

The Faculty of Physics has the following two job openings:

Research Positions (Postdocs) in the field of cosmology



ID: Wiss23548

- Start: 01.10.2024
- fulltime
- salary according to Remuneration level 13 TV-L
- fixed-term

In the ERC project "Probing cosmic large-scale structure beyond the average" two postdoctoral positions are available in the field of cosmology. The goal of the project is to develop new methods for dynamical and statistical description of the large-scale structure of the Universe in order to extract the maximum cosmological information from galaxy surveys such as Euclid. The two posts each relate to one of the core aspects of the project:

1. The extraction of statistical information beyond average densities that dominate the standard two-point correlations. The focus is on developing 1-point statistics for spectroscopic and photometric galaxy clustering as well as weak lensing, in particular counts-in-cells and weak lensing convergence PDFs and density-split statistics in the context of Euclid. New methods will be developed to translate existing theoretical predictions including systematic effects to real observational data and to analyze data from galaxy surveys (Dark Energy Survey and Euclid), in particular by combining two-point and one-point statistics.
2. The description of the phase-space dynamics of dark matter beyond an effective fluid. The focus is on the further development of a wave-based forward model based on Schrödinger equations. This includes the numerical solution of the Schrödinger-Poisson equation, a perturbative treatment of similar Schrödinger equations with external potentials and their combination. The description of dark matter will be translated to survey observables to enable a map-based data analysis.

The project is carried out in the Cosmology and Astroparticle Physics group (Prof. Dr. Uhlemann) at the Faculty of Physics. The team already includes a postdoc and a PhD student, has a close collaboration with LMU Munich and CEA Saclay, as well as involvement in the Euclid working teams "Additional Galaxy Clustering Probes" and "Higher-Order Weak Lensing Statistics".

Your Tasks

Your Profile

- research in the field of modeling and statistical analysis of the large-scale structure of the universe according to the ERC project description (80 %)
- contributions to an active and positive research group culture, e. g., by co-supervising undergraduate and graduate students, taking on selected teaching responsibilities (15 %)
- presenting research findings to scholarly and popular science audiences (5 %)

The tasks will be carried out in collaboration with the local research group, focused international research teams and within international collaborations such as the Euclid Consortium.

Employment is conducive to scientific qualification.

We offer

- salary according to Remuneration level 13 TV-L
- fixed-term 3 years (§ 2 (1) sentence 2 of the WissZeitVG; in accordance with the provisions of the WissZeitVG and the Agreement on Satisfactory Conditions of Employment, the length of contract may differ in individual cases)
- fulltime
- internal and external training opportunities
- variety of health, consulting and prevention services
- reconcilability of family and work
- flexible working hours
- collegial working environment
- exciting, varied tasks

We expect

- scientific academic degree (e. g. Master or diploma) in Physics, Astronomy or equivalent
- completed relevant PhD
- research experience in cosmology, especially in the field of large-scale structure of the universe (e. g. documented by scientific publications, conference contributions and references obtained from us)
- experience in programming
- fluent in written and spoken English
- independent, self-reliant and dedicated style of work
- strong organizational and coordination skills
- ability to cooperate and to work in a team
- enthusiasm for promoting equality, diversity and inclusion in science

Preferred experience and skills

- experience in dark matter modeling and prediction of galaxy clustering and weak lensing statistics
- experience with statistical data analysis for galaxy surveys (e. g. two-point and higher correlations)
- experiences with cosmological software packages (Python, C++, etc.)

Application Procedure

We are looking forward to receiving your application. For full consideration, your application (1-page cover letter mentioning the project preference, CV with publication list, max. 3-page research statement detailing previous experience and interests, contact details for two referees) should be received via either email (a single PDF document is required) sent to rededer@physik.uni-bielefeld.de or post (see postal address). Please mark your application with the identification code:

Contact

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Bielefeld University has received a number of awards for its achievements as an equal-opportunity employer and has been recognized as a family-friendly university. The university welcomes applications from women. This is particularly true with regard both to academic and technical posts as well as positions in information technology as well as the skilled crafts and trades. Applications are handled according to the provisions of the state statutes on equal opportunity. Applications from suitably qualified handicapped and severely handicapped persons are explicitly encouraged.

At Bielefeld University on request positions can be carried out with reduced working hours as long as this does not conflict with official needs.

