



PHYSICS	
CYCLE	XLII
COORDINATOR	Prof.ssa Raffaella BURIONI email: raffaella.burioni@unipr.it Department of Mathematical, Physical and Computer Sciences
DURATION	3 years
START DATE	01/11/2026
POSITIONS AVAILABLE	5
ADMISSION PROCEDURES	Assessment of QUALIFICATIONS and Research Project Oral Exam in PRESENCE or REMOTELY
ADMISSION REQUIREMENTS	Regardless of age and citizenship, applicants may apply if they hold at least one of the following qualifications: • a Master's degree (Laurea Magistrale or equivalent); • a degree awarded under the previous Italian system; • an equivalent academic qualification obtained abroad, recognized as suitable for admission to the PhD programme. Applicants who have not yet graduated may also apply, provided that they obtain their degree by 31 October 2026 .
TRAINING OBJECTIVES	
The PhD Program in Physics, which lasts three years, is established as a unifying element for all third-level university education in the field of Physics. In addition to the primary focus on research activities, the program includes a training and study component consisting of advanced courses and participation in national and international schools. Students are encouraged to spend part of their time abroad to engage in scientific collaborations in their respective fields of interest and to attend advanced courses relevant to their research program. Over the course of the three years, the teaching commitment is gradually reduced in favor of full-time independent research activity. The training progress is evaluated at the end of each year through open seminars. Independent scientific research is expected to lead to the publication of results in international peer-reviewed journals. The target of the PhD in Physics is to provide high-level professional training that can be applied both in academic settings and in public or private research centers and laboratories. The PhD in Physics is structured into three specializations, corresponding to the main disciplinary groups within the Physical Sciences in which the Department of Mathematical, Physical and Computer Sciences carries out its research activities: Condensed Matter and Materials Physics, Theoretical Physics, Biophysics and Applied Physics.	
RESEARCH AREAS (Modified with the Rector Decree no. 1001 of July 2, 2026)	
• New Physics from the Large-Scale Structure of the Universe • Computational Gastronomy: Networks, Ingredients, and Culinary Structures in Complex Food Systems • Tailored quantum evolution • Rare events in stochastic dynamics from biological system to machine learning • Error-resilient quantum information processing with neutral atom qubits • Intrinsic Dynamics of Emulsion, from Experiments on Earth and in Microgravity • Spin systems for quantum information processing and sensing • New aspects and applications of field theories	



Position with Scholarship		
N°	Funding entity	Research Area, if any
2	University of Parma (Ministerial funds, University funds and Cariparma Foundation)	
1	Fully funded by Cariparma Foundation	
Position with Scholarship LINKED TO SPECIFIC TOPICS (art. 6 of Position with Scholarship)		
N°	Funding entity	BOUND RESEARCH TOPIC
1	partially funded by University and Cariparma Foundation funds and co-funded by Brown University	Spin systems for quantum information processing and sensing
1	funded by INFN – The Italian National Institute for Nuclear Physics	New aspects and applications of field theories

ADMISSION ASSESSMENT
Assessment of QUALIFICATIONS: up to 50 points (a minimum score of 20 points shall be required to be admitted to the Oral Exam) ORAL EXAM: up to 70 points Minimum score for ELIGIBILITY: 70/120

ORAL EXAM PROGRAM		
Applicants admitted to the ORAL EXAM can take it either in PRESENCE or REMOTELY in Audio and Video Teleconference Applicants who intend to take the Oral Exam remotely must submit a formal request, using the form attached to the competition notice.		
The oral examination requires the candidate to present and discuss their research proposal and is aimed at assessing their aptitude for scientific research as well as their general knowledge of topics related to the research areas of the PhD programme.		
Foreign Language the fluency of which shall be assessed	ENGLISH	The evaluation of the knowledge of this language will be oral and will consist of carrying out part of the interview in English

SCHEDULE OF THE ADMISSION EXAMS		
ASSESSMENT OF QUALIFICATIONS		It is the candidate's responsibility to verify the outcome of the evaluation of qualifications, which can be consulted in their reserved area by connecting to the page http://unipr.esse3.cineca.it/Home.do in the days preceding the date of the Oral Exam. Publication on the website constitutes official notification. No individual communication will be sent to candidates by email.
ORAL EXAM	DATE	1 st September 2026 (with possible extension to 2 nd September 2026)
	TIME	10:30 am (Italian time)
	PLACE	Department of Mathematical, Physical and Computer Sciences PHYSICS BUILDING Parco Area delle Scienze, 7/A – Campus 43124 PARMA – ITALY



FURTHER INFORMATION	The Oral Exam will focus on the description of the research work carried out to prepare the Graduation Thesis for the Laurea Magistrale/Specialistica, as well as on the research project that the candidate proposes to carry out within the research topics of the Research Doctorate Program in Physics at the Department of Mathematical, Physical and Computer Sciences of the University of Parma which are described at https://corsi.unipr.it/en/phd-fis/progetti	
	In the application to participate in the competitive examination, the candidate must choose and specify one research topic. The candidate may indicate a second priority choice.	
	For foreign candidates, the admission examinations may be held in English at the candidate's choice.	

