Postdoctoral Researcher, I-Form Research Centre for Advanced Manufacturing in Ireland, College of Engineering

Ref. No. NUIG 164-20

Applications are invited from suitably qualified candidates for a full-time, specific purpose position as a Postdoctoral Researcher with I-Form, the SFI Research Centre for Advanced Manufacturing in Ireland at the National University of Ireland, Galway.

This position is funded by Science Foundation Ireland and is available from 02 January 2021 to 30 November 2022.

I-Form was established by Science Foundation Ireland in late 2017 with a mission to shape the future of manufacturing through high-impact research into the application of digital technologies to materials processing. The Centre is applying developments in digital technologies to materials processing in order to improve understanding, modelling and control of the manufacturing process, thus increasing the competitiveness of Irish industry. I-Form brings together expertise in materials science, engineering, data analytics and cognitive computing. One of our key materials processing demonstrators is the area of Additive Manufacturing (or 3D printing), which has the potential to disrupt traditional manufacturing and create new and individualised products in areas such as medical devices, aerospace and pharmaceuticals. I-Form operates in close collaboration with a network of companies, as well as leading manufacturing research centres from around the globe. Over the course of its first phase, the Centre will recruit a multi-disciplinary team of over 100 PhD and Post-Doctoral researchers. In addition to NUI Galway, the Centre is composed of six further institutes; University College Dublin, Dublin City University, Trinity College Dublin, Maynooth University, IT Sligo and Waterford IT.

The position will play an essential role in an international collaboration between NUI and IMDEA Materials Institute in Madrid, Spain. IMDEA Materials is a public research organization founded in 2007 by Madrid's regional government to carry out research of excellence in Material Science and Engineering by attracting talent from all over world to work in an international and multidisciplinary environment. IMDEA Materials has grown rapidly since its foundation and currently includes more than 120 researchers from 17 nationalities and has become one of the leading research centres in materials in Europe, which has recently received the María de Maeztu seal of excellence from the Spanish government (bestowed to only a handful of top-level institutions nationwide). Research activities focus on the areas of materials for transport and materials for energy. The Institute has state-of-the-art facilities for processing, characterization and simulation of advanced materials. More information at http://www.imdea.org/materials

Job Description:
The successful candidate will play a key role in the development of multi-physics, multi-scale models of metal laser-based powder bed fusion processing and post process heat treatments. Developing fast, accurate modelling tools is a critical element of the adoption of metal additive manufacturing more broadly in industry as it supports rapid and cost-effective product and process development. Delivery of sufficiently accurate modelling tools is a challenge due to the complexity of the process and number

of variables involved. The candidate will work with a team of researchers across I-Form to improve on the state-of-the art substantiation of modelling tools in this area.

A key part of this role is engaging in international collaboration with the IMDEA Materials Institute in Spain. It is envisaged that the candidate will spend up to half of their time co-located at IMDEA, co-hosted by the research groups in *Multiscale Materials Modeling* and *Modeling and Simulation of Materials Processing*, interacting with other researchers involved in related projects within the framework of the Institute strategic initiative on *Damage-tolerant additive manufacturing*, thus leveraging their expertise in materials modelling and applying best practice within I-Form.

Duties:

- Develop phase-field modelling solutions for additive manufacturing of metallic materials, such as Ti6Al4V. This will involve code development.
- Crystal plasticity modelling of additively manufactured Ti6Al4V, at different stages of process.
- Coupling of phase-field modelling and crystal plasticity modelling for additive manufacture of Ti6Al4V.
- Act as focus of collaborative research between I-Form and IMDEA.
- Contribute to management of PhD and Master's research on related topics within I-Form and IMDEA.
- Publish developments in high-impact journals.
- Present at high impact international conferences.

Qualifications/Skills required:

Essential Requirements:

- Hold a PhD in solid mechanics, materials modelling, computational physics, or a closely related discipline;
- Have a strong publication record;
- Be willing to spend time on research collaboration visits at IMDEA (Madrid);
- Possess experience and knowledge of metallurgical processes for metals, such as Ti6Al4V, and modelling of metallurgical processes.
- Possess experience and knowledge of development of phase field modelling code for metallic materials, ideally for effect of manufacturing processes, e.g. additive manufacturing or welding.
- Possess a good knowledge of material modelling and code development.
- Possess basic knowledge of finite element modelling.

Desirable Requirements:

- Have experience of international collaborations, ideally involving short- to medium-term overseas visits.
- Have experience in research funding applications (e.g. Irish Research Council).
- Have excellent communication skills.
- Be expected to assist in the supervision of PhD students.

Salary: €38,631 to €41,026 per annum, pro rata.

Start date: Position is available from 02 January 2021.

Continuing Professional Development/Training:
Researchers at NUI Galway are encouraged to avail of a range of training and development opportunities designed to support their personal career development plans.

Further information on research and working at NUI Galway is available on [Research at NUI Galway]

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

Further information about the I-Form Research Centre for Advanced manufacturing in Ireland and Mechanical Engineering at NUI Galway can be found at (www.i-form.ie) and (http://www.nuigalway.ie/engineering-informatics/mechanical-engineering/).

Informal enquiries concerning the post may be made to Professor Seán Leen, Mechanical Engineering, NUI Galway, sean.leen@nuigalway.ie and +353 87 6284451.

To Apply:
Applications to include a covering letter, CV, and the contact details of three referees should be sent, via e-mail (in word or PDF only) to Professor Seán Leen, Mechanical Engineering, School of Engineering, NUI Galway, Galway, H91 HX31, sean.leen@nuigalway.ie.
Please put reference number **NUIG 164-20** in subject line of e-mail application.

Closing date for receipt of applications is 5.00 pm on Friday, 20th November 2020.

We reserve the right to re-advertise or extend the closing date for this post.

Interviews will be held remotely in line with COVID-19 restrictions.

National University of Ireland, Galway is an equal opportunities employer.

All positions are recruited in line with Open, Transparent, Merit (OTM) and Competency based recruitment

'NUI 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 www.nuigalway.ie/rdc for further information.'