Professor Yi Wei Daniel Tay, Dr Bak Koon Teoh and Professor Tan Ming Jen



Introduction:
Integrating continuous vertical reinforcement is a major bottleneck in 3D concrete printing (3DCP). Robotic rebar insertion into freshly printed concrete is a promising and highly automated route, but as the printed material stiffens over time, its applicable time window, achievable insertion depth and resulting bond quality have remained unclear.

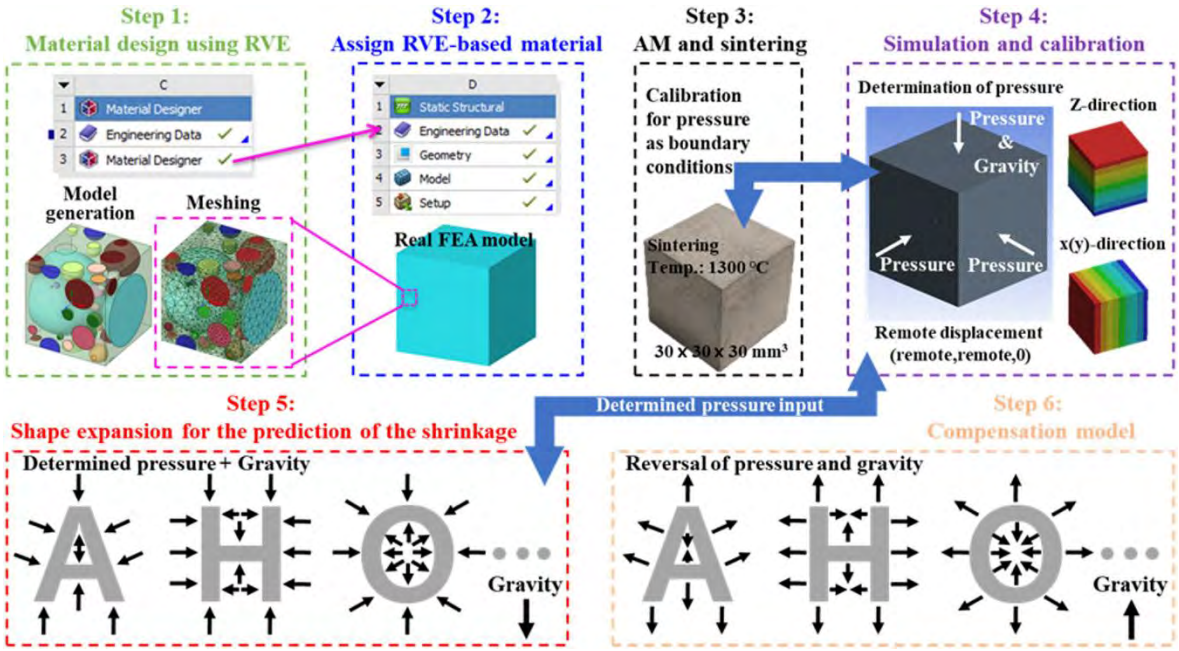
Key Highlights:
- As the resting time increased from 15 to 55 min, the early-age compressive strength of the fresh material rose from 5.5 to 26.3 kPa, and the rebar insertion force increased from 8.1 N to the 30 N process cap.
- Micro-CT revealed larger interfacial voids at longer resting times, with cracking at 55 min. Accordingly, the rebar bond strength decreased by up to 60% (8.5–22.7 MPa), while cementitious grouting enhanced bond by up to 100%.
- Finite element simulations with a Mohr–Coulomb model reproduced the measured force–depth response, showing the yielded zone around the rebar expanding with resting time.
- A multi-criteria framework (open window, buildability, penetrability, process quality and structural performance) was developed to estimate the maximum admissible insertion depth.

Conclusion:
This study clarifies the applicability limits of robotic rebar insertion in 3D printed concrete. Short-to-medium-length insertion is generally feasible: for a representative lattice-infill bathroom unit, the framework predicts a maximum feasible insertion length of ≤1790 mm and a conservative length of ≤350 mm.

Source: 10.1016/j.conbuildmat.2026.148184

A Representative Volume Element-Based Approach for Predicting Sintering Shrinkage in Metal Binder Jetting

Seong Je Park, Seungyon Cho, Sangjun Jeon & Seung Ki Moon



Introduction:
Binder jetting (BJT) is a laser-free metal additive manufacturing process that bonds powder layers with a binder and then densifies the printed part by sintering. However, sintering induces significant and often non-uniform shrinkage, causing dimensional deviations from the design and compromising structural integrity. Commercial simulation tools can predict this shrinkage with high fidelity but demand substantial expertise and cost. To address this limitation, this study proposes an accessible finite element analysis (FEA) framework that uses a representative volume element (RVE) to predict the sintering shrinkage trends of metal BJT parts.

