



Decreto Rettorale n. */2026 **Oggetto:** **Concorso pubblico, per titoli ed esami, per l'ammissione al Corso di dottorato di ricerca in Sustainable Development and Climate change – XLII ciclo – A.A. 2026-2027**

*n. della registrazione di protocollo riportato nei metadati del sistema di protocollo informatico Titulus

Pubblicato all'Albo della Scuola

Area: Didattica, Orientamento e Alumni

U.O.: Dottorato SDC

IL RETTORE

VISTA la Legge 30 dicembre 2010, n. 240;

VISTO il Decreto ministeriale 29 dicembre 2021, n. 226 “Regolamento recante modalità di accreditamento delle sedi e dei corsi di dottorato e criteri per la istituzione dei corsi di dottorato da parte degli enti accreditati”;

VISTO il Decreto ministeriale 22 ottobre 2004, n. 270, “Modifiche al regolamento recante norme concernenti l'autonomia didattica degli Atenei, approvato con decreto del Ministro dell'Università e della Ricerca scientifica e tecnologica 3 novembre 1999, n. 509”;

VISTO lo Statuto della Scuola Universitaria Superiore IUSS, emanato con Decreto Rettorale n. 46/2022 pubblicato nella Gazzetta Ufficiale della Repubblica Italiana del 30.03.2022;

VISTO il Regolamento per i corsi di dottorato della Scuola emanato con Decreto Rettorale n. 743/2025;

VISTO il Regolamento per il Corso di dottorato in Sustainable Development and Climate change emanato con Decreto Rettorale n. 292/2026;

RICHIAMATA la delibera del Senato Accademico del 27 maggio 2026 con cui è stato approvato il bando per l'ammissione al Corso di dottorato di ricerca in Sustainable Development and Climate change - XLII ciclo;

RICHIAMATA la delibera del Consiglio direttivo e di sorveglianza del 28 maggio 2026 con cui è stato approvato il bando per l'ammissione al Corso di dottorato di ricerca in Sustainable Development and Climate change - XLII ciclo;

RICHIAMATI i Decreti Rettorali d'urgenza n. 405/2026 e n. 419/2026 con cui sono stati integrati i posti per il bando di concorso per l'ammissione al corso

di Dottorato nazionale in Sustainable Development and Climate change
- ciclo XLII per un totale di posti pari a n. 35;

- CONSIDERATO** l'addendum alla convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritto con il Politecnico di Torino in data 28/05/2026 (prot. n. 6443/2026);
- CONSIDERATO** l'addendum alla convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritto con la Scuola Superiore Sant'Anna in data 12/06/2026 (prot. n. 7067/2026);
- CONSIDERATO** l'addendum alla convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritto con la Scuola Superiore Sant'Anna in data 21/07/2026 (prot. n. 8894/2026);
- CONSIDERATO** l'addendum alla convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritto con l'Università degli Studi di Messina in data 03/06/2026 (prot. n. 6631/2026);
- CONSIDERATO** l'addendum alla convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritto con l'Università degli Studi di Torino in data 10/06/2026 (prot. n. 6948/2026);
- CONSIDERATA** la convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritta con il Politecnico di Milano in data 15/06/2026 (prot. n. 7173/2026);
- CONSIDERATA** la convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritta con la Scuola Superiore Normale in data 03/06/2026 (prot. n. 6632/2026);
- CONSIDERATA** la convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritta con l'Università di Pisa in data 10/06/2026 (prot. n. 6947/2026);
- CONSIDERATA** la convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritta con l'Università degli Studi dell'Insubria in data 03/06/2026 (prot. n. 6630/2026);

