

Physics	
Cycle	39°
Director	Prof.ssa Eleonora Luppi (eleonora.luppi@unife.it) Department of Physics and Earth Science
Duration	3 years
Course Type	PhD in association with INFN - National Institute for Nuclear Physics - INFN Joint PhD Programme in Physics with H. Niewodniczański Institute of Nuclear Physics Polish Academy of Sciences (IFJ PAN), Kraków, Poland Industrial PhD with Lighthouse S.P.A.
Curriculum	No
Research Topics	https://www.unife.it/studenti/dottorato/it/corsi/riforma/physics
Qualification required for admission	Italian degree known as “Laurea specialistica/magistrale” or a degree awarded prior to approval of Ministerial Decree D.M. n. 509 of 3 November 1999, updated with D.M. n. 270 of 22 October 2004, n. 270; Master’s (second level) degree, or an equivalent foreign academic qualification awarded abroad.

Assessment Criteria	
Evaluation of qualification: maximum score 20 points. Minimum score required to be admitted to the interview 12/20	
Interview: maximum score 60 points (including the foreign language examination)	
Minimum final score required: 60/80	
Language of the interview:	English
List of assessable credentials	
Academic curriculum/ Curriculum vitae	<p>Mandatory documents: Complete academic career information, a list of examinations and grades and final mark, for Bachelor and Masters degrees. Thesis abstract (max length 1 page), with the following structure: motivation, research methodology, obtained or expected results and bibliography. Only for undergraduate students the abstract must be signed by the supervisor.</p> <p>Up to 10 points</p>
Research project	<p>Maximum 2,000-character project, spaces included, written in English, on an original research topic, structured as follows: introduction of the topic within the international scientific context, relevance of the problem, method proposed to address the problem, expected results.</p> <p><i>The mentioned project is not binding regarding the subsequent choice of the doctoral thesis, except for the positions with defined themes.*</i></p> <p>*If applying for scholarships with a specific theme, the coherence of the research project with the theme is a requirement for evaluation. Therefore, the research project</p> <p>Up to 7 points</p>

	<p><i>must necessarily relate to the topic of interest, or else the application will be excluded.</i></p> <p><i>If admitted to the doctoral program, the candidate will pursue research training and the thesis consistently with the reported theme.</i></p> <p><i>It is possible to apply for a maximum of 2 scholarships with defined themes by submitting 2 distinct research projects as a mandatory requirement.</i></p>	
Scientific publications	<p>Mandatory documents:</p> <p><i>In extenso</i> copy of the publications, including abstracts and/or papers presented in national or international congresses and meetings;</p> <p style="text-align: center;">OR</p> <p>File containing the full list of the publications with relevant link</p>	Up to 1 point
Reference letter	Maximum 1 letter, supporting the application, written and signed by teachers, experts, researchers or professionals, qualified on the course topics.	Up to 1 point
Other academic or professional qualifications	Certified working experiences in the field. Others academic qualifications	Up to 1 point
Interview agenda/program		
The oral examination entails a discussion of the presented project and the candidate's previous activities, as well as an assessment of their language proficiency. Its purpose is to evaluate the candidate's aptitude for scientific research and their general preparation on topics related to the research themes of the doctoral program.		
Examination Timetable		
Evaluation of qualifications and interview will take place within the 19 th of September 2023. Evaluations' results, the beginning date for consulting the evaluations' results and the interview schedule will be available within the present call deadline at the following page: https://www.unife.it/studenti/dottorato/it/concorsi/esiti-prove-concorso-di-dottorato-per-il-ciclo-39deg		

TOTAL AVAILABLE POSITIONS	23
With scholarship	21
Positions reserved for foreign scholarship holders and/or scholarship holders of specific international mobility programs	2
Industrial PhD reserved for employees of Lighthouse S.p.A. (with salary retention)	1

Regular positions with scholarship		
N°	Funding institution	Research topic or area (if applicable)
3	Università degli Studi di Ferrara	
2	The National Institute for Nuclear Physics (INFN)	
1	The National Institute for Nuclear Physics (INFN) - Legnaro	Physics and nuclear technologies
1	Co-funded by Dipartimento di Fisica e Scienze della Terra and Università degli Studi di Ferrara	Precision constraints from space borne observations of the cosmic microwave background and of the large scale structure of the Universe
1	Co-funded by Dipartimento di Fisica e Scienze della Terra and Università degli Studi di Ferrara	Beam dynamics and spin tracking simulations of a storage ring with hybrid lattice for the search of the electric dipole moment of charged particles
1	Co-funded by Dipartimento di Fisica e Scienze della Terra and Università degli Studi di Ferrara	Development of a plethysmography system for the measurement of the cerebral venous outflow in microgravity and in clinical conditions through the detection of cardiac oscillations
1	Co-funded by Fondazione Bruno Kessler- FBK and Università degli Studi di Ferrara	Optical and structural characterisation of stress-controlled films deposited on monocrystalline silicon wafers and defined by unconventional photolithographic processes

Positions funded by PNRR Project: National Center for HPC, Big Data, and Quantum Computing, CUP code F77G22000120006.		
N°	Spoke e WP	Research topic
1	<p>Related Spoke 1 - Future HPC & Big Data</p> <p>WP title WP2 Heterogeneous acceleration, architecture, tools, and software</p>	<p>Exploitation of heterogeneous hardware accelerated HPC systems for scientific applications</p> <p>Scientific manager: Prof. Sebastiano Schifano</p>

Positions funded under Ministerial Decree No. 118/2023

N°	Area of interest	Research topic
1	PhD courses in programs dedicated to digital and environmental transitions - M4C1 I. 3.4 CUP: F73C23000720006	Development of simulation and reconstruction workflow on heterogeneous accelerated architectures for a neutrino physics imaging detector
1	PNRR PhD Programmes - M4C1 I. 4.1 CUP: F73C23000470006	UAVs and Neural Networks for Automated Radiometric Monitoring
1	Cultural Heritage PhD Programmes - M4C1 I. 4.1 CUP: F73C23000710006	Sensors for preventive conservation in museum systems

Positions funded under Ministerial Decree No. 117/2023

Innovative PhDs for Enterprises - M4C2 I. 3.3

CUP: F73C23000520006

N°	Funding company	Research topic
1	Co-funded by GEOexplorer Impresa Sociale Srl	Integrating numerical modeling and machine learning techniques to support sustainable water resource management and exploitation.
1	Co-funded by SACMI Imola S.C.	Characterization of chemoresistive metal-oxides semiconductors for artificial olfactory systems
1	Co-funded by See Through	Use of artificial intelligence in computed tomography optimization
1	Co-funded by Institute of High Energy Physics	ISO-SPECT - Integrated Sensor and readOut for Single Photon Computed Tomography
1	Co-funded by MEE0	HPC and Deep Learning methodologies for processing satellite images
1	Co-funded by Lighthouse S.p.A.	Innovative marine seismic and bathy-morphological data processing for the study of submarine landslides and shallow gas release
1	Co-funded by Lighthouse S.p.A.	Development of innovative approaches for online 3D visualisation of high-resolution bathymetric data acquired by AUV (Autonomous Underwater Vehicle)