

## **ANNEX 1 (ALLEGATO 1) AREAS OF RESEARCH**

### **Scholarship code: ARCH1**

Language of the Phd Program: English

PhD Course and curriculum: **Architecture, Design, Planning; curriculum in sustainable Planning, cultural Heritage, built Environment**

Leader of the Phd Course: prof. Gerardo Doti

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino, School of Architecture and Design of Ascoli Piceno.

Research Topic and project:

### **Redefining the relationship between environmental networks and urban systems to improve quality of life and reduce exposure to risks**

The research proposal is part of the LIFE INTEGRATED IMAGINE UMBRIA Project, which aims to study the role of environmental networks in improving quality of life by enhancing the relationship between urban and peri-urban areas and Natura 2000 sites. The PhD project combines basic and applied research activities, both in Italy and abroad, focuses on the Umbria Region and includes: 1. Scientific and bibliographic research on green infrastructure, climate change adaptation strategies for urban and peri-urban areas, and Natura 2000 sites; 2. In-depth study of recent community and international directives; 3. Survey of case studies and best practices in Europe and internationally. This includes the possibility of conducting research abroad; 4. Support for the development of pilot interventions under LIFE Imagine's action C20, defining projects for ecological reconnection; 5. Support for experimenting with two "governance models": the Landscape Agreement (Actions C6, E3), and the Crater Community (Actions C8, E3).

Supervisor: Prof. Massimo Sargolini

Co-supervisor: Ilenia Pierantoni

### **Scholarship co funded under LIFE INTEGRATO IMAGINE UMBRIA - Integrated Management and Grant Investments for the N2000 Network in Umbria - ADI230002 Life 2019 "IMAGINE"**

co-financing from the Research Project funds "LIFE INTEGRATO IMAGINE UMBRIA - Integrated Management and Grant Investments for the N2000 Network in Umbria"

"The recruitment of a PhD student with a 50% co-financed scholarship is intended to cover the activities of Actions C3, C6, C8, C20, E.3) of the Life Imagine project work program."

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

- 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

### **Mandatory Period of research mobility abroad: at least 6 months**

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): at least 6 months

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program

- Semestral reports
- Trimestral and Quadrimetral monitoring Reports of the LIFE Project
- Deliverables foreseen in the different Actions of the LIFE Project (C3, C6, C8, C20, E.3)

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### **Scholarship code: ARCH2**

Language of the Phd Program: English

PhD Course and curriculum: **Architecture, Design, Planning; curriculum in sustainable Planning, cultural Heritage, built Environment**

Leader of the Phd Course: prof. Gerardo Doti

Lead Partner of the PhD Program: University of Camerino

Partner and operative site of the Phd Student (where applicable): University of Camerino, School of Architecture and Design of Ascoli Piceno.

Research Topic and project:

**Innovations in regional and national legislation on planning and territorial governance. Innovations in regional and national legislation on spatial planning and governance**

This research proposal aims to study the most recent regional legislation on spatial governance, also referring to the National Institute of Urban Planning's national law proposal on Fundamental Principles of Governance of Territory. Through the collaboration between the University of Camerino, the National Institute of Urban Planning (INU) and the Directorate of Urban Planning, Landscape and Territorial Information of the Marche Region, with which close operational collaboration is expected) the doctoral student will focus on the LR 30/11/2023, no. 19 "Planning rules for the government of the territory" and its implementation. PhD research activities include: review of literature on the topic; in-depth study of recent directives to contextualize the regulatory analysis; detailed study of the legislation to highlight key elements, strengths and potential problems; reconnaissance of case studies and best practices in the European and international context (research abroad is also planned); analysis and monitoring of the implementation process of the law at the various levels of government; and definition of planning guidelines.

Supervisor: Prof.ssa Rosalba D'Onofrio

Co-supervisor: Prof. Elio Trusiani

Scholarship funded by University of Camerino

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

### **Mandatory Period of research mobility abroad: at least 6 months**

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): at least 6 months

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program

- Semestral reports
- Didactic activities
- Participation to the activities, on the topic of research, between SAAD/Unicam and Marche Region
- Participate to the national network of PhD

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### **Scholarship code: CHEM 1**

Language of the Phd Program: English

PhD Course and curriculum: **Chemical and Pharmaceutical Sciences and Biotechnology - curriculum Chemical Sciences**

Leader of the Phd Course: Prof. Claudio Pettinari

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project: **Mechanisms and kinetics of Na-ion batteries.**

The PhD project, in collaboration with FIB company, proposes to shed light onto the mechanisms of charge/discharge at both electrodes, by using advanced chemical, morphological, structural, electrochemical techniques, applied on commercial anode, cathode, electrolyte materials for Na-ion batteries. Particular attention will be paid to the evolution of electrode structures and of electrode/electrolyte interfaces, which are of paramount importance to monitor and forecast cell ageing and failure. A wide array of instrumental techniques, e.g. SEM, TGA, XRD, XPS, DSC, tensiometry, rheology, CV, EIS, galvanostatic cycling, etc., will be applied for a thorough characterization of materials, slurries, electrodes.

Supervisor: Prof. Francesco Nobili

Scholarship co-funded under Research Agreement UNICAM/F.I.B. Spa

Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

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### **Scholarship code CHEM2**

Language of the Phd Program: English

PhD Course and curriculum: **Chemical and Pharmaceutical Sciences and Biotechnology** – curriculum **Pharmaceutical, Nutraceutical and Food Sciences**

Leader of the Phd Course: Claudio Pettinari

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic: **Biomaterials for health**

## Project: **Synthesis and characterization of novel antimicrobial biomaterials for the prevention of implant associated infections**

Implantable devices have become widely used in public health, but up to 19% of them can become infected, leading to serious health and economic challenges. Current solutions include device removal and extensive antibiotic therapy, but these are becoming less effective due to increasing bacterial resistance. Developing antimicrobial coatings is a key strategy to prevent infections on biomedical devices. Current options using metal nanoparticles have toxicity concerns. This doctoral program focuses on the synthesis and characterization of novel, permanent antimicrobial coatings based on silane chemistry. These coatings will be developed, tested, and optimized for mechanical properties, durability, and biocompatibility. Techniques like 3D printing, microfluidics and electrospinning will be used for application. The program aims to reduce infections, lower healthcare costs, and provide a scalable, eco-friendly, and commercially viable solution for the medical device industry. This project promises significant socio-economic benefits and transformative impact in managing implant infections

Supervisor: Roberta Censi

Co-supervisor: Serena Gabrielli

Scholarship funded under FISA Project, code: FISA-2022-00931. Title: Advanced Antimicrobial Surface Coatings for Biomedical Applications (ADMIRE); CUP: J13C24000100001

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

*Special requirements, additional to "standard" ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program and project including **annual report**

## **Scholarship code CHEM3**

Language of the Phd Program: English

PhD Course and curriculum: **Chemical and Pharmaceutical Sciences and Biotechnology - curriculum Pharmaceutical, Nutraceutical and Food Sciences**

Leader of the Phd Course: **Prof. Claudio Pettinari**

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project:

### **New weapons against vector-borne diseases (VBDs): a next-generation of synthetic and naturally inspired insecticides**

Vector-borne diseases (VBDs) are at the heart of a global concern. The increasing emergence of VBDs accounts for 17% of the estimated burden of infectious diseases and climate change significantly exacerbates the spread of these vectors. Invasive mosquitoes are particularly threatening, as they transmit pathogens responsible for Yellow Fever, Dengue, Chikungunya, Zika virus, and Filariasis diseases. These infections are no longer restricted to Third World Countries but are increasingly spreading also in Europe. Recently, health organizations both in Europe and worldwide have been promoting the search for innovative products by tapping into natural sources. Based on the above, the goal of this project will be the discovery and synthesis of naturally inspired scaffolds, endowed with a specific insecticidal activity against mosquito vectors. Moreover, the work will be focused on exploring the structure-activity relationship (SAR) by synthesizing analogues of identified prototypes. It will also involve developing suitable formulations to enhance their delivery and boost their insecticidal activity.

Supervisor: **Riccardo Petrelli**

Co-supervisor: **Filippo Maggi**

Scholarship funded under: **FFO-100%, Fondo di Ateneo**

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): **180**

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

## **Mandatory Period of research mobility abroad: at least 6 months**

*Special requirements, additional to “standard” ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program:

- **Annual reports**
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### **Scholarship code CHEM4**

Language of the PhD Program: English

PhD Course and Curriculum: **Chemical and Pharmaceutical Sciences and Biotechnology - Curriculum Chemical Sciences**

Leader of the PhD Course: Prof. Claudio Pettinari

Lead Partner of the PhD Program: University of Camerino

Operative site of the PhD student: University of Camerino

Research Topic and project: **Innovative coatings with bio- and ecocompatible waste materials for fully biobased primary and secondary packaging development**

Packaging is the largest end-use market segment, accounting for just over 40% of total plastic usage. In between this broad classification, coated cardboard, also known as coated corrugated, is helpful for products that need an extra layer of protection. In fact, the packaging sector is often linked to food, and the continuous growth of the world population and the rising need for apportioned and practical-managed foods make food packaging a rapidly expanding sector. In the past, wax-coated cardboard was the most widespread choice for vegetable packaging, poultry, and meat, but it relies on fossil-based materials. For this reason, the need to create innovative and sustainable packaging systems is welcomed. Thus, using renewable resources and bio-compatible polymeric materials for film layer development on paper has gained great attention. In this regard, the doctoral program is prominent in developing a fully bio-based coating that protects the paper from chemical damage and polar and non-polar absorption. The coating systems that will be tested on virgin and recycled paper will be of various polymeric natures, such as biobased acrylic resins, biobased and hybrid polyurethane resins, polysilanes or silicic acid derivatives. However, polymeric products are insufficient, so reticulation systems, such as polycarbodiimides, and small organic derivatives, such as citric acid and tannic acid, will be studied and tested. The application characteristics depend on the characteristics of the polymer, the degree of different absorption of the support, and the desired chemical-physical-mechanical resistances. The cross-linking system will be tuned, especially for bio-based polyurethanes, which, in fact, with cross-linking, increase the thermal stability of the coating and increase their stability in the storage phases even in the presence of strong humidity, avoiding swelling. Furthermore, the hybrid polyurethane/polyurethane systems acrylic paint allows for dimensional stability in the application even after the drying time (film-forming); this entails mechanical stability of the application, allowing for the same film-forming stability. Therefore, the polymer/cross-linker combination allows an increase in the chemical and technological properties of the film, which in this case will depend both on the chemical structure of the polymer used and on the structure of the final network obtained, i.e. on the cross-linking density by evaluating the glass transition temperature (T<sub>g</sub>). Bio-based polymers with bio-based waste materials inside the formulation will allow us to obtain a new, innovative, and fully biobased product with specific and unique properties. This doctoral program focuses on a radical ecological transition towards complete climate neutrality and sustainable environmental development to mitigate threats to natural and human systems: without a substantial reduction in climate-altering emissions, global warming will reach and exceed 3-4 °C before the

end of the century, causing irreversible and catastrophic changes in our ecosystem and significant socioeconomic impacts. So, developing new, more sustainable approaches will lead to a very high impact and a progressive and complete decarbonization of the system ("Net-Zero") and strengthen the adoption of circular economy solutions to protect nature and biodiversity and guarantee fair, healthy, and environmentally friendly systems.