CONSIDERATA	la convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritta con l'Università degli Studi di Napoli l'Orientale in data 11/06/2026 (prot. n. 6982/2026);
CONSIDERATA	la convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritta con l'Università degli Studi di Napoli Federico II in data 10/06/2026 (prot. n. 6946/2026);
CONSIDERATA	la convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritta con l'Università degli Studi di Perugia in data 12/06/2026 (prot. n. 7068/2026);
CONSIDERATA	la convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritta con l'Università degli Studi di Trento in data 03/06/2026 (prot. n. 6629/2026);
CONSIDERATA	la convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritta con il Consiglio Nazionale delle Ricerche in data 16/06/2026 (prot. n. 7258/2026);
CONSIDERATA	la convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritta con la Libera Università di Bolzano in data 19/05/2026 (prot. 6055/2026);
CONSIDERATA	la convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritta con l'Università Cattolica del Sacro Cuore in data 19/05/2026 (prot. n. 6058/2026);
CONSIDERATA	la convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritta con l'Università degli Studi di Palermo in data 19/05/2026 (prot. n. 6050/2026);
CONSIDERATA	la convenzione per l'attivazione e il funzionamento del corso di dottorato nazionale in Sustainable Development and Climate change (SDC) - ciclo XLII sottoscritta con l'Università degli Studi di Bari in data 28/05/2026 (prot. n. 6440/2026);
RITENUTO	di dover provvedere all'emanazione del bando relativo alla indizione di pubblico concorso, per titoli ed esami, per l'ammissione al Corso di dottorato di ricerca in Sustainable Development and Climate change -

XLII ciclo con sede amministrativa presso la Scuola Universitaria Superiore, nelle more della ricezione del parere favorevole dell'Agenzia Nazionale di Valutazione del sistema Universitario e della Ricerca (ANVUR) dei requisiti per l'accreditamento previsto dal D.M. 226/2021 necessario ai fini della conferma di accreditamento;

DECRETA

Art.1 – È emanato il bando di Concorso pubblico, per titoli ed esami, per l'ammissione al Corso di dottorato di ricerca in Sustainable Development and Climate change – XLII ciclo – A.A. 2026-2027, con sede amministrativa presso la Scuola universitaria superiore IUSS, come da allegato facente parte integrante del presente atto.

Art.2 – La domanda di ammissione al concorso deve essere presentata esclusivamente *on line* entro le ore **13.00 del 26 agosto 2026**.

Pavia, data del protocollo

IL RETTORE

Prof. Mario Lloyd Virgilio Martina

(Documento firmato digitalmente ai sensi del D.Lgs 82/2005)



**Bando di concorso per l'ammissione al Corso di Dottorato Nazionale in
Sustainable Development and Climate change (SDC) - 42°ciclo A.A. 2026/2027
SCADENZA BANDO 26/08/2026 ore 13.00**

Modifiche e/o integrazioni al bando saranno pubblicate sul
Sito Istituzionale della Scuola
sezione Concorsi, bandi e selezioni/Bandi per Dottorato

INDICE

Art. 1 - ISTITUZIONE DEL CORSO DI DOTTORATO NAZIONALE	3
1.1 <i>Descrizione e obiettivi del Corso di dottorato</i>	3
1.2 <i>Università convenzionate</i>	4
1.3 <i>Borse di studio messe a bando</i>	5
Art. 2 - REQUISITI DI AMMISSIONE	5
Art. 3 - DOMANDE DI AMMISSIONE ALLA SELEZIONE	6
3.1 <i>Procedura di ammissione</i>	6
3.2 <i>Documenti da allegare</i>	7
Art. 4 - PROVE DI AMMISSIONE	10
Art. 5 – COMMISSIONE GIUDICATRICE	11
Art. 6 – GRADUATORIE E ASSEGNAZIONE DELLE BORSE DI STUDIO	11
Art. 7 - IMMATRICOLAZIONE	12
7.1 <i>Procedura di immatricolazione</i>	12
7.2 <i>Adempimenti ulteriori per candidati richiedenti visto</i>	13
7.3 <i>Tasse di iscrizione</i>	13
7.4 <i>Certificazione lingua inglese</i>	13
Art. 8 - BORSE DI STUDIO	13
Art. 9 - COMPATIBILITÀ E INCOMPATIBILITÀ	13
Art. 10 - TRATTAMENTO DEI DATI PERSONALI	14
<i>Amministrazione trasparente</i>	14
Art. 11 - NORME DI RIFERIMENTO	14
<i>Responsabile del procedimento amministrativo</i>	15

Art. 1 - ISTITUZIONE DEL CORSO DI DOTTORATO NAZIONALE

È indetto presso la Scuola Universitaria Superiore IUSS, con sede in Piazza della Vittoria n. 15, 27100 Pavia (di seguito denominata “la Scuola”) il concorso pubblico per l’ammissione al corso di **Dottorato Nazionale in Sustainable Development and Climate change (SDC)** – XLII ciclo - A.A. 2026/2027.

