



MATERIALS SCIENCE AND TECHNOLOGY	
CYCLE	XXXVII
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 anni
STARTING DATE OF THE PHD PROGRAM	01/11/2021
PARTNER INSTITUTION	<ul style="list-style-type: none"><li>The Italian National Research Council (C.N.R.)</li></ul>
PARTNER INSTITUTION FOR UNIVERSITY COOPERATION AGREEMENTS	<ul style="list-style-type: none"><li>Kazan University (Russia)</li></ul>
<b>RESEARCH TOPICS</b> (The candidate <b>MUST mandatorily</b> indicate one research topic in the ANNEX A)	
<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></ul>	
<b>TRAINING OBJECTIVES</b>	
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.	
<b>ADMISSION REQUIREMENTS</b>	Regardless of age and citizenship, applicants holding at least one of the following academic qualifications can apply for admission: <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> Undergraduate applicants may also submit applications with the obligation of getting their degree by <b>October 31<sup>st</sup> 2021</b> .

POSITION PUT OUT TO COMPETITION	15	With Scholarship	11
		Reserved to holders of Research Grant	2
		Reserved to holders of scholarship within specific international mobility programs	2



Position with Scholarship		
N°	Funding entity	Research Topic, if any
3	Scholarship funded by University of Parma (Ministerial funds)	<ul style="list-style-type: none"> <li>Control of the electrical and optical properties of doped Ga<sub>2</sub>O<sub>3</sub> epitaxial thin films (<i>Supervisor: Dr. Piero Mazzolini</i>)</li> <li>Solar cells based on high band-gap chalcogenides by ultra low-cost synthesis and deposition techniques (<i>Supervisor: Dr. Andrea Zappettini</i>)</li> <li>Design of biomedical devices for innovative approaches in the treatment of difficult-to-heal dermatological wounds (<i>Supervisor: Dr. Monica Sandri</i>)</li> </ul>
1	Scholarship funded by University of Parma (University funds)	<ul style="list-style-type: none"> <li>Self-diagnostic vitrimers (<i>Supervisor: Prof. Roberta Pinalli</i>)</li> </ul>
1	Scholarship funded by by The Italian National Research Council C.N.R. - IMEM	<ul style="list-style-type: none"> <li>Magnetocaloric materials for low-carbon solid-state refrigeration and thermomagnetic generation (<i>Supervisor: Dr. Franca Albertini</i>)</li> </ul>
Position with Scholarship LINKED TO SPECIFIC TOPICS (art. 11 of the Competition notice)		
<p>During the Oral Exam, applicants may express and / or confirm their interest to the Examination Board in being assigned a scholarship dedicated to a specific research topic.. The Board will express its judgement on eligibility to be assigned the scholarship in consideration of the specific competences, experience and specific aptitudes of the applicants.</p>		
N°	Funding entity	BOUND RESEARCH TOPIC
2	Scholarship funded by Department of Chemistry, Life Sciences and Environmental Sustainability (funds of "Departments of Excellence" program)	<ul style="list-style-type: none"> <li>Applications of colloidal nanostructures in catalysis, magnetism, and structural materials (<i>Supervisor: Prof. Ludovico Cademartiri</i>)</li> <li>Hybrid Nanomaterials from Near-Infrared Dyes and Plasmonic Nanostructures (<i>Supervisor: Prof. Andrea Secchi</i>)</li> </ul>
1	Scholarship partly financed with UNIVERSITY funds and co-financed by the Department of Chemistry, Life Sciences and Environmental Sustainability	<ul style="list-style-type: none"> <li>Supramolecular nanostructures for bacteria detection (<i>Supervisor: Prof. Alessandro Casnati</i>)</li> </ul>
1	Scholarship funded by 10 10 ONE OBJECT OWNER S.B. S.r.l.	<ul style="list-style-type: none"> <li>Laser induced graphene: synthesis and applications (<i>Supervisor: Prof. Mauro Riccò</i>)</li> </ul>
1	Scholarship partly financed by Department of Chemistry, Life Sciences and Environmental Sustainability and co-financed by Davines S.p.A.	<ul style="list-style-type: none"> <li>Sustainable materials derived from cosmetic waste (<i>Supervisor: Prof. Federica Bianchi</i>)</li> </ul>
1	Scholarship co-funded by Bormioli Pharma S.p.A. and by The Italian National Research Council (C.N.R.)	<ul style="list-style-type: none"> <li>Increase the mechanical resistance of glass containers by improving the surface quality (<i>Supervisor: Dr. Davide Calestani</i>)</li> </ul>
Position reserved to HOLDERS OF RESEARCH GRANT		
N°	Subject area of the research	
1	ISTEC – Institute of Science and Technology for Ceramics "Development of new drug delivery systems based on biomimetic calcium phosphate nanoparticles" ( <i>Supervisor: Dr. Michele Iafisco</i> )	
1	IMEM - Institute of Materials for Electronics and Magnetism "New-concept magnetic materials for sustainable permanent magnets" ( <i>Supervisor: Dr. César de Julián Fernández</i> )	



Reserved to HOLDERS OF SCHOLARSHIP WITHIN SPECIFIC INTERNAZIONALE MOBILITY PROGRAMS	
N°	Agreements/Cooperations/Mobility Programs
2	Reserved to holders under the PROJECT UE H2020 MSCA-ITN-ETN "NanED" project 956099 (Supervisor: Dr. Mauro Gemmi)

<b>ADMISSION PROCEDURES</b>	<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>ADMISSION PROCEDURES for positions reserved to of scholarship funded by foreign States and/or scholarship holders within specific international mobility programs</b>	<b>Assessment of QUALIFICATIONS:</b> up to 120 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: <b>ENGLISH</b> . The evaluation of the knowledge of this language will be oral and will consist in translating of a scientific text.
<b>CANDIDATES ADMITTED TO THE ORAL TEXT CAN TAKE THE EXAM IN PRESENCE OR REMOTELY IN AUDIO AND VIDEO TELECONFERENCE</b>  (Candidates who intend to take the Oral Exam remotely must submit request, to this purpose, as per the model attached to the competition notice)	
<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>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>FURTHER QUALIFICATIONS THAT MAY BE ATTACHED TO THE APPLICATION, IF IN POSSESSION OF THE APPLICANT</b> (only qualifications attested by a document drawn up in Italian or in English)	
<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>Scientific Publications</b>	Articles and/or reviews in scientific journals with peer reviewing, abstracts of papers or posters presented at conventions or meetings	
<b>Final mark of graduation</b>		
<b>Average of the exam marks</b>	(for candidates enrolled under conditions and who graduate by 31.10.2021)	
<b>EVALUATION CRITERIA</b>		
<b>QUALIFICATION</b>	<b>EVALUTATION CRITERIA</b>	<b>POINTS</b>
<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 October 2021)	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 and at describing the 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>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>
<b>LIST OF QUALIFICATIONS TO BE SUBMITTED AND THEIR ASSESSMENT</b>		
<b>Positions reserved to holders of scholarship within specific international mobility programs</b>		
<b>Curriculum Vitae et studiorum</b>	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	<b>Up to 50 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>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 30 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 and at describing the specific research interests	<b>Up to 10 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 10 points</b>
<b>SCHEDULE OF THE ADMISSION EXAMS</b>		
<b>ORAL EXAM</b>	<b>DATE</b>	16 September 2021 (with possible extension in the following days)
	<b>TIME</b>	09:00 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>OTHER INFORMATION</b>	For foreign candidates, the admission examinations may be held in English at the candidate's choice.	