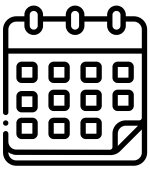
HOW TO APPLY

PhD SDC
SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE

An overview of procedures - Second Call



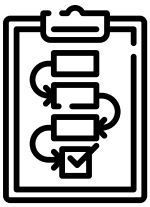
Deadline for Application

1.00 PM CEST on 04 August 2023

Admission Requirements

Master's degree or equivalent qualification

The qualification must be obtained by the start of the doctoral course (20 December 2023).



Online Application Procedure

- Register on https://pica.cineca.it/iuss/dottorato-39-bis/. You will be prompted to insert your details (such as your name, address, email, date and country of birth, etc.). Once registered, you will receive an email asking you to activate your account.
- Log in if you are already registered and enter "Sustainable Development and Climate Change" in the Search field.
  Select "Bando di concorso per l'ammissione al corso di dottorato nazionale in Sustainable Development and Climate Change".

Required Accompanying Documents

- Valid ID document (with photo)
- Curriculum Vitae
- Research Proposal
- Letter of Purpose
- University Degree

For details please refer to Art. 3.2 of the official Call for Applications.

Finanziato dall'Unione europea NextGenerationEU

Ministero dell'Università e della Ricerca

Italiadomani PIANO NAZIONALE DI RIPRESA E RESILIENZA

IUSS Scuola Universitaria Superiore Pavia

Call for applications

National Doctoral Course in Sustainable Development and Climate Change

39th cycle – 2023/2024 academic year – Second Call

DEADLINE FOR SUBMISSION 13:00 (Italian Time) 4 August 2023

Changes or additions to the call will be published on the "Call for applications" page of the School's official website

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Art. 1 - ESTABLISHMENT OF THE DOCTORAL COURSE IN SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE

The Scuola Universitaria Superiore IUSS, Piazza della Vittoria n. 15 – 27100 Pavia (hereafter "the School"), hereby announces a Call for Applications to enroll in the **39th – XXXIX cycle of the National Doctoral Course in Sustainable Development and Climate Change** (hereafter PhD-SDC) for the **2023/2024 academic year** – Second Call

PhD Programme Coordinator: **Professor Mario Martina – phd-sdc.coordinator@iusspavia.it**

1.1 Course Description and Objectives

The **Doctoral Course in Sustainable Development and Climate Change (PhD-SDC)** has a duration of **three years** and aims to equip talented students with the skills to build a more resilient society – one that will be able to address and manage effectively the problems of climate change. A society capable of rethinking the processes of sustainable development, and the objectives of which are not aimed solely at economic growth. The course is focused on the interrelation of complex issues such as technological progress, availability of natural resources, migration, human rights, climate change, access to food and water and the quality of life of present and future generations.

The combined challenges of sustainability and climate change need to be firmly embedded in university education. Universities should aim to identify and create innovative projects going beyond a traditional, single-discipline approach, so that by effectively combining a variety of abilities, methods and communicative skills, society will be able to manage the present challenges.

The main objective of the course is to provide doctoral candidates with a high-level preparation by coordinating and integrating – in partnership with host universities – a diverse team of high-profile educators, who can offer a full spectrum of disciplinary areas, ranging from ecology, technology, economics and engineering to maths, philosophy, medicine and agriculture. PhD candidates will have the chance to propose effective means of achieving the 2030 Sustainable Development Goals (SDGs) as defined by the United Nations.

The PhD programme offers six curricula, described in detail in the document **"Research Topics".** The six curricula are:

CU1. Earth System and Environment

CU2. Socio-economic Risk and Impacts

CU3. Technology and Territory

CU4. Theories, Institutions and Cultures

CU5. Agriculture and Forestry

CU6. Health and Ecosystems

1.2 Affiliated bodies

1. Gran Sasso Science Institute
2. Libera Università di BOLZANO
3. Luiss Libera Università internazionale degli studi sociali Guido Carli
4. Politecnico di BARI
5. Politecnico di MILANO
6. Politecnico di TORINO
7. Scuola Normale Superiore di PISA
8. Scuola Superiore di Studi Universitari e Perfezionamento Sant'Anna
9. Univesità Cattolica del Sacro Cuore
10. Università degli Studi "G. d'Annunzio" CHIETI-PESCARA
11. Università degli Studi "Mediterranea" di REGGIO CALABRIA
12. Università degli Studi dell'AQUILA
13. Università degli Studi di BARI ALDO MORO
14. Università degli Studi di BRESCIA
15. Università degli Studi di CAGLIARI
16. Università degli Studi di CAMERINO
17. Università degli Studi di CATANIA
18. Università degli Studi di FERRARA
19. Università degli Studi di FIRENZE
20. Università degli Studi di MESSINA
21. Università degli Studi di MILANO
22. Università degli Studi di MODENA e REGGIO EMILIA
23. Università degli Studi di NAPOLI "L'Orientale"
24. Università degli Studi di Napoli Federico II
25. Università degli Studi di PADOVA

26. Università degli Studi di PALERMO
27. Università degli Studi di PAVIA
28. Università degli Studi di ROMA "La Sapienza"
29. Università degli Studi di ROMA "Tor Vergata"
30. Università degli Studi di SALERNO
31. Università degli Studi di SASSARI
32. Università degli Studi di SIENA
33. Università degli Studi di TERAMO
34. Università degli Studi di TORINO
35. Università degli Studi di TRENTO
36. Università degli Studi di TRIESTE
37. Università degli Studi di Urbino Carlo Bo
38. Università degli Studi INSUBRIA Varese-Como
39. Università di PISA
40. Università IUAV di VENEZIA
41. Università Politecnica delle MARCHE
42. Università Telematica UNITELMA SAPIENZA
43. Università "Carlo Cattaneo" - LIUC
44. Università degli Studi di Bergamo
45. Università degli Studi di Parma
46. Università degli Studi ROMA TRE
47. Università degli Studi di Udine

1.3 Scholarships

The attached "**Research Topics**" document describes the **11** scholarships available. Each scholarship is linked to a specific research topic, that is, there is a requirement for the recipients to focus their doctoral research on one of the topics listed in the above-mentioned document and to conduct their research activity

at the host university. Each individual scholarship can only be assigned to those candidates who are evaluated as eligible by the Selection Board.

Interviews held during the selection process will allow the Selection Board to establish whether the candidates have the necessary knowledge and skills to be admitted to the doctoral course and to study the selected scholarship research topics. For further information on the doctoral course and its "Educational Programme", please visit the IUSS website or email phd-sdc@iusspavia.it.

Art. 2 – ADMISSION REQUIREMENTS

Applications are welcome from all qualified candidates regardless of age or nationality. Eligible candidates must have the following academic qualifications:

a) Master's degree (Laurea Magistrale or Laurea Specialistica or Laurea Vecchio Ordinamento);

b) Analogous academic qualification awarded abroad (comparable to an Italian master's degree, in terms of duration and study content) and recognized by the Selection Board as suitable for application to the course.

