



PhD position in Astronomical Instrumentation – Astrophotonics

Applications are invited for a doctoral student under supervision of Prof. Lucas Labadie at the Institute for Astrophysics of the University of Cologne, Germany. The institute is strongly involved internationally in the development of state-of-the-art instrumentation for infrared and sub-millimeter ground-based and space-based facilities (VLT/I, ELT, JWST, ALMA, CCAT).

The project: the proposed position is offered in the context of the DFG-funded project NAIR (“novel astronomical instrumentation through photonic reformatting”), a collaborative initiative between the **University of Cologne**, the **Leibniz-Institute-for-Astrophysics-Potsdam** and the **Durham University**. The ambition of NAIR is to enable significant progress in the deployment on-sky of innovative photonic-based solutions for long-baseline interferometry, nulling and integrated field spectroscopy, targeting primarily the near- and mid-infrared spectral range, and leveraging the technology transfer from manufacturing platform to astronomical instrumentation. NAIR focuses on the integration of small-scale optical functions and on the simplification of the interface to the telescope infrastructure through micro-optics. The end goal is to qualify these new technologies for future astronomical exploitation at facilities such as the CHARA array in the US, or the VLTI array in Chile.

The role: The doctoral student, mainly based at the Institute for Astrophysics in Cologne (formerly I. Physics Institute), will pursue a research project to develop, characterize and optimize so-called *discrete beam combiners* (DBC) for astronomical interferometry. These integrated photonic devices will be manufactured by ultrafast laser writing (ULI) in close collaboration with the Politecnico di Milano/CNR in Italy. The major steps foreseen for this project are: the ULI fabrication of the devices during dedicated research stays at the Politecnico di Milano/CNR; the extended characterization of the devices at the astrophotonics lab at the University of Cologne using the existing infrared interferometric bench; the final on-sky test at the CHARA interferometric facility, California, in close collaboration with the IAP/Potsdam. The results will be published in peer-review journals and contribute to the PhD thesis.

The candidate: The applicant should have a Master of Science (MSc) in experimental physics, engineering or a related discipline. She/He should be motivated by the fields of research associated with astronomical instrumentation, optics, photonics and lab demonstrators. A first experience with the technique of ultrafast laser writing is an asset. The working language is English.

Conditions: The position is for **3 years** starting at earliest convenience. The salary is based on the 65%-E13 scale of German civil service. Applicants should send to **labadie@ph1.uni-koeln.de** a single PDF including a CV, educational titles and transcripts and a brief statement of research interests. They must arrange the email addresses of two referees that can be contacted directly. Further inquiries can be made at the same address. The deadline for submission is **15.12.2023**, with the review of applications starting immediately following reception, until the position is filled. Late applications are considered, but with no guarantee. The University of Cologne is an equal opportunity employer in accordance with German laws. Women, minorities and persons with disabilities are strongly encouraged to apply.