**Supervisor: Prof Serena Gabrielli**

Scholarship cofounded by the enterprise Sifa SPA

Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular-related activities: 7 ECTS for participation in thematic option courses; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defending the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The curricular-related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

*Special requirements, additional to "standard" ones:*

Mandatory period in a Company: A previously accorded period will be spent in the Company (up to 18 months)

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**Scholarship code CHEM5**

Language of the Phd Program: English

PhD Course and curriculum: **Chemical and Pharmaceutical Sciences and Biotechnology**, Curriculum "Chemical Sciences"



Leader of the Phd Course: **Prof. Claudio Pettinari**  
Lead Partner of the PhD Program: **University of Camerino**  
Operative site of the Phd Student: **University of Camerino**

Research Topic and project:

**Study of innovative tin-free green catalysts for the cross-linking process of silane-grafted polyolefins.**

The aim of the project is to design and synthesize innovative green catalysts based on coordination and organometallic compounds of main group elements, which are active in processes for the silane cross-linking of polymeric compounds. These catalysts should be compatible with additives and/or fillers normally added to the compound and exhibit activity similar to that of the currently used organotin catalysts (OTCs). The goal is to enable the replacement of OTCs with new low environmental impact catalysts and to overcome the specific restrictions imposed by the European Chemicals Agency (ECHA) on OTCs under the European Regulation for the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). Furthermore, the project aims to study the chemical and biological properties of the new catalysts to obtain green species that are respectful of both humans and the environment.

Supervisor: **Prof. Carlo Santini**  
Co-supervisor: **Prof. Maura Pellei**

Scholarship funded under NGEU – PNRR, DM 630/2024, M4 C2 I3.3, CUP J11J24001870006 With the contribution of FAINPLAST SRL – VAT N° / registration n°: 01362890442

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

*Special requirements, additional to “standard” ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program and meet any further requirements set by the MUR in the framework of the PNRR (Italian National Plan for Recovery and Resilience) – NGEU, and in particular under the Ministerial Decree n. 630/2024:

- Semestral reports through the MUR dedicated online portal

- Respect of the DNSH principle and horizontal principles of the Program
  - Respect of deadlines and guidelines set by the MUR
  - Mandatory periods in Italy and abroad:
    - o Mandatory period of research mobility abroad: at least 6 months, no more than 12
    - o Mandatory period in the Company that cofunds the scholarship: at least 6 months up to 18 months
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### **Scholarship code CHEM6**

Language of the Phd Program: English

PhD Course and curriculum: **Chemical and Pharmaceutical Sciences and Biotechnologies**, curriculum **Chemical Sciences**

Leader of the Phd Course: Prof. Claudio Pettinari

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project: **Eco-sustainable synthesis and characterization of new binders to produce paints to be used in food contact.**

The graduate student has opportunities to design and study new catalytic processes with applications for industrial chemical synthesis. The scientific interest aims to develop innovative, efficient, and environmentally responsible methods for the synthesis of small molecules utilized as binders to produce paints used in food contact. Paints necessary for the use of metals that replace plastic packaging given their greater recycling solutions. These new packaging needs arising from greater sensitivity to the environment and human health and will allow also to develop practical scientific principles in solving real synthesis problems. Significant portion of the work is devoted to find methods for preparing new carbon-carbon, nitrogen-carbon and oxygen-carbon bonds under mild conditions and to improve own skills in analytical techniques such as Infrared, Mass Spectrometry, and NMR Spectroscopy.

Supervisor: Prof. Enrico Marcantoni

Co-supervisor: Dr. Giovanna Biondi (Elantas Europe Ascoli Piceno Plant)

Scholarship funded under Research Agreement UNICAM/ Elantas Europe S.r.l. (Ascoli Piceno)

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events

- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

### **Mandatory Period of research mobility abroad: at least 6 months**

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#### **Scholarship code CHEM7**

Language of the Phd Program: English

PhD Course and curriculum: **Chemical and Pharmaceutical Sciences and Biotechnology – curriculum Pharmaceutical, Nutraceutical and Food Sciences**

Leader of the Phd Course: Claudio Pettinari

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic: **Biomaterials for health**

Project: **Formulation and testing of antimicrobial coatings for biomedical use**

Implant-related infections are a significant issue in healthcare, caused by bacteria adhering to medical implants and forming biofilms, which are resistant to antibiotics and the immune system. The health challenges include chronic infections that are difficult to eradicate, severe complications like sepsis and repeated surgeries, and increased antibiotic resistance. Innovative solutions, such as preventive antimicrobial coatings, are urgently needed. This doctoral project aims to develop and test new antimicrobial coatings to prevent bacterial adhesion and biofilm formation. Objectives include formulating and applying silane-biopolymers with antimicrobial properties, testing their effectiveness against various microorganisms, and assessing biocompatibility in vitro and in vivo. These coatings could revolutionize the management of implantable devices, improving patient outcomes, reducing healthcare burdens, and maintaining patients' quality of life

Supervisor: Roberta Censi

Co-supervisor: Luca Agostino Vitali

Scholarship funded under FISA Project, code: FISA-2022-00931. Title: Advanced Antimicrobial Surface Coatings for Biomedical Applications (ADMIRE); CUP: J13C24000100001

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses; 3 ECTS for participation in seminars and events

- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

### **Mandatory Period of research mobility abroad: at least 6 months**

*Special requirements, additional to "standard" ones:*

The Phd Student must collaborate in the reporting activities as scheduled and foreseen in the Funding Program and project including **annual report**

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### **Scholarship code CHEM8**



Ministero  
dell'Università  
e della Ricerca



Italiadomani  
PIANO NAZIONALE  
DI RIPRESA E RESILIENZA



Language of the Phd Program: English

PhD Course and curriculum: **Chemical and Pharmaceutical Sciences and Biotechnology** – curriculum **Chemical Sciences**

Leader of the Phd Course: Prof. Claudio Pettinari

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic: **Organic Chemistry - Innovative synthetic methodologies for the sustainable preparation of biologically active molecules**

Project: The project aims to contribute to the development of new synthetic protocols with low environmental impact, aimed at minimizing waste production (prevention of natural resources, better quality of life and the environment) and lower energy consumption. In particular, by exploiting innovative technologies such as flow chemistry (also photoflow), processes promoted by microwaves, the use of supported solid reagents and the implementation of one-pot processes, the doctoral student will develop new protocols aimed at the synthesis and derivatization of biologically active and pharmacologically useful heterocyclic systems, as well as to preparation of "small molecules", key intermediates for the preparation of complex molecular architectures.

Supervisor: Prof. Alessandro Palmieri

Scholarship funded under NGEU – PNRR, DM 630/2024 M4 C2 I3.3, CUP J11J24001870006 With the contribution of Indena s.p.a. – VAT N° / registration n°: 04411780150

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

*Special requirements, additional to “standard” ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program and meet any further requirements set by the MUR in the framework of the PNRR (Italian National Plan for Recovery and Resilience) – NGEU, and in particular under the Ministerial Decree n. 630/2024:

- Semestral reports through the MUR dedicated online portal
- Respect of the DNSH principle and horizontal principles of the Program
- Respect of deadlines and guidelines set by the MUR
- Mandatory periods in Italy and abroad:
  - o Mandatory period of research mobility abroad: at least 6 months, no more than 12
  - o Mandatory period in the Company that cofunds the scholarship: at least 6 months up to 18 months

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### **Scholarship code CHEM9**



Language of the Phd Program: English

PhD Course and curriculum: **Chemical and Pharmaceutical Sciences and Biotechnology** – curriculum **Chemical Sciences**

Leader of the Phd Course: Prof. Claudio Pettinari

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project: **Synthesis and characterization of innovative materials for catalytic processes**  
Project

Ammonia production plays a crucial role in the chemical industry, being a key component for the production of fertilizers, explosives and numerous other chemical products. However, the traditional Haber-Bosch process, while highly effective, requires high amounts of energy and uses iron-based catalysts which have limitations in terms of efficiency and sustainability. Therefore, the objective of this research is to develop and characterize innovative catalysts for the production of ammonia, possibly tested in other reactions, using a pilot plant to study in detail the kinetics and thermodynamics of the new materials.

Supervisor: Mario Berrettoni

Co-supervisor: Maura Pellei

Scholarship funded under NGEU – PNRR, DM 630/2024 M4 C2 I3.3, CUP J11J24001870006 With the contribution of KairoSpace S.r.l. – VAT N° / registration n°: 04268240712

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

*Special requirements, additional to “standard” ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program and meet any further requirements set by the MUR in the framework of the PNRR (Italian National Plan for Recovery and Resilience) – NGEU, and in particular under the Ministerial Decree n. 630/2024:

- Semestral reports through the MUR dedicated online portal
- Respect of the DNSH principle and horizontal principles of the Program
- Respect of deadlines and guidelines set by the MUR
- Mandatory periods in Italy and abroad:
  - o Mandatory period of research mobility abroad: at least 6 months, no more than 12
  - o Mandatory period in the Company that cofunds the scholarship: at least 6 months up to 18 months

## **Scholarship code COMP 1**

Language of the Phd Program: English

PhD Course and curriculum: **Computer Science and Mathematics**

Leader of the Phd Course: Prof. Andrea Polini

Lead Partner of the PhD Program: University of Camerino

### **Research Topic and project: Innovation in digital management of urban sanitation services**

Project: The project aims to innovate the management of urban sanitation services and the tracking of waste supply chains according to the technical and quality requirements stipulated by ARERA by exploiting blockchain technology for transparency, traceability, trust and security. For this purpose, it will be necessary to develop smart contracts and software programs installed and executed in the blockchain and coordinate execution according to a priori codified rules. The key idea to reach this goal is to combine model-driven approaches with the technologies needed to support the digitization of processes, their mapping and the development of innovative traceability systems.

