

PhD in THE HADRON ACADEMY Risk and Complexity in High Tech Medical Innovation

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Scientific fields	ICAR/09; ICAR/03; IUS/02; FIS/07; ING-INF/06; FIS/01; MED/36; FIS/02; MED/06; BIO/13
Brief description	<p>The extraordinary increase of technologies available in the biomedical field induces as a consequence the need of controlling the adequacy of medical procedures and their prescription, the preparation of medical staff for the informed use of technologies and the management of risks associated to their use with patients.</p> <p>The increasing complexity of this topic requires the harmonization of different competences in order to optimize all phases of the therapeutic route of the patient. In addition, the technological development in medicine is a complex procedure also under the legal and ethical point of view, aspects essential for allowing innovation reaching the patient.</p> <p>In this scenario, the PhD program in Risk and Complexity in High Tech Medical Innovation aims at the education of medical doctors, medical physicists, biologists, engineers, physicists with a program whose goal is building a common language and integrating different skills and competences.</p> <p>The agreement between the Scuola Universitaria Superiore IUSS (IUSS), the University of Cagliari and Fondazione CNAO (CNAO) ensures the right synergy of scientific, methodological, technological, legal/ethical competences needed for considering the mentioned topics in the specific scientific/technological area of Hadrotherapy.</p> <p>The PhD course, characterized by a high degree of interdisciplinarity, proposes every year to the candidates, research topics and activities characterized by interdisciplinarity and complexity that can be dealt with by motivated students coming from different disciplines, i.e. biomedical disciplines (medical doctors, radiotherapists, biologists, biotechnologists), technological disciplines (physicists, engineers, data scientists), humanities/social disciplines (lawyers, economists, philosophers). The research activities will be accompanied by a curriculum including both common and specialistic courses. Common courses will deal with general topics related to hadrotherapy (the main focus of the PhD) and to risks associated to the technological innovation in the biomedical field, including those related to legal and ethical implications of innovations.</p>
Language	English
Duration	3 years
Number of positions available	<p>7 positions, of which:</p> <ul style="list-style-type: none"> - 1 position with scholarship funded by National Recovery and Resilience Plan (PNRR) - DM 118/2023 – Research PNRR, on the following topic: <i>Wearable, unobtrusive systems for the monitoring of relevant biosignals.</i> Topics will include: wearable electronics, epidermal electronics. - 1 position with scholarship funded by National Recovery and Resilience Plan (PNRR) - DM 118/2023 – Research PNRR, on the following topic: <i>Comprehensive cancer treatment coupling hadron therapy with advanced theranostics.</i> Topics will include: synergy of adrotherapy with targeted immunotherapies by means of theranostics technologies.

