ASTROPHYSICS

Coordinator	Prof. Francesco Rosario Ferraro Department of Physics and Astronomy Via Piero Gobetti 93/2 - Bologna francesco.ferraro3@unibo.it
Starting date of the PhD Programme	01/11/2020
Duration	3 calendar years
Language of the PhD Programme	English
Mandatory stay abroad	Yes (3 months)
Associated partners pursuant to art. 2, par. 2, lett. a) of the M.D. n. 45/2013	Istituto Nazionale di Astrofisica (INAF)

Research topics

- Stellar populations in the Local Group
- Populations, chemistry and dynamics of stellar clusters
- Stellar and chemical evolution of galaxies
- Formation and evolution of galaxies and AGN
- Radioastronomy
- High energy astrophysics
- Astronomical technology
- Galactic dynamics
- Galaxy Clusters, large-scale structure of the Universe, Cosmology.

PhD positions and scholarships

Position n.	Financial support	Description	Positions linked to research subjects
1	PhD Scholarship	Totally funded by the University of Bologna general budget	Topics of interest of the PhD. Topics will be communicated to the candidates before the oral examination.
2	PhD Scholarship	Totally funded by the University of Bologna general budget	Topics of interest of the PhD. Topics will be communicated to the candidates before the oral examination.
3	PhD Scholarship	Totally funded by the University of Bologna general budget	Topics of interest of the PhD. Topics will be communicated to the candidates before the oral examination.
4	PhD Scholarship	Funded by the University of Bologna general budget and co-funded by the Department of Physics and Astronomy with funds made available by PRIN project (MORESCO)	Cosmology with gravitational waves and combination with other probes
5	PhD Scholarship	Funded by the Department of Physics and Astronomy	Characterizing the cold gas of galaxies: from the local Universe up to the Epoch of Reionization (EoR)
6	PhD Scholarship	Funded by the Department of Physics and Astronomy	Searching for high-redshift progenitors of massive galaxies
7	PhD Scholarship	Funded by the Department of Physics and Astronomy	Light-on-dark: the physics of star cluster cores at sub-arcsecond scale
8	PhD Scholarship	Funded by the Department of Physics and Astronomy with funds made available by Progetti di Sviluppo Strategico dei Dipartimenti (PSSD) - COFIN PSSD	Applications of numerical methods for astrophysics
9	PhD Scholarship	Funded by CTA - Cherenkov Telescope Array	Synergies SKA-CTA: jet-accretion process across the mass scale
10	PhD Scholarship	Funded by INAF - Istituto Nazionale di Astrofisica	Topics of interest of INAF. Topics will be communicated to the candidates before the oral examination.
11	PhD Scholarship	Funded by INAF - Istituto Nazionale di Astrofisica	Topics of interest of INAF. Topics will be communicated to the candidates before the oral examination.

12	PhD Scholarship	Funded by INAF - Istituto Nazionale di Astrofisica	Topics of interest of INAF. Topics will be communicated to the candidates before the oral examination.

Positions linked to specific research subjects: during the oral examination, applicants may express their interest in one or more positions linked to specific research subjects. Considering the expressions of interest above, the Admission Board shall express its view on the suitability of the interested applicants, taking into account their specific skills, experience and aptitude.

Admission requirements

Please, see art. 2 of the Call for applications

Mandatory documents to be attached to the application

Please, see art. 3 of the Call for applications

Further qualifications that may be attached to the application, if in possession of the applicant (only qualifications attested by documents drawn up in Italian, English, French, German and Spanish shall be considered as valid and assessed by the Admission Board)

