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MATERIALS SCIENCE AND TECHNOLOGY	
CYCLE	**XLII**
COORDINATOR	Prof. Mauro RICCO' email: mauro.ricco@unipr.it Department of Mathematical, Physical and Computer Sciences
DURATION	3 years
START DATE	01/11/2026
PARTNER INSTITUTION	• The Italian National Research Council (C.N.R.)
POSITIONS AVAILABLE	**12**
ADMISSION PROCEDURES	Assessment of QUALIFICATIONS 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 Ph.D. in "Materials Science and Technology" aims to provide graduates in: Materials Science, Physics, Chemistry, Industrial Chemistry, Biological Sciences, Biotechnology and Engineering with the skills necessary to carry out research activities of high scientific and professional qualification in the field of Materials Science and Technology at Universities, public bodies or private entities. The course offers a highly interdisciplinary preparation with specific courses, and with research conducted abroad in groups with which there are collaborative relationships.

RESEARCH AREAS

- Materials for sensors and bioelectronics
- Materials for electrochemical storage (batteries and supercapacitors)
- Nanodiagnostic techniques
- Auxetic polymers
- Supramolecular sensors and devices
- Carbon nanostructures
- Low-dimensional semiconductor structures
- Self-repairing and self-diagnostic polymers
- Ceramic and composite materials
- Vitrimers
- Materials for bionanotechnology and nanomedicine
- Photocatalytic solid foams
- Semiconductor materials for applications in power electronics and UVC radiation detection
- Porous materials for chemical separation
- Molecular and nanostructured materials for energy, health and environment
- Multifunctional magnetic thin films and nanostructures
- Magnetic materials for energy transition (permanent magnets, shape memory magnetic materials, magnetocaloric materials)

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Position with Scholarship		
N°	***Funding entity***	***Research Topic***
1	University of Parma (Ministerial funds, University funds and Cariparma Foundation)	
1	Scholarship funded by The Italian National Research Council C.N.R. - IMEM	
1	Scholarship funded by The Italian National Research Council C.N.R. - STIIMA	
Position with Scholarship LINKED TO SPECIFIC TOPICS (art. 6 of the Competition notice)		
N°	***Funding entity***	***BOUND RESEARCH TOPIC***
1	partially funded by University and Cariparma Foundation funds and co-funded by the **Department of Mathematical, Physical and Computer Sciences** (funds Prof. Solzi)	Development of magnetic high-entropy alloys and oxides obtained by mechano-synthesis for applications in energy conversion processes
1	Partially funded by University and Cariparma Foundation funds and co-funded by the **Department of Chemistry, Life Sciences and Environmental Sustainability** (funds Project TELETHON Multi-Round Call POC 2025 "Brain-Targeted Biodegradable Nanoparticles for Innovative Fragile X Therapy", BERT_A_25_ASSPRIV_BRAIN-X_01, CUP: D53C26000580007) FONDAZIONE Telethon	Design and synthesis of functional nanomaterials for the development of novel formulations for the delivery of biological therapeutic agents in the context of rare diseases.
1	Partially funded by University and Cariparma Foundation funds and co-funded by the **Department of Chemistry, Life Sciences and Environmental Sustainability** (funds prof. Pedrini)	Development of composite membranes based on microporous materials for the selective removal of emerging pollutants from aqueous matrices
1	Partially funded by University and Cariparma Foundation funds and co-funded by the **Department of Chemistry, Life Sciences and Environmental Sustainability** (funds Project "Dipartimenti di Eccellenza")	Optical Spectroscopy of Functional Molecular Materials
1	partially funded by University and Cariparma Foundation funds and co-funded by **Stazione Sperimentale per l'Industria delle Conserve Alimentari (SSICA)**	Development of innovative analytical methodologies and AI for authenticity, origin, safety, quality and traceability of plant matrices, valorization of by-products and sustainable packaging.
1	Partially funded by University (Ministerial funds) and Cariparma Foundation funds and co-funded by the **Department of Chemistry, Life Sciences and Environmental Sustainability** (funds Prof. Pinalli)	Synthesis of molecular receptors to enrich epigenetic modifications on histone proteins, DNA and RNA, and their grafting on silica nanoparticles.
1	Partially funded by University (Ministerial funds) and Cariparma Foundation funds and co-funded by The Italian National Research Council C.N.R. - IMEM	Development of x-ray detectors for non-destructive testing of food.
1	Scholarship funded by Versalis S.p.A.	Styrenic ionomers

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RESERVED POSITIONS	
Industrial PhD reserved for employees of the company ELANTAS Europe S.r.l. (with salary maintained)	**1**

ADMISSION ASSESSMENT

Assessment of QUALIFICATIONS: up to 60 points
(a minimum score of 30 points shall be required to be admitted to the Oral Exam)
ORAL EXAM: up to 60 points
Minimum score for ELIGIBILITY: 70/120

ORAL EXAM PROGRAM

THE ORAL EXAM TAKES IN THE PRESENCE and with the possibility of carrying out the interview **REMOTELY** for candidates residing abroad or temporarily abroad for study / work reasons. To this end, candidates **must submit a motivated REQUEST as per the model attached to the competition announcement)**

The oral examination requires the candidate to present and discuss their Statement of Research Interest 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 during the Oral Exam	**ENGLISH**	The evaluation of the knowledge of this language will be oral and will consist in translating of a scientific text.

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**	1st September 2026 (with possible extension in the following day)
	TIME	09:00 am (Italian Time)
	PLACE	ROOM "RUTHERFORD" PHYSICS BUILDING Parco Area delle Scienze, 7/A – Campus 43124 PARMA - ITALY
FURTHER INFORMATION		**The choice of the Research Topic to be expressed in Annex A is not binding on the assignment of the research project, and it is intended to assess candidates' skills during the admission exam.** The PhD research topic will be assigned by the Academic Board.
	THE INTERVIEW MAY BE HELD ALSO IN ENGLISH	For foreign candidates, the admission examinations may be held in English at the candidate's choice.

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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 approved by their supervisor (abstract/draft of the thesis: 10.000 characters including spaces)	
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).	
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 20 points**
Graduation mark	Score related to the final mark: - 110 with honors (magna cum laude): 20 points - 110: 16 points - From 105 to 109: 12 points - From 100 to 104: 8 points - From 95 to 99: 4 points - Under 95: 0 points	**Up to 20 points**
Average of the exam marks (if the candidate will attain the degree no later than 31 October 2026)	Score related to the average of the exam marks: - 30/30: 20 points - From 28/30 to 29/30: 16 points - From 26/30 to 27/30: 12 points - 25/30: 8 points - 24/30: 4 points - Under 24/30: 0 points	**Up to 20 points**
Graduation thesis	Consistency of the Master's Degree thesis with the doctoral program research topics (briefly describe the topics in the curriculum vitae)	**Up to 10 points**
Statement of Research Interest	Short text – maximum 2 pages – 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 5 points**
Scientific Publications	Articles and/or reviews in scientific journals with peer reviewing, abstracts of papers or posters presented at conventions or meetings	**Up to 5 points**

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EVALUATION ORAL EXAM		
Interview Program	**Evaluation CRITERIA**	**POINTS**
The ORAL exam includes the presentation and discussion of the master's thesis and the statement of research interest; it 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 foreign languages: 10 points ○ general knowledge of issue connected to the Master's thesis: 25 points ○ general knowledge of issues connected to the PhD course: 25 points	**Up to 60 points**