Helmholtz-Zentrum Dresden-Rossendorf e.V.

With cutting-edge research in the fields of ENERGY, HEALTH and MATTER, around 1,500 employees from more than 70 nations at Helmholtz-Zentrum Dresden-Rossendorf (HZDR) are committed to mastering the great challenges facing society today. The Institute of Fluid Dynamics conducts both fundamental and applied research in the fields of thermo-fluid dynamics and magnetohydrodynamics to enhance the sustainability, the energy efficiency, and the safety of industrial processes. The Department Process Diagnostics develops highly precise measurement techniques, e.g., ultrafast X-Ray tomography, ultrasound techniques and inductive methods, to characterize multiphase flows in fluids. These techniques can also be applied to non-transparent fluids as liquid metals. We are seeking a PhD Student (f/m/d) to contribute to “Development of a demonstrator for solidification processes in continuous casting of steel”, which is one sub project in the European Training Network COMBINE, where a total of 17 PhD positions are available at the premises of 14 European institutions from academia and industry: https://euraxess.ec.europa.eu/jobs/401249.

PhD Student (f/m/d) EU MSCA-Doctorate Network COMBINE: Development of a demonstrator for solidification processes in continuous casting of steel

City: Dresden; Starting date (earliest): 01/09/26; Duration: 36 Months;
Remuneration: Salary in accordance with the EU MSCA regulations for Doctoral Researchers; Reference number: 2026/22; Closing date: 30/04/26

Tasks

- Design and construction of a physical model of the solidification during continuous casting using low-melting metal alloys
- Incorporation of different measurement techniques, amongst others ultrasound velocimetry, inductive flow tomography, X-Ray radioscopy
- Realization and evaluation of laboratory experiments
- Compilation of project reports and scientific publications
- Close collaboration with project partners
- Participation in secondments with industrial partners SWERIM (SE), Tata Steel Europe Ltd. (NL) and Kaunas University of Technology (LT)

Your mission

The aim of the project is the development of a physical model of the initial solidification of steel during continuous casting. The process covers 96 % of the total production volume of steel world-wide. The tasks cover the construction of the laboratory demonstrator using low-melting metal alloys including the incorporation and further development of different measurement techniques (X-Ray radioscopy, ultrasound velocimetry, inductive flow tomography, temperature sensors) to detect the solidification front, temperature and velocity distributions within the liquid metal. The experimental

works are supported by numerical simulations of project partners inside the doctoral network. Within the project duration of 36 months three transnational secondments of two months each are planned to acquire further knowledge and foster scientific exchange.

Requirements

- Completed university degree (M.Sc. or Diploma) in mechanical, electrical, process engineering or comparable subject
- Excellent communication skills and motivation to work in an interdisciplinary and international research environment
- Affinity to experimental work
- Willingness to travel and participate in international secondments
- Excellent written and spoken English skills
- Experience in magnetic field measurements, ultrasound techniques, X-Ray radioscopy helpful
- Programming experience in Python helpful

Additional information

The candidate will be registered as a doctoral student at Dresden University of Technology. The EU Mobility Rule applies. That is, the candidate must not have resided or carried out her/his main activity (work, studies, etc.) in the host country (in this case Germany) for more than 12 months in the 3 years immediately before the recruitment date. Compulsory national service, short stays such as holidays, and time spent as part of a procedure for obtaining refugee status under the Geneva Convention are not taken into account.

What we offer

- A vibrant research environment within an open, diverse, and international team
- Multi-sectoral research and multi-national collaboration with fellows in the network
- Comprehensive network-wide and local training in technical and soft skills
- Attractive secondments at leading academic and industrial network partner institutions
- Salary in accordance with the EU MSCA regulations for Doctoral Researchers (page 118ff) (https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-2-msca-actions_horizon-2023-2024_en.pdf)
- Numerous company health management offerings
- Employee discounts with well-known providers via the platform Corporate Benefits
- An employer subsidy for the "Deutschland-Ticket Jobticket"

Application

We look forward to receiving your application documents (including cover letter, CV, diplomas/transcripts, etc.), which you can submit via our online-application-system: https://www.hzdr.de/db/Cms?pNid=490&pLang=en&pOid=76485

More information at https://stellenticket.de/203291/TUBS/
Offer visible until 30/04/26