Il Coordinatore del Corso di dottorato nazionale è il Prof. Roberto Buizza – phd-sdc.coordinator@iusspavia.it.

1.1 Descrizione e obiettivi del Corso di dottorato

Il **Dottorato Nazionale in Sustainable Development and Climate change** vuole preparare le generazioni future a ridisegnare una società resiliente, in grado di affrontare e risolvere il problema del cambiamento climatico, e a ripensare ad un progresso sostenibile, non più esclusivamente misurato da una crescita economica. Centrale al percorso dottorale è lo studio della complessità determinata dalle interrelazioni tra progresso tecnologico, disponibilità di risorse naturali, migrazioni, benessere e qualità della vita della generazione presente e di quelle future, cambiamento climatico, specificità territoriali, accessibilità all’acqua e al cibo. Nel contesto della formazione universitaria, i temi dello sviluppo sostenibile e del cambiamento climatico vanno affrontati. La sfida è identificare e realizzare progetti innovativi per andare oltre l’approccio tradizionale, specialistico e disciplinare, per preparare alle sfide attuali e costruire una efficace connessione tra competenze diverse utilizzando linguaggi e metodi fortemente eterogenei.

Il dottorato è articolato in una pluralità di curricula in diversi ambiti disciplinari interconnessi, con una notevole distribuzione territoriale. Per garantire che i dottorandi seguano un percorso educativo multi- ed inter-disciplinare, il dottorato agirà su due reti di interconnessione:

- una rete di curricula riguardanti gli ambiti di strumenti disciplinari;
- una seconda rete di Università, Enti Pubblici di Ricerca (EPR) ed istituzioni coinvolte nella gestione dei diversi curricula, e coordinate da un comitato nazionale che integra e gestisce la complessità realizzando l’interazione fra i curricula.

Il tema del dottorato è unico, ma viene declinato in 3 curricula per poter essere sviluppato in maniera approfondita in diverse aree disciplinari. Il tema dello sviluppo sostenibile e del cambiamento climatico definisce la direzione del percorso formativo: può essere pensato come la missione del dottorato che, tramite le risorse, le competenze e gli strumenti caratteristici dei diversi ambiti disciplinari (tools), sarà completata declinandola in obiettivi concreti (goals) che costituiranno gli argomenti di ricerca degli allievi.

L’interazione e la collaborazione scientifica tra gli allievi e le allieve dei diversi ambiti sarà favorita da un approccio multi-disciplinare coordinato a livello centrale e realizzato sia all’interno di uno dei goals, mediante il collegamento tra un ambito disciplinare principale e gli altri ambiti, e fra i goals di aree disciplinari diverse.

Il Corso, che ha **durata triennale**, è articolato nei seguenti **tre curricula**, la cui descrizione (con i relativi SSD – Settori Scientifico- Disciplinari) è riportata nell’allegato “**Educational Programme**” facente parte integrante del presente bando:

- CU ALPHA - ONE HEALTH: EARTH SYSTEM AND HUMAN LIFE
- CU BETA - HUMAN SOCIETY: SOCIO-ECONOMIC IMPACTS, INSTITUTIONS AND THEORIES
- CU GAMMA - TECHNOLOGY AND TERRITORY: SUSTAINABLE STRATEGIES AND SOLUTIONS FOR THE TRANSITION

1.2 Università convenzionate

Per l'attivazione del Corso di dottorato nazionale la Scuola ha formalizzato convenzioni con le seguenti Università e Centri di ricerca, che saranno sedi operative del programma:

1. *Politecnico di Milano*
2. *Politecnico di Torino*
3. *Scuola Normale Superiore di Pisa*
4. *Scuola Universitaria Superiore Pisa Sant'Anna*
5. *Università degli Studi di Bari Aldo Moro*
6. *Libera Università di Bolzano*
7. *Università Cattolica del Sacro Cuore*
8. *Università degli Studi Insubria Varese-Como*
9. *Università degli Studi Mediterranea di Reggio Calabria*
10. *Università degli Studi di Messina*
11. *Università degli Studi di Napoli Federico II*
12. *Università degli Studi di Napoli L'Orientale*
13. *Università degli Studi di Palermo*
14. *Università degli Studi di Perugia*
15. *Università di Pisa*
16. *Università degli Studi di Torino*
17. *Università degli Studi di Trento*

18. Consiglio Nazionale delle Ricerche (CNR)

1.3 Posti a bando

I posti messi a bando sono n. **35** come riportato nell'allegato "Research Topics". Il numero dei posti potrà essere aumentato qualora venissero accertate, prima dell'inizio del Corso di dottorato, ulteriori disponibilità finanziarie.

