

Open Doctoral Student Positions in the EU project MIMESIS

MIMESIS – Mathematics and Materials Science for Steel Production and Manufacturing is a European Industrial Doctorate (EID) project in the programme *Innovative Training Networks (ITN)* and part of Marie Skłodowska Curie Actions within the Horizon 2020 programme.

Driven by the five partners EFD Induction in Norway; SSAB, Outokumpu, and the University of Oulu, in Finland; and Weierstrass Institute for Applied Analysis and Stochastics (WIAS, Germany), eight doctoral thesis projects will be jointly carried out, providing a unique interdisciplinary and inter-sectorial training opportunity. The research is focussed on three major topics - induction heating, phase transformations in steel alloys, and gas stirring in a steelmaking ladle.

A successful treatment of the projects requires an understanding of the behaviour of the materials from a materials science and phase transformations perspective. Improved and optimized process control necessitates quantitative mathematical modelling, simulation and optimization of the complex thermal cycles and thermal gradients experienced by the processed material.

Accordingly, the doctoral degree programme offers tailored industrial on-site training, customized courses in physical modelling and testing of steels as well as numerical simulation of induction heating and fluid flow phenomena combined with scientific research on the interface of materials science and applied mathematics. It will provide the early stage researchers with excellent qualifications to pursue a career in academia or industry.

We are looking for 8 post-graduate researchers (Early Stage Researchers - ESR), specialized in Applied Mathematics, Materials Science, or similar. In EID projects a close cooperation with industry is mandatory, and hence a stay of 18 months with the industrial partners is expected and prescribed.

The positions are offered for **3 years** for the following individual research projects:

ESR1: Modelling, simulation and optimization of HF-welding.

Host institution: EFD. Scientific partner: WIAS.

ESR2: Simulation and optimization of single- and multi-frequency induction hardening of helical and bevel gears.

Host institution: WIAS. Industrial partner: EFD.

ESR 3: Novel gradient wear materials.

Host institution: University of Oulu. Industrial partner: EFD.

ESR 4: Sensitisation during stainless steel production.

Host institution: University of Oulu. Industrial partner: Outokumpu.

ESR 5: Computational fluid dynamics modelling of ladle treatments.

Host institution: University of Oulu. Industrial partner: Outokumpu.

ESR 6: Optimal control of ladle stirring.

Host institution: WIAS. Industrial partner: SSAB.

ESR 7: Modelling, simulation and optimization of inductive pre- and postheating for thermal cutting of steel plates.

Host institution: WIAS. Industrial partner: SSAB.

ESR 8: Modelling martensite formation and austenite retention.

Host institution: SSAB. Scientific partner: University of Oulu.

Requirements

Potential candidates have a master degree in applied mathematics or materials science or related fields as relevant for the chosen position.

Preferred qualifications for candidates include excellent grades, research talent (as proven by the master thesis), affinity with mathematical modelling and simulation in engineering applications, and personal ambition.

Candidates are expected to have and prove an excellent command of English, together with good academic writing and presentation skills.

According to the regulations for mobility within the Marie Skłodowska Curie programme, at the time of recruitment by the host organisation, researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of their host organisation for more than 12 months in the 3 years immediately prior to the reference date.

Terms and conditions

The doctoral student will be employed with full social security coverage by the host institution and s/he will have all benefits provided for in the Marie Skłodowska Curie ITN fellowships regulations, including a highly competitive remuneration, living allowances and mobility expenses. As an Early Stage Researcher the applicants will register for a doctoral degree in Mathematics either at Technische Universität Berlin or Freie Universität Berlin (projects 1, 2, 6, 7), while researchers in projects 3, 4, 5, 8 will enrol in a doctoral program in Advanced Materials at the University of Oulu.

Application

Applications should be sent before 5 October 2015 to jobs@wias-berlin.de, with subject 'MIMESIS'. Applicants should indicate two individual research projects in order of preference (1st and 2nd choice). Applicants applying for positions ESR3, ESR4 or ESR 5 in addition have to fill in an electronic application in the address <http://www.oulu.fi/english/jobs>. They should include a detailed CV, a motivation letter, a list of MSc courses and grades, a copy of the master thesis, and a list of publications, if applicable. For residents outside the EEA, a TOEFL English language test may be required. For more information about the vacancies, please check www.mimesis-eid.eu or contact the MIMESIS coordinator Prof. Dietmar Hömberg (dietmar.hoemberg@wias-berlin.de).