Applications from candidates who are still to graduate will be considered pending. These candidates must submit the relative degree certificate by the start of the course on Wednesday 20 December 2023.

Art. 3 - APPLICATIONS

3.1 Application Procedure

Applications must be submitted exclusively online by **4 August, 2023 at 13:00 Italian time**. There are no application fees.

Please refer to the application procedure described below.

- Go to the following link: https://pica.cineca.it/iuss/dottorato-39-bis/;
- Log in if you have already registered;
- If you are logging in for the first time, click on "New Registration" and enter the following data:
    - Name
    - Surname
    - Gender
    - Date of birth
    - Fiscal Code (for Italian citizen only)
    - State of birth
    - Place of birth
    - Phone number

Once you have completed registration your login credentials will be sent to the email address provided. You will be able to log in once you receive an email confirming registration.

In order to apply, you have to upload the following documents:

- Curriculum Vitae
- Valid ID (clearly visible)
- Research Proposal
- Letter of Purpose
- Academic qualification (for those candidates who have not yet obtained the required qualification the procedure will required University name and major)
- Other titles

Successful submission of the application will be confirmed to the email address provided in the registration details. If you have not yet received a confirmation email after 24 hours please contact the help desk of PICA platform.

3.2 Required Accompanying Documents

a)	**A scan of a valid form of photographic ID**	Please scan both sides of the document. If the ID document is not written in Latin characters, you must provide a certified Italian translation. **Please note that if you do not provide a certified translation your ID document will not accepted**.
b)	**Curriculum Vitae**	Language: English Length: max 2000 words Must include: - academic qualifications and training path; - research and/or work experience (if any); - list of publications (if any); other relevant qualifications/documents that provide information on the applicant's academic and professional experience.
c)	**Proof of university degree awards needed for the admission, including**	Language: Italian, English, French or Spanish. For academic documents in all other languages applicants

	the following information: 1. University; 2. Degree type; 3. Full name of the degree; 4. Major; 5. Date of graduation (or expected date); 6. Final mark/grade; List of exams undertaken and the associated grade awarded.	must provide an official translation provided by the university issuing the degree or by an authorized body or translator. **Without a certified translation the documents will not be accepted**. Type of certificate for degrees awarded in: 1. **Italian public universities:** self-declaration* of master's degree award, signed and dated; **2. EU and non-EU member state universities**: where available, certificates, transcripts of records master's degree or diploma supplement, if available.
d)	**Proof of other academic qualifications,** **including the following information:** 1. University; 2. Degree type; 3. Full name of the degree; 4. Major; 5. Date of graduation (or expected date); 6. Final mark/grade; List of exams undertaken, the associated grade awarded.	Language: Italian, English, French or Spanish. For all other languages, applicants must provide an official translation provided by the university issuing the degree or by an authorized body or translator. **Without a certified translation the documents will not be accepted**. Type of certificate for degrees awarded in: 1. **Italian public universities:** self-declaration* of of bachelor's or master's degree award, signed and dated; 2. **EU and non-EU member state universities**: where available, certificates, transcripts of records of bachelor's or master's degree or diploma supplement, if available.
e)	*For applicants due to be awarded their master's degree:* **Proof of exams taken and grades awarded.**	Language: Italian, English, French or Spanish. For all other languages, applicants must provide an official translation provided by the university issuing the degree or by an authorized body or translator. **Without a certified translation the documents will not be accepted**.
f)	**Research Proposal**	Language: English The **Research Proposal** (1,000-2,500 words) should focus on the scholarship research topic chosen as first preference and must include: - Abstract (max 250 words); - Scope of research and questions; - Methodology;

		Expected results and impacts.
g)	**Letter of Purpose**	Language: English The **Letter of Purpose** (max 500 words) must include your motivations for conducting the proposed research, that is the research topic listed as your first preference, and it must also mention your interest in the other research topics selected (if any) based on relevant skills and experience.

***** Current regulations do not recognize certificates issued by other Public Administrations. Qualifications included in the application must be self-certified if issued by Italian public universities.

With the exception of a), which can be in the original language, and c) and d), and e) which can be in Italian, English, French or Spanish, **all documents must be in English**. For documents issued in a different language, an official translation (into Italian or English, by the issuing university or by an authorized body) must be provided.

All documents referred to in a), b), c) - or, for applicants due to be awarded their master's degree, in e) - f), g) are strictly required. Failing to submit any of the said documents during application will result in the candidate's exclusion from admission.

Art. 4 – ADMISSION PROCEDURE

Evaluation	Selection will be based on an assessment of the qualifications listed in the "Qualification Assessment" section followed by an interview. The Selection Board will award a score from 1 to 100. **1. Qualification Assessment:** The Selection Board will assess the applicants' scientific qualifications and determine an overall score up to a maximum of 60 points. Applicants who receive a score of at least 35 will be invited to attend an interview. The Selection Board will award scores based on: - CV and academic qualifications (Required documents b), c) and d)): up to a maximum of 20 points; - Research Proposal and Letter of Purpose (Required documents e) and f)): up to a maximum of 40 points. At this stage candidates may already be determined non-eligible for one or more of the selected scholarships.
	2. Interview: interviews will be conducted in English via Zoom and will focus on the applicant's scientific background, Research Proposal and Letter of Purpose. The candidate may use slides and the screen sharing option within Zoom. The Selection Board can invite a proven expert for each research topic to participate in the interview. This expert could be a member of the Academic Board. The Selection Board will determine a score for the interviews up to a maximum of 40 points. A minimum of 25 points is required to continue the process. During the interview, the Selection Board will verify that the candidate has the necessary knowledge and skills for attending the doctoral course and will proceed to evaluate the eligibility of the candidate for the research topics selected. At this stage, subject to the candidate's authorization and based on their curriculum, the Selection Board will asses eligibility for scholarships other than their preferred choice(s). If the assessment in positive, eligibility for the alternative scholarship will be taken into consideration only in case of unassigned scholarships after the final ranking.

Qualifications Assessment	- Curriculum Vitae; - Diploma supplement or transcripts of master's degree grades or levels; - List of publications (if any) as stated on CV; - Research Proposal; - Letter of Purpose; - Any other relevant qualifications listed on the CV that provide evidence of academic and professional experience.
Assessment Results	The results of the qualification assessment will be published on the IUSS website – on the "Call for Applications" page, by 8 September 2023.
Interview Schedule	The interviews will be conducted starting from 13 September 2023. Candidates will be given reasonable notice of the date and timing of the interview.
Special needs	People with disabilities can apply for special equipment and/or other aids during the application process.

Candidates must be connected on the Zoom platform via both audio and video. Failing to connect at the time and date of the interview or lacking ID proof will be regarded as withdrawal from the application process.

Art. 5 – SELECTION BOARD

The Selection Board for admission to PhD programmes is appointed by the Rector of the university. The list of the Board Members is published on the School website – "Call for Applications" page. The Selection Board is divided into subcommittees, corresponding to the different curricula. The subcommittees will be responsible for arranging and conducting the relevant interviews and can be joined by experts, for each of the research topics. The experts may also be part of the Academic Board.

