

**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

---

## 2025

### **Additive Manufacturing-by-Design for Support Structure: A Critical Review.**

Su J, Mo Y, Shangguan P, Panwisawas C, Jiang F and Sing SL. *International Journal of Extreme Manufacturing*. IOP Publishing.

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

Dai G, Min J, Sun Z, Guo Y, Bhowmik A, Shinjo J, Lu J and Panwisawas C. *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.**

Leung CLA, Gardy J, Isaacs M, Marathe S, Kosowski MM, Shinjo J, Panwisawas C and Lee PD. *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.**

Wannapraphai P, Panwisawas C, Houghton OS, Shinjo J, Wakabayashi H, Phetrattanarangsi T, Kuimalee S, Reed RC, Greer AL, Lohwongwatana B and Puncreobutr C. *Journal of Materials Research and Technology*. Elsevier.

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

Yang L, Ren N, Li J, Panwisawas C, Zhang Y, Xia M, Dong H and Li J. *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.**

Aliyu AAA, Puncreobutr C, Shinjo J, Kuimalee S, Phetrattanarangsi T, Boonchuduang T, Taweekitkul P, Panwisawas C, Wanming L, Pongsiri K and Lohwongwatana B. *Engineering Failure Analysis* vol. 168, Elsevier.

## 2024

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

Xiong F, Lian Y, Panwisawas C, Chen J, Li M-J and Liu A. *Additive Manufacturing* vol. 95, 104517-104517. Elsevier.

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

Mukherjee T, Shinjo J, DebRoy T and Panwisawas C. *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.**

Zhang G, Chen G, Panwisawas C, Teng X, An R, Cao J, Huang Y, Dong Z and Leng X. *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.**

ZHANG K, Chaoyue CHEN, Songzhe XU, Tao HU, Xia LI, Cao Z, Xiaopeng LI, PANWISAWAS C, Linda KE, Jiang WANG and Zhongming REN. *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.**

Guan W, Chen C, Pan X, Zhao R, Xufei L, Tao H, Songzhe X, Xuan W, Panwisawas C, Lei L, Wang J and Ren Z. *Materials Characterization* 113969-113969.Elsevier.

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

Aliyu AAA, Puncreobutr C, Kuimalee S, Phetrattanarangsi T, Boonchuduang T, Taweekitkul P, Panwisawas C, Shinjo J and Lohwongwatana B. *Journal of Materials Research and Technology* vol. 30, 5121-5132.Elsevier.

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

Zhang K, Chen Y, Marussi S, Fan X, Fitzpatrick M, Bhagavath S, Majkut M, Lukic B, Jakata K, Rack A, Jones MA, Shinjo J, Panwisawas C, Leung CLA and Lee PD. *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.**

Shinjo J, Kutsukake A, Wakabayashi H, Arakawa K, Ogawara A, Uchida H, Panwisawas C and Reed RC. *Additive Manufacturing* vol. 80, 103953-103953.Elsevier.

## 2023

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

Ren N, Li J, Zhang R, Panwisawas C, Xia M, Dong H and Li J. *Nature Communications* vol. 14, (1) 7990-7990. Springer Nature.

**High-temperature phase stability and phase transformation of NbCr<sub>2</sub> Laves phase: Experimental and first-principles calculation studies.**

Hajra RN, Panwisawas C, Park JW, Choo W, Han BJ and Kim JH. *Materials and Design* 112483-112483.Elsevier.

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

Yang L, Ren N, Panwisawas C, Li J, Xia M, Dong H and Li J. *Metallurgical and Materials Transactions A*.Springer Nature.

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

Win TT, Panwisawas C, Jongvivatsakul P, Pansuk W and Prasittisopin L. *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.**

Zhang G, Chen G, Panwisawas C, Teng X, Ma Y, An R, Huang Y, Cao J and Leng X. *Acta Materialia* vol. 261, 119387-119387.Elsevier.

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

Guoqing D, Xue M, Guo Y, Chang H, Sun Z, Lu J, Li W, Panwisawas C and Alexandrov IV. *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.**

Yang L, Ren N, Panwisawas C, Li J, Xia M, Dong H and Li J. *Journal of Materials Research and Technology* vol. 25, 4094-4109.Elsevier.

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

Lu Z, Ren N, Xu X, Li J, Panwisawas C, Xia M, Dong H, Tsang E and Li J. *Communications Engineering* vol. 2, (1). Springer Nature.

**Simulation of the solute transport and microstructure evolution during the selective laser melting process.**

Ren N, Li J, Panwisawas C, Xia M, Dong H and Li J. *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.**

Dai G, Sun Z, Li Y, Jain J, Bhowmik A, Shinjo J, Lu J and Panwisawas C. *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.**

Sereewatthanawut I, Panwisawas C, Ngamkhanong C and Prasittisopin L. *Scientific Reports* vol. 13, 6091-6091. Springer Nature.

