

## PHD PROGRAMME TABLE 37TH CYCLE

Section "Available Positions and Scholarship" integrated on 29/04/2021

PROGRAMME'S NAME	<b>PHYSICS</b>
ASSOCIATED PARTNERS <i>pursuant to art. 2, para 2, lett. a) of the M.D. n. 45/2013</i>	Istituto Nazionale di Fisica Nucleare - INFN
DURATION	3 years
PROGRAMME START DATE	01/11/2021
LANGUAGE	Italian, English
MANDATORY STAY ABROAD	6 months
COORDINATOR	Prof. Michele Cicoli ( <a href="mailto:michele.cicoli@unibo.it">michele.cicoli@unibo.it</a> )
CURRICULA	N/A
RESEARCH TOPICS	<ul style="list-style-type: none"> <li>- Theoretical Physics</li> <li>- Nuclear and Subnuclear Physics</li> <li>- Physics of Condensed Matter, Atoms and Molecules</li> <li>- Applied Physics and Complex Systems</li> <li>- Physics Education and History of Physics</li> </ul>
PHD POSITIONS	17
ADMISSION PROCEDURE	Qualifications and research proposal evaluation Oral examination

### Available Positions and Scholarships

Pos. n.	Financial Support	Description	Positions linked to research topics
1	PhD scholarship	Totally funded by the University of Bologna general budget	
2	PhD scholarship	Totally funded by the University of Bologna general budget	
3	PhD scholarship	Totally funded by the University of Bologna general budget	
4	PhD scholarship	Totally funded by the University of Bologna general budget	
5	PhD scholarship	Co-funded by the University of Bologna general budget and the Department of Physics and Astronomy	
6	PhD scholarship	Co-funded by the University of Bologna general budget and the Department of Physics and Astronomy with funds made available by Istituto Nazionale di Fisica Nucleare (INFN)	Theoretical Physics of Fundamental Interactions
7	PhD scholarship	Co-funded by the University of Bologna general budget and the Department of Physics and Astronomy with funds made available by Istituto Nazionale di Fisica Nucleare (INFN)	Experimental Physics of Fundamental Interactions
8	PhD scholarship	Co-funded by the University of Bologna general budget and the Department of Physics and Astronomy with funds made available by the project H2020 "Healthcare Alliance for Resourceful Medicines Offensive against Neoplasms in hematology - HARMONY PLUS" - Grant Agreement n° 945406 - P.I. Daniel Remondini	Machine learning and network-based techniques for analysis and modelling of Haematologic cancer data
9	PhD scholarship	Co-funded by the University of Bologna general budget and the Department of Physics and Astronomy with funds made available by the project H2020 ERC- COG 2019 "SLIDE - Advancing Solid Interfaces and Lubricants by First Principles Material	Advancing solid interfaces for energy harvesting and tribological applications

		Design” - Grant Agreement n° 865633 - P.I. Prof.ssa Maria Clelia Righi	
10	PhD scholarship	Co-funded by the University of Bologna general budget and the Department of Physics and Astronomy with funds made available by the project H2020 ERC- COG 2019 “SLIDE - Advancing Solid Interfaces and Lubricants by First Principles Material Design” - Grant Agreement n° 865633 - P.I. Prof.ssa Maria Clelia Righi	Reactions at materials interfaces activated by mechanical forces: fundamental understanding and applications
11	PhD scholarship	Funded by the Department of Physics and Astronomy with funds made available by the project H2020 Cryst^3.ATOM-LIGHT CRYSTALS IN PHOTONIC CRYSTALS - Grant Agreement n° 964531 - P.I. Dott. Francesco Minardi	Experimental cold atoms physics and photonics
12	PhD scholarship	Funded by the Department of Physics and Astronomy with funds made available by the project H2020 - ERC - 2020 - STG Cosmic AntiNuclei - Grant Agreement n. 950692 - P.I. Prof. Francesca Bellini	Measurement of (Anti)helium production with ALICE at the LHC for indirect dark matter searches in cosmic rays
13	PhD scholarship	Funded by the Department of Physics and Astronomy with funds made available by the project H2020 - FEDORA (Grant Agreement n. 872841) P.I. Prof.ssa Olivia Levrini	Role of STEM education in the society of acceleration and uncertainty: development of methodologies for analysing the impact of didactical activities in formal and non-formal contexts
14	PhD scholarship	Funded by Istituto Nazionale di Fisica Nucleare (INFN)	Nuclear, subnuclear and astroparticle physics and physics of the fundamental interactions, investigated both experimentally and theoretically, and technological research and development
15	PhD scholarship	Funded by Istituto Nazionale di Fisica Nucleare (INFN)	Nuclear, subnuclear and astroparticle physics and physics of the fundamental interactions, investigated both experimentally and theoretically, and technological research and development
16	PhD scholarship	Funded by Istituto Nazionale di Fisica Nucleare (INFN)	Nuclear, subnuclear and astroparticle physics and physics of the fundamental interactions, investigated both experimentally and theoretically, and technological research and development
17	PhD scholarship	Funded by Fondazione Bruno Kessler	Statistical Physics of human mobility in urban systems

## Admission Exams

	DATE AND TIME	RESULTS
Qualifications and research proposal evaluation	Applicants' participation is not required	Available from <b>11/06/2021**</b>

<b>Oral examination</b>	<b>Date:</b> starting from <b>17/06/2021 – 9 am CEST*</b> <b>Place:</b> Remotely, using Microsoft Teams	Available from <b>25/06/2021**</b>
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\* In case that the oral examination cannot be completed in one day due to the large number of applicants, the oral examination detailed schedule shall be made available on the webpage [Studenti Online](#) together with the results of the qualifications evaluation. **During the oral examination applicants may express their interest in one or more positions linked to specific research topics.**

\*\* The **results of the admission exams** will be available on the webpage [Studenti Online](#) (select “summary of the requests in progress” > “see detail” and open the .pdf file at the bottom of the page. **No personal written communication will be sent to applicants concerning the examinations results.**

## Required and Supporting Documents to be attached to the application

*(only documents in Italian, English, French, German and Spanish shall be considered as valid and be assessed by the Admission Board)*

Only qualifications obtained during the last 5 calendar years shall be taken into consideration, except for the University Degree. The Admission Board will assess the relevance of the supporting documents to the PhD Programme.