Art. 6 – RANKING AND ASSIGNMENT OF SCHOLARSHIPS

Following the interviews, the final ranking for each curriculum will be published on the School's website – "Call for Applications" page by **29 September 2023.**

The final ranking:

- Will be in decreasing order of scores (in the event of a tie, the youngest candidate will be given precedence);
- Will confirm the candidate's eligibility to study the research topics of their choice or additional research topics based on the assessment of the Selection Board.

The scholarships will be assigned according to the following procedure:

1. Each candidate will be notified by email and offered a scholarship in observance of the final ranking and of their order of preference as formally declared at the application stage;
2. Candidates must confirm acceptance by replying to the email before the deadline indicated;
3. Once scholarships are assigned, they are no longer obtainable;
4. Candidates who reject the scholarship or fail to confirm before the deadline will forfeit the right to the scholarship offered and to any further scholarship. The place will be offered to the next eligible candidate.

This procedure will continue until all scholarships are assigned, including any alternative scholarships for which candidates were deemed eligible by the Selection Board during assessment, up until **5 October 2023,** subject to any subsequent update regarding deadlines for Decrees n. 117/2023 and 118/2023.

Art.7 – ENROLMENT

7.1 Enrolment Procedure

Publication of the rankings on the School's online Official Register (Albo Ufficiale) shall be considered official notification. The Doctoral Course Programme will start on Wednesdey **20 December 2023.**

Successful candidates will be notified of the final date for enrolment – failure to enrol by that date will result in their exclusion from the doctoral course.

The following is a summary of the documents to be submitted to the enrolment office:

a) tax status form;

b) for candidates who obtained their master's degree abroad a Declaration of Local Value (or a copy of the application to the competent authority) or a Diploma Supplement is required;

c) for candidates awarded their master's degree ("laurea magistrale") after the deadline for applications to the course but no later than 20 December 2023, a degree certificate or self-declaration of the qualification including grades, date and place of degree awarded must be sent by email to phd-sdc@iusspavia.it.

In order to enroll, candidates need to complete procedure on Service Esse3 – Reserved Area; more information will be provided you by the secretariat

7.2 Additional Requirements for Visa Applicants

Non-EU students entering Italy should apply for a specific study visa using the online procedure on the Universitaly portal. Students must apply to the local Police Department ("Questura") within eight (8) days of arriving in Italy for a residence permit for study purposes.

For further information, please go to IUSS website.

7.3 Registration Fee

PhD students must pay the registration fee for each academic year. The registration fee includes the regional study tax and the stamp duty.

In case of withdrawal from the doctoral course candidates cannot be reimbursement the registration fee.

Art.8 – SCHOLARSHIPS

Scholarships will be paid monthly at the end of each month.

The annual amount of the scholarship is € 16,243.00. This sum is exempt from IRPEF (income tax) but is subject to payment to the Italian National Institute of Social Security (INPS), to which the university contributes two-thirds and the student one-third (or "gestione separata").

Art. 9 – SCHOLARSHIPS FUNDED BY THE NATIONAL RECOVERY AND RESILIENCE PLAN (PNRR)

In accordance with the National Recovery and Resilience Plan (PNRR), the Ministry of University and Research has assigned universities resources (Ministerial Decree no. 117/2023) for the funding of doctoral scholarships dedicated to: cutting-edge paths for innovative needs of companies.

The School has selected the research projects to be included in the doctoral courses of the 39th cycle, in line with the eligibility criteria defined by the aforementioned Decree, as listed in this call with the label PNRR. At the end of the selection procedure, the candidates who have been awarded the grants referred to in Ministerial Decree no. 117/2023 will proceed with enrolment in accordance with the provisions as laid out in art. 7.

Once the scholarships have been assigned, the MUR (Ministry of University) will authenticate the eligibility of the projects for PNRR support. The ANVUR (Italian National Agency for the Evaluation of Universities and Research Institutes) will then verify that the requirements outlined in the aforementioned Decree have been met. Admission to the doctoral course for students awarded the grants referred to in said Decree is therefore to be considered provisional, pending confirmation of their eligibility for ministerial funding.

The acceptance of scholarships labelled as PNRR entails additional obligations to those listed in the Regulations for the School's Doctoral Programs, notably:

- submission of a report every six months outlining the main research activities and respective time frame;
- spend a period of study and research abroad from a minimum of 6 to a maximum of 12 months and a period of study and research in a company for a minimum of 6 to a maximum of 12 months;

Failure to comply with the above requirements may call for revocation of the scholarship.

Art. 10 – LIMITATIONS ON OTHER EMPLOYMENT

Admission to the PhD course implies a full-time commitment and no other type of employment is allowed. However, art. 17 of the "Regolamento in materia di corsi di dottorato" (Regulation for Doctoral Courses) allows the student to occasionally work within strict guidelines for other entities while enrolled in the course. Please refer to the Regulations for more details.

Art. 11 – MANAGEMENT OF PERSONAL DATA

The School, as Controller (piazza Vittoria, 15, 27100 Pavia PV – PEC direzione@pec-iusspavia.it), in full conformance with Legislative Decree n. 196/2003 and with any subsequent updates, and with article 13 of the EU General Data Protection Regulation n. 679/2016, collects and processes personal data in order to manage the application for participation in the doctoral competition.

Data will be kept and may be used after the completion of the selection procedure for operational, administrative, accounting and/or other purposes related to the management of institutional activities and legal obligations, as well as for informing the successful applicants of any opportunities. Any data subjects wishing to exercise their statutory rights as per articles 15-22 of Reg. UE/2016/679 may do so by writing an email to the Controller.

Further information on the management of personal data by the School can be found at: https://www.iusspavia.it/en/privacy.

Transparent Administration

The School operates in compliance with Law no. 190/2012 (Provisions for the prevention and repression of corruption and illegality in public administration), applying the measures identified in the

"Piano Integrato" that can be found in the "Trasparenza" section (in Italian) on the School's web site at: https://trasparenza.iusspavia.it

Art 12 – REFERENCE RULES

For any items or information not included in this announcement, please refer to the "Regulations for Doctoral Courses" issued by the D.R. n. 65 – 2022 and the "Regulation for the PhD in Sustainable Development and Climate Change".

Submission of an application using the procedure described in art. 3 implies acceptance of the regulations contained in this announcement and of those that apply to PhD courses.

Procedure Supervisor

Giovanna Spinelli, Head of Education Unit – Palazzo del Broletto, Piazza della Vittoria n. 15 – 27100 Pavia – tel +39 0382375811, fax +39 0382375899, e-mail: info@iusspavia.it.

Disclaimer

The Italian version of this document is the official and legally binding announcement document.
The English version is not legally binding and is only meant to provide information.