Supervisor: Prof. Flavio Corradini

Scholarship cofunded by the company

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

### **Mandatory Period of research mobility abroad: at least 6 months**

Further mandatory period of research and training mobility for the scope of the research topic (in Italy where applicable): at least 6 months

Mandatory period in a Company (where applicable): up to 18 months

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### **Scholarship code COMP 2**

Language of the Phd Program: English

PhD Course and curriculum: **Computer Science and Mathematics**

Leader of the Phd Course: Prof. Andrea Polini

Lead Partner of the PhD Program: University of Camerino

Research Topic and project: **Traceability and management of waste supply chains for its digital transformation**

Project: Waste management requires careful and sometimes critical procedures when, for example, handling hazardous/special waste. These are relevant application domains from the scientific research perspective in computer science. They deal with various forms of objects (waste), and the processing procedures are diverse, typically depending on the types of waste, and distributed in time and space. Formalization of processes, simulation of their behaviour, and management and analysis of the vast amount of data and information produced are topics that can no longer be procrastinated to predict situations of interest, prevent dangerous situations, and make increasingly informed decisions to reduce costs for citizens when dealing with urban waste. To this end, it is necessary to investigate and design a digital platform that knows how to integrate objects and their connections, as in IoT and Blockchain, to ensure integrity and transparency of processes and traceability of transformations and repository, middleware as a dashboard for integration and analysis data and information from the different digital modules involved, and digital twin of physical objects integrated to business processes to simulate and predict abnormal behaviours.

Supervisor: Prof. Flavio Corradini

Scholarship co-funded by the company

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills



- 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

Mandatory Period of research mobility abroad: at least 6 months

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): at least 6 months (where applicable)

Mandatory period in a Company (where applicable): up to 18 months

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### **Scholarship code COMP 3**



Language of the Phd Program: English

PhD Course and curriculum: Computer Science and Mathematics

Leader of the Phd Course: Prof. Andrea Polini

Lead Partner of the PhD Program: University of Camerino

Research Topic and project: **Models and computational systems for automated testing**

Project: The research project aims to develop models for automatic quality testing in an industrial environment. For this purpose, various measurement techniques, related error theory and information extraction using Machine Learning techniques will be analyzed. It is also intended to develop computational codes to concretely test and validate these methodologies with case studies provided by real industrial applications.

Supervisor: Prof.ssa Nadaniela Egidi

Scholarship funded under NGEU – PNRR, DM 630/2024 M4 C2 I3.3, CUP J11J24001890006

With the contribution 2T S.r.l– VAT N° / registration n°: 02066870433

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

- 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

*Special requirements, additional to “standard” ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program and meet any further requirements set by the MUR in the framework of the PNRR (Italian National Plan for Recovery and Resilience) – NGEU, and in particular under the Ministerial Decree n. 630/2024:

- Semestral reports through the MUR dedicated online portal
- Respect of the DNSH principle and horizontal principles of the Program
- Respect of deadlines and guidelines set by the MUR
- Mandatory periods in Italy and abroad:
  - o Mandatory period of research mobility abroad: at least 6 months, no more than 12
  - o Mandatory period in the Company that cofunds the scholarship: at least 6 months up to 18 months

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#### **Scholarship code COMP 4**

Language of the Phd Program: English

PhD Course and curriculum: **Computer Science and Mathematics**

Leader of the Phd Course: Prof. Andrea Polini

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project: **Development of Formal Tools and Methodologies for Brain Computer Interface**

Project: In this project, we will study the combination of Machine Learning Techniques with Formal Languages for the analysis of spatio-temporal signals to develop a Brain Computer Interface (BCI) system that is able to control movement of different kinds of equipment in both virtual and physical environments. The goal is to study the combination of ML and Formal Methods to lower the gap between the BCI Motor Imagery systems and their actual implementation in real-world scenarios, for example, to help people with severe motor disabilities.

Supervisor: Prof. Michele Loreti

Scholarship co-funded by Unicam

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

### **Mandatory Period of research mobility abroad: at least 6 months**

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#### **Scholarship code COMP 5**

Language of the Phd Program: English

PhD Course and curriculum: **Computer Science and Mathematics**

Leader of the Phd Course: Prof. Andrea Polini

Lead Partner of the PhD Program: University of Camerino

Research Topic and project: **Object-Centric Process Mining Novel Methodologies for multi- dimensional Process Optimization**

Project: The project aims to study and develop innovative methodologies and techniques in the area of Business Process Management, particularly in Process Mining. More specifically, the project will focus on the analysis, optimization, and monitoring of business processes using case studies from the real world. Particular attention will be given to techniques pertaining to the field of object-centric process mining, an approach that allows the modelling and analysis of processes involving multiple interconnected entities, overcoming the limitations of traditional process mining methods focused on a single type of event. This methodology makes it possible to represent and analyze processes involving different types of objects, such as documents, products, and customers, which interact with each other through various process activities. The main objective of the project is to develop advanced OCPM tools and techniques that can be applied to real-world case studies, thereby improving the understanding and efficiency of business processes. Applications definition and study of innovative OCPM-type techniques on data and trust scenarios, resulting from the blockchain domain, especially if based on flexible processes are desired.

Supervisor: Prof.ssa Barbara Re

Scholarship co -funded by Unicam

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

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### **Scholarship code COMP 6**



Language of the Phd Program: English

PhD Course and curriculum: **Computer Science and Mathematics**

Leader of the Phd Course: Prof. Andrea Polini

Lead Partner of the PhD Program: University of Camerino

Research Topic and project: **AI FOR OPEN DATA PLATFORMS**

Project: In today's information driven world, open data is crucial in making valuable structured data freely accessible to the public. The FAIR principles have been defined to characterize fundamental aspects that have to be addressed in order to have an effective way of sharing data sets for their possible usage.

The FAIR Data Principles set out criteria that enable the philosophy of openness to be realized in a tangible way through modern publishing practices and infrastructures that support current data science needs. On the other hand the mere enunciation of such principles do not enable the satisfaction of the principles “per se”. This project intends to build on the results already obtained within the ODECO project, applying AI based approaches to improve the quality of data sets in relation to the mentioned principles and aspects. In particular AI based techniques such as LLM and Knowledge Graphs will be used (and are currently used) both to improve the metadata associated to a datasets and to “intelligently” link data sets, to provide powerful search and retrieval mechanisms to the final users.

Supervisor: Prof. Andrea Polini

Scholarship funded under NGEU – PNRR, DM 629/2024, M4 C1 I4.1 “Pubblica Amministrazione”, **CUP J11J24001880006**

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

*Special requirements, additional to “standard” ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program and meet any further requirements set by the MUR in the framework of the PNRR (Italian National Plan for Recovery and Resilience) – NGEU, and in particular under the Ministerial Decree n. 629/2024:

- Semestral reports through the MUR dedicated online portal
- Respect of the DNSH principle and horizontal principles of the Program
- Respect of deadlines and guidelines set by the MUR
- Mandatory periods in Italy and abroad:
  - o Mandatory period of research mobility abroad: at least 6 months, no more than 12
  - o Further mandatory period of research and training mobility for the scope of the research topic : at least 6 months, no more than 12.

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**Scholarship code: COMP 7**

Language of the Phd Program: English

PhD Course and curriculum: **Computer Science and Mathematics**

Leader of the Phd Course: Prof. Andrea Polini

Lead Partner of the PhD Program: University of Camerino

Research Topic and project: **Optimization of Industrial Cyber-Physical Systems combining Digital Twin and Artificial Intelligence**

Project: The project aims to define optimization systems based on Digital Twin technology and Artificial Intelligence techniques applied to cyber-physical systems (CPS) related to machinery used within industrial and civil processes. Specifically, it aims to:

- Define a system for representing and monitoring CPS systems in Industry 4.0 environments, using Digital Twin technology to reduce the gap between physical reality and the digital world.
- Define an optimization system in which Machine Learning and Deep Learning models support the automatic correlation of CPS state with process configuration data.
- Develop automatic and semi-automatic modules based on Digital Twin to reflect the optimized state of the machine's digital model on its real counterpart.
- Define new business models based on Blockchain and Distributed Ledger to manage decentralized CPS data and optimization

Supervisor: Prof.ssa Barbara Re

Scholarship funded under NGEU – PNRR, DM 630/2024 M4 C2 I3.3, CUP J11J24001890006

With the contribution of Euro Engineering – VAT N° / registration n°: 02217530449

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

*Special requirements, additional to “standard” ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program and meet any further requirements set by the MUR in the framework of the PNRR (Italian National Plan for Recovery and Resilience) – NGEU, and in particular under the Ministerial Decree n. 630/2024:

- Semestral reports through the MUR dedicated online portal
- Respect of the DNSH principle and horizontal principles of the Program
- Respect of deadlines and guidelines set by the MUR
- Mandatory periods in Italy and abroad:

- o Mandatory period of research mobility abroad: at least 6 months, no more than 12
- o Mandatory period in the Company that cofunds the scholarship: at least 6 months up to 18 months

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**Position code: COMP 8**

**Type of position: supernumerary – international mobility Phd Position without scholarship**

Language of the Phd Program: English

PhD Course and curriculum: **Computer Science and Mathematics**

Leader of the Phd Course: Prof. Andrea Polini

Lead Partner of the PhD Program: University of Camerino

Partner and operative site of the Phd Student: University of Camerino –Italy; FHNW University of Applied Sciences and Arts, Northwestern Switzerland

Research Topic and project: **BIM and Digital Twins - Better together**

Project: This project intends to leverage BIM with the integration of Digital Twins. In particular the research will be directed to solve the following questions: How BIM powered digital twins can support the different stakeholder groups? How do existing BIM frameworks support this and what functionalities can be enabled through a digital twin? Review of how BIM can enhance the exchange of information across different knowledge arenas/domains. How can the functionality of BIM support this? Development of frameworks for the acquisition of data throughout the asset lifecycle – the use of symbolic and non-symbolic AI. How can this be implemented? What data could be collected for compliance? This could feed into the proposal work. What could be the standards for the next generation of compliance and what role would real-time data play a role in this?