- Abstract of the second cycle master's degree thesis. Undergraduate applicants may submit the draft of the thesis approved by their supervisor (please, note that abstracts cannot exceed 5.000 characters, including spaces and formula possibly used. The above figure does not include: the title of thesis, the outline, and images such as graphs, diagrams, tables etc. - where present);
- No more than 2 reference letters signed by Italian and international academics and professionals in the research field, which do not form part of the Admission Board, attesting the suitability of the applicant and his/her interest for the scientific research.
  Please, note that the above letters cannot be uploaded by applicants. When filling the online application form on http://studenti.unibo.it, applicants will be only allowed to provide the email accounts of the requested academic/professional. The latter shall receive an email from the University of Bologna providing for the instructions for uploading. Only letters in pdf format submitted before the expiry date and time of the Call shall be accepted.
- List of the publications (monographs, articles published on scientific journals book's chapters).
- List of the minor publications (conference papers, etc.).
- List of the abstracts and posters presented during national and international conferences, etc.).
- Study periods completed by students outside their countries of origin (e.g. Erasmus programme or other similar mobility programmes).
- Other qualifications attesting the suitability of the applicants (scholarships, prizes, etc).

Admission exams (art. 4 of the call for applications)

<table>
<tr><td>Examination type</td><td colspan="2">Schedule (please, note that applicants shall not receive any communication concerning the exams schedule)</td><td>Examination results publication (please, note that applicants shall not receive any communication concerning the publication of results)</td></tr>
<tr><td>Evaluation of qualifications</td><td colspan="2">Non-presential.</td><td>The results of the evaluation of qualifications shall be available online starting from the 08/06/2020 at the page http://studenti.unibo.it (please, select: (please, select “summary of the requests in progress” - “see detail” and open the pdf file “risultati valutazione titoli”)</td></tr>
<tr><td rowspan="3">Oral examination</td><td>Date</td><td>22/06/2020
In case that the oral examination cannot be completed in one day due to the large number of applicants, the oral exam schedule shall be made available at the webpage http://studenti.unibo.it together with the results of the evaluation of qualifications</td><td rowspan="2">The results of the oral examination shall be available on the webpage http://studenti.unibo.it starting from 29/06/2020 (please, select “summary of the requests in progress” - “see detail” and open the pdf file “risultati prova orale”)</td></tr>
<tr><td>Time</td><td>9 a.m. (local time)</td></tr>
<tr><td colspan="3">Applicants shall take the exam remotely. For further details please refer to the relevant provision laid down in art. 4 of the Call for applications.</td></tr>
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Evaluation criteria

Points will be allocated to applications out of a total of 100 on the basis of the following weighting:

1. **Qualifications**
   - Minimum for admission to the oral exam: 30 points
   - Maximum: 50 points

   Only qualifications relating to the last 5 calendar years prior to the calendar year of publication of the Call for applications shall be taken into consideration, with the exception of the University Degree (Diploma di laurea). Please, note that qualifications must be consistent with the PhD Programme.
   - Graduation final mark. Undergraduates shall be evaluated on the basis of the Weighted Average Mark (WAM): max 30 points
   - Publications: max 3 points
   - CV evaluation (thesis abstract, reference letters, other qualifications): max 17 points

2. **Oral examination**
   - Minimum for inclusion in the final ranking list :30 points
   - Maximum: 50 points

   Oral examination is intended to assess the suitability of the applicant in respect of the pursuing of scientific research as well as the general knowledge of issues connected to the PhD Programme.
   During the oral examination, knowledge of the following foreign languages shall be assessed: English.
   The oral examination is carried out in Italian or in English.

   Points relating to the oral examination shall be allocated on the basis of the following criteria:
   - general knowledge of Physics and Astrophysics fundamental issues: max 20 points
   - thorough knowledge and ability to discuss with a critical eye about issues pertaining to the Master's degree dissertation: max 20 points
   - clarity in argumentation: max 10 points

Possible evaluation sub-criteria will be available on the Unibo website, selecting the relevant PhD Programme → "PhD programme information" at the bottom of the page in the section "Notices".

Final ranking list and enrolment (arts.6 and 7 of the Call for applications)

After the publication of the results of the oral exam, the final ranking list will be available on the Unibo website, selecting the relevant PhD Programme → "PhD programme information" at the bottom of the page in the section "Notices".
Following the publication of the final ranking list, successful applicants must enroll on http://studenti.unibo.it by the deadline indicated on the Unibo website, selecting the relevant PhD Programme → "PhD programme information".