

One full time PhD studentship at Montanuniversität Leoben, Austria

Applications are invited for one part time research assistant (30h, limited to 3 years) at Chair of Casting Research (CCR), Montanuniversität Leoben (MUL), Austria, beginning 1st April 2023 or later, to be agreed at interview. The interview is expected at the middle of March 2023.

MUL has a strong background in mining, metallurgy and materials engineering. The main research focus in CCR at MUL is on the solidification microstructure control for high performance alloys. In order to get a better control of solidification microstructure, the current casting research is particularly focusing on the nucleation phenomenon in the cast alloys and the effect of trace elements on solidification. CCR at MUL is well equipped with state-of-the-art facilities for both solidification processing and materials characterization (such as high-resolution scanning and / or transmission electron microscope) as well as computation facilities. These facilities can build up the link between the solidification science and the processing of the cast components in the final products, which can enable the further development of a lighter production. The official cooperation between the MUL and the Austrian Foundry Research Institute (ÖGI) promotes the joint research in the field of casting technique, which further promotes the world-leading research collaborations in the field of casting and solidification.

The successful applicant will receive a full time Ph.D payment for a period of 36 months. The successful applicant will work on designing recycled 6082 alloy for impact extrusion, mainly including (i) designing alloy compositions and impact extrusion processing parameters of recycled 6082 alloy based on machining learning, and (ii) a detailed experimental transmission electron microscopy and atom probe tomography investigation on phase selection of recycled 6082 alloy produced by advanced casting technologies (directional chill casting with electronic magnetic stirring) and subsequent impact extrusion. The project is aimed to achieve better alloy performance (not only mechanical properties but also thermal conductivity) with recycled materials up to 100% (fully recycled). The project involves directional chill casting with electronic magnetic stirring, mechanical properties and thermal conductivity testing, and microstructure characterization at different length scales (mainly including SEM, EBSD, TEM and atom probe tomography) as well as data analysis using machining learning.

Informal enquiries should be directed to Priv.-Doz. Dr. Jiehua Li at jiehua.li@unileoben.ac.at or +43(0)38424023304

Eligibility

Successful candidates are required to have a first degree at or equivalent to 2:1 or above in a suitable engineering discipline, e.g. materials science and engineering, metallurgy, chemistry, physics, etc. A Master's level qualification is essential. Experience in solidification processing of metallic materials, skills in microstructural characterisation using various electron microscopy techniques (SEM, EBSD, TEM and atom probe tomography) and a working knowledge of mechanical testing of metallic materials is an advantage. Any experience in data analysis using machining

learning is highly required. In addition, he/she should be highly motivated, able to work in a team and have good communication skills.

How to Apply

If you wish to apply, please email the following to jiehua.li@unileoben.ac.at

Your up-to-date CV;

Your single A4 page, single-spaced personal statement setting out why you are interested in undertaking this project;

Your degree certificate(s) and transcript(s);

Evidence of your English language capability to IELTS 6.5 or equivalent, if appropriate;

Names and contact details for two academic referees;