Supervisor: Prof. Emanuele Laurenzi

Co-supervisor: Prof. Andrea Polini

Position managed under an agreement signed in 2022 between UNICAM and FHNW University of Applied Sciences and Arts, Northwestern Switzerland, for research in the field of “Business Information Systems”.

Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

- 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

o Mandatory period of research mobility abroad: at least 6 months

*Special requirements, additional to “standard” ones:*

Further aspects related to this topic must comply with the Agreement the position is based on

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### **Scholarship code: LEGAL 1**



Language of the Phd Program: English

PhD Course and curriculum: **Legal and Social Sciences - Curriculum Fundamental Rights in the Global Society**

Leader of the Phd Course: Carlotta Latini

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project: **Potential and limits of regulatory sandboxes/ Potenzialità e limiti delle sandbox normative**

The project aims to investigate the virtual sandbox in the field of Financial Technology, introduced with the decree of the Ministry of Economy and Finance of 30 April 2021, n. 100, comparing the results of theoretical reflection with the analysis of the use of sandboxes, the results of which can offer a guide to distinguish best practices and for a conscious regulation, in line with the principles and constitutional rules of reference.

Considering the wide discretion enjoyed by the independent administrative authorities on the admission or denial of the project to be tested, it will also be necessary to delve deeper into the role and function of these authorities, verifying how high the risk of discrimination and inequalities between economic operators admitted or not admitted to the trial and to what extent the sandbox institute may collide with internal and European rules on free competition.

Supervisor: Tatiana Guarnier

Co-supervisor: Paolo Bianchi

Scholarship funded under NGEU – PNRR, DM 629/2024, M4 C1 I4.1 “Pubblica Amministrazione”, CUP J11J24001900006

With the foreseen contribution of an institution competent on the matter (e.g. ITTIG-CNR)

Exclusive participation to the project for the entire duration of the scholarship is foreseen.



Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

*Special requirements, additional to “standard” ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program and meet any further requirements set by the MUR in the framework of the PNRR (Italian National Plan for Recovery and Resilience) – NGEU, and in particular under the Ministerial Decree n. 629/2024:

- Semestral reports through the MUR dedicated online portal
- Respect of the DNSH principle and horizontal principles of the Program
- Respect of deadlines and guidelines set by the MUR
- Mandatory periods in Italy and abroad:
  - o Mandatory period of research mobility abroad: at least 6 months, no more than 12
  - o Further mandatory period of research and training mobility for the scope of the research topic: at least 6 months, no more than 12.

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**Scholarship code: LEGAL 2**

Language of the Phd Program: English

PhD Course and curriculum: **Legal and Social Sciences - Curriculum Civil Law and Constitutional Legality**

Leader of the Phd Course: Carlotta Latini

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

**Research Topic and project: Person and Markets in the Sustainable Transition Era: the Role of Civil Law – “Fragility and sporting and social inclusion - (FSSI)”**

The project has two intervention plans: the study of the legal framework and the practical application profile of the rules. As regards the first, it is necessary to consider the scientific aspect of the research, which concerns the study of the rules (national, international and supranational) relating to the protection and, above all, the pro-active support of people with fragility. In this sense, the study will also be dynamic: it will not be enough to identify the rules for recognizing and supporting people with fragility, but it will also be necessary to, first, investigate and, then, suggest the necessary innovations, in order to make inclusion of fragile people more efficient.

In relation to the second, the operational aspect will also serve to identify the areas that require greater attention for support interventions.

Supervisor: Antonio Magni

Scholarship funded under NGEU – PNRR, DM 630/2024, M4 C2 I3.3, CUP J11J24001910006  
With the contribution of GABRI SRL (JESI)– VAT N° / registration n°: 00916630429

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

*Special requirements, additional to “standard” ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program and meet any further requirements set by the MUR in the framework of the PNRR (Italian National Plan for Recovery and Resilience) – NGEU, and in particular under the Ministerial Decree n. 630/2024:

- Semestral reports through the MUR dedicated online portal
- Respect of the DNSH principle and horizontal principles of the Program
- Respect of deadlines and guidelines set by the MUR
- Mandatory periods in Italy and abroad:
  - o Mandatory period of research mobility abroad: at least 6 months, no more than 12
  - o Mandatory period in the Company that cofunds the scholarship: at least 6 months up to 18 months.
  - o Mandatory period in a Company: stage, 10 months - third sector organisation.

**Scholarship code: LEGAL 3**

Language of the Phd Program: English

PhD Course and curriculum: **Legal and Social Sciences - Curriculum Civil Law and Constitutional Legality**

Leader of the Phd Course: Carlotta Latini

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project: **Contractual Innovation in the Energy Sector: Analysis of Structures and Types of Traditional Contracts, Blockchain and Smart Contracts for Energy Production, Consumption and Sharing / Innovazione Contrattuale nel Settore Energetico: Analisi delle Strutture e delle Tipologie dei Contratti tradizionali, Blockchain e Smart Contracts per la Produzione, il Consumo e la Condivisione dell'Energia**

E-CON-SMART aims to analyze "smart" energy contracts (B2B, A2B, and B2C) utilized by the CACER and regulated by the Italian "CER Decree". The primary goal of E-CON-SMART is to draft appropriate contractual clauses and identify the applicable regulations. Additionally, E-CON-SMART will focus on the supply chains of energy production, with particular attention to the agro-photovoltaic sector. This sector is incentivized by the recent Decree-Law on Agriculture, prompting a specific analysis of "intelligent" land use contracts. These contracts combine the ownership or rental of production facilities with the development of agricultural production by integrating smart bargaining and smart monitoring of both agricultural and energy production within CACER as appropriately identified.

Supervisor: Lucia Ruggeri [lucia.ruggeri@unicam.it](mailto:lucia.ruggeri@unicam.it)

Scholarship funded under Research Agreement UNICAM/ Avv. Francesco Pezone - Studio Legale. With the contribution of Avv. Francesco Pezone - Studio Legale (Torino) – VAT N° / registration n°: 02802040614

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

- 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

### **Mandatory Period of research mobility abroad: at least 6 months**

*Special requirements, additional to “standard” ones:*

Mandatory period in a Company: at least 6 months up to 18 months (Studio Legale Avv. Francesco Pezone)

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program:

- Semestral reports
- Dissemination and Communication activities

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### **Scholarship code: LEGAL 4**



Language of the Phd Program: English

PhD Course and curriculum: **Legal and Social Sciences - Curriculum Fundamental Rights in the Global Society**

Leader of the Phd Course: Carlotta Latini

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project: **“Innovations on regulatory and procedural simplification: what impact on administrative discretion?” – “Le innovazioni sulla semplificazione normativa e procedimentale: quale impatto sulla discrezionalità amministrativa?”**

The objective of administrative simplification is pursued with significant interventions in various sectors and areas: precisely, these interventions concerned both regulatory and procedural simplification. The research intends to evaluate the impact that the new procedural rules can have on the methods of exercising administrative discretion and on the strengthening of "administrative capacity", with repercussions on the full exercise of citizens' individual freedoms.

Supervisor: Sara Spuntarelli

Scholarship funded under NGEU – PNRR, DM 629/2024, M4 C1 I4.1 “Pubblica Amministrazione”, CUP J11J24001900006

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

*Special requirements, additional to “standard” ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program and meet any further requirements set by the MUR in the framework of the PNRR (Italian National Plan for Recovery and Resilience) – NGEU, and in particular under the Ministerial Decree n. 629/2024:

- Semestral reports through the MUR dedicated online portal
- Respect of the DNSH principle and horizontal principles of the Program
- Respect of deadlines and guidelines set by the MUR
- Mandatory periods in Italy and abroad:
  - o Mandatory period of research mobility abroad: at least 6 months, no more than 12
  - o Further mandatory period of research and training mobility for the scope of the research topic: at least 6 months, no more than 12.

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**Scholarship code: LIFE 1**

Language of the Phd Program: English

PhD Course and curriculum: **LIFE AND HEALTH SCIENCES – Curriculum: ONE HEALTH**

Leader of the Phd Course: Attilio Fabbretti

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project:

**Title: Yeast symbionts as tool for control mosquito vectors**

Description: The project aims to characterize fungal blends to lure and kill mosquitoes. To that the fungal volatilome will be detailed in relation to specific attractive abilities as well as the entomopathogenic property of selected fungi associated with specific mosquito breeding site will be also analysed.

Supervisor: Guido Favia

Co-supervisor: Irene Ricci

Scholarship funded under NGEU – PNRR, DM 629/2024 M4 C1 I4.1 “ricerca PNRR”, **CUP J11J24001920006**

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

*Special requirements, additional to “standard” ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program and meet any further requirements set by the MUR in the framework of the PNRR (Italian National Plan for Recovery and Resilience) – NGEU, and in particular under the Ministerial Decree n. 629/2024:

- Semestral reports through the MUR dedicated online portal
- Respect of the DNSH principle and horizontal principles of the Program
- Respect of deadlines and guidelines set by the MUR
- Mandatory periods in Italy and abroad:
  - o Mandatory period of research mobility abroad: at least 6 months, no more than 12

**Scholarship code: LIFE 2**



Language of the Phd Program: English

PhD Course and curriculum: **LIFE AND HEALTH SCIENCES – Curriculum: ONE HEALTH**

Leader of the Phd Course: Attilio Fabbretti

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project:

**Title: The laboratory analysis as a tool for animal health surveillance and public health protection**

**Description:** The aim of the project is to evaluate laboratory alterations in various animal species in order to correlate them with the presence of pathogenic noxes potential causes of zoonoses. This will be achieved through the identification, the characterization and validation of instruments and diagnostic tests useful in veterinary laboratory practice that allow to obtain more accurate and sensitive results. In addition, many diseases have a similar pattern in dogs and humans, and it has been shown that dogs can always be considered as sentinel animals in relation to human health. The results of laboratory tests provide a scientific basis for the planning and implementation of health surveillance programs and disease control interventions. Information sharing and collaboration between different components of the health sector are crucial to address animal and public health challenges in an effective and coordinated manner