**Laser-based Additive Manufacturing of Bulk Metallic Glasses: Recent Advances and Future Perspectives for Biomedical Applications.**

Abdu Aliyu AA, Panwisawas C, Shinjo J, Puncreobutr C, Reed RC, Pongsiri K and Lohwongwatana B. *Journal of Materials Research and Technology* vol. 23, 2956-2990.Elsevier.

**Additive manufacturing of tantalum scaffolds: Processing, microstructure and process-induced defects.**

Aliyu AAA, Pongsiri K, Shinjo J, Panwisawas C, Reed RC, Puncreobutr C, Tumkanon K, Kuimalee S and Lohwongwatana B. *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.**

Shinjo J, Kutsukake A, Arote AS, Tang YT, McCartney DG, Reed RC and Panwisawas C. *Additive Manufacturing* 103428-103428.Elsevier Bv.

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

Rui WANG, Jiang WANG, Tingwei CAO, Ruixin ZHAO, Lu X, Wei GUAN, Tao HU, SHUAI S, Songzhe XU, Weidong XUAN, PANWISAWAS C, Chaoyue CHEN and Zhongming REN. *Additive Manufacturing* 103363-103363. Elsevier.

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

Tang YT, Panwisawas C, Jenkins BM, Liu J, Shen Z, Salvati E, Gong Y, Ghoussoub JN, Michalik S, Roebuck B, Bagot PAJ, Lozano-Perez S, Grovenor CRM, Moody MP, Korsunsky AM, Collins DM and Reed RC. *Additive Manufacturing* 103389-103389.Elsevier.

## 2022

**A physics-based life prediction model of HP40Nb heat-resistant alloy in a coupled creep-carburisation environment.**

Fuyang C, Gong J, Wang X, Panwisawas C and Chen B. *Materials Science and Engineering: A* vol. 860, 144260-144260.Elsevier.

**variant-sensitive deformation behaviour of Inconel 718 superalloy.**

Zhang RY, Qin HL, Bi ZN, Tang YT, de Oliveira JA, Lee TL, Panwisawas C, Zhang SY, Zhang J, Li J and Dong HB. *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.**

Jamshidi P, Panwisawas C, Langi E, Cox SC, Feng J, Zhao L and Attallah MM. *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.**

Aliyu AAA, Udomlertpreecha S, Medhisuwakul M, Panwisawas C, Reed R, Puncreobutr C, Khamwannah J, Kuimalee S, Yipyintum C and Lohwongwatana B. *Materials & Design* vol. 218,.Elsevier.

**Insight into the sensitivities of freckles in the directional solidification of single-crystal turbine blades.**

Ren N, Li J, Panwisawas C, Xia M, Dong H and Li J. *Journal of Manufacturing Processes* vol. 77, 219-228.Elsevier.

**Metallurgical Data Science for Steel Industry: A Case Study on Basic Oxygen Furnace.**

Nenchev B, Panwisawas C, Yang X, Fu J, Dong Z, Tao Q, Gebelin JC, Dunsmore A, Dong H, Li M, Tao B, Li F, Ru J and Wang F. *Steel Research International* vol. 93, (12).

**Evaluating data-driven algorithms for predicting mechanical properties with small datasets: A case study on gear steel hardenability.**

Nenchev B, Tao Q, Dong Z, Panwisawas C, Li H, Tao B and Dong H. *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.**

Daungwilailuk T, Yenchai C, Rungjaroenkiti W, Pheinsusom P, Panwisawas C and Pansuk W. *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.**

Shinjo J and Panwisawas C. *Additive Manufacturing* vol. 51, Elsevier.

•  
and Panwisawas C. *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.**

Panwisawas C, Gong Y, Tang YT, Reed RC and Shinjo J. *Additive Manufacturing* vol. 47, Elsevier.

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

Ren N, Panwisawas C, Li J, Xia M, Dong H and Li J. *Acta Materialia* vol. 215, Elsevier.

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

Shinjo J and Panwisawas C. *Acta Materialia* vol. 210, Elsevier.

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

Suwanpreecha C, Alabort E, Tang YT, Panwisawas C, Reed RC and Manonukul A. *Materials Science and Engineering A* vol. 812, Elsevier.

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

Ren N, Li J, Panwisawas C, Xia M, Dong H and Li J. *Acta Materialia* vol. 206, Elsevier.

