



HR EXCELLENCE IN RESEARCH

**Postdoctoral Researcher – Next Generation Ocean Modelling**  
**College of Science and Engineering**  
**NUI Galway**  
**Ref. No. NUIG 194-20**

Applications are invited from suitably qualified candidates for a full-time fixed term position as a Postdoctoral Researcher with Civil Engineering at the National University of Ireland, Galway. This position is funded by The Marine Institute and is available from 1<sup>st</sup> of February 2021 to contract end date of 31<sup>st</sup> of January 2026. If necessary, it may be possible to arrange a later start date.

**Project Description:**

Coastal ocean is a dynamic, complex region where offshore and nearshore processes interact and create physical and biogeochemical conditions suitable for rich ecosystems and blue-growth. In Irish coastal waters, hydrodynamic and biogeochemical dynamics of these systems is simulated by the ROMS Marine Institute operational modelling system (MIOMS) consisting of three dynamically linked models: NE Atlantic and embedded within Connemara and Bantry Bay models. While the system accuracy and performance are generally satisfactory, recent developments in ocean observations and improved numerical algorithms provide a new opportunity to reduce sources of model uncertainties in the MIOMS through data assimilation (DA) and soft modelling techniques. In this project, a range of DA techniques will be applied to MIOMS and tested for model accuracy and computational efficiency. The forecasting skill of MIOMS will be further improved by applying a robust soft-computing, supervised machine learning algorithms. Ultimately, spatial and temporal information from the MIOMS forecast and reanalysis will be used to assess effectiveness of current MI observation system for operational purposes and to propose an optimized, informative, cost-efficient observing network (in-situ, satellite observations, models) for downstream services (extreme surges, HABs, search/rescue operations). The research is funded by the Marine Institute under the Marine Research Programme.

**Job Description:**

The successful candidate will be based at the National University of Ireland Galway and contribute towards a recently awarded project in the field of Ocean Modelling. The project is aimed at improving forecasting skill of the Marine Institute operational modelling system. The successful candidate will work with colleagues in the Marine Institute Ireland to reduce diverse sources of model uncertainties in the MIOMS through data assimilation and soft modelling techniques in order to improve the performance of the MIOMS.

**Duties:**

- Conduct research (both independently and as part of a team) in the area of ocean model development by application of data assimilation techniques and machine learning algorithms to the existing operational modelling system platform.
- Assist with optimization of MI observational network and analysis of modelling results.
- Contribute to the writing of scientific papers and reports for international journals and progress reporting to other researchers and industry partners.

- Assist with the coordination of research activities and actively contribute to research outputs to meet project milestones.
- Participate in and/or present at conferences and/or workshops relevant to the project as required.
- Assist with the supervision of PhD and research students.

**Qualifications/Skills required:**

**Essential requirements:**

- PhD in mathematics, physical oceanography, engineering or related area.
- Demonstrated experience with the setup, running and interpretation of numerical models (e.g. hydrodynamic models).
- Demonstrated experience in data assimilation, machine learning algorithms and/or other related statistical/probabilistic analysis.
- Demonstrated ability to work in a team, collaborate across disciplines and build effective relationships.
- Strong interpersonal skills with demonstrated ability to communicate and interact with a diverse range of stakeholders and students.
- Demonstrate excellent communication skills in English.
- Demonstrated organisation ability including the capacity to meet deadlines.

**Desirable requirements:**

- Competence in a Linux environment.
- Experience in working with MPI codes.
- Programming skills sufficient to adapt and/or modify existing models.
- Track record in software development for scientific computing in Fortran, C++ or similar.
- Proven track record in using one or more scripting languages, e.g. MATLAB, Python or similar.
- Demonstrated ability to conduct independent research with limited supervision.
- Demonstrated track record of publications and conference presentations relative to opportunity.
- Experience with large data collection and processing.

**Salary:** €38,631 – €47,265 per annum, pro rata.

**Start date:** Position is available from 1<sup>st</sup> of February 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.

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](http://www.nuigalway.ie/rdc) for further information.



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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](http://www.euraxess.ie)

Further information about School of Engineering is available at <http://www.nuigalway.ie/engineering-informatics/postgraduatestudents/researchprogrammes/>

Informal enquiries concerning the post may be made to Dr. Indiana Olbert: [Indiana.olbert@nuigalway.ie](mailto:Indiana.olbert@nuigalway.ie)

**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 Dr. Indiana Olbert: [indiana.olbert@nuigalway.ie](mailto:indiana.olbert@nuigalway.ie)

Please put reference number **NUIG 194-20** in subject line of e-mail application.

**Closing date for receipt of applications is 5.00 pm Monday, 4<sup>th</sup> January 2021**

Due to the University closure related to COVID-19, interviews may have to take place virtually and start dates may need to be delayed.

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

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