Research Topics

39° cycle – Academic Years - 2023/2024 – 2025/2026
Second Call

www.phd-sdc.it

PhD SDC
SUSTAINABLE DEVELOPMENT
AND CLIMATE CHANGE

PhD SDC
SUSTAINABLE DEVELOPMENT
AND CLIMATE CHANGE

List of topics

CU1 Earth Systems and the Environment

- The role of new particle formation in atmospheric nanoparticles levels in urban areas
- Impact of climate change on the renewable energy sector in Italy
- Adaptive response to climate change for safety management airport infrastructures under strong winds

CU2 Socio-Economic Risk and Impacts

- Development of innovative sustainable strategies for pluvial flooding risk management
- Trajectories of the amazon rainforest in the Anthropocene: how to avoid Amazon's tipping point?
- Framework for risk quantification of business interruption across different economic sectors

CU3 Technology and Territory

- Ocean space utilization for energy harvesting purposes
- Reversible manufacturing through the smartness paradigms
- Hydrogen valley: leverage local assets and address local needs
- Disruptive and Scalable Technologies for Energy Transition

CU4 Theories, Institutions and Cultures

- Managing Scarce Resources: Ethical, Social and Educational Profiles

PhD SDC
SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE

Scholarship code

CU1.03

Curriculum: CU1 - Earth Systems and the Environment

The role of new particle formation in atmospheric nanoparticles levels in urban areas

Reference Person: Bigi Alessandro (alessandro.bigi@unimore.it)

Host University/Institute: Università di Modena e Reggio Emilia / Dipartimento di Ingegneria 'Enzo Ferrari'

Research Keywords: Nanoparticles

Atmospheric modelling

Urban areas

Reference ERCs: PE10_1 Atmospheric chemistry, atmospheric composition, air pollution

PE10_3 Climatology and climate change

Reference SDGs: GOAL 11: Sustainable Cities and Communities, GOAL 13: Climate Action

Description of the research topic

Atmospheric aerosols have large impact on air quality, human health, weather and climate, with important societal implications. Regarding its impact on air quality, both the chemical composition and the size of aerosols is critical, with smaller particles showing a larger potential to give severe health effects, particularly in cities where most of world's population resides. To improve our understanding of the role of potential sources of nanoparticles in urban areas, specific experimental measurements are needed, featuring instruments for the detection of nanoparticles at a fine size and time resolution. The project will focus on new particle formation (NPF) processes in a pilot urban area, based on a wide set of cutting edge aerosol analysers deployed in a collaborative effort along with the Institute of Atmospheric Sciences and Climate of the National Research Council. The activity will start with a literature review to gain an up-to-date view on this topic, on the observational methods and the most suitable data analysis tools. The main expected activities are: – assuring the experimental monitoring of nanoparticles size distribution – analysing the data collected from these and ancillary observations. The expected results are: – the correlation of NPF to aerosol properties, gas precursors and meteorology – an assessment of the role of NPF on urban nanoparticles for the pilot area – the delivery of this research at International conferences and on high impact journals.

Research team and environment

The activities will be hosted at the LARMA Lab of the Dept. of Engineering "Enzo Ferrari" (www.larma.unimore.it), and will include a collaboration with ISAC-CNR Bologna and INAR at

the University of Helsinki. LARMA includes 10 scientists among professors, research technicians, postdocs and PhD students, working on atmospheric modelling and monitoring by regulatory and non-regulatory devices. The lab has International collaborations in EU with several partners of the ACTRIS and ICOS Infrastructures and collaborates with the Regional Environmental Agency. The team is also in charge of the Geophysical Observatory of Modena (www.ossgeo.unimore.it) and of the local AERONET sun photometer.

Suggested skills for this research topic

The candidate is expected to have a solid background in physics, math, earth/environmental sciences or related disciplines, as well as experience in the analysis of observational data and/or numerical simulations. A training in atmospheric chemistry/physics, data analysis and atmospheric modelling are considered an asset.

Source of fundings

Host University's fundings

Period of research abroad

For this scholarship it is mandatory a period of research abroad of 6 months.

Internship

For this scholarship it is not planned a period of intership

PhD SDC
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Scholarship code

CU1.11

Curriculum: CU1 - Earth Systems and the Environment

Impact of climate change on the renewable energy sector in Italy

Reference Person: Fosser Giorgia (giorgia.fosser@iusspavia.it)

Host University/Institute: Scuola Univeritaria Superiore IUSS Pavia / Classe di Scienze, Tecnologie e Società

Research Keywords: Renewable energy

Convection-permitting models

Climate Change

Reference ERCs: PE10_3 Climatology and climate change

PE10_2 Meteorology, atmospheric physics and dynamics

PE10_21 Earth system modelling and interactions

Reference SDGs: GOAL 11: Sustainable Cities and Communities, GOAL 12: Responsible Consumption and Production, GOAL 13: Climate Action

Description of the research topic

The renewable energy sector is strongly tied with climate since the availability of renewable sources, like hydro, solar and wind power, very much depend on rain, radiation, and wind patterns. This research topic aims to determine the impact of climate change on the renewable energy sector over the Italian peninsula. Climate variables will be extracted from observational and reanalysis dataset, like RCMs from the CORDEX dataset and CPMs from the CORDEX-FPS CONV initiative, for the historical, near and future climate. The analysis of climate data will provide an assessment of the changes expected to impact the energy sector. Climate analysis will be then integrated into energy system models developed and used within the A2A group. In particular, the results of climate analysis will the basis of the estimation of the electricity production from renewable sources over the Italian territory in the long-term horizon. The main goal will be to identify potential trends of producibility in a spatial-temporal framework and, subsequently, to estimate the tendency of generation volumes of existing and future renewable plants in Italy. The probability of extreme climate events that may statistically limit the producibility of the renewable power assets will also be analyzed. In addition, a geographical analysis aimed to identify and categorize the investment attractiveness of Italian regions/areas may be conducted.

Research team and environment

The CARISMA team within IUSS is composed by STEM and Social scientists working on different aspects of climate change among which: data analysis and modelling of Earth

system and economic system processes; impact assessment of extreme natural events and anthropogenic activities on human and natural environments.

A2A is an Italian multiutility active in several fields: generation of electricity from different sources, distribution and sale of electricity and natural gas, district heating, waste collection and treatment, electric mobility, public lighting, water service. The analysis of climatic phenomena is of great importance for A2A especially in electricity generation and consumption.

Suggested skills for this research topic

The ideal candidate should have a strong background in data analysis and statistics (analysis of probability distribution functions, uncertainties, etc.) and be familiar with the management of large datasets. He/she should preferably have basic knowledge of the energy system and its sectors, as well as its possible interactions with weather and climate.

Source of fundings

DM117/2023 - M4C2 - Inv. 3.3. - Dottorati Innovativi

Period of research abroad

For this scholarship it is mandatory a period of research abroad of 6 months.

