



Postdoc position

Surface brightness color relations and optical interferometry

Job offer: 3-year contract (H2020_AdG 2020: Project 101019953 ISSP)

Level: PostDoc, PhD required

Salary: Depending on experience

Type of position: postdoc position with research activities in stellar physics, interferometric observations, infrared photometry, spectroscopy – surface brightness color relations for distance determination

Situation : Université Côte d'Azur – Observatoire de la Côte d'Azur - Laboratoire LAGRANGE – Bâtiment Fizeau du Campus Valrose (Nice) & Calern Observatory for remote observations

Description of Observatoire de la Côte d'Azur :

Observatoire de la Côte d'Azur is a French public Center for research in earth sciences and astronomy. With more than 450 persons working at four different locations (Nice Observatory, Université de Nice, Sophia Antipolis, Plateau de Calern), its role is to explore, understand and transfer knowledge about Earth sciences and astronomy, whether in astrophysics, geosciences, or related sciences such as mechanics, signal processing, or optics. OCA is composed of 3 research units (ARTEMIS, GEOAZUR, and LAGRANGE) and 1 support structure (GALILEE). This program will be developed in the Lagrange Laboratory.

The Interferometric Survey of Stellar Parameters (ISSP) ERC-Adv grant, started on 1 Sep 2021 for 5 years, aims at realizing and exploiting an ambitious and homogenous survey of the angular diameters of a thousand stars as faint as magnitude 8 in the visible and as small as 0.2 milliseconds of arc. It takes benefit of the recently commissioned CHARA/SPICA instrument installed on the CHARA Array, Mount Wilson Observatory (USA, CA). The survey is built to address key questions about the relation between planets and stars and to offer to the broader community a unique and primary source of direct information on a representative and large sample of stars all over the HR diagram. The ISSP team is offering three 3-year post doc positions to support the scientific programs of the survey that benefits from 200 nights of observation over the four coming years (~1 week/month, mostly through our remote facility at Observatoire de la Côte d'Azur).

Description of the position:

This position is focused on the S04 SPICA program aiming at collecting a few hundred of interferometric angular diameters over the HR diagram to build unique surface brightness color relations (SBCR). It is also related to additional programs of the survey aiming at understanding the bias in the determination of the stellar parameters in presence of various sources of variability. Constraining SBCR on different parts of the HR diagram is fundamental to determine the angular diameter of any non-active stars, even faint, for PLATO, but also for the distance determination of early-type eclipsing binaries in other galaxies, which is crucial for the calibration of the Hubble constant (in collaboration with the Araucaria Project). Contributing to the management of this observing program, in collaboration with the co-investigators of the ISSP survey,

will be one of the main tasks of this position. Building SBCR is highly dependent on the quality of photometric data, but also on surface gravity and metallicity. Within the ISSP project we aim at obtaining, with the possible installation of a new infrared photometer at Calern Observatory, new high quality infrared photometry of the bright interferometric targets, together with spectroscopic diagnostics (from existing surveys or with additional time requests) for the sample of stars that will be used. The candidate will contribute to these additional observing programs, aiming at characterizing the variability of stars and its impact on the extraction of the fundamental parameters.

A good expertise of photometry and spectroscopy measurements is of course important for this position. We expect candidates with a good knowledge of infrared photometry, also in terms of instrumentation. Some knowledge of optical interferometry would be of course ideal, together with an interest in observing and in experimentation. Synergies between the different positions will permit to benefit from the different scientific activities of the ISSP survey.

This team welcomes applicants with diverse backgrounds and experiences. We regard gender equality and diversity as a strength and an asset.

Main activities

- Observations with the CHARA/SPICA instrument and the CHARA Array. Data reduction. Exploitation of the interferometric data for the optimal extraction of stellar fundamental parameters.
- Contribution to the installation and qualification of a new infrared photometer on the UniversCity telescope at Calern Observatory. Management of the photometric program in support to the ISSP survey
- Identification of existing spectroscopic data for the targets of the survey – preparation of time requests for additional data – observations and analysis.
- Production of the stellar parameters and indicators for the whole survey. Contribution to the elaboration of new surface brightness color relations.
- Reporting and publications.

Skills

A good expertise of photometry and spectroscopy measurements is of course important for this position. We expect candidates with a good knowledge of infrared photometry, also in terms of instrumentation. Some knowledge of optical interferometry would be of course ideal, together with an interest in observing and in experimentation.

Conditions

The position assumes some mobility in the United States at Mount Wilson in California for onsite observations. Many observations will take place remotely from the Plateau de Calern site of the Côte d'Azur Observatory.

Applications

The initial deadline is fixed to 15 Jun 2022. Interviews will be organized.

Application must be sent by email to denis.mourard@oca.eu. The application should contain a detailed CV, a letter of motivation describing the interest for the position and the skills for the activities that are described. Letters of recommendation (maximum 2) should be sent directly by the reference persons to denis.mourard@oca.eu

Contact :

- Denis Mourard, (+33) 625 665 130, denis.mourard@oca.eu
- <https://lagrange.oca.eu/fr/welcome-erc-issp>