Supervisor: Alessandra Gavazza

Co-supervisor: Giacomo Rossi

Scholarship funded under NGEU – PNRR, DM 630/2024 M4 C2 I3.3, CUP J11J24001930006

With the contribution of CDVET RESEARCH – VAT N° / registration n°: 10111011002

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:

- 50 ECTS in research activity (writing and defend the Doctoral dissertation)
- 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

*Special requirements, additional to “standard” ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program and meet any further requirements set by the MUR in the framework of the PNRR (Italian National Plan for Recovery and Resilience) – NGEU, and in particular under the Ministerial Decree n. 630/2024:

- Semestral reports through the MUR dedicated online portal
- Respect of the DNSH principle and horizontal principles of the Program
- Respect of deadlines and guidelines set by the MUR
- Mandatory periods in Italy and abroad:
  - o Mandatory period of research mobility abroad: at least 6 months, no more than 12
  - o Mandatory period in the Company that co-funds the scholarship: at least 6 months up to 18 months

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**Scholarship code: LIFE 3**



Language of the Phd Program: English

PhD Course and curriculum: **LIFE AND HEALTH SCIENCES – Curriculum: ONE HEALTH**

Leader of the Phd Course: Attilio Fabbretti

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project:

**Title: Clinical evaluation of an antiseptic medical device to be used during surgery, in order to reduce post-operative infections in veterinary medicine. Study of product stability and clinical efficacy**

**Description:**

The project's aim is to evaluate effectiveness of an antimicrobial solution, which does not contain antibiotics, for use in veterinary medicine during surgery on patients with infections (e.g. osteomyelitis), in order to reduce the use of antibiotics. This liquid product boasts technology that prevents bacteria from forming biofilm, thus reducing the possibility of colonization and proliferation bacterial. After duly requesting authorization and the informed consent of the owner, we will proceed to use the product (already in use in human medicine) in a group of patients spontaneously affected by surgical site infections. We will carry out a surgical debridement (as per practice), a swab to be sent to the microbiology laboratory for culture and susceptibility testing and the infected site will be irrigated with this solution to mechanically eliminate the debris, reduce the bacterial load, provide a cleaning action and prevent the biofilm formation. Before the synthesis of the surgical wound another procedure will be performed swab to be sent to the Microbiology laboratory. Patients will be followed clinically and the response to treatment will be evaluated through clinical examination, blood tests and diagnostic tests (X-ray, ultrasound and possibly CT), in the event that the patient does not respond to therapy, we will proceed with treat it in the conventional way.



Supervisor: Angela Palumbo Piccionello

Scholarship funded under NGEU – PNRR, DM 630/2024 M4 C2 I3.3, CUP J11J24001930006  
Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

*Special requirements, additional to “standard” ones:*

The Phd Student must collaborate in the reporting activities as scheduled in the Funding Program and meet any further requirements set by the MUR in the framework of the PNRR (Italian National Plan for Recovery and Resilience) – NGEU, and in particular under the Ministerial Decree n. 630/2024:

- Semestral reports through the MUR dedicated online portal
- Respect of the DNSH principle and horizontal principles of the Program
- Respect of deadlines and guidelines set by the MUR
- Mandatory periods in Italy and abroad:
  - o Mandatory period of research mobility abroad: at least 6 months, no more than 12
  - o Mandatory period in the Company that cofunds the scholarship: at least 6 months up to 18 months

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**Scholarship code: LIFE 4**

Language of the Phd Program: English

PhD Course and curriculum: **LIFE AND HEALTH SCIENCES – Curriculum: MOLECULAR BIOLOGY AND CELLULAR BIOTECHNOLOGY**

Leader of the Phd Course: **Attilio Fabbretti**

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project:

**Title: EXPLORING THE DARK GENOME OF NEURODEGENERATIVE DISORDERS**

**Description:** The primary objective of this research is to comprehensively characterize non-SNP genetic variations, including insertions, deletions, copy number variations (CNVs), and structural variants (SVs), within the dark genome of neurodegenerative disease patients. Leveraging advanced sequencing technologies and innovative bioinformatics pipelines, we will analyze genomic data from patient cohorts to identify and annotate these elusive genetic elements. By elucidating the landscape of non-SNP genetic variation, we aim to uncover novel disease-associated loci and regulatory elements that may have been previously overlooked.

Supervisor: Valerio Napolioni

Scholarship co - funded by UNICAM and supervisor research funds

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

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**Scholarship code: LIFE 5**

Language of the Phd Program: English

PhD Course and curriculum: **LIFE AND HEALTH SCIENCES – Curriculum: ONE HEALTH**

Leader of the Phd Course: Attilio Fabbretti

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project:

**Title: Insecticide resistance and symbiosis in mosquito vectors**

**Description:**

Combining metagenomics and selection studies with innovative structural and biochemical approaches to dissect mechanisms and metabolic pathways, the project aims to answer the following questions: which bacteria contribute to mosquito insecticide susceptibility/resistance? How do they perform this function? Finally, how does insecticide resistance in turn affect symbionts, the interactions between them, and thus host biology? We aim to investigate the contribution of some components of the microbiota with particular regard to the *Asaia*, *Serratia*, *Klebsiella* and *Pantoea* genera, in the onset of resistance to insecticides in mosquitoes. These bacteria will be isolated in different populations of several mosquito species/strains to be collected in Europe, Americas and Africa, in very different eco-ethological contexts (i.e. intense or non-intensive treatment with insecticides). The genomic analysis of bacteria will essentially focus on the analysis of genes that confer resistance to insecticides or Plant Secondary Compounds. In the first instance, we will analyse genes encoding PH, Cytochrome P450 and those involved in the degradation pathways of geraniol, cumate, cinnamate and ene-pinene / limonene. Through phylogenomics analysis, we will verify whether, in relation to genome reduction, these genes are absent or present, how functional they are and the consequent effects on insecticide resistance.

Supervisor: Guido Favia

Co-supervisor: Claudia Damiani

Scholarship co funded by UNICAM

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

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## **Scholarship code: LIFE 6**



Language of the Phd Program: English

PhD Course and curriculum: **LIFE AND HEALTH SCIENCES – Curriculum: ONE HEALTH**

Leader of the Phd Course: Attilio Fabbretti

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student (where applicable): University of Camerino **and** “Montagna di Torricchio” Nature Reserve

Research Topic and project:

**Title: Towards the identification and monitoring of old-growth forests: patterns and drivers of multi-taxon forest diversity**

**Description:** Temperate forests are widespread in Europe and provide essential ecosystem services, but they are threatened by global changes. The need to maintain forest diversity is included in all international and national policies; however, many diversity components are still overlooked, and their patterns and drivers remain largely unknown. These taxa are particularly relevant in old-growth forests, representing an incredibly high treasure of biodiversity despite their rarity (< 1%) and continuous decline at alarming rates. The aim of this project is to assess patterns and drivers of multi-taxon forest diversity to provide innovative tools for the identification, conservation, and monitoring of old-growth forests. The main study area will be the Montagna di Torricchio nature Reserve in the framework of the MIMTB project. The PhD student will benefit from several networks and research infrastructures in which our research group is already involved. The outcomes of the project will fulfill the needs of national and international regulations, including the sustainable forest management principles (Forest Europe 2020) and the EU Forest and Biodiversity Strategies for 2030.

Supervisor: Stefano Chelli

Co-supervisor: Roberto Canullo

Scholarship co-funded under “MIMTB - Monitoraggio Integrato Multitaxon Biodiversità” - CUP J13C23000490006 - “National Biodiversity Future Center (NBFC)”, a valere su risorse PNRR, Missione 4 “Istruzione e ricerca”, componente 2 “Dalla ricerca all’impresa”, linea di investimento 1.4 “Potenziamento strutture di ricerca e creazione di “Campioni nazionali di R&S” su alcune key enabling technologies”, finanziato dall’Unione Europea-Next Generation EU.

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

- 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

### **Mandatory Period of research mobility abroad: at least 6 months**

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#### **Scholarship code: LIFE 7**

Language of the Phd Program: English

PhD Course and curriculum: **LIFE AND HEALTH SCIENCES – Curriculum: NUTRITION, FOOD AND HEALTH**

Leader of the Phd Course: Attilio Fabbretti

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student (where applicable): University of Camerino. The PhD Student may have access to the structures involved in the project (i.e. Hospitals and partners involved in the project)

Research Topic and project:

**Title:** Unraveling the pleiotropic effects of vitamin D: from preventive measures to therapeutic support

**Description:** This project aims to investigate the pleiotropic effects of vitamin D through primary and secondary studies, specifically through the following modalities: - Participation in activities related to the conduction of a clinical trial designed to evaluate the effect of restoring normal vitamin D levels on fatigue in cancer patients. - Conducting systematic reviews with meta-analyses designed to evaluate and synthesize the primary evidence available to date in order to outline guidelines for the use of vitamin D in physiological and pathological settings. These new data will help to increase knowledge regarding the pleiotropic effects of vitamin D, guiding the conduct of future clinical studies of both interventional and observational nature and promoting the translatability of the evidence to clinical practice.

Supervisor: Rosita Gabbianelli

Co-supervisor: Laura Bordoni

Scholarship co-funded under project 'HOSPICE' - Fondazione Anello della Vita Onlus (PI Prof. SAGRATINI)

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

**Duration: 3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

### **Mandatory Period of research mobility abroad: at least 6 months**

*Note: this scholarship will be available only in case that the project will be funded and provided to UNICAM*

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### **Scholarship code: LIFE 8**

Language of the Phd Program: English

PhD Course and curriculum: **LIFE AND HEALTH SCIENCES – Curriculum: ONE HEALTH**

Leader of the Phd Course: Attilio Fabbretti

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project:

**Title: DEVELOPMENT OF NEW GUIDELINES FOR THE PREVENTION AND TREATMENT OF BRACHYCEPHALIC OBSTRUCTIVE SYNDROME (BAOS) IN DOGS**

**Description:** This project aims to develop and publish guidelines for the management of brachycephalic syndrome (BAOS) in dogs, so that, in the future, the percentage of patients suffering from severe symptoms and the mortality rate can be reduced. The research project will be divided into two phases. The first phase of the project involves the development of a scoring questionnaire for owners of brachycephalic dogs. The purpose of the questionnaire will be to perform early diagnosis of BAOS, before patients develop serious symptoms. The second phase of the study will instead focus on symptomatic dogs in respiratory failure (RF), conducted at our University Teaching Veterinary Hospital for the management of acute symptoms. The effectiveness of a new device (Continuous Positive Airway Pressure helmet) in the management of patients in acute RF will therefore be evaluated and validated.