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

Luo D, Xiao Y, Hardwick L, Snell R, Way M, Morell XS, Livera F, Ludford N, Panwisawas C, Dong H and Goodall R. *Entropy* vol. 23, (1) 1-23. Mdpi.

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

Tang YT, D Souza N, Roebuck B, Karamched P, Panwisawas C and Collins DM. *Acta Materialia* vol. 203, Elsevier.

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

Tang YT, Panwisawas C, Ghossoub JN, Gong Y, Clark JWG, Németh AAN, McCartney DG and Reed RC. *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.**

Collins DM, D Souza N, Panwisawas C, Papadaki C, West GD, Kostka A and Kontis P. *Acta Materialia* vol. 200, 959-970. Elsevier.

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

Strickland J, Nenchev B, Perry S, Tassenberg K, Gill S, Panwisawas C, Dong H, D'Souza N and Irwin S. *Acta Materialia* vol. 200, 417-431. Elsevier.

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

Panwisawas C, Tang YT and Reed RC. *Nature Communications* vol. 11, (1).Springer Nature.

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

D'Souza N, Roebuck B, Collins DM, West GD and Panwisawas C. *Materials Science and Engineering A* vol. 773,. Elsevier.

**2018**

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

Basoalto HC, Panwisawas C, Sovani Y, Anderson MJ, Turner RP, Saunders B and Brooks JW. *Proceedings of The Royal Society A* vol. 474, (2220).The Royal Society.

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

Turner RP, Panwisawas C, Lu Y, Dhiman I, Basoalto HC and Brooks JW. *Materials Letters* vol. 230, 109-112. Elsevier.

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

Anderson MJ, Panwisawas C, Sovani Y, Turner RP, Brooks JW and Basoalto HC. *Acta Materialia* vol. 156, 432-445. Elsevier.

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

Flint TF, Panwisawas C, Sovani Y, Smith MC and Basoalto HC. *Materials & Design* vol. 147, 200-210.Elsevier.

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

Panwisawas C, Sovani Y, Turner RP, Brooks JW, Basoalto HC and Choquet I. *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.**

Panwisawas C, D Souza N, Collins DM and Bhowmik A. *Scientific Reports* vol. 7, (1).Springer Nature.

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

Mathur HN, Panwisawas C, Jones CN, Reed RC and Rae CMF. *Acta Materialia* vol. 129, 112-123.Elsevier.

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

Collins DM, D Souza N and Panwisawas C. *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.**

Panwisawas C, Perumal B, Ward RM, Turner N, Turner RP, Brooks JW and Basoalto HC. *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.**

Qiu C, D'Souza N, Kelleher J and Panwisawas C. *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.**

D'Souza N, Kelleher J, Kabra S and Panwisawas C. *Materials Science and Engineering A* vol. 681, 32-40.Elsevier.

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

Panwisawas C, Qiu C, Anderson MJ, Sovani Y, Turner RP, Attallah MM, Brooks JW and Basoalto HC. *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 CFD/FE Methodology.**

Turner RP, Panwisawas C, Sovani Y, Perumal B, Ward RM, Brooks JW and Basoalto HC. *Metallurgical and Materials Transactions B* vol. 47, (5) 2954-2962. Springer Nature.

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

Panwisawas C, Perumal B, Sovani Y, Turner RP, Ward RM, Brooks JW and Basoalto HC. *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.**

D'Souza N, Kelleher J, Qiu C, Zhang S-Y, Gardner S, Jones RE, Putman D and Panwisawas C. *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.**

Turner RP, Villa M, Sovani Y, Panwisawas C, Perumal B, Ward RM, Brooks JW and Basoalto HC. *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.**

Qiu C, Panwisawas C, Ward M, Basoalto HC, Brooks JW and Attallah MM. *Acta Materialia* vol. 96, 72-79. Elsevier.

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

Panwisawas C, Qiu CL, Sovani Y, Brooks JW, Attallah MM and Basoalto HC. *Scripta Materialia* vol. 105, 14-17. Elsevier.

## 2013

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

Panwisawas C, Gebelin J-C and Reed RC. *Materials Science and Technology* vol. 29, (7) 843-853. Sage Publications.

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

Panwisawas C, Mathur H, Gebelin J-C, Putman D, Rae CMF and Reed RC. *Acta Materialia* vol. 61, (1) 51-66. Elsevier.

## 2012

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

Panwisawas C, Mathur H, Gebelin J, Putman DC, Withey P, Warnken N, Rae CMF and Reed RC. *Superalloys 2012* 547-556. Wiley.

## 2011

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

Panwisawas C, Gebelin JC, Warnken N, Broomfield RW and Reed RC. *Advanced Materials Research* vol. 278, 204-209. Trans Tech Publications.