University of Nottingham
UK | CHINA | MALAYSIA

Role profile

Job title	Research Associate/Fellow in Additive Manufacturing of Novel Aluminium and Multi-Metallic Structures.	Job family and level	Research Level 4 (Appointment will be Level 4 Career training grade where an appointment is made before PhD has been completed)
School/ Department	Engineering - Centre for Additive Manufacturing	Location	Jubilee Campus, Advanced Manufacturing Building

Purpose of role

The role holder will be part of a team working on an industrially funded project investigating two areas of metallic Additive Manufacturing (specifically Laser Powder Bed Fusion): the processing of a novel aluminium material alongside the multi-material processing of Inconel and Copper-based materials. Led by Prof Richard Hague and Dr Marco Simonelli at the University of Nottingham, the role will support the Investigator team in achieving overall research objectives of these two exciting research challenges.

The role holder will conduct internationally leading research to widen the understanding of both single and multi-metallic printing via LPBF, the most prominent metal AM technique. The successful applicant will make use of two systems within the Centre for Additive Manufacturing: an industrial system (for single material, novel aluminium-based materials) and a state-of-the-art Aconity printing platform that features a novel Schaeffler-Aerosint multi-material powder deposition recoater and a multi-laser beam heat delivery for processing of Inconel and Cu-based materials. This research will require the development of precise printing parameters (comprising: material recoater, (multi-) laser fluence, laser scanning strategy, deposition sequence, etc.) to fabricate defect-free Aluminium (Al) parts as well as the identification of suitable printing parameters for processing dissimilar materials, specifically copper (Cu) and Inconel (In) alloys. Targeted engineering components that will be designed and fabricated in this research project will be chosen within the context of aerospace, space and automotive applications.

	Main responsibilities (Primary accountabilities and responsibilities expected to fulfil the role)	**% time per year**
1	**Contribution to printing and testing of multi-metallic additive manufactured structures.** • The successful applicant will be required to determine printing parameters for individual materials (Aluminium (Al), Inconel (In) and Copper-Cu) as well as In/Cu interfaces. • They will characterise the microstructure and the performance of the printed structures. • They will determine fabrication guidelines for Al and In/Cu structures to ensure low-defect production. • They will be required to produce specimens of increasing geometrical complexity	70%

2	**Documentation and reporting** • The role holder will be responsible for ensuring that their work is thoroughly documented such that other researchers can advance this work either simultaneously or subsequently. • They will attend meetings with colleagues and stakeholders, both within the university and with the industrial funding partner. • They will be required to produce written reports on their work. • The individual will need to make these reports professionally written in English and easy to read without extra support.	10%
3	**Stakeholder liaison** • The role holder will have to make regular reports to the industrial funder. • They will be responsible for monitoring and communicating project milestones/deliverables. • They will also be expected to explain their work to co-workers within the Centre for Additive Manufacturing research group and occasionally to parties from close collaborators in research groups in other Universities.	10%
4	**Other** • Researchers within the Centre for Additive Manufacturing are expected to contribute to internal seminar and training activities, by attending and where appropriate presenting. • The role holder will be asked to ensure that they undertake regular continued professional development. • Any other duties as appropriate to this post as requested by the line manager.	10%

Person specification

	Essential	Desirable
Skills	▪ Excellent oral and written communication skills, including the ability to communicate with clarity on complex information. ▪ Demonstrable skills (in the form of published work and PhD thesis) in a materials science or engineering discipline, particular concerning metallics ▪ Analytical ability to facilitate conceptual thinking, innovation and creativity. ▪ Effective laboratory note-taking and logging of experiments and data. ▪ Ability for independent research within the context of a team.	▪ Ability to prioritise and organise resource requirements (project management skills). ▪ Ability to foster a research culture and commitment to learn in others.
Knowledge and experience	▪ Experience in metallurgy (Al, Cu, Inconel), or materials for aerospace / automotive applications. ▪ Experience in microstructural characterisation and thermo-mechanical testing. ▪ Ability to use programming software (e.g. Matlab or Python) for both data- processing and the modelling and analysis of engineering systems and components. ▪ A good understanding of laser processing.	▪ Experience in Laser Powder Bed Fusion. ▪ Experience in processing dissimilar materials (AM, welding, joining, or other processing techniques). ▪ Experience in manufacturing methods (joining, fabrication, etc.) of refractory metals. ▪ Experience in computer aided design (CAD, SolidWorks, Catia, Autodesk, etc.)
Qualifications, certification and training (relevant to role)	▪ An honours degree in Materials or Mechanical Engineering or similar (e.g. Physical Sciences). ▪ Holds (or studying towards) a PhD in Materials or Mechanical Engineering or similar (e.g. Physical Sciences)	▪ Holds (or studying towards) a PhD in Materials or Mechanical Engineering or similar (e.g. Physical Sciences), ideally in a field closely related to advanced processing of automotive or aerospace materials.

Expectations and behaviours

The University has developed a clear set of core expectations and behaviours that our people should be demonstrating in their work, and as ambassadors of the University's strategy, vision and values. The following are essential to the role:

Valuing people	Is friendly, engaging and receptive, putting others at ease. Actively listens to others and goes out of way to ensure people feel valued, developed and supported.
Taking ownership	Is clear on what needs to be done encouraging others to take ownership. Takes action when required, being mindful of important aspects such as Health & Safety, Equality, Diversity & Inclusion, and other considerations.
Forward thinking	Drives the development, sharing and implementation of new ideas and improvements to support strategic objectives. Engages others in the improvement process.
Professional pride	Is professional in approach and style, setting an example to others; strives to demonstrate excellence through development of self, others and effective working practices.
Always inclusive	Builds effective working relationships, recognising and including the contribution of others; promotes inclusion and inclusive practices within own work area.

Key relationships with others