

FED-tWIN

Programme de coopération durable sur le plan de la recherche entre les établissements scientifiques fédéraux et les universités

In the framework of the FED-tWIN program, the royal Belgian Institute for Space Aeronomy (BIRA-IASB) and the Université catholique de Louvain (UCLouvain) associate their expertise in a new project called “Radiative transfer in planetary atmospheres of celestial bodies, including (exo)planets and moons”, i.e. RT-MOLEXO.

To support the activities of the FED-tWIN research profile,
we are looking for a

scientist (M/F/X)

The two institutions:

The **royal Belgian Institute for Space Aeronomy** (BIRA-IASB) is a scientific institution of the Belgian Federal Space Pole located in Uccle (Brussels). Its principal mission is the development of scientific and technological expertise in the field of aeronomy. One of its research domains is planetary aeronomy, which focuses on the atmospheres of terrestrial planets. BIRA-IASB has developed expertise in both space-based observations and theoretical understanding of planetary atmospheres, and has also built instruments for space missions to Venus and Mars. More information about the Institute, its activities and the projects in which it is involved: see www.aeronomie.be

For the “**Université catholique de Louvain**” (UCLouvain), the project will take place in the Institute of Condensed Matter and Nanosciences (IMCN). The institute has a broad range of research subjects from the heterogeneous catalysis to the quantum modelling of batteries or the study of the coherence in electrons motion. In particular concerning high-resolution spectroscopy, several spectrometers allow to record reference spectral signatures of van der Waals complexes and molecular ions and to target the study of reactive phenomena at the molecular scale. More information about the Institute, its activities and the projects in which it is involved: see <https://uclouvain.be/en/research-institutes/imcn>

The synergy between laboratory high-resolution molecular spectroscopy and radiative transfer theory is of prime importance to better understand the chemical and physical processes at play in planetary atmospheres.

The objective of this research profile is to foster the collaboration between atmospheric and laboratory measurements by identifying the area of improvements for molecular databases, in particular concerning CIAs, bearing in mind representative scenarios on other planets.

The FED-tWIN researcher will participate in the activities of both laboratories.

She/He will

- be responsible to determine and achieve the most relevant laboratory measurements for planetary applications
- develop and improve the laboratory set-ups at UCLouvain and at BIRA-IASB
- evaluate the feasibility of new experiments, consider the most efficient design of original experiments.
- participate to the development of the radiative transfer code in order to implement new or improved parameterizations of continua, CIA and other absorption features related to high pressures and dense gas mixtures.
- give advice to the Planetary Atmospheres (D43) group at BIRA-IASB regarding which spectroscopic parameters and parameterizations to implement to improve the simulation of radiation-atmosphere interaction.

Required competences:

The candidate has obtained maximum 12 years before the submission date with derogations (extension for maternity, parental, adoption, long-term illness: see details in article 14 of the Law). This period of 12 years is extended by one year for each absence due to pregnancy, parental or adoption leave, as well as each long-term absence due to illness of the candidate or and long-term absence due to illness of a family member of the first degree.

The PhD was obtained in physical chemistry (experimental and or theoretical spectroscopy) or in atmospheric sciences (remote sensing instrumentation and retrieval techniques). The researcher has now at least 5 years of experience and he/she worked on each of the topics, enabling him/her to be strongly knowledgeable in both spectroscopy and atmospheric sciences. Experience in the fields should be attested by refereed papers.

The scientific expertise required for this research position should encompass the following:

- spectroscopy: the researcher must have expertise in theoretical approach of internal structure of molecules. He/she has expertise in experimental high-resolution molecular spectroscopy. He/she designed measurement set ups, performed the experiments and analyzed the recorded spectra, in order to derive higher level information on the energy levels structure. He/she should also have expertise in the modelling of the radiation-matter interaction.
- atmospheric sciences: The researcher must have expertise in designing and developing IR and UV space-borne instruments and their calibration set-ups (OGSE, detector calibration, ...). He/she has been involved in remote sensing missions on Earth or other planetary bodies. This implies expertise in radiative transfer modelling of planetary atmospheres.

The researcher ought through his/her strong expertise in those two fields to be a competent interlocutor with experts in both fields. The researcher has built his/her own network of scientific collaboration in both areas.

Experience in educational tasks and supervision of Master/PhD students will be an asset.

The researcher should be able to work independently, to manage his/her own team, to successfully write scientific proposals and papers.

More specific skills:

- Very good knowledge of programming languages (Python, Fortran and MATLAB) under UNIX and windows environments
- Knowledge of English (written and spoken)
- Good communication skills (presenting results to the team and to the scientific community)
- Ability to write reports, documentation and scientific papers in French and English.
- Interest for the scientific activities of the teams and of the institute/university

We offer:

- The candidate should be available on 1st January 2023.
- Full time position **of indeterminate duration** shared between the two laboratories, *i. e.* one part-time contract (50%) will be issued by each partner.

@ BIRA-IASB:

- A contractual position (SW2-Workleader). Salary is according to the federal regulations for the scientific contractual personnel.
- All relevant work experience (public + private sector) will be considered when determining seniority.
- Dynamic working environment with international contacts.
- Refund of commuting expenses when using public transportation or bicycle.
- Access to special advantages arranged for the employees of the federal scientific institutions (e.g., collective hospital insurance and possibility to follow trainings).
- Possibility to work from home
- Attractive annual leave policy

@ UCLouvain:

- The salary granted according to the legal rules applied for the contractual scientific staff of the UCLouvain
- Dynamic working environment with international contacts.
- Refund of commuting expenses when using public transportation or bicycle.
- Access to special advantages arranged for the employees

For more information about this vacancy, please contact Dr. Séverine Robert at severine.robert@aeronomie.be and Pr. Clément Lauzin at clement.lauzin@uclouvain.be

Interested?

Please send a detailed CV, including a list of your scientific publications, a cover letter describing your motivation and contact information of 2 referees, preferably by email to:

severine.robert@aeronomie.be and clement.lauzin@uclouvain.be

with reference: “FED-tWIN – RT-MOLEXO”

Deadline for applications: 30th September 2022