



The Leibniz Institute for Astrophysics Potsdam (AIP) is a publicly funded German research institute with a long history, including the Berlin Observatory and the Astrophysical Observatory Potsdam. The latter was the world's first observatory to emphasize explicitly the research area of astrophysics. Today, the AIP has an international reputation as a competence centre for the development of research technology in the fields of spectroscopy, robotic telescopes and E-Science. About 130 scientists work on a variety of astrophysical topics such as magnetic fields, solar and stellar physics, stellar and galactic evolution and cosmology. As a member of staff of the AIP, you will have the advantage of living very close to the Berlin metropolitan area as well as enjoying the calm, family-friendly area of Potsdam-Babelsberg for your work place and residence.

The Cosmology and High-energy Astrophysics Section at the Leibniz Institute for Astrophysics Potsdam (AIP) invites applications for a

Doctoral student position (m/f/d)

for a project on **exploring the non-thermal emission from galaxy clusters: radio halos, relics, and the missing gamma rays.**

Overview

The project aims at studying a diverse set of problems ranging from the plasma physics of cosmic-ray transport, to exploring the impact of cosmic rays and magnetic fields on the formation and evolution of galaxy clusters, to verifying the resulting non-thermal signatures in the form of **radio halos, relics, and the gamma rays**. The goal of the PhD project lies in progress toward a new generation of high-resolution cosmological magneto-hydrodynamical simulations of the formation of galaxy clusters that include the physics of cosmic rays, magnetic fields as well as state-of-the-art galaxy formation physics.

The AIP is located in the beautiful Potsdam/Babelsberg area, at the southwestern border of the Berlin metropolitan region. About 130 scientists at AIP work on a variety of topics in astrophysics spanning from solar physics to cosmology, as well as on the development of new computational algorithms, technologies and instrumentation for astronomical spectroscopy and ground-based telescopes.

Your tasks

- Carry out state-of-the-art calculations of zoomed cosmological simulations of galaxy clusters with cosmic rays and magneto-hydrodynamics
- Verify code implementations of cosmic ray electron and proton physics in idealized and cosmological MHD simulations
- Improve existing algorithms for accuracy and efficiency
- Develop a pipeline for mock simulations of multi-frequency non-thermal radiation processes (from radio to gamma-rays wavelengths)
- Analyse simulations and develop conceptually transparent models to extract a physical understanding of the underlying astrophysical processes

Your profile

- Master degree in Physics or Astrophysics
- Thorough background in Astrophysics, Physics and Computational Methods
- Very good to excellent programming skills (e.g. C/C++ and Python)

- Hands-on knowledge of advanced hydrodynamical methods
- Very good experience in running cosmological hydrodynamical simulations are an advantage
- Self-motivation, creativity, flexibility and the ability to work alone and in a team are highly appreciated

Conditions

The AIP is an equal opportunity employer and particularly encourages women to apply. It values diversity. The appointment is part-time for the duration of 48 months and planned to start by September 1, 2019. Salary and social benefits are calculated based on the German public service scale (TV-L).

To apply, please send a single PDF (up to 10 MB), with your Curriculum Vitae (including publication list), cover letter, a list of references (2 or more) and statements on education and skills to bewerbung_2019-17@aip.de. For questions on the offered position please contact Prof. Dr. Pfrommer at the address below. Review of applications will continue until the position is filled.

Contact

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