	<ul style="list-style-type: none"> - 1 position with scholarship funded by National Recovery and Resilience Plan (PNRR) - DM 118/2023 – Investment 3.4 - Digital and Environmental Transitions, on the following topic: <i>Machine-learning classification models applied to biomedical imaging and data.</i> Topics will include: application of advanced techniques for the automatic or semi-automatic extraction of information from biomedical images and datasets, and the use of this information for the development of machine-learning algorithms for the automatic classification of clinical conditions of interest. - 1 position with scholarship co-funded by National Recovery and Resilience Plan (PNRR) - DM 117/2023 – Investment 3.3. Innovative Doctorates, on the following topic: <i>Wearable non-invasive Devices for detection and monitoring infectious diseases,</i> with Copan Group. Topics will include: sensors and biosensors for the detection of pathological conditions. - 1 position with scholarship co-funded by National Recovery and Resilience Plan (PNRR) - DM 117/2023 – Investment 3.3. Innovative Doctorates, on the following topic: <i>Pre-Clinical Radiobiology Research,</i> with Fondazione CNAO. Topics will include: tissue, cellular and molecular experimental activities aimed at studying the response mechanisms after particle irradiation. - 1 position with scholarship co-funded by National Recovery and Resilience Plan (PNRR) - DM 117/2023 – Investment 3.3. Innovative Doctorates, on the following topic: <i>Technological improvement and new modality in treatment combination with particle and drugs,</i> with Fondazione CNAO. Topics will include: the development of techniques to improve the accuracy of the treatment both on the side of the dose distribution and on the side of the dose delivery verification; the study of a new therapeutic approach based on a new therapy called BNCT (Boron Neutron Capture Therapy). - 1 position with scholarship funded by University of Cagliari through National Recovery and Resilience Plan (PNRR) - DM 118/2023 – Research PNRR on the following topic: <i>Design and development of multiparametric devices for the study of the effect of ionizing particles on in vitro cellular cultures.</i> Topics will include: Radiation detection systems based on organic semiconductors
<p>Submission deadline for the online application</p>	<p>5 July 2023 at 13:00 (CEST)</p>
<p>Mandatory documentation* to be attached to the online application <i>*failure to upload the documentation referred to in (a) and (b) will result in exclusion from the competition procedure</i></p>	<ul style="list-style-type: none"> a) a PDF copy of a valid identity document; b) self-certification of the Master Degree Certificate (Italian or UE educational qualification), or Copy of the MSc Degree Certificate (NON-EU educational qualification); c) self-certification of the Bachelor Degree Certificate (Italian or UE educational qualification), or Copy of the Bachelor Degree Certificate (NON-EU educational qualification); d) diploma Supplement/Transcript/or similar document of Master Degree Certificate;

	<p>e) diploma Supplement/transcript/or similar document of Bachelor Degree Certificate;</p> <p>f) a proposal of research project (see guidelines on the IUSS website) related to one or more of above mentioned topics;</p>
Qualification assessment	<p>a) diploma Supplement/Transcript/or similar document of Master Degree Certificate;</p> <p>b) diploma Supplement/transcript/or similar document of Bachelor Degree Certificate;</p> <p>c) research project (see guidelines on the IUSS website). <u>The candidate who intends to compete for more than one scholarship is required to submit a project for each of the scholarship he/she is applying for. Up to a maximum of three preferences may be expressed. Please note that both expression of interest and order of the preferences are binding for the scholarship assignment. (NB: the topic of the scholarship must be included in the header of the project).</u></p> <p>d) academic and professional CV;</p> <p>e) publications;</p> <p>f) recommendation letters (maximum n. 3), sent by the referees through the online system, within the deadline of the call.</p>
Interview and evaluation	<p>The selection will be performed through the assessment of the qualifications listed in the section “Qualification assessment” (maximum 50 points) and through an interview (maximum 50 points). The Selection Board will therefore award a final score from 1 to 100.</p>
	<p>The Selection Board will assess the submitted scientific qualifications awarding a score up to 50 points. The candidates obtaining a score of at least 36/50 in the assessment phase, will be accepted to the interview. Candidates are not required to be present during the assessment of qualifications.</p> <p>The interview may also be carried out online, as long as the candidate can be identified. The interview will entail a discussion about the scientific background and skills of the candidate and about the research that the candidate would like to conduct, as well as technical/scientific questions, with the aim of ascertaining the candidate’s background, vocation and aptitude for research. Candidates obtaining a score below 36/50 in the interview will not be eligible to be admitted to the programme hence not part of the ranking list.</p> <p><u>During the interview, the selection board will verify that the candidate has the necessary fundamental knowledge and skills to for attending the doctoral course and evaluate the eligibility for the research topics of the scholarships selected, also based on the research project/s submitted.</u></p> <p>IUSS Pavia will notify the scholarship holders of their admission to the programme using the e-mail address provided in the application.</p>
Test schedule	<p>The results about the evaluation process will be published on the IUSS website http://www.iusspavia.it</p> <p>The interviews will be carried out on 24/07/2023 at 11:00am CEST, at the IUSS building or online, via Zoom.</p>
Information	<p>e-mail: postlaurea@iusspavia.it</p>