The German Center for Astrophysics (DZA) is a new research center in Lusatia, Saxony, that is currently being established. The decision to create the center was made on 29.09.2022 as part of the competition "Science Creating Prospects for the Region!", which was launched by the Federal Government, represented by the Federal Ministry of Education and Research (BMBF), the Free State of Saxony and the Land of Saxony-Anhalt as part of the Act on Structural Change in Coal Mining Areas (Strukturstärkungsgesetz Kohleregionen, StStG) to strengthen Germany’s position as a leading location for science and innovation as well as the economic development of the regions affected by the coal phase-out. As a globally visible sign of innovation, the DZA will create new opportunities for strategic leadership roles of German astrophysics and have a lasting impact on structural change in Lusatia.

A three-year start-up phase began in 2023 with the aim of establishing the DZA as an independent institution in 2025. The start-up phase is being jointly organized by TUD Dresden University of Technology and the Deutsches Elektronen Synchrotron (DESY). There is a unique opportunity to actively contribute to the establishment of a large research center and to become involved in shaping the future structures.

For TUD and DZA diversity is an essential feature and a quality criterion of an excellent university. Accordingly, we welcome all applicants who would like to commit themselves, their achievements and productivity to the success of the whole institution.

As part of the development of the DZA, several positions are to be filled in Görlitz and/or Dresden as

**Research Associate / PhD-Student (m/f/x)**
within Pilot Team for Cutting Edge Method Developments in Radio Astronomy
(subject to personal qualification employees are remunerated according to salary group E 13 TV-L)

starting at the **earliest possible date**. The positions are limited until December 31, 2025 with the option for extension/permanence. The period of employment is governed by the Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz – WissZeitVG). Balancing family and career is an important issue. The positions are generally suitable for candidates seeking part-time employment. Please indicate the request in your application.

**Tasks:** Within the project to build up the German Centre for Astrophysics (DZA) in Görlitz we are seeking several software developers, radio astronomers with an interest in algorithms, data scientists and mathematically oriented method developers with an interest in radio astronomy, and a project manager with a radio astronomical background. These will form a development team for radio astronomical data processing for the next generation of radio interferometric telescopes that are planned or are under construction at various locations on this planet. The pilot team is envisaged to consist of about ten astronomers, data scientists, mathematicians, software engineers, and project coordinators at various early career stages (PhD students, initial and advanced postdoctoral researchers) and will be embedded in a vibrant national and international community including collaboration work and conference visits. The pilot team will develop:

1. infrastructure for the handling of large radio astronomical data sets in various supercomputer environments (CPU/GPU clusters, in-memory-computing) and user interfaces for the astronomers to interact with this (Please address any technical queries to Prof. Dr. Wolfgang Nagel, wolfgang.nagel@tu-dresden.de)
2. fast, FPGA based methods to detect transient astrophysical signals and trigger their subsequent analysis (Please address any technical queries to Prof. Dr. Diana Goehringer, diana.goehringer@tu-dresden.de)
3. a radio camera, an integrated software that performs radio interferometric correlations, detects and separates transient signals, calibrates and self-calibrates the instrument and ionosphere, and is interfaced to traditional and Bayesian imaging methods (Please address any technical queries to PD Dr. Torsten Enßlin, torsten.ensslin@dzastro.de).

Team members should ideally have several of the following qualifications:

- knowledge of radio interferometry, its measurement equation, the available software packages, and/or its technical challenges
- ability to process interferometer data (calibrating, imaging, pipelining)
- good command of Bayesian probability theory, signal processing, information field theory, machine learning, and/or excellent mathematical skills
- good command of informatics and/or programming, in particular in C, C++, Python, JAX, CUDA, hardware description languages (e.g. VHDL), high performance computing, for GPUs and/or FPGAs
- professional experience in operating computer cluster or HPC facility
- ability to work and take responsibilities in local, national, and international teams.

Requirements:

- completed university degree (e.g. Master or equivalent) in physics, mathematics, computer science, electrical engineering or related subjects
- relevant experience or profound knowledge in the areas of radio astronomy, data science, computer science, programming, mathematics, machine learning, or project coordination
- resilience, flexibility and adaptability in an evolving organization
- willing to travel for business purposes
- business fluent in English.
- Desirable are several of the qualifications mentioned above.

What we offer you:

- the chance to contribute to the development of the largest research center for astrophysics in Germany
- the opportunity to play an active role in shaping structural change in Upper Lusatia
- the opportunity to establish the personnel requirements to support the discovery of groundbreaking research results and to contribute to the realization of research projects
- a dynamic, committed, international and interdisciplinary environment with renowned experts from science and industry
- remuneration according to TV-L, as well as conditions and social benefits of the public sector
- compatibility of family and career
- the possibility of a permanent employment contract after the start-up phase.

The positions are aimed to be filled starting October 2024, but other starting dates are possible. As the DZA is currently in a preparation phase and therefore has only project status, the initial contracts will only be until the end 2025. A prolongation of the contracts is envisioned, but has to wait for the DZA to be formally funded.

TUD and DZA strive to employ more women in academia and research. We therefore expressly encourage women to apply. The University is a certified family-friendly university and offers a Dual Career Service. We welcome applications from candidates with disabilities. If multiple candidates prove to be equally qualified, those with disabilities or with equivalent status pursuant to the German Social Code IX (SGB IX) will receive priority for employment.

Please submit your detailed application with the usual documents quoting the job reference "w24-229" by August 1, 2024 (stamped arrival date or the time stamp on the email server of TUD applies), preferably via the TUD SecureMail Portal https://securemail.tu-dresden.de by sending it as a
Reference to data protection: Your data protection rights, the purpose for which your data will be processed, as well as further information about data protection is available to you on the website: https://tu-dresden.de/karriere/datenschutzhinweis.