

**Dr Chinnapat Panwisawas**  
BSc, PhD, CEng, FIMMM, FInstP, FIMechE, FHEA

School of Engineering and Materials Science  
Queen Mary University of London  
Mile End Road  
London E1 4NS

tel: +44 (0)20 7882 8732  
email: c.panwisawas@qmul.ac.uk web: www.sems.qmul.ac.uk/c.panwisawas

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2025

**Laser additive manufacturing of high-resolution microscale shell lattices by toolpath engineering.**

. *International Journal of Extreme Manufacturing* vol. 8, (1) 015002-015002.IOP Publishing.

**Achieving superior strength and corrosion resistance synergy in 316L stainless steel nanocomposites using ceramic nanoparticles by laser powder bed fusion approach.**

. *Progress in Additive Manufacturing* 1-23.Springer Nature.

**Pore-lean directed energy deposition additive manufacturing through laser power modulation.**

. *Acta Materialia* 121515-121515.Elsevier Bv.

**A Novel Virtual Reality Cycling System Using Controllers for Pedal Motion-Based Tracking: Movement Techniques, Motion Sickness, and User Experience.**

. *IEEE Access* 1-1.Institute of Electrical and Electronics Engineers (IEEE).

**Elemental segregation and solute transport in the in-situ alloying of miscible Ti-Nb alloys using laser powder bed fusion.**

. *Acta Materialia* vol. 299, 121417-121417.Elsevier.

**Achieving the Strength-Ductility Balance Through the Control of the Prior -Grain Size in Laser Beam Powder Bed Fusion of Ti-6Al-4V.**

. *Additive Manufacturing* vol. 109, 104842-104842.Elsevier.

**Additive manufacturing-by-design for support structures: a critical review.**

. *International Journal of Extreme Manufacturing* vol. 7, (5).IOP Publishing.

**Tailoring microstructure in functionally graded NiTi alloys using in-situ alloying directed energy deposition.**

. *Journal of Materials Processing Technology* 118884-118884.Elsevier Bv.

**Unravel melt pool and bubble dynamics during laser powder bed fusion of polyamides using synchrotron X-ray imaging and process simulation.**

. *Virtual and Physical Prototyping* vol. 20, (1) e2465905-e2465905.Taylor & Francis.

**Quantifying chemical homogeneity across the melt pool in laser powder-bed fusion of metallic glass matrix composites from blended elemental powders.**

. *Journal of Materials Research and Technology*.Elsevier.

**Thermal-solutal convection-induced low-angle grain boundaries in single-crystal nickel-based superalloy solidification.**

. *Journal of Materials Science & Technology* vol. 208, 214-229.Elsevier.

**Lack of fusion-induced cracking effect on tensile and fatigue behaviours of laser powder-bed fusion-processed Ti-6Al-4V implant.**

. *Engineering Failure Analysis* vol. 168,.Elsevier.

---

## 2024

**A microscale cellular automaton method for solid-state phase transformation of directed energy deposited Ti6Al4V.**

. *Additive Manufacturing* vol. 95, 104517-104517.Elsevier.

**Integrated modeling to control vaporization-induced composition change during additive manufacturing of nickel-based superalloys.**

. *Npj Computational Materials* vol. 10, (1) 230-230.Springer Nature.

**Uncovering the fracture mechanism of Laves (1 1 1)/ Ni6Nb7 (0 0 0 1) interfaces by first-principles calculations.**

. *Acta Materialia* vol. 281, 120426-120426.Elsevier.

**On the microstructure evolution and strengthening mechanism of GH4099 Ni-based superalloy fabricated by laser powder bed fusion.**

. *Materials Today Communications* vol. 40, 109734-109734.Elsevier.

**On the control of epitaxial growth and stray grains during laser-directed energy deposited Ni-based single crystal superalloy.**

. *Materials Characterization* 113969-113969.Elsevier.

**Laser-inherent porosity defects in additively manufactured Ti-6Al-4V implant: Formation, distribution, and effect on fatigue performance.**

. *Journal of Materials Research and Technology* vol. 30, 5121-5132.Elsevier.

**Pore evolution mechanisms during directed energy deposition additive manufacturing.**

. *Nature Communications* vol. 15, (1) 1715-1715.Springer Nature.

**In-process monitoring and direct simulation of Argon shielding gas and vapour dynamics to control laser-matter interaction in laser powder bed fusion additive manufacturing.**

. *Additive Manufacturing* vol. 80, 103953-103953.Elsevier.

## 2023

**Solute trapping and non-equilibrium microstructure during rapid solidification of additive manufacturing.**

. *Nature Communications* vol. 14, (1) 7990-7990.Springer Nature.

**High-temperature phase stability and phase transformation of NbCr2 Laves phase: Experimental and first-principles calculation studies.**

. *Materials and Design* 112483-112483.Elsevier.

**Melt Flow-Induced Mechanical Deformation and Fracture Behaviour of Dendrites in Alloy Solidification.**

. *Metallurgical and Materials Transactions A*.Springer Nature.

**Effects of Fly Ash Composition to Mitigate Conversion of Calcium Aluminate Cement Composites.**

. *Buildings* vol. 13, (10) 2453-2453.Mdpi.

