# Postdoctoral Position in Field-Level Inference for Galaxy Clustering

## Summary

**Institution:** Ludwig-Maximilians-Universität München
**Location:** Munich, Germany
**Duration:** 2 years (with a possible extension by 2 years depending on funding availability)
**Start date:** fall 2026
**Application Deadline:** 7 December 2025

## Job Description

The University Observatory in the Faculty of Physics of the Ludwig-Maximilians-Universität Munich announces the opportunity for a postdoctoral position as part of the DFG-funded project "Robust yet precise: perturbative forward modeling for Large-Scale Structure cosmology at the field-level". The researcher will work with Dr. Julia Stadler on the forward modeling of clustering systematics and on the field-level analysis of spectroscopic survey data.

#### General Scientific Context

Our group aims to maximize the scientific return of spectroscopic galaxy surveys by establishing field-level analysis as a new methodology. In this approach, we compare survey data and theoretical predictions at the level of the three-dimensional density distribution. By foregoing the traditional compression into summary statistics, field-level analysis guarantees optimal cosmological constraints and simultaneously provides a consistent reconstruction of the primordial perturbations as well as the evolution of cosmic structures. A crucial component of the method is a forward model of the observed galaxy density, and perturbative techniques — particularly the Effective Field Theory of Large-Scale Structure — provide a robust and efficient framework for modeling gravitational evolution and galaxy bias. While the potential of such an approach has been demonstrated in conceptual studies, we are working to incorporate the full complexity of cosmological surveys to realize this potential for actual observations.

#### Main tasks

The successful applicant will lead the inclusion of survey systematics such as fiber collisions, imaging systematics and redshift uncertainties into the forward model and demonstrate their control in the analysis of mock observations. Depending on their background and interest it further is possible to explore topics related to sampling efficiency and evaluation metrics. The ideal outcome of this project would be  the reconstruction of initial conditions from DESI at fixed cosmology, led by the researcher.

The position includes opportunities for mentoring student researchers from the university's B.Sc. and M.Sc. programs in physics and astrophysics, and it may include teaching opportunities.

#### Qualifications

Scientists with a PhD degree in Physics, Astrophysics, or related fields are invited to apply. We seek a candidate with strong previous experience in the modeling of observational systematics in spectroscopic surveys. Experience in programming (C++), high-performance computing and Bayesian analysis are beneficial.

The advancement of women in science is an integral part of the university's policy. Therefore, women are especially encouraged to apply. Persons with disabilities will be given preference to other applicants with equal qualifications. German language skills are not required. Applications may also be considered for other postdoctoral job opportunities in Astrophysics at LMU.

**About the research group**

The Emmy Noether Group by Dr. Stadler was established in 2025 and is part of the chair for Astrophysics, Cosmology, and Artificial Intelligence at the University Observatory of the Department of Physics at the Ludwig-Maximilians University. The University Observatory of the Ludwig-Maximilians-Universität is part of Munich's vibrant and growing astrophysics research community that includes the European Southern Observatory headquarters, the Max Planck Institutes for Astrophysics, for Physics, for Extraterrestrial Physics, and for Plasma Physics, the Technical University of Munich, and the DFG Excellence Cluster ORIGINS. The group has access to extensive computing facilities at LMU and at the Leibniz Supercomputing Centre.

Salary and benefits are paid according to the German public service pay agreement TV-L E13.

# Application Details

Please apply by uploading your application documents to the cloud folder. Application documents should be summarized in a single PDF file and include the following:

- cover letter
- CV
- publication list
- statement of research interests and plans (3 pages maximum).

Further, applicants are asked to arrange for three recommendation letters to be uploaded.

Please submit your complete application by 7 December 2025 for full consideration.

# Inquiries

Informal inquiries about the position are welcome.

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