

RESEARCH EXPERT IN EXOPLANET MODELLING

ref. OZK-2021-71

The Institute of Astronomy (IoA) of the Department of Physics and Astronomy of KU Leuven and the Royal Observatory of Belgium (ROB) seek a highly motivated and skilled research expert in the field of exoplanet modelling. This recruitment is embedded in the research profile "STELLA: Study of Terrestrial Exoplanets" (Prf2021022) within the FED-tWIN framework, the Programme of sustainable research cooperation between the Belgian federal scientific institutes and the universities. The position is a full-time position (50% at the IoA, 50% at the ROB with open-ended contracts). In particular, we are looking for an excellent recognised scientist who can bridge and strengthen the expertise domains at the IoA and the ROB in the field of numerical models simulating the evolution of exoplanetary atmospheres, surfaces, and interiors. The overall short-term objective for the FED-tWIN researcher is to advance our understanding of close-in rocky exoplanets by linking theoretical models for the planet interior and its evolution (expertise domain of the ROB) with exoplanet atmosphere models including complex chemistry (expertise of KU Leuven). The long-term ambition of this FED-tWIN research is to boost our knowledge of the conditions favorable for a planet to be habitable and for life to develop. These novel models simulating the evolution of the atmospheres, interiors and surfaces of planets over billions of years will be crucial for an optimal interpretation of the current and future exoplanet observations in terms of the highest possible accuracy.

The Department of Physics and Astronomy of - KU Leuven, conducts research in various domains in modern physics in order to understand the fundamentals of physics. It contains several research units comprising activities in physical acoustics and thermal physics, biophysics, nuclear and radiation physics, semiconductor physics, solid state physics, theoretical physics and astronomy. In addition to the leading international research activities, mostly financed by national and international institutions for scientific research, a diverse range of assignments related to education and services are accomplished. The department belongs to the Science, Engineering and Technology Group, Faculty of Science, and currently counts about 350 staff members. Within this department, the Institute of Astronomy (IoA) is an internationally recognised centre of expertise in stellar and planetary astrophysics, currently counting about 90 scientists. Most of the science topics are related to the study of stellar and planet evolution, in a broad context. The IoA has an established expertise in (3D) atmospheric exoplanet models, including hydrodynamics, radiative transfer, and chemistry. For the latter aspect, the IoA is collaborating with (inter)national colleagues specialised in mathematics, quantum-chemistry and bio-engineering techniques. The IoA is one of the main partners of the large Marie-Curie ITN CHAMELEON network focussing on the modelling of planet-forming disks and exoplanet atmospheres. In addition, the IoA is actively contributing to the developing of space missions (such as the James Webb Space Telescope and the ARIEL Space Mission) and ground-based instruments (such as the MARVEL to be installed on the Flemish Mercator observatory in La Palma). For more information: see <http://fys.kuleuven.be/ster/>.

The Royal Observatory of Belgium is one of the ten Belgian Federal Scientific Institutes and was founded in 1826. It nowadays consists of four operational directorates performing internationally recognised research in Reference Systems and Planetology, Seismology and Gravimetry, Astronomy and Astrophysics, and Solar Physics and Space Weather. It currently counts about 180 employees. Within the Planetology team, about 30 scientists investigate the interior structure, composition, evolution, dynamics, and atmosphere of terrestrial planets and moons. The team is heavily involved in several ESA and NASA solar system missions such as BepiColombo, ExoMars 2022, JUICE (Jupiter Icy Moons Explorer), and InSight (Interior exploration using Seismic Investigations, Geodesy, and Heat Transport), and leads several international research projects. Besides its main focus on Solar System

planets and moons, the team also applies its expert knowledge on planetary interiors and evolution to exoplanets. For more information: see <https://www.astro.oma.be/en/>.