Tutte le borse di studio messe a bando prevedono obbligatoriamente lo svolgimento dell'attività su uno specifico tema di ricerca, come dettagliato nelle schede presenti nel suddetto allegato, e vincolano gli assegnatari allo svolgimento delle attività di ricerca previste nella descrizione di ciascuna borsa presso l'università indicata come "host university". Possono essere assegnate solo ai candidati e alle candidate che siano stati giudicati idonei dalla Commissione per l'esecuzione dello specifico tema.

La selezione dei candidati prevede anche un colloquio, durante il quale la Commissione giudicatrice verificherà il possesso delle conoscenze disciplinari di base necessarie per la frequenza del corso di dottorato e per la competenza circa gli argomenti di ricerca previsti dalla tematica associata alla/e borsa/e di dottorato indicata/e dal/la candidato/a.

Per ulteriori informazioni sul Corso di dottorato nazionale e il relativo "Educational Programme" è possibile consultare il sito del corso del dottorato <https://phd-sdc.it/> o scrivere all'indirizzo phd-sdc@iusspavia.it.

Art. 2 - REQUISITI DI AMMISSIONE

Possono partecipare alla selezione, senza limitazioni di età e di cittadinanza, i candidati e le candidate in possesso di almeno uno dei seguenti titoli di studio:

- a) Laurea magistrale o specialistica;
- b) Laurea dell'ordinamento previgente (vecchio ordinamento);
- c) Analogo titolo accademico di secondo livello rilasciato dalle istituzioni facenti parte del comparto AFAM (Alta Formazione Artistica e Musicale);
- d) Titolo analogo a quelli menzionati ai punti a), b) e c) conseguito all'estero, riconosciuto equivalente ai suddetti titoli accademici di secondo livello, ai soli fini della partecipazione al concorso per l'ammissione al dottorato.

Sono ammessi con riserva i candidati e le candidate che non possiedono i requisiti di cui sopra alla data di scadenza del presente bando. Il titolo di studio necessario per l'accesso ai corsi di dottorato dovrà essere conseguito entro la data di inizio corso (1 novembre 2026).

Art. 3 - DOMANDE DI AMMISSIONE ALLA SELEZIONE

3.1 Procedura di ammissione

La domanda di ammissione alla selezione deve essere presentata online **entro le ore 13 del giorno 26 agosto 2026**. I candidati dovranno provvedere al pagamento, entro il termine di scadenza del bando, del contributo per la partecipazione al concorso pari a **euro 30**, pena l'esclusione dal concorso medesimo. Il contributo concorsuale versato non sarà in nessun caso rimborsato.

Per presentare domanda di ammissione alla selezione, il candidato dovrà:

- accedere alla piattaforma PICA seguente link: <https://pica.cineca.it/iuss/dottorato-42>
- se già in possesso di credenziali di accesso, accedere tramite "login";
- in caso di primo accesso, cliccare su "Nuova Registrazione". La procedura chiederà di inserire i seguenti dati:
 - Nome
 - Cognome
 - Sesso
 - Data di nascita
 - Codice Fiscale (solo per cittadini italiani)
 - Stato di nascita
 - Comune di nascita
 - Telefono
 - Cellulare

Una volta effettuata la registrazione, si riceverà una mail per l'attivazione dell'account all'indirizzo e-mail indicato. Ad account attivato, il candidato potrà effettuare il login.

Per procedere alla candidatura, la procedura richiede il caricamento dei seguenti documenti:

- Curriculum Vitae
- Documento di identità ben leggibile e in corso di validità
- Research Proposal
- Letter of Purpose
- Titolo di studio posseduto (per coloro che in fase di candidatura non avessero ancora conseguito il titolo richiesto, la procedura richiede di inserire l'Università, la Classe di Laurea - solo per titolo italiano)
- Altri titoli valutabili

Una volta caricati tutti i documenti richiesti, cliccare su "salva" e tornare alla dashboard.