**First-principles study of oxygen segregation and its effect on the embrittlement of molybdenum symmetrical tilt grain boundaries.**

. *Acta Materialia* vol. 261, 119387-119387.Elsevier.

**Gradient microstructure and strength-ductility synergy improvement of 2319 aluminum alloys by hybrid additive manufacturing.**

. *Journal of Alloys and Compounds* vol. 968, 171781-171781.Elsevier.

**Melt flow-induced mechanical deformation of dendrites in alloy solidification: A coupled thermal fluid - solid mechanics approach.**

. *Journal of Materials Research and Technology* vol. 25, 4094-4109.Elsevier.

**Real-time prediction and adaptive adjustment of continuous casting based on deep learning.**

. *Communications Engineering* vol. 2, (1).Springer Nature.

**Simulation of the solute transport and microstructure evolution during the selective laser melting process.**  
. *IOP Conference Series Materials Science and Engineering* vol. 1281, (1).IOP Publishing.

**Grain refinement and columnar-to-equiaxed transition of Ti6Al4V during additive manufacturing via different laser oscillations.**  
. *International Journal of Machine Tools and Manufacture* 104031-104031.Elsevier.

**Effects of extended mixing processes on fresh, hardened and durable properties of cement systems incorporating fly ash.**  
. *Scientific Reports* vol. 13, 6091-6091.Springer Nature.

**Laser-based Additive Manufacturing of Bulk Metallic Glasses: Recent Advances and Future Perspectives for Biomedical Applications.**  
. *Journal of Materials Research and Technology* vol. 23, 2956-2990.Elsevier.

**Additive manufacturing of tantalum scaffolds: Processing, microstructure and process-induced defects.**  
. *International Journal of Refractory Metals and Hard Materials* 106132-106132.Elsevier Bv.

**Physics-based thermal-chemical-fluid-microstructure modelling of in-situ alloying using additive manufacturing: Composition-microstructure control.**  
. *Additive Manufacturing* 103428-103428.Elsevier Bv.

**Microstructure characteristics of a René N5 Ni-based single-crystal superalloy prepared by laser-directed energy deposition.**  
. *Additive Manufacturing* 103363-103363.Elsevier.

**Multi-length-scale study on the heat treatment response to supersaturated nickel-based superalloys: Precipitation reactions and incipient recrystallisation.**  
. *Additive Manufacturing* 103389-103389.Elsevier.

## 2022

**A physics-based life prediction model of HP40Nb heat-resistant alloy in a coupled creep-carburisation environment.**  
. *Materials Science and Engineering: A* vol. 860, 144260-144260.Elsevier.

**variant-sensitive deformation behaviour of Inconel 718 superalloy.**  
. *Journal of Material Science and Technology* vol. 126, 169-181.Elsevier.

**Development, characterisation, and modelling of processability of nitinol stents using laser powder bed fusion.**  
. *Journal of Alloys and Compounds* vol. 909,.Elsevier.

**A new toxic-free Ti40Zr10Co36Pd14 metallic glass with good biocompatibility and surface behaviour comparable to Ti-6Al-4V.**  
. *Materials & Design* vol. 218,.Elsevier.

**Insight into the sensitivities of freckles in the directional solidification of single-crystal turbine blades.**  
. *Journal of Manufacturing Processes* vol. 77, 219-228.Elsevier.

**Metallurgical Data Science for Steel Industry: A Case Study on Basic Oxygen Furnace.**  
. *Steel Research International* vol. 93, (12).

**Evaluating data-driven algorithms for predicting mechanical properties with small datasets: A case study on gear steel hardenability.**  
. *International Journal of Minerals, Metallurgy and Materials* vol. 29, (4) 836-847.Springer Nature.

**Use of barite concrete for radiation shielding against gamma-rays and neutrons.**  
. *Construction and Building Materials* vol. 326,.Elsevier.

**Chemical species mixing during direct energy deposition of bimetallic systems using titanium and dissimilar refractory metals for repair and biomedical applications.**  
. *Additive Manufacturing* vol. 51,.Elsevier.

.  
The Proceedings of The Fluids Engineering Conference vol. 2022, os11-os08. Japan Society of Mechanical Engineers.

## 2021

**Additive manufacturability of superalloys: Process-induced porosity, cooling rate and metal vapour.**

. *Additive Manufacturing* vol. 47,.Elsevier.

**Solute enrichment induced dendritic fragmentation in directional solidification of nickel-based superalloys.**

. *Acta Materialia* vol. 215,.Elsevier.

**Digital materials design by thermal-fluid science for multi-metal additive manufacturing.**

. *Acta Materialia* vol. 210,.Elsevier.

**A novel low-modulus titanium alloy for biomedical applications: A comparison between selective laser melting and metal injection moulding.**

. *Materials Science and Engineering A* vol. 812,.Elsevier.

**Thermal-solutal-fluid flow of channel segregation during directional solidification of single-crystal nickel-based superalloys.**

. *Acta Materialia* vol. 206,.Elsevier.

