

## Research Associate – Additive Manufacturing of Metals

Job Ref: REQ250053

Full or part-time, fixed term for 12 months

*As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.*

**The Wolfson School of Mechanical, Electrical and Manufacturing is one of the leading Engineering Schools in the country. With a strong tradition in Manufacturing and in the discovery and application of Materials for applications in a broad range of industrial sectors (e.g., electronics, bioengineering & healthcare, automotive, food industry, etc), we strive for academic excellence and research at the leading edge.**

### Project Description

This post can be held FULL or PART-TIME.

We are looking for a hands-on engineer or scientist with experience in Additive Manufacturing, in particular Selective Laser Melting (SLM), using metals (incl., Titanium and its alloys) to conduct research in the areas of physical manufacture, characterisation and validation of powder alloys and multifunctional materials and structures. We welcome manufacturers with industrial experience, as well as researchers with a background in metallurgy, to develop new scientific understanding of materials processing and manufacturing techniques. This is an EPSRC-funded project, already ongoing and with a multidisciplinary team in place. The post can be held full or part time, and we encourage candidates to express their preference at the time of the application or at interview.

### Job Description

**Job Grade:** Specialist and Supporting Academic Grade 6

#### Job Purpose

To manufacture CAD structures using Additive Manufacturing techniques, esp. Selective Laser Melting or Sintering (SLM, SLS), and Electron Beam Melting (EBM). To conduct research in the areas of physical manufacture, characterisation and validation of the feedstock powder as well as the resulting materials and structures produced (nominally engineered porous structures and lightweight materials, metals and alloys). To develop new scientific understanding of materials processing and manufacturing techniques by creating protocols that parameterise the process. To generate high quality scientific reports and papers suitable for publication in International Journals.

#### Job Duties

- To develop and implement Design of Experiments techniques and protocols that support manufacturing, materials characterisation, process simulation and validation.
- For the design, to create CAD models and prepare them for manufacture, including 'Magics' operations.
- For the manufacture, to be able to operate Additive Manufacturing equipment using metal powders, esp. SLM machines.
- For the validation, to be able to measure physical and mechanical properties (i.e., mechanical testing) of the manufactured materials and structures.
- For the physical characterisation, to perform, physical, chemical, microstructural, metallurgical characterisation and analysis of the products and processes, incl. materials under study (e.g., SEM, DSC, XPS, micro-CT, XRD, optical microscopy, etc)

- To apply experience in data gathering and analysis using tools such as MatLab, Origin, Excel, etc, to perform basic statistical analysis to support process optimisation.
- To work as part of a multi-disciplinary, multi-location team that addresses different aspects of the design, manufacturing, validation cycle of porous materials and structures.
- To conduct research of academic rigour and scientific standard, carry out authoritative literature reviews, and publish in top quality journals, consistent with the School's and Research Lab's quality and ambition.
- To be responsible for the day-to-day running and maintenance of the specific resources required in these roles that are pertinent to the project.
- To carry out Risk Assessments and COSHH inventories to ensure a safe environment in the labs and working place(s) for all the team members involved.
- To assist the academic staff in the project team with the supervision of undergraduate, MSc and PhD project work and day-to-day supervision and support of other researchers.
- Write up regular progress reports and present outcomes to all Investigators and Collaborators (incl. those located at other Institutions), making recommendations for next steps.
- To attend and contribute to conferences, seminars, webinars and other events of interest to the team.
- To contribute ideas for new research and impact directions.
- To always maintain confidentiality and ensure that intellectual property (IPR) generation is safeguarded, and agreements are not violated.
- When appropriate, to support the Teaching & Learning activities in the School (i.e. help with tutorials and laboratory sessions to students).
- To engage in training programmes in the University (or elsewhere) that are consistent with the needs and aspirations of the project and those of the Lab.
- To undertake other duties as may be reasonably requested and that are commensurate with the nature and grade of the post.

### **Points To Note**

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed. Training will be provided as necessary and in support of the Researchers' professional development, and an attitude for learning will be an essential criterion in the selection of a successful candidate.

### **Special Conditions**

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equity & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equity & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses which include Belonging and Inclusion and, where appropriate, Recruitment and Selection.

### **Organisational Responsibility**

Reports to Prof Paul P. Conway and Prof Carmen Torres-Sanchez, Principal Investigators.

