
SUMMARY OUTLINE OF THE NOTICE OF COMPETITION

Subject:

Public selection procedure, based on qualifications and possible interview, for the awarding of a post-doc research fellowship, lasting two years, for the needs of the PRIN-MUR-2022 project “Advanced X-ray modeling of black hole winds”, entitled: “Modeling Photoionization in the Hot and Energetic Universe”.

Description of the research activity to be carried out:

The selected candidate will develop equilibrium and time-evolving photoionization models to be applied to a variety of gaseous environments of astrophysical sources in the hot-and-energetic universe, from quasar outflows to the interstellar medium of star-forming regions of high-z galaxies where multi-messenger transients go off. The selected candidate will work both on the theoretical development of the modeling (starting from the already in-house codes WINE and TEPID) and its spectral interface, as well as the time-resolved data-analysis of UV and X-ray spectra (XMM-Newton and XRISM as soon as they will become available). The theoretical work will focus on (a) time-evolving electron-level population and gas emission in gas undergoing photoionization from variable sources (either transients or stochastically variable sources) and (b) prediction of emission and absorption line-profiles in radiatively- and magnetically-driven AGN outflows.

The selected candidate will work at the INAF – Observatory of Rome (OAR), in a scientifically rich, diverse and motivated environment, active in several aspects of modern astrophysics, from extragalactic astrophysics and cosmology, to high-energy galactic and extragalactic phenomena, to stellar physics and planetology. The candidate will work within the framework of the project DRAGON (“Advanced X-ray modeling of black hole winds”), a collaboration between the INAF–OAR and the University of Rome “Tor-Vergata” (funded by the Italian Ministry of Research and University), and will be part of the INAF–OAR extragalactic-astrophysics group, counting now several PhD students and post-docs working on diverse observational and theoretical projects, including relativistic (and not) X-ray and UV quasars’ outflows, high-z massive quasars and galaxies, quasars’ SED, etc.

A possible complementary interview will focus on the topics specified below, relating to the sector of activity for which the selection is announced and the activities specified in art. 1 of the announcement:

- **Scientific experience and past research activity and publications of the candidate, in the context of the themes of the call shown above;**
- **Ionized gas in astrophysics, with particular emphasis to AGN ionized outflows and their feedback with the host galaxy;**
- **Experience in programming and coding;**
- **Data-analysis and spectroscopy.**

Admission requirements:

In order to be admitted to the selection procedure governed by this "Call", the possession of one of the following qualifications is required:

- PhD in Astronomy or Astrophysics or equivalent, issued by a Higher Institute or University (including foreign);

or

- Master degree (or 2nd level Laurea degree, if issued by an Italian University) in Physics, Astrophysics or Astronomy or equivalent qualification, issued by a Higher Institute or University (including foreign), together with at least three years of documented experience in scientific activities or technological after graduation. The equivalence will be established by the selection board according to criteria defined for the purposes of the selection procedure.

A good knowledge of the English language is required.

The following skills and experiences will be considered preferential requirements:

- 1) experience with equilibrium photoionization codes, such as Cloudy, PION or XSTAR;**
- 2) good knowledge of programming (Fortran, C) and scripting (e.g. Python) languages;**
- 3) experience in analysis of UV and X-ray spectra of ionized gas;**
- 4) good knowledge of atomic physics and mechanisms of radiation-matter interaction;**
- 5) good knowledge of the English language;**
- 6) skills in performing autonomous and independent research and presenting its results.**

Application for admission:

Applications must be submitted in one of the following ways:

- for Italian citizens:
 - ✓ by certified e-mail, including all required documents in PDF format, sent to inafoaroma@pcert.postecert.it. Only e-mail PEC from one of the operators indicated in the list of the AgID Digital Italy Agency pursuant to Presidential Decree No. 68 of 11/02/2005 is considered valid;
 - ✓ by regular electronic mail (e-mail) to inafoaroma@pcert.postecert.it if they do not have a certified e-mail address;
 - ✓ registered mail with return receipt to the National Institute of Astrophysics - Astronomical Observatory of Rome - Via Frascati 33 - 00078 Monte Porzio Catone (RM);
 - ✓ authorized express courier to INAF-Osservatorio Astronomico di Roma - Via Frascati 33, 00078 Monte Porzio Catone (RM).

• for foreign citizens:

- ✓ by regular electronic mail (e-mail) to inafoaroma@pcert.postecert.it;
- ✓ authorized express courier to INAF-Osservatorio Astronomico di Roma - Via Frascati 33, 00078 Monte Porzio Catone (RM).