**High entropy alloys as filler metals for joining.**

. *Entropy* vol. 23, (1) 1-23.Mdpi.

**Ultra-high temperature deformation in a single crystal superalloy: Mesoscale process simulation and micromechanisms.**

. *Acta Materialia* vol. 203,.Elsevier.

**Alloys-by-design: Application to new superalloys for additive manufacturing.**

. *Acta Materialia* vol. 202, 417-436.Elsevier.

## 2020

**Spinodal decomposition versus classical nucleation in a nickel-base superalloy powder: An in-situ neutron diffraction and atomic-scale analysis.**

. *Acta Materialia* vol. 200, 959-970.Elsevier.

**On the nature of hexagonality within the solidification structure of single crystal alloys: Mechanisms and applications.**

. *Acta Materialia* vol. 200, 417-431.Elsevier.

**Metal 3D printing as a disruptive technology for superalloys.**

. *Nature Communications* vol. 11, (1).Springer Nature.

**Relating micro-segregation to site specific high temperature deformation in single crystal nickel-base superalloy castings.**

. *Materials Science and Engineering A* vol. 773,.Elsevier.

## 2018

**A computational study on the three-dimensional printability of precipitate-strengthened nickel-based superalloys.**

. *Proceedings of The Royal Society A* vol. 474, (2220).The Royal Society.

**Neutron tomography methods applied to a nickel-based superalloy additive manufacture build.**

. *Materials Letters* vol. 230, 109-112.Elsevier.

**Mean-field modelling of the intermetallic precipitate phases during heat treatment and additive manufacture of Inconel 718.**

. *Acta Materialia* vol. 156, 432-445.Elsevier.

**Prediction of grain structure evolution during rapid solidification of high energy density beam induced re-melting.**

. *Materials & Design* vol. 147, 200-210.Elsevier.

**Modelling of thermal fluid dynamics for fusion welding.**

. *Journal of Materials Processing Technology* vol. 252, 176-182.Elsevier.

## 2017

**The contrasting roles of creep and stress relaxation in the time-dependent deformation during in-situ cooling of a nickel-base single crystal superalloy.**

. *Scientific Reports* vol. 7, (1).Springer Nature.

**Nucleation of recrystallisation in castings of single crystal Ni-based superalloys.**

. *Acta Materialia* vol. 129, 112-123.Elsevier.

**In-situ neutron diffraction during stress relaxation of a single crystal nickel-base superalloy.**

. *Scripta Materialia* vol. 131, 103-107.Elsevier.

**Keyhole formation and thermal fluid flow-induced porosity during laser fusion welding in titanium alloys: Experimental and modelling.**

. *Acta Materialia* vol. 126, 251-263.Elsevier.

**An experimental investigation into the stress and strain development of a Ni-base single crystal superalloy during cooling from solidification.**

. *Materials & Design* vol. 114, 475-483.Elsevier.

**Visco-plasticity during in-situ cooling from solidification of a nickel-base single crystal superalloy using neutron diffraction.**

. *Materials Science and Engineering A* vol. 681, 32-40.Elsevier.

**Mesoscale modelling of selective laser melting: Thermal fluid dynamics and microstructural evolution.**

. *Computational Materials Science* vol. 126, 479-490.Elsevier.

## 2016

**An Integrated Modeling Approach for Predicting Process Maps of Residual Stress and Distortion in a Laser Weld: A Combined CFDFE Methodology.**

. *Metallurgical and Materials Transactions B* vol. 47, (5) 2954-2962.Springer Nature.

**Porosity Formation in Laser Welded Ti6Al4V Alloy: Modelling and Validation.**

. *Proceedings of The 13th World Conference On Titanium 1897-1900*. Wiley.

**The role of stress relaxation and creep during high temperature deformation in Ni-base single crystal superalloys Implications to strain build-up during directional solidification.**

. *Acta Materialia* vol. 106, 322-332.Elsevier.

## 2015

**An Improved Method of Capturing the Surface Boundary of a Ti-6Al-4V Fusion Weld Bead for Finite Element Modeling.**

. *Metallurgical and Materials Transactions B* vol. 47, (1) 485-494.Springer Nature.

**On the role of melt flow into the surface structure and porosity development during selective laser melting.**

. *Acta Materialia* vol. 96, 72-79.Elsevier.

**On the role of thermal fluid dynamics into the evolution of porosity during selective laser melting.**

. *Scripta Materialia* vol. 105, 14-17.Elsevier.

## 2013

**Analysis of the mechanical deformation arising from investment casting of directionally solidified nickel-based superalloys.**

. *Materials Science and Technology* vol. 29, (7) 843-853.Sage Publications.

**Prediction of recrystallization in investment cast single-crystal superalloys.**

. *Acta Materialia* vol. 61, (1) 51-66. Elsevier.

2012

**Prediction of Plastic Strain for Recrystallisation during Investment Casting of Single Crystal Superalloys.**

. *Superalloys 2012* 547-556. Wiley.

2011

**Numerical Modelling of Stress and Strain Evolution during Solidification of a Single Crystal Superalloy.**

. *Advanced Materials Research* vol. 278, 204-209. Trans Tech Publications.