

ESRI4: “Translating scientific concepts & dilemmas into teaching material”

Host: UAn / supervisor

PhD enrolment and planned dual degree with: UAn & UCPH

Promotors:

Katrien Kolenberg & Peter Van Petegem
Dept. of Physics & Dept. of Social Sciences
University of Antwerp, Belgium (UAn)

Anja Andersen
Niels-Bohr Institute
University of Copenhagen, Denmark (UCPH)

We are offering a PhD fellowship (4 years) in the framework of the CHAMELEON ITN network commencing in early 2021.

Project Description

STEM stands for Science Technology Engineering and Mathematics, and thus it encompasses several disciplines essential to 21st century life (skills) and future solutions. Astrophysics is a STEM discipline par excellence, making use of expertise from various fields (physics, math, chemistry, biology, geography, high-tech, engineering, ...). Moreover, as a subject triggering the imagination – and even raising philosophical questions – it has the potential to raise interest in STEM disciplines. Therefore, the development of STEM projects linked to topics in Astrophysics is a useful endeavour, both for school education and for reaching a larger segment of society through public outreach.

More and more, the value of integrated STEM projects at school is put into practice and even investigated. Some stubborn misconceptions in science may be cleared up by the integrated STEM approach. The goal of this PhD project is to investigate the effectiveness of educational STEM interventions for the field of Astrophysics and Space Sciences.

In the framework of the CHAMELEON project and various ongoing projects, astro-STEM material will be developed and implemented for the classroom and for public outreach. In collaboration with Physics and the EduBron groups at the University of Antwerp and under the co-supervision of Prof. Katrien Kolenberg and Prof. Peter Van Petegem, we plan to investigate the effectiveness of such educational / outreach approaches. Secondments at the University of Copenhagen (Denmark, under the supervision of Prof. Anja Andersen) and the KU Leuven (Belgium, STEM coordination unit) are envisaged as well.

Key tasks

Key tasks of the PhD student will be to:

- Generate and analyse new approaches for using astrophysics and space sciences as part of the STEM education in schools and as a way to promote science and lift the general interest in and knowledge of science.
- Write a PhD thesis consisting of several peer-reviewed scientific articles based on the research carried out during the PhD.
- Complete PhD courses or other equivalent education corresponding to approx. 30 ECTS points.
- Gather international research experience, through collaboration within the CHAMELEON ITN network and other relevant international research groups.

- Disseminate the scientific research results to a broader public through conference presentations and public talks.

CHAMELEON: Innovative Training Network (ITN)

This project is part of the Marie Skłodowska-Curie Innovative Training Network (ITN) CHAMELEON “Virtual Laboratories for Exoplanets and Planet Forming Disks” (<https://chameleon.wp.st-andrews.ac.uk/>). The ITN combines the expertise of eight European research institutes (Universities of St Andrews, Groningen, Copenhagen, Edinburgh, Leuven and Antwerp, the Max-Planck Institute in Heidelberg and the Netherlands Institute for Space Research) to cover all relevant aspects for this complex modelling task, joining the expertise in planetary atmospheres and proto-planetary disks, including observation and interpretation, as well as the transfer of knowledge into educational and outreach projects. All students will obtain double degrees. The network will consist of 15 Early Stage Researchers (PhD students) and their respective supervisors.

Key criteria for assessment of applicants

We seek an excellent student with a strong background in physics or astrophysics but a keen interest in school education and social sciences, or with a strong background in educational sciences or science education and with a keen (preferably proven) interest in astrophysics and space sciences. This is a multidisciplinary project: STE(A)M lesson modules will be developed, and during their piloting phase, their effectiveness will be evaluated. Therefore, the PhD student will have close collaboration with both the exact sciences and the social sciences.

Applicants must have qualifications corresponding to a Masters degree related to the subject area, e.g. a MSc degree in astrophysics or a related subject area, or a MSc degree in education sciences with affinity with STEM and astrophysics. Previous experience working within education sciences is not a requirement, but will be an advantage. Due to the CHAMELEON international profile, it is required for the applicant to be fluent in written and spoken English; knowledge of Dutch would be an advantage but is not required.

Other important criteria are:

- An excellent grade point average in undergraduate and graduate studies
- Professional qualifications relevant to the PhD project
- A proven ability to work independently
- A keen interest in astrophysics and education science
- Thorough knowledge or experience with statistical analysis programs is an advantage, as are good writing skills.

Note that the general eligibility and mobility rules of Marie Skłodowska-Curie Actions apply, i.e. applicants must not have resided or carried out their main activity (work, studies, etc.) in the country of the main host institution for more than 12 months in the 3 years immediately before the recruitment date.

Place of employment

The project is intended as a double PhD degree between University of Antwerp and University of Copenhagen. The PhD student will primarily be based at the Department of Training and Education Section at University of Antwerp, but as part of the double degree program, the student will spend at least 6 months at University of Copenhagen. The PhD student will

join the network of the Inter-university Center for Educational Sciences (ICO), which offers a broad base for the domain in The Netherlands and Dutch-speaking Belgium. The PhD fellow will be enrolled both at University of Antwerp (Belgium) & University of Copenhagen (Denmark). The project is envisioned to be at University of Antwerp for the first two years and the fourth year, while the third year will be based at the Niels Bohr Institute at University of Copenhagen. Supervisors at University of Antwerp will be Prof. Katrien Kolenberg and Prof. Peter Van Petegem, at University of Copenhagen it will be Prof. Anja C. Andersen.

Terms of employment

The employment as PhD fellow is full time and for 4 years. It is conditioned upon the applicant's successful enrolment as a PhD student at both the Graduate School at University of Antwerp and at the Faculty of Sciences, University of Copenhagen. This requires submission and acceptance of an application for the specific project formulated by the applicant.

The PhD study at University of Antwerp must be completed in accordance with the general PhD regulations of the Board of Governors (2020) and at University of Copenhagen in accordance with The Ministerial Order on the PhD program (2013) and the Faculty's rules on achieving the degree.

Salary, pension and terms of employment are within the rules for EU Marie Skłodowska-Curie fellows, which provides generous benefits, including a fixed salary with additional mobility and family allowances.

Questions

For specific information about the position, please contact the principal supervisor Prof. Katrien Kolenberg – katrien.kolenberg@uantwerpen.be

- Information regarding the CHAMELEON ITN network can be found at <https://chameleon.wp.st-andrews.ac.uk>
- General information on PhD study at the University of Antwerp, <https://www.uantwerpen.be/en/research/phd/>
- General information on PhD study at the University of Copenhagen, <https://www.science.ku.dk/phd/>

Application

- Applications are to be submitted [online](#), and should include a copy of your CV and a motivation letter, by the closing date January 10, 2021 (or until position is filled). The CV should include information on education, experience, language skills and other skills relevant for the position. There should also be a Master of Science diploma and transcript of records, if not completed, a certified/signed copy of a recent transcript of record or a written statement from the institution or supervisor will do. Publication list (if applicable)
- Two recommendation letters need to be sent by January 10, 2021 to katrien.kolenberg@uantwerpen.be.
- A pre-selection will be made amongst the submitted applications.
- The remainder of the selection procedure is specific to the position and will be determined by the selection panel.
- More information about the application form can be obtained from vacatures@uantwerpen.be

We reserve the right not to consider material received after the deadline, and not to consider applications that do not live up to the above-mentioned requirements.