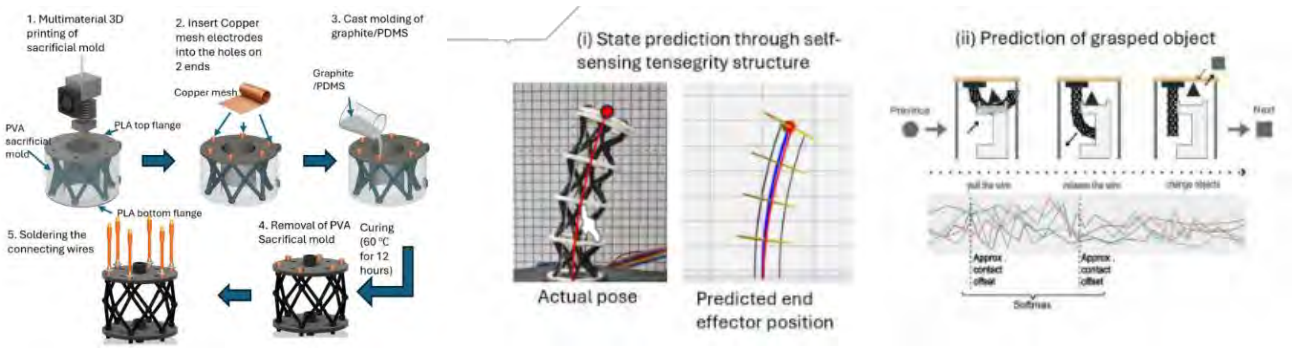
Key Highlights:
The RVE model homogenizes the powder–binder microstructure into a porous skeleton that shrinks under a calibrated equivalent pressure.
The framework predicted the shrinkage of complex geometries with overlap ratios of 90.1–95.8% against experimental measurements.
For geometries susceptible to large deformation, numerical instability coincided with their experimental collapse after sintering, indicating that the framework can also screen out shapes vulnerable to sintering failure.

Conclusion:
The proposed framework is a simplified, readily applicable alternative to specialized sintering software for predicting shrinkage trends and designing compensation models in metal BJT. Future work will extend it to a three-phase (powder–binder–air).

Source: https://doi.org/10.1007/s40684-026-00881-x

A 3D Printing-enabled Soft Continuum Robot with Integrated Sensing for Multi-purpose Predictions with Machine Learning

Dr Guo Liang Goh, Chunpeng Yu, Kyohei Watanabe, Dr Guo Dong Goh, Xinchao Gao, Ruichen Zhang, Han Wei Chua, Dr Max Austin, Professor Kohei Nakajima & Professor Wai Yee Yeong



Introduction:
Soft continuum robots offer exceptional compliance and adaptability, but accurately sensing their highly deformable shapes remains challenging. This work addresses this limitation by integrating conductive composite sensing directly into the robot structure, enabling intrinsic proprioception and intelligent state estimation.

Key Highlights:
- **Intrinsic sensing through multifunctional materials:** A graphite–PDMS conductive polymer composite is integrated directly into the soft continuum robot, allowing the structural lattice to simultaneously function as the robot body and a distributed strain-sensing network.
- **Near-real-time shape reconstruction using machine learning:** A Conformer-based neural network interprets the nonlinear and hysteretic sensor signals to reconstruct the robot's shape at approximately 50 Hz, achieving an end-effector RMSE of 6.3 mm and mean position error of 3.8 mm.
- **Robust sensing under external disturbances:** The embedded sensing system can capture deformation caused by external loading, enabling the robot to estimate its state beyond what can be inferred from tendon actuation alone.
- **Multi-purpose sensing beyond proprioception:** The same self-sensing structure can infer properties of objects during grasping, achieving 85% classification accuracy across four object conditions using only the resistance time-series signals.

Conclusion:
This work demonstrates a self-sensing soft continuum robot in which structural, sensing, and computational functions are integrated into a single compliant system. By combining multifunctional conductive materials with machine learning, the approach enables near-real-time proprioception and environmental perception without relying on bulky external sensors, providing a pathway toward more intelligent and autonomous soft robots.

