







MATERIALS SCIENCE AND TECHNOLOGY	
CYCLE	XXXIX
COORDINATOR	Prof. Enrico DALCANALE email: <a href="mailto:enrico.dalcanale@unipr.it">enrico.dalcanale@unipr.it</a> Department of Chemistry, Life Sciences and Environmental Sustainability
DURATION	3 years
STARTING DATE OF THE PHD PROGRAM	01/01/2024
PARTNER INSTITUTION	<ul style="list-style-type: none"><li>The Italian National Research Council (C.N.R.)</li></ul>
<b>TRAINING OBJECTIVES</b>	
<p>The PhD program in Materials Science aims at the preparation of PhDs equipped with strong scientific background and wide research experience in materials science. Enrollment is open to MS laureates in Materials Science, Chemistry, Physics, Industrial Chemistry, Engineering and Biological Sciences. The Board provides a wide range of courses and seminars in different scientific areas, with particular focus on all aspects of materials science (synthesis, characterization, functions and devices). It also offers soft skills courses. The PhD program offers an interdisciplinary preparation through research activity, also in collaboration with foreign Institutions.</p>	
<b>RESEARCH AREAS</b>	
<ul style="list-style-type: none"><li>Photovoltaic devices</li><li>Functional materials</li><li>Nanodiagnostics</li><li>Nanostructured materials</li><li>Supramolecular sensors and devices</li><li>Semiconductive massive crystals</li><li>Low dimensionality semiconductive structures</li><li>Self-healing and self-diagnostic polymers</li><li>Ceramic and composite materials</li><li>Magnetic materials and magneto-refrigeration</li><li>Vitrimers</li></ul>	
<b>ADMISSION REQUIREMENTS</b>	<p>Regardless of age and citizenship, applicants holding at least one of the following academic qualifications can apply for admission:</p> <ul style="list-style-type: none"><li>Laurea specialistica or Laurea magistrale (second cycle master's degree)</li><li>Laurea Vecchio Ordinamento (degree obtained under the previous Italian regulations);</li><li>Second cycle Master's degree obtained abroad, equivalent to the above mentioned Italian degrees and recognized as suitable for the admission to doctoral program</li></ul> <p>Undergraduates can also apply for admission to the selection, with the obligation to obtain the degree <b>by 31.12.2023</b></p>

POSITIONS PUT OUT TO COMPETITION* (Modified by Rector Decree n. 2159 of 13.11.2023)		7
With Scholarship		5
Reserved to holders of Research Grant		1
Reserved to holders of scholarship within specific international mobility programs		1
<b>Position with Scholarship</b>		



<b>LINKED TO SPECIFIC TOPICS (art. 11 of the Competition notice)</b> <b>(Modified by Rector Decree n. 2159 of 13.11.2023)</b>		
<b>N°</b>	<b>Funding entity</b>	<b>BOUND RESEARCH TOPIC</b>
<b>1</b>	Scholarship partly financed with UNIVERSITY funds and co-financed by The Italian National Research Council C.N.R. - ISSMC	Synthesis, characterization and modeling of thin multifunctional ceramic coatings for industrial applications
<b>1</b>	Scholarship partly financed with UNIVERSITY funds and co-financed by the Department of Chemistry, Life Sciences and Environmental Sustainability (funds Project 2022285HC5 PNRR-M4C2- I1.1 - PRIN 2022 "Self-assembly of bacteria-targeting materials across the mesoscale - SAMBA") CUP D53D23010030006  	Synthesis and self-assembly of organic materials for the detection and treatment of bacterial infections.
<b>1</b>	Scholarship partly financed with UNIVERSITY funds and co-financed by the Department of Chemistry, Life Sciences and Environmental Sustainability (funds Project 2022FPYZ2N PNRR-M4C2- I1.1 - PRIN 2022 "CRISPR-Cas-based sensing platforms for the monitoring of clinically relevant antibodies - CRISPR-ABS") CUP D53D23009090001  	Biomolecular sensors harnessing synthetic nucleic acid systems and CRISPR-Cas technologies for the detection of clinically relevant antibodies and other biomarker proteins.
<b>1</b>	Scholarship partly financed with UNIVERSITY funds and co-financed by the Department of Chemistry, Life Sciences and Environmental Sustainability (funds Project 2022XZ2M8 PNRR-M4C2- I1.1 - PRIN 2022 "Polymorph screening to enable electron-phonon coupling engineering in organic semiconductors - POLYPHON") CUP D53D23009240006  	Structural and spectroscopic study of advanced semiconducting materials
<b>1</b>	Scholarship funded by Department of Department of Chemistry, Life Sciences and Environmental Sustainability (Project PRIN 2022-PNRR "Sustainable-by-design PLA vitrimers (PLA-VIT)" CUP D53D23017000001)  	Polylactic acid vitrimers
<b>Position reserved to HOLDERS OF RESEARCH GRANT</b>		
<b>N°</b>	<b>Subject area of the research</b>	
<b>1</b>	IMEM-CNR Istituto dei Materiali per l'Elettronica ed il Magnetismo FIS/03 "Advanced in-operando studies of technologically scalable 2D materials during device operation" codice CUP B53D23004010006	
<b>Reserved to HOLDERS OF SCHOLARSHIP WITHIN SPECIFIC INTERNATIONAL MOBILITY PROGRAMS</b>		
<b>N°</b>	<b>Agreements/Cooperations/Mobility Programs</b>	
<b>1</b>	Reserved to holders under the mobility program Project UE HORIZON-MSCA-2022-DN-01-01 n. 101119852 - Heat4Energy "Magnetic Materials and Machines for Heat Recovery"	