Supervisor: Caterina Di Bella

Co-supervisor Angela Palumbo Piccionello

Scholarship co-funded by SANTA CECILIA VET S.R.L., Via Porta Nuova snc - Rapolano Terme, Siena 53040  
P.IVA 01547950525

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

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**Scholarship code: LIFE 9**

Language of the Phd Program: English

PhD Course and curriculum: **LIFE AND HEALTH SCIENCES – Curriculum: ONE HEALTH**

Leader of the Phd Course: Attilio Fabbretti

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project:

**Title:** Use of canine umbilical cord-derived mesenchymal stem

Cells and platelet-rich plasma for the improvement of post-thaw quality related parameters in dog semen

**Description:**

The research focuses on the paracrine activity of umbilical cord derived Mesenchymal stem cells (UC-MSCs) or platelet-rich plasma (PRP) and they capacity to activate the cellular defense mechanisms, the antiapoptotic and antioxidant effect that can avoid the spermatozoa damages normally induced by freezing and thawing of canine semen. The aim of the project is to add canine UC-MSCs and PRP to the commercial canine semen extender during semen freezing in order to evaluate their activity in the protection and repair of sperm for the freezing-induced damages.

Supervisor: Alessandro Troisi

Scholarship co-funded by Unicam

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

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**Scholarship code: LIFE 10**

Language of the Phd Program: English

PhD Course and curriculum: **LIFE AND HEALTH SCIENCES – Curriculum: ONE HEALTH**

Leader of the Phd Course: Attilio Fabbretti

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project:

**Title: Development and characterization of a hypoglycemic nutraceutical product for type-2 diabetes management.**

**Description:** The project aims to develop and characterize a nutraceutical product with hypoglycemic activity, that will be assessed *in vitro* and *in vivo*. *In vitro* evaluations will be carried out by different cellular and molecular biology approaches, aimed at evaluating the normalization of the T2D-specific molecular targets. Conversely, *in vivo* assays will focus on the evaluation of hematobiochemical parameters linked to **type-2 diabetes**. The study would have an impact both from the perspective of the circular economy, thanks to the use of production waste products such as date seeds, and from the perspective of developing a valid dietary and natural alternative or a tool for strengthening the pharmacological treatment of type 2 diabetes.

Supervisor: Alessandro Di Cerbo



Scholarship funded by UNICAM

Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

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**Position code: LIFE 11**

**Type of Position: without scholarship**

Language of the Phd Program: English

PhD Course and curriculum: **LIFE AND HEALTH SCIENCES – Curriculum: NUTRITION, FOOD AND HEALTH**

Leader of the Phd Course: Attilio Fabbretti

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project:

Title: **Multicultural aspects in sensory and consumer sciences.**

Description: This PhD project will explore the influence of multicultural aspects on consumer perceptions and behavior through the use of sensory and consumer science methodologies, in order to develop a deeper understanding of the interaction between sensory and cultural factors in consumer decision-making processes. The main contribution of this research will be to provide strategic, practical and theoretical solutions for the food and consumer industry, in order to improve the processes of innovation and adaptation of products to different global cultural and social contexts.

Supervisor: Elena Vittadini

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

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**Position code: LIFE 12**

**Type of Position: without scholarship**

Language of the PhD Program: English

PhD Course and curriculum: **LIFE AND HEALTH SCIENCES – Curriculum: ONE HEALTH**

Leader of the PhD Course: Attilio Fabbretti

Lead Partner of the PhD Program: University of Camerino

Operative site of the PhD Student: University of Camerino

Research Topic and project:

**Title: Nurse Case Manager Lifestyle Medicine for the patient with Type II Diabetes**

**Description:** Lifestyle Medicine (LM) is considered by many people to be a relatively new discipline despite having been practiced for thousand years. Nurse Case Manager (NCM) interventions in diabetic patients have found an overall improvement in care coordination which has been more accentuated on glycaemic control and proactive interaction between all the actors involved in the care process. The main objective of the Research Project will be to evaluate and measure the NCM in LM view in diabetic subjects from a qualitative and quantitative outcome. Secondly, the assistance provided by NCMLM to subjects suffering from Type 2 Diabetes will be evaluated in the various care settings for the development of the proposed Research Project and also the potential that this health professional could have in the post-Covid-19 pandemic healthcare reorganization will be evaluated.

Supervisor: Fabio Petrelli  
Co-supervisor: Rosita Gabbianelli

Duration: 3 years  
Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

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**Scholarship code: PHYS\_MAT\_EARTH\_1**

PhD Course and curriculum: **Physics, Earth and Materials Sciences** – curriculum **Physics**

Leader of the Phd Course: Prof. Roberto Gunnella

Lead Partner of the PhD Program: University of Camerino

Partner and operative site of the Phd Student: University of Camerino and section INFN-Perugia

**Research Topic and project: Nuclear Physics**

Study of fragmentation cross sections of proton and carbon ion beams on human tissues, through characterization of detectors needed for the measurements, in particular silicon detectors

Supervisor: Stefano Simonucci

Co-supervisor: Leonello Servoli (The National institute of Nuclear Physics INFN-Perugia)

Scholarship co funded under agreement with INFN Perugia.

Exclusive participation to the project for the entire duration of the scholarship is foreseen.

Duration: **3 years**

Provisional starting date: **1<sup>st</sup> November 2024** (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

### **Mandatory Period of research mobility abroad: at least 6 months**

*Special requirements, additional to “standard” ones:*

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): According to the agreement with INFN

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### **Scholarship code: PHYS\_MAT\_EARTH\_2**

Language of the Phd Program: English

PhD Course and curriculum: **Physics, Earth and Materials Sciences** – curriculum **Physical and chemical processes in Earth systems**

Leader of the Phd Course: Roberto Gunnella

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

Research Topic and project: **Near-Surface Geophysical Imaging of Seismogenic Faults**

Geophysical imaging plays a crucial role in understanding the geometry and fluid content of primary geological structures beneath the Earth's surface. The challenge lies in imaging both the very near surface and deep subsurface - ranging from the first 50 meters to depths of up to 2 kilometers. This project aims to characterize key seismogenic faults in Italy by employing a combination of geophysical techniques, including deep resistivity methods, magnetotelluric surveys, and gravimetric analysis. Cutting-edge techniques like electrical resistivity tomography (ERT) allow us to map variations in subsurface resistivity at depths of up to 1-2 kilometers. These variations provide crucial clues about fault zones, fractures, and other geological features. By gaining insights into subsurface fault structures, we enhance our assessment of seismic hazards.

Additionally, the same protocols and techniques can benefit applications such as geothermal feasibility analysis. In addition, the PhD candidate will explore fault related geological features like mud volcanoes and karstic systems.

Supervisor: Miller Zambrano

Scholarship funded under UNICAM funds

Duration: **3 years**

Provisional starting date: **1<sup>st</sup> November 2024** (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

### **Mandatory Period of research mobility abroad: at least 6 months**

*Special requirements, additional to "standard" ones:*

The Phd Student must collaborate in the activities of the project including geological and geophysical campaigns, as well as seminars and workshops of the research group.

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### **Scholarship code: PHYS MAT EARTH 3**

Language of the Phd Program: English

PhD Course and curriculum: **Physics, Earth and Material Sciences** - curriculum **Physical and Chemical Processes in Earth Systems**

Leader of the Phd Course: Roberto Gunnella

Lead Partner of the PhD Program: University of Camerino

Research Topic and project: **Mineralogical characterization of lunar meteorites aimed at the production and testing of lunar regolith simulants.**

This proposal is aimed at:

- examine lunar meteorites in order to let the PhD student acquire knowledge and experience on materials to be mimicked (first 8 months);
- synthesise single minerals (e.g. anorthite, olivine, ortho e clino-pyroxenes, glasses whose composition reproduce impact glasses found in lunar regolith) to be then used for producing the simulant;
- mix the produced minerals in adequate proportions to simulate a loose material and a sintered regolith simulant.

These activities will be performed during the 3-year PhD grant. Furthermore, during the 2nd and 3rd year, the Phd candidate will have to interact with other research group also working on the element extraction from the simulant and on the sintering of the simulant aimed to the manufacture of building material.

Supervisor: Gabriele Giuli

Scholarship co - funded by UNIFI

Duration: **3 years**

Provisional starting **date: 1<sup>st</sup> November 2024** (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

*Special requirements, additional to "standard" ones:*

Further aspects related to these topics must comply with the Agreements the positions are based on.

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**Scholarship code: PHYS MAT EARTH 4**

Language of the Phd Program: English

PhD Course and curriculum: **Physics, Earth and Materials Sciences** – curriculum **Physics**

Leader of the Phd Course: Roberto Gunnella

Lead Partner of the PhD Program: University of Camerino

Operative site of the Phd Student: University of Camerino

**Research Topic and project: Fundamental Physics- Revealing the nature of Universe's dark constituents using multi-messenger data from Black Hole astronomy.**

In particular, the project intends to examine whether the excess vacuum energy predicted by quantum models of field can be resolved through quantum cancellation mechanisms that produce the abundances observed in dark matter. From this, at least two immediate consequences of this mechanism can be emphasized. The first is linked to the abundance of primordial black holes, while the other is a direct unification between the dynamic evolution of dark energy with the fundamental properties of dark matter. So, as potential candidates for dark matter, primordial and astrophysical black holes will be studied first, as well as their interaction and the physics of ultralight fields. To do this, the study of accretion around black holes and of the thermodynamic properties of the latter, as well as the possible interactions with the cosmological background will be taken into consideration.

Supervisor: Stefano Mancini

Co-supervisor: Orlando Luongo

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

*Special requirements, additional to "standard" ones:*

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): at least 6 months including at INAF, ASI, INFN, etc.