Internship

For this scholarhip it is mandatory a period of Min 6 months - Max 18 months at A2A

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Scholarship code

CU1.36

Curriculum: CU1 - Earth Systems and the Environment

Adaptive response to climate change for safety management airport infrastructures under strong winds

Reference Person: Ricci Alessio (alessio.ricci@iusspavia.it)

Host University/Institute: Scuola Univeritaria Superiore IUSS Pavia / Classe di Scienze, Tecnologie e Società (STS)

Research Keywords: Airport infrastructures

Extreme winds

Numerical wind prediction and risk assessment

Reference ERCs: PE10_2 Meteorology, atmospheric physics and dynamics

PE8_4 Computational engineering

PE8_5 Fluid mechanics

Reference SDGs: GOAL 9: Industry, Innovation and Infrastructure, GOAL 11: Sustainable Cities and Communities, GOAL 13: Climate Action

Description of the research topic

Airports are important nodes that facilitate the connectivity by airlines to passengers and freight customers within the EU and further afield. In 2015, Airports Council International estimated the total economic impact of airport and aviation-related activities at €338 billion across the EU. Regardless the positive impact on the global trade, the increasing of extreme winds due to climate change represents a serious threat for such infrastructures, workers and passengers. Accidents in these areas can cause detrimental economic and human losses. On this subject, the project is targeted at improving the awareness of risks and the prevention of detrimental accidents in airports due to strong winds. The goal is to develop an integrated tool to improve the prediction of local-scale wind conditions in an international airport (selected as case study) and assist flight controllers with the safety management of aircrafts and airport infrastructures/facilities during the taxi/idle out. The Computational Fluid Dynamics (CFD) will be used to perform simulations on the study area, starting from an historical database of field measurements and km-scale climate simulation. Afterwards, km-scale climate simulations of the near future can be used to investigate how the local-scale wind conditions will modify under climate change and thus evaluate the future risks for the study area. The CFD results, validated by means of experimental tests, will serve as input for the integrated tool.

Research team and environment

The PhD candidate will carry out the research study at IUSS of Pavia, in the CARISMA group, in close collaboration with SAVE S.p.a. leader in the safety management of airport infrastructures. The student will be co-supervised by Dr. Alessio Ricci, Dr. Giorgia Fosser, Dr. Andrea Manganaro with the scientific support of the University of Western Ontario – Wind Engineering group. The candidate will benefit from the extensive experience in climatology, wind measurement and modeling; airport management; risk management of natural and anthropogenic hazards; formulation and proposal of new economic and political models of sustainable development.

Suggested skills for this research topic

The candidate should have knowledge of Computational Fluid Dynamics, finite volume method, data analysis and statistics. Programming skills in Matlab/Python /C++ and knowledge of signal processing could also be beneficial. Team working attitude and excellent knowledge of spoken and written English are highly desirable.

Source of fundings

DM117/2023 - M4C2 - Inv. 3.3. - Dottorati Innovativi

Period of research abroad

For this scholarship it is mandatory a period of research abroad of 6 months.

Internship

For this scholarhip it is mandatory a period of Min 6 months - Max 18 months at SAVE S.p.a

PhD SDC
SUSTAINABLE DEVELOPMENT
AND CLIMATE CHANGE

Scholarship code

CU2.02

Curriculum: CU2 - Socio-Economic Risk and Impacts

Development of innovative sustainable strategies for pluvial flooding risk management

Reference Person: Aronica Giuseppe Tito (garonica@unime.it)

Host University/Institute: Università degli Studi di Messina / Dipartimento di Ingegneria

Research Keywords: Pluvial flooding

Resilience and risk impact

Sustainable engineering

Reference ERCs: PE8_11 Environmental engineering, e.g. sustainable design, waste and water treatment, recycling, regeneration or recovery of compounds, carbon capture & storage

SH7_6 Environmental and climate change, societal impact and policy

PE10_17 Hydrology, hydrogeology, engineering and environmental geology, water and soil pollution

Reference SDGs: GOAL 11: Sustainable Cities and Communities, GOAL 13: Climate Action

Description of the research topic

The growing complexity of urban systems and the uncertainty associated with flood risk, exacerbated by climate change, pose serious challenges to the sustainability of our communities. Therefore, it appears more urgent than ever to develop innovative and sustainable strategies for the management of flood risk, in order to increase the socio-economic resilience of urban communities with regard to the disastrous effects resulting from extreme hydro-meteorological events. For this purpose, the proposed research topic intends to focus on the development of a methodological framework for modelling the cascade effects of pluvial flooding events, through the simulation of risk scenarios for the urban population, infrastructures, and socio-economic systems, capable to take into account also all the uncertainties. Since understanding the potential changes, both in the extent of extreme rainfall and in the characteristics of the urban areas, is fundamental for the design of sustainable urban drainage systems capable of mitigating the effects of pluvial flooding events, particular attention will be paid to the estimation of possible future changes in intense rainfall, as well as the implementation of measures aimed at minimizing soil imperviousness and sealing through infiltration, retention and temporary detention of water. This will enable a step change in the management of pluvial flooding improving understanding of the potential impacts and quicker recovery of urban communities.

Research team and environment

The research activity will take place at the Department of Engineering within the Research Group of Water Engineering and Hydrology coordinated by Prof. Giuseppe T. Aronica. The Group includes an Associate Professor, two post-doc researchers and five Ph.D students; the research activities cover research topics related to flood risk management, sustainable urban drainage systems, pluvial flooding, stochastic hydrology and water resources management. These activities are supported by many national and international research projects, consultancies for Public Agencies and Private Companies. The Research Group have strong collaborations with Italian and international Universities

Suggested skills for this research topic

The ideal candidate should have a strong background in civil and environmental studies, specifically in the field of pluvial flooding, sustainable urban drainage systems, flood vulnerability and damage evaluation. Familiarity with programming languages such as MATLAB, R, C++ and commercial software as EPA-SWMM, HEC-RAS, as experiences in statistics, data analysis and socio-economic modelling will be an added value. Fluency in English, both written and spoken is recommended. Finally the candidate should be strongly motivated to work in a collaborative environment, with an inter-disciplinary approach. Last but not least, willingness to international mobility is required

Source of fundings

DM117/2023 - M4C2 - Inv. 3.3. - Dottorati Innovativi

Period of research abroad

For this scholarship it is mandatory a period of research abroad of 6 months.

Internship

For this scholarhip it is mandatory a period of Min 6 months - Max 18 months at GETOPEN srl

PhD SDC
SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE

Scholarship code

CU2.06

Curriculum: CU2 - Socio-Economic Risk and Impacts

Trajectories of the amazon rainforest in the Anthropocene: how to avoid Amazon's tipping point?

Reference Person: Caiani Alessandro (alessandro.caiani@iusspavia.it)

Host University/Institute: Scuola Univeritaria Superiore IUSS Pavia / Classe di Scienze, Tecnologie e Società

Research Keywords: Macroeconomic Modeling

Ecosystems

Climate Tipping Points

Reference ERCs: SH1_1 Macroeconomics; monetary economics; economic growth

SH1_12 Environmental economics; resource and energy economics; agricultural economics

SH1_3 Development economics; structural change; political economy of development

Reference SDGs: GOAL 8: Decent Work and Economic Growth, GOAL 13: Climate Action

Description of the research topic

The Amazon rainforest if of utmost importance for the stability of the Earth System but also fulfils important "socioeconomic functions" by providing ecosystem services that are essential for the global economy.

