

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 is conducting basic and applied research in the fields of thermo-fluid dynamics and magnetohydrodynamics in order to improve the sustainability, the energy efficiency and the safety of industrial processes. The Department of Thermal Energy and Process Technology is looking for a

Postdoc (f/m/d) Analysis of Supercritical Carbon Dioxide Fluid Properties: Experimental Characterization, Numerical Modeling and Sensor Development

City: Dresden; Starting date (earliest): 01/01/27; Duration: 36 Months;

Remuneration: TVöD-Bund; Reference number: 2026/126; Closing date: 06/11/26

Tasks

- Evaluation of sources of impurities and breakdown products in sCO₂ Brayton cycles over a range of applications, temperatures, and periods of time
- Characterization of fluid properties of supercritical and subcritical CO₂ with and without purities, in-situ in running cycles as well as in external measurement devices
- Development of fluid property models of both steady-state and dynamic nature
- Assessment and design of measurement techniques for sCO₂ system safety, control and purification in the context of impurities
- Contributions to the design and control recommendations for sCO₂ cycles for broader implementation and robustness
- PhD student mentoring and proposal writing
- Scientific documentation and communication of results in the form of conference contributions and journal publications

Requirements

- Completed university studies (PhD) in the field of Process Engineering, Chemical Engineering, Mechanical Engineering or related field
- Solid knowledge of thermodynamics, heat and mass transfer phenomena, process engineering, and process technology
- Strong knowledge of experimental measurement technology in thermo-fluid sciences
- Willingness to work on numerical and experimental tasks
- Excellent teamwork and communication skills in an interdisciplinary and international research environment
- Motivation and self-discipline to carry out research independently
- Excellent command of English (spoken and written)

- Proficient programming skills (e.g., MATLAB, SIMULINK, Python) or other common process simulators

What we offer

- A vibrant research community in an open, diverse and international work environment
- Scientific excellence and extensive professional networking opportunities
- 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-application-system: <https://www.hzdr.de/db/Cms?pNid=490&pLang=en&pOid=78965>

More information at <https://stellenticket.de/207951/TUD/>
Offer visible until 06/11/26