**Position code: PHYS MAT EARTH 5**

Type of Position: **supernumerary – international mobility Phd Position - without UNICAM scholarship**

Language of the Phd Program: English

PhD Course and curriculum: **Physics, Earth and Materials Sciences - curriculum Physics**

Leader of the Phd Course: prof. Roberto Gunnella

Lead Partner of the PhD Program: University of Camerino - Italy

Partner and operative site of the Phd Student: University of Toyama (Japan) and University of Camerino - Italy

Position managed under an agreement signed in 2024 between UNICAM and Toyama University, for research in the field of “Science and Engineering”.

Research Topic and project: **X-ray spectroscopy**

Advanced algorithms for data-analysis and interpretation of experimental data collected at synchrotron radiation and free-electron-laser facilities. The experimental program will include performance of x-ray experiments under extreme and/or transient conditions. The data-analysis and computational program will take advantage of recent RMC and AI advances for manipulation of multiple set of data. Multiple-scattering and other advanced simulation programs will be developed and tested for x-ray spectroscopy data of materials under standard and extreme conditions.

Supervisor: Andrea Di Cicco (Unicam)

Co-supervisor: Keisuke Hatada (Toyama University)

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses ; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills



The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

### **Mandatory Period of research mobility abroad: at least 6 months**

*Special requirements, additional to “standard” ones:*

Further aspects related to these topics must comply with the Agreements the positions are based on. However, the cumulative learning time in UNICAM should be at least 18 months.

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**[Joint PhD Programme pursuant to Ministerial Decree No. 226/2021, Art.3 c.2. Phd course under the framework of the REDI research Consortium \(\[www.redi-research.eu/it/homepage/\]\(http://www.redi-research.eu/it/homepage/\)\), among University of Camerino, Gran Sasso Science Institute, National Institute of Geophysics and Vulcanology-INGV, National Institute of Nuclear Physics-INFN:](#)**  
**[Natural hazards and disaster risk reduction](#)**

**Note. The number of topics is higher than the number of positions/scholarships currently available under this Phd Program. The topics may be used for both position with and without scholarships. Positions without scholarship will be available only in case that Ministerial requirements for the activation of positions without scholarship are met.**

#### **Scholarship/position code: NHDRR 1**

Language of the Phd Program: English

PhD Course and curriculum: **Natural Hazards and Disaster Risk Reduction-NHDRR**

Leader of the Phd Course: Emanuele Tondi

Lead Partner of the PhD Program: University of Camerino (UNICAM)

Partners and possible operative sites of the Phd Student: University of Camerino, Gran Sasso Science Institute (GSSI), Istituto Nazionale di Geofisica e Vulcanologia (INGV), Istituto Nazionale di Fisica Nucleare (INFN)

Research Topic and project: ***Analyzing and mapping multiple, potentially concurring natural hazards as a preliminary step for risk reduction.***

The project aims to produce new techniques of analysis and/or geo-referenced mapping of potentially concurring natural hazard factors (e.g., geophysical, hydrogeological and/or meteorological), their reciprocal interactions, and the impact of human activities.

Supervisor: Supervisor and co-supervisor will be identified among the Scientific Board of the PhD Course on the basis of the specific project of the candidate (<https://isas.unicam.it/scientific-board/scientific-board-natural-hazards-and-disaster-risk-reduction>).

Scholarship funded under REDI Consortium <https://www.redi-research.eu/it/homepage/>

Duration: **3 years**

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (3 years): Consistent with the Plan of the Joint Phd Program.

The Phd Student must participate to the workshop of the PhD Course organized by the scientific board twice a year. The PhD student is expected to present his/her project and to demonstrate progress and quality of the research project and an ability to present research. The PhD student will present in front of his/her supervisor and the department faculty, including fellow PhD students, will also be invited.

*Special requirements, additional to "standard" ones:*

Mandatory Period of research mobility abroad: at least 6 months

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): at least 6 months

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**Scholarship/position code: NHDRR 2**

Language of the Phd Program: English

PhD Course and curriculum: **Natural Hazards and Disaster Risk Reduction-NHDRR**

Leader of the Phd Course: Emanuele Tondi

Lead Partner of the PhD Program: University of Camerino (UNICAM)

Partners and possible operative sites of the Phd Student: University of Camerino, Gran Sasso Science Institute (GSSI), Istituto Nazionale di Geofisica e Vulcanologia (INGV), Istituto Nazionale di Fisica Nucleare (INFN)

Research Topic and project: ***Seismic risk reduction of buildings and infrastructures.***

The project aims to provide new tools for the seismic risk reduction, including new methodologies to develop advanced and more refined response models of constructions, new technologies for the mitigation of the damage following earthquakes, and innovative monitoring techniques to reduce prediction uncertainties.

Supervisor: Supervisor and co-supervisor will be identified among the Scientific Board of the PhD Course on the basis of the specific project of the candidate (<https://isas.unicam.it/scientific-board/scientific-board-natural-hazards-and-disaster-risk-reduction>).

Scholarship funded under REDI Consortium <https://www.redi-research.eu/it/homepage/>

Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (3 years): Consistent with the Plan of the Joint Phd Program.

The Phd Student must participate to the workshop of the PhD Course organized by the scientific board twice a year. The PhD student is expected to present his/her project and to demonstrate progress and quality of

the research project and an ability to present research. The PhD student will present in front of his/her supervisor and the department faculty, including fellow PhD students, will also be invited.

*Special requirements, additional to “standard” ones:*

Mandatory Period of research mobility abroad: at least 6 months

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): at least 6 months

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**Scholarship/position code: NHDRR 3**

Language of the Phd Program: English

PhD Course and curriculum: **Natural Hazards and Disaster Risk Reduction-NHDRR**

Leader of the Phd Course: Emanuele Tondi

Lead Partner of the PhD Program: University of Camerino (UNICAM)

Partners and possible operative sites of the Phd Student: University of Camerino, Gran Sasso Science Institute (GSSI), Istituto Nazionale di Geofisica e Vulcanologia (INGV), Istituto Nazionale di Fisica Nucleare (INFN)

Research Topic and project: ***Empirical methods for the evaluation of shaking and risk scenarios of historical and recent earthquakes.***

The purpose of the activity is to use different methods to calculate seismic hazard at the site, calibrated on instrumental and historical-macroseismic data. The candidate will evaluate the impact of different methods on risk evaluation for prevention, seismic codes and civil protection applications.

Supervisor: Supervisor and co-supervisor will be identified among the Scientific Board of the PhD Course on the basis of the specific project of the candidate (<https://isas.unicam.it/scientific-board/scientific-board-natural-hazards-and-disaster-risk-reduction>).

Scholarship funded under REDI Consortium <https://www.redi-research.eu/it/homepage/>

Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (3 years): Consistent with the Plan of the Joint Phd Program.

The Phd Student must participate to the workshop of the PhD Course organized by the scientific board twice a year. The PhD student is expected to present his/her project and to demonstrate progress and quality of the research project and an ability to present research. The PhD student will present in front of his/her supervisor and the department faculty, including fellow PhD students, will also be invited.

*Special requirements, additional to “standard” ones:*

Mandatory Period of research mobility abroad: at least 6 months

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): at least 6 months

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**Scholarship/position code: NHDRR 4**

Language of the Phd Program: English

PhD Course and curriculum: **Natural Hazards and Disaster Risk Reduction-NHDRR**

Leader of the Phd Course: Emanuele Tondi

Lead Partner of the PhD Program: University of Camerino (UNICAM)

Partners and possible operative sites of the Phd Student: University of Camerino, Gran Sasso Science Institute (GSSI), Istituto Nazionale di Geofisica e Vulcanologia (INGV), Istituto Nazionale di Fisica Nucleare (INFN)

Research Topic and project: ***Facilities for laboratory dynamic testing aimed at studying seismic interaction between structures.***

The project aims at developing innovative lab facilities and test rigs capable of simulating the interaction between structures, substructures and soil by exploiting hybrid shaking table and pseudo dynamic equipment. The most promising systems could be realised to carry out experimental investigations in systems of importance for structural and geotechnical engineering.

Supervisor: Supervisor and co-supervisor will be identified among the Scientific Board of the PhD Course on the basis of the specific project of the candidate (<https://isas.unicam.it/scientific-board/scientific-board-natural-hazards-and-disaster-risk-reduction>).

Scholarship funded under REDI Consortium <https://www.redi-research.eu/it/homepage/>

Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (3 years): Consistent with the Plan of the Joint Phd Program.

The Phd Student must participate to the workshop of the PhD Course organized by the scientific board twice a year. The PhD student is expected to present his/her project and to demonstrate progress and quality of the research project and an ability to present research. The PhD student will present in front of his/her supervisor and the department faculty, including fellow PhD students, will also be invited.

*Special requirements, additional to "standard" ones:*

Mandatory Period of research mobility abroad: at least 6 months

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): at least 6 months

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**Scholarship/position code: NHDRR 5**

Language of the Phd Program: English

PhD Course and curriculum: **Natural Hazards and Disaster Risk Reduction-NHDRR**

Leader of the Phd Course: Emanuele Tondi

Lead Partner of the PhD Program: University of Camerino (UNICAM)

Partners and possible operative sites of the Phd Student: University of Camerino, Gran Sasso Science Institute (GSSI), Istituto Nazionale di Geofisica e Vulcanologia (INGV), Istituto Nazionale di Fisica Nucleare (INFN)

Research Topic and project: ***Socio-Economic Impacts of Natural Disasters.***

Socio-economic impacts of natural disasters are nowadays on the top of the policy agendas world-wide. Recent events such as COVID-19, socio-political tensions, man-made risks and climate change claim for a deep understanding of and innovative solutions to the socio-economic challenges in different countries, regions, territories and communities. The research track aims to analyze, both in the ex-ante and ex-post perspectives, the socio-economic impacts of natural disasters by integrating in the REDI multi-disciplinary context research and analyses tackling the socio-economic costs and impacts of disasters at territorial level and providing technical assistance and sound policy advice even in terms of the disaster risk management. Suitable candidates mainly have (but not only) a background in applied economics, regional economics and economic geography.

Supervisor: Supervisor and co-supervisor will be identified among the Scientific Board of the PhD Course on the basis of the specific project of the candidate (<https://isas.unicam.it/scientific-board/scientific-board-natural-hazards-and-disaster-risk-reduction>).

Scholarship funded under REDI Consortium <https://www.redi-research.eu/it/homepage/>

Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (3 years): Consistent with the Plan of the Joint Phd Program.