Source: https://doi.org/10.1038/s41528-026-00589-7

FEATURED SC3DP'S FACULTY



Professor Tan Ming Jen

School of Mechanical and Aerospace Engineering , NTU

TAN Ming Jen received both his B.Sc.(Eng.) and Ph.D. from The Royal School of Mines (Imperial College, London) 1982-89, the latter degree on a Alcoa/CASE scholarship. He was a JSPS (Japan Society for the Promotion of Science) Fellow at Kyoto University in 1991, Science & Technology Agency (STA) Fellow at the Mechanical Engineering Laboratory (A.I.S.T., M.I.T.I.), Tsukuba, Japan 1992-93, Visiting Scientist at Columbia University (2003) and Fulbright Scholar (2004) at both UCLA and Northwestern University in the U.S.

Together with his collaborators and researchers, he has more than 300 publications in various international journals. His research has garnered over 23,000 citations (Source: Google Scholar, 2025). He has been listed by Stanford/Elsevier in recent years as World's Top 2% Scientist based on citation impact, and also as a "Global Shaker" for his group's pioneering work on Concrete 3D Printing: https://globalshakers.com/world-shakers/tan-ming-jen/

He was the Programme Director (Building & Construction) at the Singapore Centre of 3D Printing (SC3DP) from 2013-2019, and Director of the HP-NTU Digital Manufacturing Corporate/Joint Lab (2018-2025). He is on the World Economic Forum's (WEF) Global Future Council on Advanced Manufacturing and Value Chains; and on UNEP/WMO's Inter-governmental Panel on Climate Change (IPCC) , specifically the Task Force on National Greenhouse Gas Inventories (TFI). He is on the Editorial Board of the "Journal of Magnesium & Alloys", "Metals" and "npj Advanced Manufacturing".



Assistant Professor Punit Kumar

School of Mechanical and Aerospace Engineering , NTU

Dr Punit Kumar is an Assistant Professor in the School of Mechanical and Aerospace Engineering at Nanyang Technological University (NTU), Singapore, Singapore NRF Fellow, and a **new member of the Singapore Centre for 3D Printing**. His research focuses on developing advanced, damage-tolerant materials for extreme environments relevant to aerospace, hypersonic, nuclear, green-hydrogen, and other clean-energy technologies.

Prior to joining NTU, Dr Kumar was a Project Scientist at the University of California, Berkeley, and an affiliated Scientist at Lawrence Berkeley National Laboratory. He holds a PhD in Materials Engineering from the Indian Institute of Science and has published over 50 articles and delivered keynote presentations at major conferences. He was also recognised among the World's Top 2% of Scientists in 2023, 2024 and 2025.

VISITOR



Associate Professor Abdulsalam A. Al-Tamimi

- Department of Industrial Engineering, King Saud University, Riyadh, Saudi Arabia
- Visiting Scholar, SC3DP, NTU

Associate Professor Dr Abdulsalam A. Al-Tamimi obtained his PhD in Mechanical Engineering from the University of Manchester and is currently based in the Department of Industrial Engineering at King Saud University, Saudi Arabia. His research focuses on additive manufacturing, biomanufacturing, biomedical engineering, and finite element analysis. As Principal Investigator (PI) of three major research projects, he advances research in physical material processing, topology optimisation, AI, and IoT for high-performance applications. Additionally, he was also a **key champion in establishing the Saudi Advanced Manufacturing Hub (Saudi AMHUB) in collaboration with the World Economic Forum (WEF).**

Dr Al-Tamimi has authored numerous peer-reviewed papers on additive manufacturing capabilities, material behaviours, and design strategies. His work focuses on developing advanced manufacturing frameworks to improve quality of life through robust, patient-specific biomedical solutions.

SC3DP STAFF AND STUDENTS



Dr Cheong Wei Mun

Research Fellow, SC3DP, NTU

Dr Cheong Wei Mun obtained her Ph.D. in Materials Science from Universiti Putra Malaysia (UPM), Malaysia. Her research interests include advanced materials, with a particular focus on glass and glass-ceramics, functional materials, and additive manufacturing. She has experience in materials processing and characterisation, with an emphasis on understanding the relationships between processing conditions, microstructure, and material properties.

She is currently conducting research at the SC3DP, NTU, focusing on the additive manufacturing of glass. Her work encompasses process optimisation, characterisation of 3D-printed silica glass, and the development of functional glass components for optical and engineering applications.



Pedro Lopes

- Final year PhD Candidate in Mechanical Engineering, Faculty of Engineering of the University of Porto (FEUP), Portugal
- Visiting Researcher, SC3DP, NTU

Pedro Lopes is undertaking a research attachment at SC3DP through the **ADAPT Programme supported by A*STAR's Singapore Research Attachment Programme (SRAP).** His research focuses on the additive manufacturing of biodegradable metals for bone fixation applications. During his attachment, he is investigating the mechanical properties and degradation behaviour of porous iron scaffolds produced by laser powder bed fusion, with the aim of supporting the development of patient-specific biodegradable implants for healthcare applications.