LIST OF QUALIFICATIONS TO BE SUBMITTED AND THEIR ASSESSMENT		
MANDATORY DOCUMENTS TO BE ATTACHED TO THE ON-LINE APPLICATION		
ANNEX A	(art. 3.2 of the Competition notice)	
Identification Document	Scanned Copy of a valid identity document with photo (i.e. identity card, passport)	
Curriculum Vitae et studiorum	No specific CV format is required (see art. 3.2 of the Competition notice)	
Abstract of degree thesis	Abstract of the second cycle master’s degree thesis. Undergraduate applicants must submit the draft of the thesis countersigned by their supervisor.	
Academic Qualifications	Certificates and academic transcript of records for both Bachelor’ and Master’ degrees containing the following details for each degree held: (art. 3.2 of the Competition notice): University that granted the degree - Type of degree (first cycle/second cycle/single cycle) Name of the degree program - Date of graduation - Final mark - List of exams and corresponding scores (academic transcript of records) - Translation into Italian or English (only for degrees issued in languages other than Italian or English).	
Research Project	A brief text (max 3 pages) in English. The candidates must describe their research interests and indicate the preferred topic among those listed above, possibly suggesting a second choice theme. For the first choice theme, candidates must outlay an original research project including a concise state of the art, the relevance of the problem and the expected results. Candidates are warmly invited to contact the potential supervisors listed at https://corsi.unipr.it/en/phd-fis/progetti In accordance with the <u>Guidelines for the responsible use of Artificial Intelligence in education and research</u>, the candidates must explicitly state whether they have used Generative Artificial Intelligence systems in the production of the research proposal attached to their application form, specifying which tools were used and for which parts of the document. During the oral examination, the Admission Board will assess the candidate's full mastery of the content included in the document and their ability to justify the methodological and scientific choices made in the project. <u>The research proposal does not constitute a binding commitment for the subsequent choice of the PhD research topic, which will be assigned by the Academic Board</u> Failure to submit the research proposal will result in exclusion from the selection procedure.	
LIST OF EVALUABLE QUALIFICATIONS		
(only qualifications attested by a document drawn up in Italian or in English)		
Curriculum Vitae et studiorum	Including academic career and postgraduate experience, accompanied by a statutory declaration in lieu of the certification of the exams passed with the relevant marks. as well as the final graduation mark.	Up to 25 points



Graduation thesis	Consistency of the Master' Degree thesis with the doctoral program research topics. The assessment will make use of the information contained in the abstract (max 1 page) of the thesis (although not yet discussed, in this case countersigned by the thesis supervisor) and in the curriculum, where a brief description of the thesis work should be reported.	Up to 5 points
Research Project	Points relating to the research project shall be allocated on the basis of the following criteria: ○ Scientific value and originality of the proposal ○ description and structure of the proposal	Up to 10 points
Statement of Research Interest	Short text – maximum 1 page – in Italian or in English, aimed at explaining the candidate's reasons to attend the PhD program and at describing her/his specific research interests	Up to 1 point
Scientific Publications	Articles and/or reviews in scientific journals with peer reviewing, Only publications of which a copy has been included among the qualifications presented will be evaluated and not any publications cited exclusively in the curriculum and / or in the form of a list	Up to 3 points
Reference Letters	A maximum of 2 written by University Teachers, Researchers, Heads of Italian and foreign Research Centers, persons in charge of research/tutoring activities. The letters must be sent directly by the researchers/professors/experts in PDF format with the file name: candidato_proponente.pdf, to the email address marco.squarcia@unipr.it . Therefore, the candidate does not need to upload them through the online application process.	Up to 3 points
Other experiences (training, work, research, teaching, etc.)	– Research activity (basic, applied, translational, etc.) carried out in any capacity, including when covered by research grant, and as a staff member of research units – Working activity – Professional and/or training internship – Other qualifications attesting the suitability of the applicants (scholarships, awards, etc.)	Up to 3 points
EVALUATION ORAL EXAM		
Interview Program	Evaluation CRITERIA	POINTS
The ORAL EXAM includes the presentation of the research project and is intended to assess the suitability of the applicant to pursue scientific research as well as the general knowledge of issues connected to the PhD course	○ knowledge of the topics of the Master's degree thesis ○ research project presentation ○ general knowledge of issues connected to the PhD course ○ knowledge of the foreign language	Up to 70 points