



OLLSCOIL NA GAILLIMHE
UNIVERSITY OF GALWAY



**Post-doctoral Researcher/Research Associate - Multi-scale, Process-
structure-property-performance Modelling for Additive Manufacturing of
Metals,
School of Engineering, College of Science and Engineering
Ref. No. 011326**

JOB ADVERTISEMENT

Applications are invited from suitably qualified candidates for a full-time, fixed term position as a Postdoctoral Researcher or Research Associate with I-Form Centre for Advanced Manufacturing in Ireland (phase 2) within Mechanical Engineering at the University of Galway, Ireland.

This position is funded by Research Ireland and is available from 1st September 2025 to contract end date of 28 February 2028.

University of Galway

Located in the vibrant cultural city of Galway in the west of Ireland, the University of Galway has a distinguished reputation for teaching and [research excellence](#)

For information on moving to Ireland please see www.euraxess.ie

Detailed Project Description:

The I-Form (www.i-form.ie) mission is to shape the future of advanced manufacturing through high-impact research into the application of digital technologies to materials processing. Our research spans materials science, engineering, materials modelling, data analytics and artificial intelligence, to progress the understanding and implementation of advanced materials processing technologies. The target is to enable sustainable, fast, reduced-cost development of new products and processes by replacing time-consuming, physical experimentation with advanced, predictive modelling. Modelling and process-structure-property-performance predictions (including but not limited to microstructure, defects, residual stresses, etc.) are key in optimisation for all additive manufacturing processes, with and without post-treatments. This funding is from Phase 2 of I-Form (2023-2029).

We are seeking an excellent candidate at University of Galway to contribute to the following research activities, in collaboration with a larger Platform 2 team at Galway (including PhD students) and within I-Form, and with international collaborators including IMDEA (Madrid):

- Combined cellular automata (CA) and phase field models (PFM) for microstructure and solid-state phase transformation modelling of additive manufacturing (AM) at component level
- Combined PFM and crystal plasticity (CP) microstructure evolution modelling for AM and post-processing heat treatment

Salary: Postdoctoral Researcher / Research Associate salary scale €45,846 - €58,481 per annum, (subject to the project's funding limitations), and pro rata for shorter and/or part-time contracts.

The default position for all new public sector appointments is the 1st point of the salary scale. This may be reviewed, and consideration afforded to appointment at a higher point on the payscale



(subject to the project's funding limitations), where evidence of prior years' equivalent experience is accepted in determining placement on the scale above point 1, subject to the maximum of the scale. [\(Research Salary Scales - University of Galway\)](#)

Closing date for receipt of applications is 17:00 (Irish Time) on 17th September, 2025. It will not be possible to consider applications received after the closing date.

JOB DESCRIPTION

The purpose of this position is to coordinate the development of multi-scale modelling methods on Platform 2 of I-Form for development of multi-scale, process-structure-property-performance modelling for additive manufacturing (AM) of Ti and NiTi alloys for biomedical and aerospace actuator applications. The successful candidate will be expected to contribute to the development of such methods as phase field, cellular automata and crystal plasticity and to coordinate and help manage the work of PhD researchers on the same topics.

A key focus of the position will be:

Combined CA and PFM for microstructure and SSPT modelling of AM

This project will develop and scale-up procedures for predicting microstructure evolution and solid-state phase transformation (SSPT), in addition to achieving enhanced accuracy:

- Scale up CA models of microstructural evolution developed in I-Form Phase 1, from sample domain level to component level.
- Predict the emergence of defects which arise during the solidification stage.
- Link solidification structure to subsequent SSPT using PFM formulations. This will result in capability to completely simulate the phase transformations in complex alloys, from above their liquidus to room temperature.
- Use the new models (in conjunction with Platform 1) to probe alloy development by virtual experimentation with new alloy compositions, especially tailored for AM processes.
- Develop linkages with crystal plasticity modelling for process-structure-property and -performance modelling.

Duties:

- Project management, to work directly with Prof Leen to support coordination and management of meetings, collaborations, reporting, financial management etc.
- Development of cellular automata (CA) and phase field models (PFM) for process-structure modelling of laser-based powder bed fusion (PBF-LB) of candidate Ti and NiTi alloys, with specific application to component level.
- Development of crystal plasticity models for linkage with PFM-CA for candidate Ti and NiTi alloys
- Liaise with other platforms to coordinate required experimental characterisation for model development within Platform 2 (Process modelling).
- Coordinate machine learning or digital twin framework for industrial application of multi-scale, modelling methods to AM processes, materials and components in aerospace and biomedical applications.
- Write internationally-leading journal articles and present at international conferences.
- Identify opportunities for licensing of software, methods or other associated intellectual property, such as patents.

ELIGIBILITY REQUIREMENTS

Essential Requirements:



- For post-doctoral role, PhD in mechanical engineering, materials science, mechanics or closely-related area for the proposed research; for Research Associate role, more than 4 years post-graduate experience in mechanical engineering, materials science, mechanics or closely-related area for the proposed research
- Track record of high impact journal publications and international conference presentations
- Experience and knowledge of multiscale computational modelling of metallurgical and metals processing methods, such as additive manufacturing.
- Experience of non-linear computational mechanics, including development, e.g. user subroutines for plasticity, fatigue, fracture mechanics etc.
- Experience of additive manufacturing related experimental testing or characterisation.
- Experience of collaborative research projects and excellent inter-personal and written-verbal communications skills.

Desirable Requirements:

- Research experience or equivalent
- Knowledge and experience of machine learning methods for materials science.
- Knowledge and experience of development or characterisation of Ti or NiTi alloys
- Experience of microstructure characterisation and micromechanical modelling or similar.
- Experience in digital twin development.

CONTINUING PROFESSIONAL DEVELOPMENT

Researchers at University of Galway are encouraged to avail of a range of training and development opportunities designed to support their personal career development plans. University of Galway provides continuing professional development supports for all researchers seeking to build their own career pathways either within or beyond academia. Researchers are encouraged to engage with our Researcher Development Centre (RDC) upon commencing employment - see [HERE](#) for further information.

TO APPLY: [Search Current University of Galway vacancies](#). Applications must be submitted online.

- [How to apply guide](#)
- For informal enquiries, please contact Prof Seán Leen, Mechanical Engineering, School of Engineering, University of Galway, Email: sean.leen@universityofgalway.ie

FURTHER INFORMATION/LINKS

- [University's Strategic Plan](#)
- [Working in Research at University of Galway](#)
- [Moving to Ireland \(Euraxess\)](#)
- [Applicant Information](#)
- We reserve the right to re-advertise or extend the closing date for this post.
- University of Galway is an equal opportunities employer.
- All positions are recruited in line with Open, Transparent, Merit (OTM) and Competency based recruitment.



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HR EXCELLENCE IN RESEARCH



Taighde Éireann
Research Ireland