## ADMISSION PROCEDURES



<b>Assessment of QUALIFICATIONS:</b> up to 60 points (a minimum score of 30 points shall be required to be admitted to the Oral Exam) <b>ORAL EXAM:</b> up to 60 points <b>Minimum score for ELIGIBILITY:</b> 70/120		
<b>Foreign Language</b>	Language the fluency of which shall be assessed during the Oral Exam The evaluation of the knowledge of this language will be oral and will consist in translating of a scientific text.	<b>ENGLISH</b>
<b>ORAL EXAMINATION INDICATION</b>		
<b>THE ORAL EXAM TAKES IN THE PRESENCE</b> and with the possibility of carrying out the interview <b>REMOTELY</b> for candidates residing abroad or temporarily abroad for study / work reasons. To this end, candidates must submit <b>a motivated REQUEST</b> as per the model attached to the competition announcement).		
<b>THE INTERVIEW MAY BE HELD ALSO IN ENGLISH</b>		
<b>LIST OF QUALIFICATIONS TO BE SUBMITTED AND THEIR ASSESSMENT</b>		
<b>MANDATORY DOCUMENTS TO BE ATTACHED TO THE ON-LINE APPLICATION</b>		
<b>ANNEX A</b>	(art. 5 of the Competition notice)	
<b>Identification Document</b>	Scanned Copy of a valid identity document with photo (i.e. identity card, passport)	
<b>Curriculum Vitae et studiorum</b>	No specific CV format is required (see art. 4 of the Competition notice)	
<b>Abstract of degree thesis</b>	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)	
<b>Academic Qualifications</b>	<b>Certificates and academic transcript of records for both Bachelor' and Master' degrees</b> containing the following details for each degree held: (art. 4 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).	
<b>LIST OF EVALUABLE QUALIFICATIONS</b> (only qualifications attested by a document drawn up in Italian or in English)		
<b>Curriculum Vitae et studiorum</b>	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.	<b>Up to 20 points</b>
<b>Graduation mark</b>	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	<b>Up to 20 points</b>



<b>Average of the exam marks</b> (if the candidate will attain the degree no later than 31 December 2023)	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	<b>Up to 20 points</b>
<b>Graduation thesis</b>	Consistency of the Master's Degree thesis with the doctoral program research topics (briefly describe the topics in the curriculum vitae)	<b>Up to 10 points</b>
<b>Statement of Research Interest</b>	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	<b>Up to 5 points</b>
<b>Scientific Publications</b>	Articles and/or reviews in scientific journals with peer reviewing, abstracts of papers or posters presented at conventions or meetings	<b>Up to 5 points</b>
<b>ORAL EXAM</b>		
<b>Interview Program</b>	<b>Evaluation CRITERIA</b>	<b>POINTS</b>
The ORAL EXAM will focus on the candidate's motivation to attend the PhD, on the description of his specific research interests and on a discussion of the qualifications presented by the candidate.	<ul style="list-style-type: none"> <li>○ knowledge of foreign languages: 10 points</li> <li>○ general knowledge of issue connected to the Master's thesis: 25 points</li> <li>○ general knowledge of issues connected to the PhD course: 25 points</li> </ul>	<b>Up to 60 points</b>

## SCHEDULE OF THE ADMISSION EXAMS

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.

<b>ORAL EXAM</b>	<b>DATE</b>	22 November 2023
	<b>TIME</b>	09:30 AM (Italian Time)
	<b>PLACE</b>	Department of Chemistry, Life Sciences and Environmental Sustainability CHEMISTRY BUILDING Parco Area delle Scienze, 17/A – Campus 43124 PARMA - ITALY
<b>ALTRE INDICAZIONI</b>		<p><b>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. <u>The PhD research topic will be assigned by the Academic Board.</u></b></p> <p>For foreign candidates, the admission examinations may be held in English at the candidate's choice.</p>