Il sistema chiede quindi di verificare i dati inseriti tramite il pulsante "verifica"; solo dopo aver verificato la correttezza delle informazioni presenti, si può proseguire e finalizzare il pagamento dell'iscrizione.

Cliccare quindi su "pagamento" e seguire le istruzioni fornite dalla piattaforma per utilizzare il sistema "PagoPA".

Il sistema richiederà quindi la firma della domanda e l'invio della stessa.

Il corretto invio della candidatura è confermato via e-mail all'indirizzo indicato in fase di registrazione. In caso di mancata ricezione (entro le 24 ore) della conferma si prega di contattare il supporto della piattaforma PICA.

3.2 Documenti da allegare

a)	Documento di riconoscimento con foto in corso di validità	Lingua: originale. Scansione fronte retro Per i documenti scritti in alfabeto NON latino, è richiesta la traduzione da un ente o persona a ciò preposti o autorizzati. In assenza della traduzione, il documento non verrà preso in considerazione.
b)	Curriculum Vitae	Lingua: inglese. Lunghezza: max 2000 parole. Deve contenere: - titoli di studio e percorso formativo - eventuali esperienze di ricerca o lavorative - eventuale elenco delle pubblicazioni - ogni altro titolo ritenuto utile dal/la candidato/a che possa qualificare l'esperienza accademica e/o professionale.
c)	Attestazione del conseguimento del titolo di laurea magistrale o equivalente presentato ai fini dell'ammissione alla procedura, indicante: 1. Università che ha rilasciato il titolo; 2. Tipologia di laurea (magistrale/ magistrale a ciclo unico/vecchio ordinamento ecc.); 3. Denominazione del corso di laurea; 4. Classe di laurea (solo per i titoli conseguiti in Italia); 5. Data di conseguimento del titolo; 6. Voto finale; 7. Lista e voto degli esami sostenuti.	Lingua: Italiano, Inglese, Francese o Spagnolo. N.B: I titoli presentati in altre lingue devono necessariamente avere una traduzione ufficiale in italiano o inglese effettuata dall'Università che ha rilasciato il titolo o da un ente o persona a ciò preposti o autorizzati. In assenza, i titoli non verranno presi in considerazione. Tipo di attestazione, per titoli conseguiti in: 1. Università pubbliche italiane: autocertificazione*, datata e firmata, del conseguimento della Laurea magistrale/vecchio ordinamento. 2. Università di Stati Ue/extra Ue: il certificato, il <i>transcript of records</i> del titolo di secondo livello oppure il <i>Diploma Supplement</i>, se presente.

d)	Attestazione del conseguimento di altri titoli posseduti. Ciascun titolo di studio universitario posseduto, di primo e secondo livello, indicante: 1. Università che ha rilasciato il titolo; 2. Tipologia di laurea (magistrale/ magistrale a ciclo unico/vecchio ordinamento ecc.); 3. Denominazione del corso di laurea; 4. Classe di laurea (solo per i titoli conseguiti in Italia); 5. Data di conseguimento del titolo; 6. Voto finale; 7. Lista e voto degli esami sostenuti	Lingua: Italiano, Inglese, Francese o Spagnolo. N.B.:I titoli presentati in altre lingue devono necessariamente avere una traduzione ufficiale in italiano o inglese effettuata dall'Università che ha rilasciato il titolo o da un ente o persona a ciò preposti o autorizzati. In assenza, i titoli non verranno presi in considerazione. Tipo di attestazione, per titoli conseguiti in: 1. Università pubbliche italiane: autocertificazione*, datata e firmata, del conseguimento della Laurea triennale e della Laurea magistrale/vecchio ordinamento. 2. Università di Stati Ue/extra Ue: il certificato, il transcript of records del titolo di primo e secondo livello oppure il Diploma Supplement, se presente;
e)	<i>Per i candidati che, alla data di presentazione della domanda, non possiedono il titolo di studio di secondo livello:</i> Attestazione relativa agli esami sostenuti e ai voti conseguiti	Lingua: Italiano, Inglese, Francese o Spagnolo. N.B.: Le attestazioni presentate in altre lingue devono necessariamente avere una traduzione ufficiale in italiano o inglese effettuata dall'Università che ha rilasciato il titolo o da un ente o persona a ciò preposti o autorizzati. In assenza, le attestazioni non verranno presi in considerazione.
f)	Research proposal	Lingua: Inglese. La “Research Proposal” (min 1000 max 2500 parole - esclusa bibliografia) deve essere elaborata sul tema della borsa per la quale è stata presentata manifestazione di interesse come prima preferenza e deve essere articolata in: - Abstract (max 250 parole) - Scope and Research Question (-s) - Methodology - Expected results and impacts
g)	Letter of purpose	Lingua: Inglese. La “Letter of Purpose” (max 500 parole) deve contenere le motivazioni del/lla candidato/a a svolgere il progetto di ricerca proposto, che si riferisce al primo tema di ricerca selezionato, nonché l'interesse agli altri temi di ricerca selezionati facendo riferimento alle competenze ed esperienze acquisite.

