Helmholtz-Zentrum Dresden-Rossendorf e.V.

HELMHOLTZ ZENTRUM DRESDEN ROSSENDORF

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. At the Helmholtz Institute Freiberg for Resource Technology (HIF), innovative technologies for the circular economy are developed to provide and use mineral and metal-bearing raw materials more efficiently and to recycle them in an environmentally friendly way. The Group Geometallurgy and Particle Based Process Modelling is looking for a PhD Student (f/m/d) Advancing particle-based automated mineralogy characterisation for better microstructure-aware mineral processing models.

PhD Student (f/m/d) Advancing particle-based automated mineralogy characterisation for better microstructure-aware mineral processing models

City: Freiberg; Starting date (earliest): 01/09/26; Duration: 36 months;
Remuneration: TVöD Bund: EG 13; Reference number: 2026/85; Closing date: 16/07/26

Tasks

- Comprehensive mineral characterisation: Establish a robust particle-based automated mineralogy characterisation methodology with the TIMA-X; incl. Validate the routine with referenced methodologies to assure data quality and correct metal deportment
- 3D characterisation method: Develop a novel methodology for phase identification in X-ray computed tomography analyses through co-registration with 2D automated mineralogy data and integrate it into existing 3D particle characterisation routines
- Routinely characterise processing products with 2D and 3D automated mineralogy systems to train particle-based separation models
- Particle-based separation model training and validation: Train Particle-Based Separation Models using both 2D and 3D data to quantify the errors coming from each methodology and better understand limitations related to stereological bias and limited phase identification

Requirements

- Completed university studies (Master/Diploma) in the field of Chemical/Metallurgical/(Mineral) Process Engineering, Mineralogy, Geology or related field
- Relevant professional experience in the specified area
- Proven experience with commercial 2D automated mineralogy systems (e.g., MLA, TIMA)
- Understanding of particle-based mineralogical characterisation methodologies applicable to X-Ray Computed Tomography

- General understanding of mineral separation processes and primary raw materials
- Experience with Particle-Based Separation Models (PSMs) is advantageous
- General understanding of R, Python, or another high-level programming language for data handling, ML model development, and statistical analysis
- Proven team player with strong communication skills for interdisciplinary collaboration
- Independent, self-driven researcher with a strong problem-solving mindset
- Strong analytical skills, scientific curiosity, and critical thinking to ensure scientific rigour
- Excellent written and spoken English

What we offer

- A vibrant research community in an open, diverse and international work environment
- Scientific excellence and extensive professional networking opportunities
- A structured PhD program with a comprehensive range of continuing education and networking opportunities - more information about the PhD program at the HZDR can be found here
- Salary and social benefits in accordance with the collective agreement for the public sector (TVöD-Bund) including 30 days of paid holiday leave, company pension scheme (VBL)
- Depending on the personal qualifications, the candidate may be classified in salary group 13 according to TVöD-Bund
- We support a good work-life balance with the possibility of part-time employment, mobile working and flexible working hours
- 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-applicationsystem: https://www.hzdr.de/db/Cms?pNid=490&pLang=en&pOid=77944

More information at https://stellenticket.de/205073/TUD/
Offer visible until 16/07/26