# PhD project in ASTROPHYSICS

**Title of the Project:** Assembly, integration, and testing techniques for ELT instrumentation

**INAF-OAS Supervisor: Rodeghiero Gabriele**

**Co-Supervisors**: Annibali Francesca e Zanella Anita

**Scientific Case and Outline of the Project:** The new generation of extremely large telescopes (ELT, TMT & GMT) is currently under construction with the ELT seeking the first technical light by the end of the decade. In parallel, many instrument consortia are building the first generation of instruments for such extremely large telescopes. INAF is a leading institute for the MORFEO and ANDES instruments to be installed at the ELT. MORFEO is a multi-conjugate adaptive optics instrument that will be coupled with the MICADO imaging camera and spectrograph. With MORFEO in its final design review and MICADO in its assembly, integration, and testing (AIT) phase, this position offers an excellent training opportunity for junior scientists and/or engineers. The candidate will work in collaboration with the MORFEO and MICADO consortia to support the ongoing activities for the instruments AIT phase. The work includes the characterization of the instrument integration hall environmental systematics, instrument internal turbulence, and the participation in the instrument AIT phase (alignment and testing) and optical interface budgeting between the two instruments.

The proposed research subject is predominantly instrumental (~70%), with a scientific part (~30%) dedicated to the simulation of extragalactic science cases. Sophisticated software tools (e.g., *Scopesim*) are already in place to simulate imaging and spectroscopic data as they will be obtained by MORFEO and MICADO under different atmospheric conditions and under availability of different natural guide star configurations. By using such tools, the PhD candidate will assess the photometric and spectroscopic performance of MORFEO and MICADO on an extragalactic theme of choice (according to her/his interests and attitudes), preferentially related to the most recent discoveries obtained with *JWST* and VLT instruments (e.g., ERIS) on the high-redshift Universe.
The position foresees the candidate to spend 6-to-8 months abroad in one of the ELT instrumentation partner institutes.

Contacts: gabriele.rodeghiero@inaf.it, francesca.annibali@inaf.it, anita.zanella@inaf.it