



PHYSICS	
Cycle	XXXIII
Duration	3 years
Coordinator	Prof. Cristiano VIAPPANI – Department of Mathematical, Physical and Computer Sciences – E-mail: cristiano.viappiani@unipr.it
Research Topics (the applicant MUST indicate one research topic)	<ol style="list-style-type: none"> 1. Modeling gravitational waves from compact binary mergers 2. Regularization of quantum field theories on complexified manifolds 3. Theoretical Physics of fundamental Interactions, complex systems and gravitation 4. Complex dynamics in neural and biological systems: theory and data 5. Molecular Nanomagnets for Quantum Information Processing 6. Muon spin spectroscopy and radio frequency spin manipulation in molecular nanomagnets 7. Carbon-based nanostructured materials for solid state hydrogen-storage 8. Human skin collagen structure: biochemical, mechanical and ultra-structural changes caused by ageing 9. Advanced statistics and data science: tools and techniques in data mining and machine learning 10. Multi-analytical non-invasive approach for the stratigraphic study of historical musical instruments 11. Monoclonal antibodies modified with photo- and chemotherapeutic agents: red/NIR light-activatable ternary conjugates for therapeutic use <p>A detailed description of the themes is available at the address: http://smfi.unipr.it/it along with the contact person for each of the proposed themes.</p>
Training objectives	<p>The PhD in Physics, with a duration of 3 years, is established as a unifying element of the third-level University education in the Physics' area. Besides their main commitment to the research activity, students are supposed to spend a substantial part of their training period in attending advanced courses as well as national and international schools. Students are encouraged to spend part of their time abroad in order to participate in scientific collaborations in their fields of interest and follow advanced courses in support of their research program. During the three-years, teaching commitments are progressively reduced towards a full time engagement in the research activity. The evaluation of the training program is carried out - at the end of each year - through open seminars held by the students. The independent scientific research is expected to lead to publication of results in</p>



	international, peer reviewed journals. The ultimate goal of the PhD in physics is a highly specialized scientific training that opens professional carriers in academic institutions and research laboratories, either public or private. The PhD in Physics is divided into three areas corresponding to major groups of disciplines of Physical Sciences covered by the research activity of the Department of Mathematical, Physical and Computer Sciences: Condensed Matter and Materials Physics, Theoretical Physics, Biophysics and Applied Physics.	
Academic degree required	Laurea pursuant to the previous university system, laurea specialistica or laurea magistrale, or a foreign academic qualification that has been recognized as equivalent	
POSITIONS PUT OUT TO COMPETITION		
With Scholarship	6	
Without Scholarship	1	
Reserved to holders of scholarship funded by foreign States	1	
TOTAL		8
KIND OF SCHOLARSHIP		
N°	Funding entity	Research Topic, if any
3	Scholarship Ministerial funds	--
1	INFN (The Italian National Institute of Nuclear Physics)	--
1	Energiee3 s.r.l.	<ul style="list-style-type: none"> Advanced statistics and data science: tools and techniques in data mining and machine learning
1	Co-funded by Fondazione Cariparma	<ul style="list-style-type: none"> Complex dynamics in neural and biological systems: theory and data
Positions reserved to holders of scholarship funded by foreign States		
N°	Universities or Foreign State	Research Topic, if any
1	University Ramon Llull (Spain)	<ul style="list-style-type: none"> Monoclonal antibodies modified with photo- and chemotherapeutic agents: red/NIR light-activatable ternary conjugates for therapeutic use
ADMISSION PROCEDURES		
Assessment of QUALIFICATIONS: up to 50 points ORAL EXAM: up to 70 points Minimum score for ELIGIBILITY: 70/120		
ADMISSION PROCEDURES for positions reserved to holders of scholarship funded by foreign States	Assessment of QUALIFICATIONS: up to 120 points Minimum score for ELIGIBILITY: 70/120	



Foreign Language	Language the fluency of which shall be assessed during the Oral Exam: ENGLISH .	
Possibility of videoconference for candidates residing or temporarily abroad (the relevant request shall be submitted using the form attached to the competitive examination announcement)		YES
THE INTERVIEW MAY BE HELD ALSO IN ENGLISH		
LIST OF QUALIFICATIONS TO BE SUBMITTED AND THEIR ASSESSMENT		
Graduation thesis	Abstract of the graduation thesis. If the degree is pending the abstract must be signed by the Master supervisor. (mandatory qualification)	Up to 5 points
Curriculum Vitae et studiorum and other qualifications	Including academic career and postgraduate experience, accompanied with a statutory declaration in lieu of the certification of the exams passed with the relevant marks, as well as the final graduation mark (mandatory qualification)	Up to 25 points
Research Project and Statement of Research Interest	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 http://smfi.unipr.it/it	Up to 10 points
Other qualifications	publications, awards, presentations to scientific meetings, stages, fellowships, reference letters, etc...	Up to 10 points
LIST OF QUALIFICATIONS TO BE SUBMITTED AND THEIR ASSESSMENT – Positions reserved to holders of scholarship funded by UNIVERSITY Ramon Llull		
Graduation thesis	Abstract of the graduation thesis. If the degree is pending the abstract must be signed by the Master supervisor. (mandatory qualification)	Up to 30 points
Curriculum Vitae et studiorum and other qualifications	Including academic career and postgraduate experience, accompanied with a statutory declaration in lieu of the certification of the exams passed with the relevant marks, as well as the final graduation mark (mandatory qualification)	Up to 60 points
Other qualifications	publications, awards, presentations to scientific meetings, stages, fellowships etc...	Up to 30 points



SCHEDULE OF THE ADMISSION EXAMS	
ORAL EXAM	<p>ORAL EXAM DATE: 18 September 2017</p> <p>TIME: starting from 10:00am in accordance with the schedule to be published on the website of the Department of Mathematical, Physical and Computer Sciences http://smfi.unipr.it/it</p> <p>PLACE: Department of Mathematical, Physical and Computer Sciences – Physics Building Parco Area delle Scienze, 7/A – 43124 PARMA - ITALY</p>
Oral Exam topics	<p>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 http://smfi.unipr.it/it</p>
OTHER INFORMATION	<p>In the application to participate in the competitive examination, the candidate must choose and specify one research. The candidate may indicate a second priority choice. The above choice will be binding with regard to the winner's research activity.</p> <p>For foreign candidates, the admission examinations may be held in English at the candidate's choice.</p>