Responsibilities

As a research expert you are responsible to complete the following major tasks:

- Take a leading role internationally and perform research in the domain of exoplanet modelling, which is essential for the research strategy of IoA and ROB and which forms a theoretical basis for designing (future) instrument development;
- Be actively involved in the (exo)planet teams at KU Leuven and ROB, contributing to and extending their specific expertise domains,
- Build bridges that strengthen the collaboration between KU Leuven and ROB;
- Aim at excellence in your research, publish in outstanding journals and present your results at the main conferences in the field.
- Apply for competitive grant funding to finance your research activities and build up your own research team;
- Contribute to the development of scientific software with open access policy;
- Organize exoplanet workshops and conferences throughout Europe, including in Belgium, to disseminate expertise and research results to the outside world to strengthen the international reputation of the research units;
- Supervise master and PhD students working on exoplanet modelling at IoA and ROB;
- Not compulsory, a limited teaching of maximum 6 ECTS at the master's level.
- Train junior researchers in the field of numerical astrophysics and planetology
- Provide scientific and expert services and outreach in the two institutes, towards society in general as well as to internal committees.

Profile

We are looking for candidates matching the following profile:

- You hold a PhD degree in astrophysics or planetology (or a closely related field). PhD must be obtained after 12 January 2010 (This period is extended by one year for each maternity, parental & adoption leave & for each long-term sick leave of yourself or of your immediate family).
- You can demonstrate expertise in at least some of the following topics: numerical modelling, planet interior, evolution of planets, atmosphere dynamics, atmosphere chemistry, convection, high-pressure physics, numerical astrophysics or planetology, with preference in exoplanet modelling;
- You can demonstrate experience in leading projects within international collaborations;
- You master a strong working knowledge of numerical algorithms and have a proven record of scientific software development;
- You are experienced in the supervision of master and PhD students, preferably in numerical astrophysics or planetology;
- You are fluent in English. Basic knowledge of Dutch or French is a plus.
- You hold a track record of speaking in front of an international group of peers;
- You can show a publication record that proves productivity, research independence, and a result-oriented mindset.
- You have strong organisational skills, a cooperative attitude and leadership capacities, and are committed to intensive collaboration between the two institutes.
- You work with attention to diversity and gender equality.

Offer

We offer

- A full-time employment consisting of two contractual positions of indeterminate duration, with simultaneous 50% appointment at KU Leuven and 50% appointment at ROB;
- The starting date is negotiable.
- Access to state-of-the-art infrastructure at ROB and KU Leuven;
- A stimulating research work environment where quality, professionalism and team spirit are encouraged;
- Different extra-legal benefits are offered both at KU Leuven and ROB;
- Flexible schedule and possibility to work occasionally from home;
- Refund of commuting expenses when using public transportation or bicycle;
- Access to special advantages arranged for employees of the federal scientific institutions and the KU Leuven (e.g. possibility to follow trainings, childcare, etc.);
- The opportunity to interact with several world-class investigators at both institutions, as well as in Europe and abroad (through an established network and research consortia) ;
- For KU Leuven a contract as research expert (postdoctoral researcher) in the research management staff category is offered;
- At ROB, the salary will follow federal regulations for the scientific career in the SW2 scale, with possibility to acquire a bilingualism bonus;
- All relevant work experience (public + private sector) will be considered when determining seniority.

Interested?

For more information please contact Prof. Leen Decin, tel.: +32 16 32 70 41 (KU Leuven, leen.decin@kuleuven.be) or Prof. Tim Van Hoolst, tel.: +32 23730668 (ROB, tim.vanhoolst@oma.be).

Your application should include

- a bio sketch in which they demonstrate their added value as an academic researcher for the core tasks of research and services in their past career and for their future activities (maximum 2 pages);
- a file about their five most important publications or realizations;
- an extensive CV (including a complete publication list);
- a research plan with attention to the development of a research line and associated research team with an eye for collaboration with fellow researchers within the employment entities (maximum 4 pages);
- their contribution to service activities (internal representation through membership in councils and administrative bodies, contributions to society through education and research, outreach and science communication) (maximum 1 page);
- their vision of leadership (maximum 1 page);
- contact information of 2 referees.

KU Leuven and the Royal Observatory of Belgium seek to foster an environment where all talents can flourish, regardless of gender, age, cultural background, nationality or impairments. If you have any questions relating to accessibility or support, please contact us at diversiteit.HR@kuleuven.be. You can apply for this job no later than January 31, 2022 via the [online application tool](#). More information on <https://www.kuleuven.be/personeel/jobsite/jobs/60061800>.

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