

JOB ANNOUNCEMENT – DETERMINA 108/2023

The Istituto Nazionale di Astrofisica – Osservatorio Astrofisico di Arcetri (INAF-OAA) is offering a two years position contract in “**Optical turbulence forecast applied to the ground-based astronomy and free-space optical communication**”.

Deadline for the applications: **31/01/2024 - 23:59 CET**.

Gross yearly salary is **30 K€**, corresponding to a net of ~ 2200 €.

Scientific responsible and contact point: Dr. Elena Masciadri (elena.masciadri@inaf.it)

RESEARCH PROJECT

The selected candidate will join the Optical Turbulence (OT) group of the Osservatorio Astrofisico di Arcetri (OAA) and he/she will be involved in the R&D activities related to the optical turbulence forecast applied to the ground-based astronomy in particular in the international projects **FATE** (applied to the Very Large Telescope) and **ALTA Center** (applied to the Large Binocular Telescope) in which INAF-OAA is leader. Such a forecast is crucial for the optimization of observations performed with instrumentation equipped with adaptive optics and interferometry on top-class telescopes (8-10 m diameter) and new generation telescopes (Extremely Large Telescopes – ELT with 30-40 m diameter).

The group is in an expanding phase and we are looking for candidates interested in a professional growth and motivated by the team work in international frameworks and in multidisciplinary activities. The selected candidate will be involved in the mentioned projects and in research finalized to the application of optical turbulence forecast to ground-based astronomy as well as to the free space optical communication in the visible.

It is requested a good ability in data analysis and autonomy in programming (Python and Fortran90). Appreciated knowledge of Bash language. We are particularly interested in candidates with experience in one or more of the following areas:

(1) Development and/or use of hydrodynamic codes applied to the atmosphere. The candidate will be involved in research in the field of the optical turbulence and its parameterization. Experience with GCMs and/or mesoscale models is appreciated.

(2) Development and application of algorithms of machine learning and deep learning, or artificial neural network, etc. The candidate will be involved in development and validation of algorithms aiming to improve the forecasts performances. Experience in data assimilation is appreciated even if not necessary.

(3) Development of real-time data elaboration systems, also operational, finalised to the atmosphere forecast: reading of data to be used for the atmospheric model initialisation, realisation of simulations, pre and post-processing procedures, visualisation of outputs and storing.

The following activities will be considered **preferential qualifications/skills**:

- documented experience in using and/or developing of hydrodynamical codes (mesoscale or general circulation models)
- documented experience in research in the field of the atmospheric turbulence, in the implementation of the atmospheric turbulence in hydrodynamical codes, in the turbulence parameterization in atmospheric hydrodynamical codes

- documented experience and autonomy in programming in Python and Fortran90
- documented experience in machine learning techniques

This is a **2 years appointment** at 100% FTE with the opportunity to extend to successive years depending on funds availability.

ELIGIBILITY

- PhD diploma in Physics or Astronomy or Mathematics or Informatics or Engineering (CASE A)
or
- Master degree plus three years of documented research activity in Physics or Astronomy or Mathematics or Informatics or Engineering (CASE B)

HOW TO APPLY

The application must be sent before deadline to: inafoarcetri@pcert.postecert.it. In the subject field the applicant should make explicit reference to: **“Bando Turbolenza - Domanda per assegno Post Doc – DD n. 108/2023”**.

Application must include:

1. the [Application Form \(Annex A\)](#) **dated and signed**
2. the [self-certification Form \(Annex B\)](#) **dated and signed**.
3. a copy of a valid passport or ID
4. a CV including the publication list (send copy of the most relevant publications related to this position - up to a maximum of 5). A description of the activities done in the past years connected to the offer (up to 3 pages including figures).
5. in case of degrees awarded by a non-Italian institution, please include a copy of the certificate of your highest degree (PhD in CASE A, or Masters degree in CASE B), and associated transcript of exams done (in CASE B).
6. in case the candidate has not the PhD, he/she is invited to clearly describe the three years of research activity as indicated in the requirements
7. whatever other document that can qualify the CV.
8. a list of all the documents submitted

Two reference letters must be sent by the referees (selected by the candidate) before deadline to: inafoarcetri@pcert.postecert.it. The subject field needs to include the string **“DD n. 108/2023”** and the full name of the applicant.”

If the dossier is not complete it will be rejected.

INAF is an equal opportunity employer and all minorities are encouraged to apply.