The research aims at assessing the possible trajectories of the Amazon Rainforest and the global economy with reference to the Amazon tipping points. For this sake, a thorough analysis of the ecological footprints caused by human economic activity on the Amazon shall be coupled with the understanding of the dependencies of the global economy on ecosystem services provided by the rainforest.

In particular, using environmentaly extended multi regional Input-Output (Env-MRIO) tables, the project aims at:

- Assessing which sectors and countries are the main source of environmental degradation of the Amazon rainforest.
- Assessing the exposure of the global economy to ecosystem services provided by the

Amazon rainforest, identifying countries and sectors that are more likely to suffer economic losses.

• Identifying the direct and indirect effects of different degrees of deforestation, as well as the impact of policies aiming at protecting the Amazon Rainforest.

Research team and environment

The selected candidate will join the research centre on Climate change impAct studies for RISk MAnagement (CARISMA) at IUSS Pavia. The CARISMA team is composed by STEM and Social scientists working in the prism of climate change on data analysis and modelling of Earth System and Economic System processes; impact assessment of extreme natural events and anthropogenic activities on human and natural environments; risk assessment and management of natural and anthropogenic hazards; and formulation/proposal of new economic, political and legal models of sustainable development.

Suggested skills for this research topic

Background in Economic/Statistical Studies

Strong Quantitative Skills

Good Programming Skills

Econometric/Statistical Skills

Source of fundings

DM117/2023 - M4C2 - Inv. 3.3. - Dottorati Innovativi

Period of research abroad

For this scholarship it is mandatory a period of research abroad of 6 months.

Internship

For this scholarhip it is mandatory a period of Min 6 months - Max 18 months at Agence Française de Développement (AFD)

PhD SDC
SUSTAINABLE DEVELOPMENT
AND CLIMATE CHANGE

Scholarship code

CU2.34

Curriculum: CU2 - Socio-Economic Risk and Impacts

Framework for risk quantification of business interruption across different economic sectors

Reference Person: Arosio Marcello (marcello.arosio@iusspavia.it)

Host University/Institute: Scuola Università Superiore IUSS Pavia / Classe di Scienze, Tecnologie e Società

Research Keywords: Indirect economic impacts

Business Interruption

Climate physical risk

Reference ERCs: PE8_3 Civil engineering, architecture, offshore construction, lightweight construction, geotechnics

PE1_15 Generic statistical methodology and modelling

SH1_1 Macroeconomics; monetary economics; economic growth

Reference SDGs: GOAL 8: Decent Work and Economic Growth, GOAL 9: Industry, Innovation and Infrastructure, GOAL 13: Climate Action

Description of the research topic

Assessing the risk of complex systems to natural hazards induced by climate and its change is an important and challenging problem. More natural extreme events (e.g., flood, storms, etc.) could result in damages to physical assets and/or interruption of production and supply chain, thus affecting the economic sector and therefore the society. Climate-related disasters' impact assessment requires also an appraisal of indirect effects due, for example, to business interruptions and Contingent Business.

In this context, the research will progress on the activities at IUSS on the development of an approach to indirect impacts due to extreme climate events (Arosio et all., EGU23-7522, https://doi.org/10.5194/egusphere-egu23-7522, 2023) that attempt to integrate engineering risk assessment models and economic input-output models. In particular, tit will be dedicated to explore the missing link between the physical damages (e.g., structure, goods, machinery) and the indirect impacts in the economic sectors.

Based on the state of art, the candidate needs:

- to critically review the most recent literature, tools and database of risk assessment,
- to develop a novel research framework addressing the existing research gap between the physical direct damage and indirect impact in the economic sectors;

- to collaborate both with IUSS research team and the research team of the industrial partner for this project, Gallagher Re, in a multi-disciplinary and applied research context;

Research team and environment

IUSS mission is to provide advanced education to undergraduate and graduate students, as well as fundamental and applied research. At IUSS, PhD candidates will find an open multidisciplinary environment offering real opportunities for developing academic and professional tools and he/she will join the research centre on Climate change impAct studies for RISk MAnagement (CARISMA). The team is composed by STEM and Social scientists working in the prism of CC on data analysis/modelling of Earth and economic system processes; impact/risk assessment of extreme events. For this scholarship a period of internship is planned with global reinsurance broker, Gallagher Re, in Italy.

Suggested skills for this research topic

The ideal candidate will have experience with most of these topics: quantitative risk assessment, input/output model, statistical analysis and large dataset. Theoretical knowledge is mandatory and professional application could be an advantage. The candidate should be passionate on research topics, self-motivated to look for new solutions and methods of doing things and creativity in analytical thinking to extract meaning from sets of data. The candidate should desire to join a multi- and inter-disciplinary research team, open to learn new topics from other sectors and effectively communicate to colleagues with different background. Competence on programming languages is preferable.

Source of fundings

DM117/2023 - M4C2 - Inv. 3.3. - Dottorati Innovativi

Period of research abroad

For this scholarship it is mandatory a period of research abroad of 6 months.

Internship

For this scholarhip it is mandatory a period of Min 6 months - Max 18 months at Gallagher Re

PhD SDC
SUSTAINABLE DEVELOPMENT
AND CLIMATE CHANGE

Scholarship code

CU3.02

Curriculum: CU3 - Technology and Territory

Ocean space utilization for energy harvesting purposes

Reference Person: Arena Felice (arena@unirc.it)

Host University/Institute: Mediterranea University of Reggio Calabria / Ingegneria Civile, dell'Energia, dell'Ambiente e dei Materiali

Research Keywords: Water wave mechanics

Energy harvesting

Offshore engineering

Reference ERCs: PE8_3 Civil engineering, architecture, offshore construction, lightweight construction, geotechnics

PE8_6 Energy processes engineering

Reference SDGs: GOAL 7: Affordable and Clean Energy, GOAL 9: Industry, Innovation and Infrastructure, GOAL 13: Climate Action

Description of the research topic

The research program deals with the development of offshore islands (as fixed or floating structures) for ocean space utilization, in which wave (marine) energy is exploited for energy supplying and to reduce CO2 emissions.

The research activities will be developed by considering:

- analysis and development of innovative models, analytical and/or numerical, of marine structures (i.e. fixed breakwater, offshore floating structures), with OWC devices;

- study of the hydrodynamics problems for the modelling of large floating structures, including structures in which OWC devices are embodied;

- risk analysis of marine structures in severe meteocean conditions, by taking into account extreme waves during sea storms; this analysis will include the study of the action of extreme waves (freak waves) on the OWC wave energy converters;

- data processing from experimental activities with physical modeling of Oscillating Water Column systems, on fixed and floating structures. These data are available at NOEL laboratory.

