UNIVERSITÄT ZU KÖLN

DYNAVERSE

**Open call for a PosDoc position**
**Application deadline: 31 September 2025**

## Trans-Neptunian Objects


Cluster of Excellence
**OUR DYNAMIC UNIVERSE**
https://dynaverse.astro.uni-koeln.de

**Prof. Dr. Susanne Pfalzner**

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### Project:

The project focusses on Tans-Neptunian objects. The key objective is to develop ML tools that provide a quantitative assessment for the quality of fit between observed properties of Trans-Neptunian objects for the various suggested theoretical models. The developed workflow should also be applicable to the other discovery science projects in Dynaverse.

The Position advertised here is located at the Jülich Supercomputing Centre (JSC) which operates one of the most advanced supercomputing infrastructures for scientific applications in Europe – including JUPITER, the first exascale supercomputer in Europe. The "Sim & Data Lab Astronomy and Astrophysics“ (SDLAA) is a research and support structure that provides an interface between the Supercomputer facilities and the Astrophysics communities, with a research focus on star and planet formation, in particular solar system formation, interstellar objects and young star cluster dynamics.

### Tasks:

- Perform scientific work on the research topic, in collaboration with SDLAA members.
- Cooperate with partners in Dynaverse on relevant adjacent topics.
- Prepare and publish results in collaboration meetings, workshops and conferences and the preparation of project reports.
- Develop and apply software tools.
- Documentations of software and data according to the FAIR data principles.
- Contributions to workshops and training activities.

### Requirements:

- Master and PhD degree in astronomy, physics, computer science or equivalent fields of study.
- Proven experience in N-body simulations and the comparison of simulation and observation results.
- Machine Learning skills to automise comparison process.
- Unbiased approach to different theoretical models.
- Experience in HPC system usage and parallel/distributed computing.
- Knowledge in GPU-based programming would be considered an asset.
- Proven record in publication of results in high-impact journals.
- Programming experience in at least one the following: C, C++, Fortran.
- Proven background in software development.
- Great ability to work in a multidisciplinary team of scientists with heterogeneous backgrounds solving scientifically challenging problems on large computers.
- Self-motivated personality with very good command of written/spoken English and ideally a very good command of German.

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**Offer:**
We work on the very latest issues that impact our society and are offering you the chance to actively help in shaping the change!

The position is initially for a fixed term of 2 years. Salary and social benefits will conform to the provisions of the Collective Agreement for the Public Service (TVöD-Bund), pay group 13, depending on the applicant's qualifications and the precise nature of the tasks assigned to them. All information about the Collective Agreement for the Public Service (TVöD-Bund) can be found on the BMI website: https://go.fzj.de/bmi.tvoed The monthly salaries in euro can be found here: https://go.fzj.de/bmi.tvoed.entgel

We support you in your work with:

- Comprehensive training courses and individual opportunities for personal and professional further development.
- Extensive company health management.
- Ideal conditions for balancing work and private life, as well as a family-friendly corporate policy.
- Flexible work (location) arrangements, e.g. remote work.
- Flexible working hours in a full-time position with the option of slightly reduced working hours ( https://go.fzj.de/near-full-time).
- 30 days of annual leave and provision for days off between public holidays and weekends (e.g. between Christmas and New Year).
- A large research campus with green spaces, offering the best possible means for networking with colleagues and pursuing sports alongside work.
- Targeted services for international employees, e.g. through our International Advisory Service
- In addition to exciting tasks and a collaborative working atmosphere at Jülich, we have a lot more to offer: https://go.fzj.de/benefitsExperience with ML/AI methods.

Dynaverse welcome applications from people with diverse backgrounds, e.g. in terms of age, gender, disability, sexual orientation / identity, and social, ethnic and religious origin. A diverse and inclusive working environment with equal opportunities in which everyone can realize their potential is important to us.

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