Applications must be received no later than **January 26, 2024 - 11:59 pm CET** (not postmarked). Late applications will not be considered.

Requests to participate can be delivered by reporting in the subject of the e-mail the following sentence: **“Selection for the call: Modeling Photoionization in the Hot and Energetic Universe”**.

Aware that false declarations against the law are punishable for and that the Administration can proceed to verify the veracity of the declarations made, the candidate must clearly and precisely declare:

- name and surname, date and place of birth, nationality, residence and address for sending correspondence,
- to possess all the requisites described in art. 2 of this announcement;
- not to be in some of the incompatibility conditions added to art. 4 of this announcement.

The lack of the declarations mentioned will result in exclusion from the selective procedure for incomplete application.

For the purposes of selection, the candidate can self-certify the possession of academic qualifications through Attachment 1.

In addition, non-EU citizens residing outside Italy, if successful, must produce originals or suitably certified copies of academic qualifications obtained outside Italy.

To participate, the following documents must be presented:

- Complete Application Form, as provided in the Annex 1 of this announcement;
- Annex 2 - substitutive declaration of certification - substitutive declaration of deed of notoriety (art. 19 - 46 - 47 of Presidential Decree 28 December 2000, n. 445);
- “Curriculum vitae”, signed and dated by the candidate, which also indicates any scholarships and research grants previously or in progress;
- Copy of a valid identity document;
- List of publications;
- Any other qualification, work experience, research activity at private public institutions and publications that the candidate deems appropriate to attach;
- List of all documents presented.

Candidates are admitted to the selection with reserve and may, at each stage, be notified of their exclusion from the selection for the following reasons:

- the application was submitted after the deadline;
- lack of demand;

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- lack of a copy of a valid identity document;
 - lack of the requisites indicated in art. 2.

If the reasons for exclusion are ascertained after the conclusion of the selection procedure, the candidate will lose all rights to participate in the selection; similarly, we will proceed if the production of false declarations is ascertained.

INAF declines all responsibility for loss of the application or documentation when this derives from the fact of the applicant for having provided incorrect contact details or for having failed or delayed notification of any changes.

Duration of the research fellowship

The duration of the fellowship is **two years**, renewable if necessary subject to the assessment of the needs of the research program, subject to a reasoned request from the Scientific Responsible and subject to verification of financial availability and, in any case, within the limits provided for in article 22, paragraph 3, of Law 240/2010 and subsequent amendments and additions.

Location of the research grant

The location of the study and research activity will be the Astronomical Observatory of Rome. The candidate will be able to participate in a transfer abroad.

Amount of the research grant

The gross annual amount of the research grant is **€ 28,000.00**; this amount is to be understood net of the charges to be borne by the Astronomical Observatory of Rome and will be paid in deferred monthly installments.

THE DIRECTOR OF THE "OSSERVATORIO ASTRONOMIC DI ROMA"

Dr. Lucio Angelo Antonelli

ATTACHMENT 1

APPLICATION SAMPLE

To the Director of the Astronomical Observatory of Rome

Via Frascati 33

00078 Monte Porzio Catone (RM)

The undersigned (married candidates must indicate their maiden name),
born in, prov., on, and resident in,
prov., In Via / Piazza, N °, C.A.P.

applies

to be admitted to participate in the selection procedure based on qualifications and interview, for the
awarding of a research grant for the needs of the **“Advanced X-ray modeling of black hole winds”** project
entitled: **“Modeling Photoionization in the Hot and Energetic Universe”**, announced with Directorial
Determination no. ___ of the ___.

To this end, under one's own responsibility and aware that the declarations made and signed in this
application have the value of a substitutive declaration of certification and/or deed of notoriety pursuant to
art. 46 and 47 of Presidential Decree no. 445/2000 and that in the case of falsification of documents or false
declarations, the sanctions provided for by art. 76 of the aforementioned Presidential Decree,

declares

1. to be an Italian citizen or to be a citizen of the following State
2. to benefit from civil and political rights and to be registered in the electoral roll of the municipality
of or not to be registered on the electoral roll or to have been canceled from the
electoral roll for the following reasons:
3. not to have been convicted of a crime or to have pending criminal proceedings, not to be the
recipient of preventive measures and administrative measures registered in the criminal record;
otherwise, the reported convictions, the measures applied and the pending criminal proceedings of
which one is aware are specified (1);