Both Monte Carlo approaches and experimental data will be used for the analysis of the dynamic response.

The hydrodynamic analysis will be conducted in the context of the potential theory for an irrotational flow with a free surface (to determine excitation forces, added mass and radiated damping).

Research team and environment

The research team operates at the NOEL (Natural Ocean Engineering Laboratory): a laboratory established within UNIRC. It is composed by a highly specialized team working in the field of ocean engineering and marine energy. Actually, the team involves 1 Professor, 2 Ass. Professors, 3 Researchers, 2 Post-docs and 2 PhD Students. The team has a 30-year experience in conducting field experiments on small-scale models of marine structures and of wave energy harvesters at the NOEL natural basin. This laboratory is a unique environment where experimentalists can pursue tests with the support, acquisition data center and specialized personnel (see www.noel.unirc.it).

Suggested skills for this research topic

Fluid mechanics

Wave mechanics

Random process theory

Dynamics of structures

Numerical analysis

Algorithm coding (Fortran, Matlab, Python, etc.)

Source of fundings

DM117/2023 - M4C2 - Inv. 3.3. - Dottorati Innovativi

Period of research abroad

For this scholarship it is mandatory a period of research abroad of 6 months.

Internship

For this scholarhip it is mandatory a period of Min 6 months - Max 18 months at TechFem

PhD SDC
SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE

Scholarship code

CU3.09

Curriculum: CU3 - Technology and Territory

Reversible manufacturing through the smartness paradigms

Reference Person: Dassisti Michele (michele.dassisti@poliba.it)

Host University/Institute: Politecnico di Bari / Dipartimento di Meccanica, Matematica e Management

Research Keywords: Reversibility

De/Re manufacturing

Smartness

Reference ERCs: PE8_9 Production technology, process engineering

PE8_7 Mechanical engineering

PE11_14 Computational methods for materials engineering

Reference SDGs: GOAL 9: Industry, Innovation and Infrastructure, GOAL 12: Responsible Consumption and Production

Description of the research topic

Analysing significant papers in the Scopus database on the "de-manufacturing," subject, it is clear the variability and lack of a common and coherent definition. Similarly, less than 30 documents about digital twin applications for demanufacturing were found, compared to more than 1000 for applications for manufacturing, according to the research findings.

In addition, the state-of-the-art analysis revealed a lack of literature on the reversibility of material cycles constituting a finished product at the end of their life cycle, lack of research outcomes and identification of embedded information into the finished product itself, and the lack of knowledge on the correlation between the material property and the different functions it can fulfil. All these points reveal the need of a new field of research, the key questions are:

RQ1) “Is it possible to explicit the knowledge of a correlation between the property of a material and the

functions it performs?”;

RQ2) Is it possible to recognize and identify embedded information from a final product at his end of life?;

RQ3) What are the degrees of reversibility of the material cycles that constitute a finished product at the end

of their life cycle?

Research team and environment

The team is composed of 2 associate professors and 1 researched plus the full professor as proponent

Suggested skills for this research topic

Production engineering: materials

Source of fundings

DM117/2023 - M4C2 - Inv. 3.3. - Dottorati Innovativi

Period of research abroad

For this scholarship it is mandatory a period of research abroad of 6 months.

Internship

For this scholarhip it is mandatory a period of Min 6 months - Max 18 months at Acciaierie d'Italia

PhD SDC
SUSTAINABLE DEVELOPMENT
AND CLIMATE CHANGE

Scholarship code

CU3.13

Curriculum: CU3 - Technology and Territory

Hydrogen valley: leverage local assets and address local needs

Reference Person: De Santoli Livio (livio.desantoli@uniroma1.it)

Host University/Institute: Università La Sapienza di Roma / DIAEE dipartimento di ingegneria astronautica elettrica energetica

Research Keywords: Green hydrogen

Hydrogen production

Hydrogen storage and use

Reference ERCs: PE8_6 Energy processes engineering

PE8_9 Production technology, process engineering

PE8_11 Environmental engineering, e.g. sustainable design, waste and water treatment, recycling, regeneration or recovery of compounds, carbon capture & storage

Reference SDGs: GOAL 7: Affordable and Clean Energy, GOAL 9: Industry, Innovation and Infrastructure, GOAL 11: Sustainable Cities and Communities

Description of the research topic

Decarbonising the global economy is one of the essential challenges of the 21st century. During the last decades, the effects of global warming have been visible worldwide. European countries face this urgent issue, promoting several directives and guidelines to reduce fuel emissions, energy consumption and pollution levels.

Carbon dioxide, the main greenhouse gas responsible for global warming, comes primarily from fossil fuel-based energy production, which is still prevalent today.

The Hydrogen Valleys fall within this context. Fuel cells and hydrogen (FCH) technologies have the potential to play a crucial role in this energy transition process. Indeed, fuel cells and hydrogen provide a safe and competitive zero-emission solution for many applications when produced as "green hydrogen" with renewable energy sources.

The main goal of the project is to create an integrated infrastructure that aims to demonstrate the feasibility, functionality, sustainability, resilience and safety of a hydrogen-

based ecosystem, as well as to offer the industry the possibility to experiment and validate in a dedicated ecosystem, the technological solutions with different TRLs, on a significant scale.

Specifically, it is planned to evaluate a city district's multifunctional infrastructures that will allow, with a technology-neutral approach, the demonstration and integration of hydrogen technologies to help achieve energy transition objectives in the short and longer term.

Research team and environment

The research team will involve researchers of Applied Physics and Energy Engineering (DIAEE), Chemical Engineering Materials Environment (DICMA), Environmental Biology (DBA), and Civil, Constructional and Environmental Engineering (DICEA) at Sapienza University. In addition, the group collaborates with several other research groups in Italy (e.g. CNR, ENEA and Ministry of the Environment. Furthermore, international research links are active in Europe.

Suggested skills for this research topic

Ideally, the successful candidate should have a basic knowledge of:

Global and the local energy cycle, processes at Earth's surface and underground, Energy Engineering and have experience with data analysis;

Sound background in Applied Physics, atmospheric and climate sciences. Experience in the treatment and analysis of data;

Skills in numerical modelling;

Work in a multidisciplinary team and an international context;

Source of fundings

DM117/2023 - M4C2 - Inv. 3.3. - Dottorati Innovativi

Period of research abroad

For this scholarship it is mandatory a period of research abroad of 6 months.

