

Numerical Modelling of Stellar Interiors

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In the Science, Engineering & Technology Group, Faculty of Science, Department of Physics and Astronomy at KU Leuven there is a full-time academic vacancy among senior academic staff in the area of Astronomy and Astrophysics. We are looking for internationally oriented candidates with an excellent research record and with educational competence within the field of numerical modelling of stellar interiors.

You are expected to collaborate with scientists of the Institute of Astronomy (IoA) in the Department of Physics and Astronomy on the one hand, and of the Centre for mathematical Plasma-Astrophysics (CmPA) in the Department of Mathematics on the other hand. Both research groups are embedded within the Faculty of Science. In the past, this faculty has systematically been given a high ranking for research and education quality by independent accreditation committees. The faculty has an extensive national and international network.

The IoA and CmPA are research centres with expertise in the topics of stellar structure and evolution, asteroseismology, interstellar and circumstellar matter, the chemistry of exoplanetary atmospheres, binary stars, solar physics, high-performance computing (HPC) in a general plasma-physical context, and MHD and kinetic descriptions of space weather. They rely on the involvement in international space missions, ground-based telescopes, and HPC-driven fundamental research collaborations.

<http://fys.kuleuven.be/ster>
<http://wis.kuleuven.be/CmPA>

Duties

*Research

You are expected to perform high-level research in the field of numerical modelling of stellar interiors. The modelling should include angular momentum transport inside stars, with a focus on the role of internal differential rotation patterns, atomic diffusion processes, magnetic field generation, magnetoconvection, etc., through state-of-the-art local numerical magnetohydrodynamical simulations. The simulations need to provide high-resolution insights in local magnetohydrodynamics, as well as be applicable to global spherical scale geometry. Global models need to connect to current knowledge of stellar structure, variability, evolution and stellar coronal activity, and need to find feedback in spectroscopic, interferometric and asteroseismic diagnostics derived from modern data.

*Teaching

You ensure high-quality education within the area of astronomy and astrophysics, physics, and mathematics, with a clear commitment for the quality of the programme as a whole. You also contribute to the pedagogic project of the faculty/university through the supervision of master theses and as supervisor of PhD students.

You develop your teachings in accordance with KU Leuven's vision on activating and researched-based education and make use of the possibilities for the educationalist professionalisation offered by the faculty and the university.

*Service

Besides the research and the teaching assignment, you are expected to be willing to provide services to the community, in particular to amateur astronomer organisations, to the government and to Belgian industry in the framework of instrument development in the topics of the research task, in a Belgian as well as an international context.

Requirements

You have a PhD or doctoral degree in Astrophysics, Mathematics, Physics or equivalent.

You are an expert in theoretical-computational studies of stellar interiors confirmed by an excellent peer-reviewed publication record. Awareness and understanding of the observational aspects of stellar evolution are assets.

You have very good teaching and training skills, in order to contribute to the quality of the department's educational program.

Near-native proficiency of English is required. KU Leuven provides courses in academic English.

The administrative and educational language at KU Leuven is Dutch. If, at your appointment, you do not speak Dutch at all or do not speak it well, KU Leuven will provide a training offer that must equip you to be able to teach in Dutch within three years. If your teaching assignment is completely in a language other than Dutch, then it is expected that you have mastered the Dutch language to a level that will allow you to participate in the administrative meetings.

Offer

We are offering full-time employment in an intellectually challenging environment. KU Leuven is a research-intensive, internationally oriented university that carries out both fundamental and applied scientific research. It is highly inter- and multidisciplinary focused and strives for international excellence. In this regard, it actively works together with research partners in Belgium and abroad. It provides its students with an academic education that is based on high-quality scientific research.

You will work in Leuven, a historic, dynamic and lively city located in the heart of Belgium, within 20 minutes from Brussels, the capital of the European Union, and less than two hours from Paris, London and Amsterdam.