4. to be in possession of the following qualifications, obtained from on (dd / mm / yyyy /)
5. to be in possession of no. years of documented experience in scientific, technological or management activities, gained at from as of, carrying out the following activities
6. the non-existence of incompatibility causes as indicated in art. 4 of the call for applications and any dependence on a public administration;
7. not to have been dispensed and or dismissed from another job employed by a public administration for persistent, insufficient performance;
8. not to have been declared forfeited from another employment employed by a public administration, pursuant to article 127, paragraph 1, letter d), of the Decree of the President of the Republic of January 10, 1957, number 3, for having obtained it by producing false documents or documents vitiated by non-remediable disability or by fraudulent means;
9. not to be the holder of other scholarships, research grants, research contracts awarded for any reason;
10. to be the beneficiary of / scholarships / research grants / research contracts awarded for any reason at the Entity / University / Institute from with expiry and to undertake to renounce it in case of passing this selective procedure;
11. to have been the beneficiary of scholarships / research grants / research contracts (delete the type of non-interest) awarded for any reason at the Body / University / Institute from the to the
from the to the
12. to have adequate knowledge of the English language;
13. (for Italian citizens) to be the owner of the following personal certified e-mail box
.. (and for foreigners) to be the owner of the following ordinary e-mail boxto whom to send communications regarding the procedure: and to undertake to communicate any changes to the Administration;
14. to have read and understood the rules contained in the selection announcement;
15. to be aware of the fact that, pursuant to art. 22 Italian law 240/2010, the research grant:
 - cannot be combined with participation in specialist degree courses, master's degree courses, as well as with participation in research doctorate courses with scholarship;
 - cannot be combined with other scholarships of any kind, except those awarded with the aim of integrating the training or research activity of the research fellow through a period spent abroad;
 - cannot allow the accumulation of income from work activities, even part-time, carried out continuously.

The undersigned attaches the following documentation:

1. Curriculum vitae et studiorum dated and signed;
2. Annex 2 - substitutive declaration of certification or substitutive declaration of deed of notoriety (art. 19 - 46 - 47 of Presidential Decree 28 December 2000, n. 445);



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3. Double-sided copy of a valid identity document;
 4. List of publications;
 5. Other qualifications, documents or publications deemed useful for the purposes of the evaluation;
 6. List of all documents submitted.

The undersigned expresses his her consent so that the personal data provided can be processed, in compliance with Legislative Decree 30 June 2003 n. 196 as amended by the "Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 concerning the protection of individuals with regard to the processing of personal data, as well as the free circulation of such data and repealing Directive 95 / 46 / EC (" General Data Protection Regulation ") , for the obligations related to this procedure.

(Place and date).....

(Signature)

Note

(1) Otherwise, indicate any criminal convictions, the details of the related verdicts (even in cases where no mention has been granted in the certificates issued by the criminal record at the request of private individuals or amnesty, pardon, pardon, forgiveness judicial or rehabilitation), the measures applied and any pending criminal proceedings.



ANNEX 2

FAC-SIMILE (ONLY FOR EU CITIZENS)

SUBSTITUTE DECLARATIONS OF CERTIFICATIONS (Art.. 46 D.P.R. n. 445/2000)

SUBSTITUTE DECLARATIONS OF NOTORY ACT (Art. 47 D.P.R. n. 445/2000)

(in this case, attach a photocopy of a valid identity document)

check next to the declaration of interest

The undersigned:

LAST NAME.....

(for married women indicate the maiden name)

NAME TAX IDENTIFICATION NUMBER

BORN IN (PROVINCE) ON

RESIDENT IN (PROVINCE

ADDRESS C.A.P.

PHONE.....,

DECLARES

under his/her own responsibility pursuant to art. 38, 46 and 47 of the Presidential Decree n. 445 of 28/12/2000, aware of the criminal penalties for false hypotheses and false declarations made pursuant to art. 76 of the same Presidential Decree:

1. to be in possession of the following qualification, required as a qualification for admission to the procedure:

(In the event that the qualification has not been obtained in Italy and has not been declared equivalent in accordance with current Italian legislation), to have taken the following exams, with any related evaluation and that the legal duration of the course is years _____;

2. to be in possession of the qualifications and to have the experience / knowledge indicated in the attached curriculum;

not to be the holder of other scholarships, research grants, research contracts awarded for any reason



OR

to have been the beneficiary of study grants / research grants / research contracts awarded for any reason at the Body / University / Institute _____

- 1) from _____ to _____
2) from _____ to _____

The undersigned also declares to be informed, pursuant to and for the purposes of Legislative Decree 196/2003, that the personal data collected will be processed, even with information technology tools, exclusively as part of the procedure for which this is made.

I enclose an unauthenticated photocopy of a valid identity document.

Place and date

The declarant

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