Claudia Guerra

- PhD candidate at the MAE, NTU
- Master's degrees in Biomedical Engineering and in Materials Engineering and Nanotechnology from Politecnico di Milano, Italy

Claudia Guerra is a PhD candidate at the School of Mechanical and Aerospace Engineering (MAE), NTU, and a **recipient of the prestigious Provost Graduate Award**. At SC3DP, her research focuses on advanced materials and bioprinting strategies for the fabrication of a vascularised pancreatic model. She holds joint Master's degrees in Biomedical Engineering and Materials Engineering and Nanotechnology from the Politecnico di Milano, Italy. Prior to joining NTU, Claudia gained research experience at the Technology Innovation Institute (TII), a leading global research center in Abu Dhabi and in Sensipdx, a company developing sensors for bacteria detection based in Netherlands. Her research interests lie at the intersection of tissue engineering, advanced biomaterials, and interdisciplinary translational research.

WORKSHOPS AND SEMINARS

Performance-Aware Generative AI for Design and Manufacturing



On 2 September, **Assistant Professor Song Binyang** delivered a seminar titled "Performance-Aware Generative AI for Design and Manufacturing. Generative AI is transforming engineering design by enabling the rapid creation of complex and diverse design solutions. However, conventional generative models often lack the engineering knowledge needed to meet performance and manufacturing requirements.

In this seminar **Prof Song Binyang** discussed performance-aware generative AI, integrating physics and engineering knowledge into generative design models. Using 3D ship hulls as a case study, different AI strategies were evaluated for achieving targeted hydrodynamic performance. A second study on TPMS structures for additive manufacturing showed that diffusion-based generative design can identify feasible, high-performing designs. The findings highlight a shift towards physics-informed, performance-aware AI for more effective engineering design and manufacturing.

Materials Innovation Challenge 2026: From Workshop to Working Prototype

From 28 September to 1 October, NTU's School of Materials Science and Engineering hosted the Materials Innovation Challenge (MIC) 2026. Around 110 pre-university, undergraduate and postgraduate students formed 18 teams and developed their skills through hands-on workshops in 3D printing, Fusion 360 modelling and Arduino electronics.

The teams then designed solutions to a real-world problem, with the top six teams advancing to the final at the Innovation Port on 1 October. During the final, the teams presented their functional 3D-printed prototypes to **Professor Paulo Bartolo,** Executive Director of SC3DP; **Dr Rui Goncalves,** SC3DP member and Lecturer at the School of Materials Science and Engineering; and **Mr Lee Wen Wei,** Fix It Today.

The winners that addressed everyday challenges on campus are:

- **1st Prize:** "Unplug and Go", a clip-on laptop accessory holder for quick transitions between classes.
- **2nd Prize:** "SeatFlag", a sensor-based system showing whether library seats are occupied, unattended or vacant.
- **3rd Prize:** A portable, adjustable laptop stand.
- **Most Popular Vote:** "Buddy Board", a 3D-printed tabletop extender for lecture theatres.

MIC 2026 demonstrated how students can turn ideas into functional prototypes when given the right tools and a real problem to solve. SC3DP congratulates all participating teams for their creativity and efforts, and thanks the organising committee, staff and volunteers for their contributions to the event.





UPCOMING EVENTS & SEMINARS

The Singapore Centre for 3D Printing will host the **7th International BioManufacturing Conference (CIRP BioM 2027), from 26 to 28 May 2027**. This conference is an ideal platform to exchange ideas, research findings, and advancements in the field of Biomanufacturing, bringing together experts from academia and industry, and encouraging interdisciplinary collaboration among experts in engineering, biology, material science, and medicine.



This is an important conference of CIRP (the International Academy for Production Engineering), which is the world leading organisation in production engineering research.

The Academy has restricted membership based on demonstrated excellence in research and comprises around 600 academic and industrial members worldwide. SC3DP is currently represented in the CIRP community by one Research Fellow and one Research Affiliate.

The conference will cover the following topics:

- Biological Transformation and Bio-Intelligence
- Biomechatronics and Biomedical Solutions
- Biodesign and Bio-Assembly
- Biofabrication and Eco-Efficiency in Production
- Biological Manufacturing Processes and Equipment
- Tissue Engineering / Organ-on-a-Chip Technology
- Bio-Inspired Sensors and Biosensors
- Integration of AI and Digital Approaches in BioManufacturing

For more information, email us SC3DPoutreach@ntu.edu.sg

- SC3DP Open House | 05 November | Link



- Formnext Frankfurt | 17 – 20 November | Link