REQUIRED DOCUMENTS	
<b>Identity document</b>	Valid identity document with photo (i.e. identity card, passport)
<b>Curriculum Vitae</b>	No specific CV format is required
<b>Degrees</b>	Documents attesting the awarding of the first and second cycle degrees, the exams taken and the marks obtained (see Art. 3 of the Call for Applications)
SUPPORTING DOCUMENTS	
<b>Research proposal</b>	Multi-annual research proposal, with special emphasis on the activities to be completed during the first-year course. The proposal must meet the following requirements: <ul style="list-style-type: none"> <li>- it must mention <b>on the first page the research topic</b> of the PhD Programme associated to the research proposal. Please, choose among the following options: (1) Theoretical Physics; (2) Nuclear and Subnuclear Physics; (3) Physics of Condensed Matter, Atoms and Molecules; (4) Applied Physics and Complex Systems; (5) Physics Education and History of Physics. More information about the research activities to be carried out on the <a href="#">website of the Department of Physics and Astronomy</a>.</li> <li>- it <b>cannot exceed 20.000 characters</b>, including spaces and formulas, if present. This figure does not include: the title, the outline, references and images (such as graphs, diagrams, tables etc. - where present);</li> <li>- it must include: state of the art; project’s description; expected results; timeline of the proposed research activities; outline of the proposed findings assessment criteria; references.</li> </ul>
<b>Thesis abstract</b>	Abstract of the <b>second cycle degree thesis</b> . Graduands may submit the draft of their thesis (abstracts cannot exceed 5.000 characters, including spaces and formulas, if present. The above figure does not include: title, outline, images such as graphs, diagrams, tables etc. if present).
<b>Personal Statement</b>	The statement shall include <b>the reasons prompting the applicant to attend the PhD Programme</b> and the relevant experiences and research interests, that make the applicant suitable for the specific PhD Programme (3000 characters maximum, including spaces).
<b>Reference Letter/s</b>	<b>No more than 2 reference letters</b> signed by <b>Italian and/or International academics and professionals</b> 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. Letters shall be uploaded following the procedure on <a href="#">Studenti Online</a> , detailed in the Call for Applications (Art. 3.2).
<b>Publications</b>	List of publications (i.e. monographs, articles on scientific journals, volume chapters), minor publications (conference papers, etc.) and abstracts and posters presented during academic conferences

<b>Other documents</b>	<ul style="list-style-type: none"> <li>- University Master Courses (Master Universitari di I e II livello), Postgraduate vocational training programmes and/or specialisation programmes relevant to the PhD Programme</li> <li>- Teaching activity carried out at university level</li> <li>- Research activity - whether basic, applied, translational, etc. - carried out in any capacity, including when covered by research grants, and as a staff member of research units</li> <li>- Working activity</li> <li>- Professional and/or training internships</li> <li>- Language proficiency certificates</li> <li>- Periods of study abroad, outside the country of origin (e.g. Erasmus programme or other similar mobility programmes)</li> <li>- Other qualifications attesting the suitability of the applicants (scholarships, prizes, etc)</li> </ul>
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## Evaluation criteria \*

Scores will be expressed in points out of 100, as follows.

### 1. Qualifications and research proposal evaluation

Minimum score for admission to the oral examination: 30 points, Maximum score: 50 points

<b>Qualifications evaluation</b>	University degree final mark. Graduands shall be evaluated according to the Weighted Average Mark (WAM)	10 points max
	Publications	3 points max
	Other documents (CV, periods of study abroad, ecc.)	12 points max
<b>Research proposal evaluation</b>	Scientific value and innovative nature of the proposal	10 points max
	Description and structure of the proposal	7 points max
	Proposal feasibility	8 points max

### 1. Oral examination

Minimum score for eligibility: 30 points, Maximum score 50 points

English proficiency	3 points max
Research project presentation	25 points max
General knowledge of issues encompassed by the PhD Programme	22 points max

Oral examination includes the presentation of the research proposal and aims to assess the suitability of the applicant for scientific research as well as the general knowledge of issues encompassed by the PhD Programme (see the list of research topics at the top of the present document). During the oral examination, English language proficiency shall be assessed. The oral examination is carried out in Italian or in English.

\*Possible further evaluation criteria will be available on the [University website](#), selecting the relevant PhD Programme > "More information", at the bottom of the page in the section "Notices".

## Final Ranking List and Enrollment

Considering the expressions of interest for **topic-specific positions** (Art. 9 of the Call for Applications), the Admission Board will establish if the applicants can be considered eligible for the allocation of the said positions, taking into account their skills, experience and aptitude. Topic-specific positions will be awarded according to a sub-ranking list of eligible applicants.

After the publication of the results of the oral examination, the **final ranking list** will be available on the [University website](#), selecting the relevant PhD Programme > "More information", section "Notices" at the bottom of the page. Following the publication of the final ranking list, successful applicants shall **enroll** on [Studenti Online](#) by the deadline indicated on the [University website](#), selecting the relevant PhD Programme > "More information".

If a successful applicant withdraws from a position, the following applicant in the ranking list, who is also eligible for the specific position, will be contacted. During the replacement procedure, the new terms of enrollment shall be communicated via e-mail to the chosen applicant.