Ten full-time PhD Fellowships in MSCA doctoral network *RESCUER*

Offer description

The RESCUER network brings together 8 beneficiaries and 9 associated partners, located in 8 countries (for beneficiaries: Denmark, France, Italy, Norway, Portugal and Spain, for associated partners: Denmark, France, Germany, Italy, Norway, Portugal, Spain, United States). Ten Doctoral candidates will enjoy a multi-disciplinary and international environment with abundant training opportunities and exchange within the institutions involved in the network.

Scientific Background:

In the face of rising temperatures and sea levels, new approaches to coastal safety and flooding protection are needed. Ensuring the safety of property and commercial developments onshore and offshore requires an integrated approach, including phase-resolving wave modeling, tracking and mitigation of morphological changes, potential flooding in urban areas and monitoring of water quality. While protective structures and emergency plans for catastrophic storm waves and storm surges are well established, the confluence of global warming and sea level rise with other known natural risk factors and increasing human activity create a new set of hazards and requires new thinking in coastal modeling and the planning of mitigation strategies.

The Doctoral Network (DN) RESCUER (Resilient Solutions for Coastal, Urban, Estuarine and Riverine Environments) aims to train 10 young researchers (Fellows) to tackle medium to long term water challenges, focusing on forecasting and modeling of coastal, riverine, and urban flooding and associated water quality issues. The DN will leverage advances in the numerical treatment of multi-scale and multi-physics problems made in the past decade, into models to address the pressing needs in the practical modeling of hydrodynamic phenomena with the goal of improving overall safety of coastal and riverine areas.

The doctoral candidates will be able to spend time one or two partner organizations through mandatory secondments. The hosts for these secondments include other beneficiaries and also academic and non-academic partners (Águas da Figueira, Portugal; Foundation AZTI, Spain; The Norwegian Public Roads Administration, Norway; Civil Protection Authority for Senigallia Municipality, Italy; Hydronia-Europe, Spain; COWI, Denmark.

Be aware that some fields of research, especially within sensitive technology areas, might be enforced by Norwegian and EU international regulations regarding Control of the Export of Strategic Goods, Services and Technology. Candidates who by assessment of the application and attachments are seen to conflict with the criteria in these regulations will be prohibited from recruitment.

Project 9: Assessment of surface water interaction and pollutant dispersion between urban watershed, canals and coastal flows

Description: An appropriate integrated urban wastewater management should consider three main components simultaneously: the sewer system, the Waste Water Treatment Plant (WWTP) and the receiving water. Maximum performance of the whole system can only be obtained by considering the current state of the receiving water body (e.g., temperature, biological oxygen demand and levels of ammonia and dissolved oxygen), operating the sewer system according to the current state of the WWTP. The current state of the art does not include systems which fully couple all components. This project focusses on the development, calibration, and validation of an integrated hydraulic and biochemical model able to simulate the complete urban coastal wastewater system including the flow dynamics and the biological, chemical and physical reactions taking place in the sewer system, the WWTP and the receiving waters. The model will be able to reproduce water levels, flow, velocity, and water quality at every point along the whole urban wastewater system and the receiving water.

Secondments at an industrial partner institution and two academic institutions are planned. The project also provides ample opportunities for professional exchange and networking with further academic and with industrial partners.

Requirements:

- Master's degree in Physics, Civil Engineering or a related field.
- Programming skills are required.
- *RESIDENCE PERMIT*
  Non-EU applicants who have a permit of stay in Spain (or the receipt of the request for the permit) must show at Staff Department (University of Zaragoza), no later than the deadline for entering the contract, the original copy of the permit of stay (or the receipt of the request for the permit). Failure to provide the document means that the winner loses the right to enter the contract. Non-EU applicants who do not yet have a permit to stay in Spain and who have been offered a fellowship, must wait for the official authorisation, which is necessary to apply for a visa. Activities can only start after the above-mentioned visa has been supplied to the Staff Department. Failure to provide the document means activities cannot begin.
- *INCOMPATIBILITIES*
  1. The research fellowship is incompatible with public or private employment, including short-term or part-time contracts, starting from the enrolment time.
  2. The fellowship is not compatible with other scholarships, except for those awarded by national or foreign institutions with the purpose of integrating the research activities with stays abroad.

Supervisor: Prof. Pilar Garcia-Navarro

Institution: University of Zaragoza, Spain.

Location: University of Zaragoza, María de Luna 3 50018 Zaragoza, Spain

Application deadline: 15.05.2024

Expected starting date: September 2024

To apply for this position, please send an e-mail to: pigar@unizar.es