## Person Specification

Your application will be reviewed with respect to meeting the essential and desirable criteria listed below.

Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application, giving examples of recent experience. You may use the **STAR** approach: explain what the **Situation** was, which **Task** you had to do or were allocated, what **Action** you took, what you did and a justification, and what was the **Result**. It is highly recommended that the candidates express in their Cover Letter how they fit to the Job Purpose and Job Duties described above. Stages of assessment are as follows:

- 1 – Application
- 2 – Test/Presentation
- 3 – Interview

### Essential Criteria

	Criteria	Stage
Experience	Proven direct experience in the operation and maintenance of Additive Manufacturing equipment, from powder feedstock preparation through to machine operation, to retrieval and post-processing tasks, if required	1, 2, 3
	Evidenced experience working with an SLM, SLS or EBM system	1, 2, 3
	Experience working with metal powders, esp. titanium and its alloys	1, 2, 3
	Significant experience within a high-quality research or development environment	1, 3
	Evidenced experience in materials selection and their manufacturing processes	1, 2, 3
	Experience writing technical reports with an R&D purpose, e.g. journal or trade articles, conference papers or industrial technical reports	1
	Skills and abilities	Working knowledge of CAD/CAM software e.g. NX, Solidworks, Magics, etc
Excellent written and oral communication skills in English		1, 2, 3
Ability to organise resources to support and further own research activities within the scope of their work		1, 3
Ability to plan own workload in accordance with the overall project objectives and work independently and self-propelled to meet deadlines		1, 3
Proven experience of effective team-work and collaboration with team members to achieve common goals		1, 3
Working knowledge of characterisation tools and techniques (some of those could be any of the following: SEM, DSC, XPS, optical microscopy, micro-CT, mechanical testing, AFM, XRD, etc) and a willingness to deepen understanding and use of these techniques (this is, to undergo training in these techniques)		1, 2, 3
Self-motivated with an ability to know when to work independently or teams to meet the project(s) deadlines		1, 3
Excellent interpersonal and organisational skills		1, 3
Working knowledge of data analysis software packages (e.g., MatLab, Origin, Excel, etc)		1, 3
Ability to write weekly project reports and make technical presentations to industrial and academic research groups		1, 3

	Knowledge of relevant Health & Safety issues	1, 3
Training	Evidence of having undertaken further training and a willingness to be trained if necessary to fulfil the requirements of the job	1, 3
Qualifications	PhD (or near completion) in Manufacturing Engineering, Mechanical Engineering, Materials Science, Physical Sciences, or related discipline. Alternatively, equivalent industrial experience in an R&D environment.	1
Other	Commitment to observing the University's Equal Opportunities policy at all times.	3

### Desirable Criteria

Area	Criteria	Stage
Experience	Involvement in or having worked across different projects, demonstrating an ability to manage own time and competing priorities	1, 3
	Experience creating protocols that parameterise the process.	1, 3
	Experience in Image Processing techniques to conduct and interrogate volumetric (re-)constructions (e.g., ImageJ, VG Studio, Dragonfly, etc)	1, 2, 3
	Dealing with problems which may affect the achievement of research objectives and deadlines	3
Skills and abilities	Understanding of Design Methodologies as a framework to inform product development, esp DfAM	1, 3
	Presentation skills of technical and non-technical aspects of the project to various audiences (i.e. academic and industrial collaborators, and general public dissemination of results and impact)	1,3
Other	Able to travel to academic and industrial collaborators' sites	1, 3

### Conditions of Service

The position available is FULL TIME or PART TIME and FIXED TERM for 12 months with a possibility for an extension. Salary will be on Specialist and Supporting Academic Grade 6 (£34,866 to £41,421 per annum) at a starting salary to be confirmed on offer of appointment according to the successful candidate's knowledge and experience.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Academic and Related staff/Operational and Administrative staff, details of which can be found [here](#).

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family-friendly policies which are available at <http://www.lboro.ac.uk/services/hr/a-z/family-leave-policy-and-procedure---page.html>.

We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: <http://www.lboro.ac.uk/services/hr/a-z/childcare-information---page.html>)

In addition, the University is supportive, wherever possible, of flexible working arrangements and dynamic working when the tasks and assignments of the project can permit it.

We also strive to create a culture that supports equity and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swan/>