The Phd Student must participate to the workshop of the PhD Course organized by the scientific board twice a year. The PhD student is expected to present his/her project and to demonstrate progress and quality of the research project and an ability to present research. The PhD student will present in front of his/her supervisor and the department faculty, including fellow PhD students, will also be invited.

*Special requirements, additional to "standard" ones:*

Mandatory Period of research mobility abroad: at least 6 months

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): at least 6 months

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**Scholarship/position code: NHDRR 6**

Language of the Phd Program: English

PhD Course and curriculum: **Natural Hazards and Disaster Risk Reduction-NHDRR**

Leader of the Phd Course: Emanuele Tondi

Lead Partner of the PhD Program: University of Camerino (UNICAM)

Partners and possible operative sites of the Phd Student: University of Camerino, Gran Sasso Science Institute (GSSI), Istituto Nazionale di Geofisica e Vulcanologia (INGV), Istituto Nazionale di Fisica Nucleare (INFN)

Research Topic and project: ***The participation of communities in the processes of post-disaster reconstruction and recovery.***

The process of physical reconstruction of an area hit by a disaster should be consistent with the socioeconomic revival necessary to complete the recovery phase. All this concerns and relates closely with the needs of the affected communities. Defining ways of interaction among planners, economists and sociologists who interpret these needs, as well as the ways of interacting and engaging with the communities themselves, is a primary objective of this research topic.

Supervisor: Supervisor and co-supervisor will be identified among the Scientific Board of the PhD Course on the basis of the specific project of the candidate (<https://isas.unicam.it/scientific-board/scientific-board-natural-hazards-and-disaster-risk-reduction/>).

Scholarship funded under REDI Consortium <https://www.redi-research.eu/it/homepage/>

Duration: 3 years

Provisional starting date Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (3 years): Consistent with the Plan of the Joint Phd Program.

The Phd Student must participate to the workshop of the PhD Course organized by the scientific board twice a year. The PhD student is expected to present his/her project and to demonstrate progress and quality of the research project and an ability to present research. The PhD student will present in front of his/her supervisor and the department faculty, including fellow PhD students, will also be invited.

*Special requirements, additional to "standard" ones:*

Mandatory Period of research mobility abroad: at least 6 months

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): at least 6 months

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**Scholarship/position code: NHDRR 7**

Language of the Phd Program: English

PhD Course and curriculum: **Natural Hazards and Disaster Risk Reduction-NHDRR**

Leader of the Phd Course: Emanuele Tondi

Lead Partner of the PhD Program: University of Camerino (UNICAM)

Partners and possible operative sites of the Phd Student: University of Camerino, Gran Sasso Science Institute (GSSI), Istituto Nazionale di Geofisica e Vulcanologia (INGV), Istituto Nazionale di Fisica Nucleare (INFN)

Research Topic and project: ***The green and digital transitions in the framework of the Next generation EU: from strategies to action plans.***

In a moment of deep understanding and sharing of some European strategies towards the green and digital transitions, particularly useful are insights into the role that urban planning can have in interpreting those strategies and implementing coherent applications and projects.

Supervisor: Supervisor and co-supervisor will be identified among the Scientific Board of the PhD Course on the basis of the specific project of the candidate (<https://isas.unicam.it/scientific-board/scientific-board-natural-hazards-and-disaster-risk-reduction>).

Scholarship funded under REDI Consortium <https://www.redi-research.eu/it/homepage/>

Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (3 years): Consistent with the Plan of the Joint Phd Program.

The Phd Student must participate to the workshop of the PhD Course organized by the scientific board twice a year. The PhD student is expected to present his/her project and to demonstrate progress and quality of the research project and an ability to present research. The PhD student will present in front of his/her supervisor and the department faculty, including fellow PhD students, will also be invited.

*Special requirements, additional to "standard" ones:*

Mandatory Period of research mobility abroad: at least 6 months

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): at least 6 months

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**Scholarship/position code: NHDRR 8**

Language of the Phd Program: English

PhD Course and curriculum: **Natural Hazards and Disaster Risk Reduction-NHDRR**

Leader of the Phd Course: Emanuele Tondi

Lead Partner of the PhD Program: University of Camerino (UNICAM)

Partners and possible operative sites of the Phd Student: University of Camerino, Gran Sasso Science Institute (GSSI), Istituto Nazionale di Geofisica e Vulcanologia (INGV), Istituto Nazionale di Fisica Nucleare (INFN)

Research Topic and project: ***The use of virtual representation for the enhancement of historic and artistic assets.***

The enhancement of historic and artistic assets, in particular those located in areas prone to natural disasters, requires fostering innovative ways of interaction with and enjoyment of those assets by their users, also through the possibilities offered today by virtual representation and augmented reality.

Supervisor: Supervisor and co-supervisor will be identified among the Scientific Board of the PhD Course on the basis of the specific project of the candidate (<https://isas.unicam.it/scientific-board/scientific-board-natural-hazards-and-disaster-risk-reduction>).

Scholarship funded under REDI Consortium <https://www.redi-research.eu/it/homepage/>

Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (3 years): Consistent with the Plan of the Joint Phd Program.

The Phd Student must participate to the workshop of the PhD Course organized by the scientific board twice a year. The PhD student is expected to present his/her project and to demonstrate progress and quality of the research project and an ability to present research. The PhD student will present in front of his/her supervisor and the department faculty, including fellow PhD students, will also be invited.

*Special requirements, additional to "standard" ones:*

Mandatory Period of research mobility abroad: at least 6 months

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): at least 6 months

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**Scholarship/position code: NHDRR 9**

Language of the Phd Program: English

PhD Course and curriculum: **Natural Hazards and Disaster Risk Reduction-NHDRR**

Leader of the Phd Course: Emanuele Tondi

Lead Partner of the PhD Program: University of Camerino (UNICAM)

Partners and possible operative sites of the Phd Student: University of Camerino, Gran Sasso Science Institute (GSSI), Istituto Nazionale di Geofisica e Vulcanologia (INGV), Istituto Nazionale di Fisica Nucleare (INFN)

Research Topic and project: ***Risk communication for prevention and preparedness.***

Preparedness as well as prevention actions for a natural event with possible catastrophic effects require correct information on natural hazards and their interaction with human activities. This research project aims to develop an effective approach to communication both in the pre- and post-event phase, when teams of planners and first responders must work together effectively and efficiently to address the myriad of problems that arise in these situations. Reliable communications are a key point to a successful emergency operation.

Supervisor: Supervisor and co-supervisor will be identified among the Scientific Board of the PhD Course on the basis of the specific project of the candidate (<https://isas.unicam.it/scientific-board/scientific-board-natural-hazards-and-disaster-risk-reduction>).

Scholarship funded under REDI Consortium <https://www.redi-research.eu/it/homepage/>



Duration: 3 years

Provisional starting date: 1<sup>st</sup> November 2024 (in any case, no later than December the 13th, 2024).

ECTS credits (3 years): Consistent with the Plan of the Joint Phd Program.

The Phd Student must participate to the workshop of the PhD Course organized by the scientific board twice a year. The PhD student is expected to present his/her project and to demonstrate progress and quality of the research project and an ability to present research. The PhD student will present in front of his/her supervisor and the department faculty, including fellow PhD students, will also be invited.

*Special requirements, additional to “standard” ones:*

Mandatory Period of research mobility abroad: at least 6 months

Further mandatory period of research and training mobility for the scope of the research topic (in Italy): at least 6 months

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**Further potential positions available in the framework of International mobility agreements with  
People’s Republic of China  
(Phd Programs for each topic will be identified later)**

**Positions codes: from “ZHENGZHOU-A 1” to “ZHENGZHOU-A 6”**

Type of positions: supernumerary – international mobility Phd Position – without UNICAM scholarship

Up to a maximum of 6 positions are reserved for Chinese citizens graduated from the Zhengzhou University of Light Industry under the agreement signed between the University of Camerino and the Zhengzhou University of Light Industry (China), for carrying out research preferably in the field of Food Sciences, Chemistry, Biology and Design. The candidate must indicate the course and the curriculum of interest in the application form. In the hypothetical research project, the candidate must specify the agreement with the Chinese university.

**Positions codes: from “ZHENGZHOU-B 1” to “ZHENGZHOU-B 5”**

Type of positions: supernumerary – international mobility Phd Position – without UNICAM scholarship

Up to a maximum of 5 scholarships are reserved for Chinese citizens graduated from the Zhengzhou University of Light Industry under the agreement signed for the issue of double degrees between the University of Camerino and the Zhengzhou University of Light Industry (China), for carrying out research preferably in the field of Food Science and Engineering, Chemical Engineering and Technology, Light Industry Technology and Engineering, Software Engineering, Computer Science and Technology, Art Design, Resources and Environment, Biology and Medicine, Business Administration. The candidate must indicate the course and the curriculum of interest in the application form. In the hypothetical research project, the candidate must specify the agreement with the Chinese university.

### **Positions codes: JILIN 1**

Type of positions: supernumerary – international mobility Phd Position

No. 1 co-funded scholarship reserved for Chinese citizens under the cotutorship agreement between the University of Camerino and Jilin Agricultural University (China). The candidate must indicate the course and the curriculum of interest in the application form. In the hypothetical research project, the candidate must specify the agreement with the Chinese university.

For all the topics related to ***Further potential positions available in the framework of International mobility agreements with People's Republic of China*** the following rules apply:

Duration: **3 years**

Provisional starting date: **1<sup>st</sup> November 2024** (in any case, no later than December the 13th, 2024).

ECTS credits (within 3 years): 180

The Doctoral program consists of 180 ECTS credits, distributed in the following way, in order to contribute to a better recognition of your title at a European and global level

- 1 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses; 3 ECTS for participation in seminars and events
- 2 Year:
  - 40 ECTS in research activity (with a yearly evaluation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills
  - 10 ECTS in curricular related activities: 7 ECTS for participation in thematic option courses; 3 ECTS for participation in seminars and events
- 3 Year:
  - 50 ECTS in research activity (writing and defend the Doctoral dissertation)
  - 10 ECTS in mandatory SAS Activities to acquire transferable skills

The Curricular related activities (seminars and courses in specific topics of interest) are organized by the Scientific Board of the Doctoral course.

**Mandatory Period of research mobility abroad: at least 6 months**

*Special requirements, additional to “standard” ones:*

Further aspects related to these topics must comply with the Agreements the positions are based on.