Internship

For this scholarhip it is mandatory a period of Min 6 months - Max 18 months at SWS Engineering

PhD SDC
SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE

Scholarship code

CU3.24

Curriculum: CU3 - Technology and Territory

Disruptive and Scalable Technologies for Energy Transition

Reference Person: Martina Mario (mario.martina@iusspavia.it)

Host University/Institute: Scuola Univeritaria Superiore IUSS Pavia / Classe di Scienze, Tecnologie e Società

Research Keywords: Energy transition

Disruptive technologies

Decarbonization of the energy sector

Reference ERCs: PE10_3 Climatology and climate change

PE10_2 Meteorology, atmospheric physics and dynamics

PE10_21 Earth system modelling and interactions

Reference SDGs: GOAL 3: Good Health and Well-being, GOAL 11: Sustainable Cities and Communities, GOAL 13: Climate Action

Description of the research topic

A global transition to clean and sustainable energy sources is vital to address diminishing fossil fuel reserves and rising energy demand. This research explores disruptive and scalable technologies to expedite the energy transition and enable a sustainable future. Objectives include: (1) identifying disruptive technologies like hydrogen, renewable energy, district heating, power from bioenergy, waste heat, and innovative approaches to transmission and distribution; (2) assessing their scalability and suitability for large-scale adoption considers factors such as resources, technology maturity, infrastructure, and economic viability; (3) analyzing economic, environmental, and social impacts focuses on decarbonizing the energy sector and promoting sustainable development; (4) develop strategies and recommendations for policymakers, industry stakeholders, and investors to facilitate the adoption of these disruptive and scalable technologies. The study involves: (a) a comprehensive literature review, analyzing potential benefits, limitations, and challenges; (b) avaluating scalability factors like resource availability, technology maturity, infrastructure, and economic viability; (c) quantifying economic, environmental, and social impacts, including reducing emissions, enhancing energy efficiency, promoting security, job creation, and local economic development. Case studies will be conducted on successful implementations offer insights into lessons learned, best practices, and challenges. Based on findings, the candidate will develop policy recommendations, investment strategies, and implementation plans to address regulatory frameworks and financial incentives.

Research team and environment

The candidate will be part of the CARISMA team and will be also involved in the R&D group of the MITO Technology company. The CARISMA team within IUSS is composed by STEM and Social scientists working on different aspects of climate change among which: data analysis and modelling of Earth system and economic system processes; impact assessment of extreme natural events and anthropogenic activities on human and natural environments.

MITO Technology company is an Italian-based leading intellectual property licensing and IP consulting company, is the strategic advisor of the fund, that provides connection with investment opportunities and scouts the most promising initiatives in the field of sustainability.

Suggested skills for this research topic

The ideal candidate should be skilled in the fields of Physical and Mathematical Sciences, Earth and Environmental Sciences or Civil Engineering, with a strong background in statistics. Specific skills in the field of climate science will be considered a plus. Moreover, the candidate should be strongly motivated to work in a pluralist and multi-disciplinary environment, collaborating with the STEM and social scientists of the CARISMA research centre.

Source of fundings

DM117/2023 - M4C2 - Inv. 3.3. - Dottorati Innovativi

Period of research abroad

For this scholarship it is mandatory a period of research abroad of 6 months.

Internship

For this scholarhip it is mandatory a period of Min 6 months - Max 18 months at MITO Technologies

PhD SDC
SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE

Scholarship code

CU4.18

Curriculum: CU4 - Theories, Institutions and Cultures

Managing Scarce Resources: Ethical, Social and Educational Profiles

Reference Person: Pirni Alberto (alberto.pirni@santannapisa.it)

Host University/Institute: Scuola Superiore Sant'Anna - Pisa / Istituto di Diritto, Politica e Sviluppo

Research Keywords: Ethics of Climate Change

Water (usage and consumption)

Scarce Resources Management

Reference ERCs: SH5_10 Ethics and its applications; social philosophy

SH7_6 Environmental and climate change, societal impact and policy

SH1_12 Environmental economics; resource and energy economics; agricultural economics

Reference SDGs: GOAL 6: Clean Water and Sanitation, GOAL 11: Sustainable Cities and Communities, GOAL 16: Peace and Justice Strong Institutions

Description of the research topic

The research aims at addressing the ethical, social, and educational profiles of the so called "scarce resources" and their appropriate management. The fundamental focus will be devoted to the management of water. Accordingly, a specific attention will be dedicated to the public, agricultural and industrial usages of water, and the correlative priority settings. The comparative analysis, which could refer to the management of other fundamental scarce resources – such as (among others) land, forests, air, river basins and oceans, biodiversity – will be also welcomed. The expected research will benefit from the analysis of concrete case studies.

We encourage ambitious submissions relying on genuine transdisciplinarity and a plurality of approaches, including (just as preliminary exemplificatory list) ethical theories, political science, law sectors, environmental economics, and public and private management. Further relevant fields of research include the impact of climate change and the ethics of sustainability on wide and urban areas, the transition to agri-food and industrial sustainability, finally, the possibility of innovating contexts of living togetherness in urban and non-urban areas. The intergenerational justice approach will constitute the leading methodological focus for addressing innovative ethical models for the redistribution of costs and burdens deriving from the climate change in specific areas of the World, Europe, and,

more specifically, in Italy. Comparative policy analysis will be also the key factors for addressing specific case studies, in cooperation with (all levels) institutional actors and international organizations operating on the same crucial sectors.

In the most comprehensive sense, successful projects are expected to contribute to contemporary ethical and theoretical-political debates related to sustainability, environmental ethics, theories of justice (including intergenerational) and global political theories, through a critical discussion of issues such as allocation of responsibilities, potential redistribution of benefits/disadvantages, mitigation of discrimination and inequalities resulting from climate change and over- and mis-uses of scarce resources, at local, national and supranational level.

Research team and environment

The research will be mainly carried out in the intellectually stimulating and highly engaging academic environment of the National PhD School in "Sustainable Development and Climate Change", and in the wider network of the scholars and institutions participating in the PhD Curriculum in 'Theories, Institutions and Culture', with specific reference to the Sant'Anna School of Advanced Studies (Pisa – Italy). At the Sant'Anna School, the research will be developed within the Institute of Law, Politics and Development (DIRPOLIS). The Institute conducts innovative research in the fields of law, political science, moral and political philosophy. Its multidisciplinary approach allows for a comprehensive representation of complex legal, political, social and economic phenomena. Its manifold projects and activities on environmental-related issues, carried out within a cooperation network gathering a number of scholars from various European and non-European universities, promote high level scientific research in the field of climate change and sustainable development.

Due to the specificity of the project, the research path will include a secondment at the "AcquaNovara.VCO", a leading public enterprise in the water-services sector, based in Piedmont, Italy, that can serve as reference case-study, since it has been implementing from several years a wide and multifaceted strategy devoted to the strengthening of the profile of sustainable consumption of water, also by consolidating an interesting territorial stakeholders' network.

Suggested skills for this research topic

Openess towards interdisciplinary approaches, together with a solid competence in the social sciences area will be appreciated.

Source of funding

DM117/2023 - M4C2 - Inv. 3.3. - Dottorati Innovativi

Period of research abroad

For this scholarship it is mandatory a period of research abroad of 6 months.

Internship

For this scholarhip it is mandatory a period of Min 6 months - Max 18 months at AcquaNovara.VCO

PhD SDC

SUSTAINABLE DEVELOPMENT
AND CLIMATE CHANGE

CONTATTI

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