* In base alla vigente normativa, la Scuola non potrà accettare certificazioni rilasciate da altre Pubbliche Amministrazioni. Pertanto, i titoli posseduti dai candidati, allegati alla domanda di ammissione al concorso, se rilasciati da Atenei pubblici italiani, dovranno obbligatoriamente essere autocertificati.

Tutti i documenti devono essere in inglese ad eccezione di a) che può essere in lingua d'origine e quelli ai punti c), d) ed e) che possono essere prodotti in una lingua a scelta tra **Italiano, Inglese, Francese o Spagnolo**. Per titoli di studio rilasciati in una **lingua diversa** deve essere allegata la traduzione ufficiale in italiano o inglese effettuata dall'Università che ha rilasciato il titolo o da un ente o persona a ciò preposti o autorizzati.

I documenti di cui alle lettere a) e c), o in caso di titolo non ancora conseguito e), sono documenti obbligatori per l'ammissione al concorso. In assenza anche solo di uno di tali documenti la candidatura sarà esclusa dal concorso.

Art. 4 - PROVE DI AMMISSIONE

Modalità di verifica	La selezione avverrà mediante la valutazione dei titoli elencati nella sezione “titoli valutabili” e colloquio. La Commissione giudicatrice esprimerà una valutazione in centesimi, con un punteggio da 1 a 100. 1. Valutazione titoli: la Commissione giudicatrice valuterà i titoli scientifici presentati assegnando un punteggio massimo di 60 punti. Saranno ammessi al colloquio i candidati che nella valutazione di cui sopra avranno conseguito un punteggio non inferiore a 35 punti. In particolare, la Commissione attribuirà i seguenti punteggi: - valutazione Curriculum Vitae (punti b, c e d dei titoli allegati alla domanda): massimo 20 punti - valutazione Research Proposal e Letter of Purpose (di cui ai punti e ed f dei titoli allegati alla domanda): massimo 40 punti La Commissione si riserva, sulla base dei titoli presentati, la possibilità di esprimere un giudizio di non idoneità del candidato rispetto ad una o più delle borse per le quali ha manifestato interesse in sede di candidatura. 2. Colloquio: il colloquio è espletato in inglese in modalità telematica mediante piattaforma Teams e avrà ad oggetto una discussione sui titoli presentati, sulla Research Proposal e sulla Letter of Purpose. La presentazione da parte del candidato di quanto sopra può avvenire, a sua discrezione, anche mediante l'utilizzo di <i>slide</i> in condivisione video. Per ognuno dei temi di ricerca messi al bando, la Commissione può invitare a partecipare al colloquio un esperto di comprovata competenza della materia anche appartenente al collegio dei docenti del dottorato. La Commissione giudicatrice potrà attribuire al colloquio orale fino ad un massimo di 40 punti. Saranno esclusi dalla graduatoria di merito i/le candidati/e che nel colloquio avranno ottenuto una votazione inferiore ai 25 punti. <u>Durante il colloquio la Commissione accerta il possesso delle conoscenze disciplinari di base necessarie per la frequenza del corso di dottorato e valuta l'idoneità del candidato rispetto a ciascuna delle Borse di studio per cui il candidato ha manifestato interesse in sede di candidatura.</u> Nella stessa sede, sulla base della coerenza del curriculum, previa autorizzazione da parte del candidato o della candidata, la Commissione procederà a valutare inoltre l'idoneità del candidato o della candidata rispetto ad ulteriori borse. Qualora l'esito di tale valutazione fosse positivo, <u>l'idoneità attribuita sarà presa in considerazione solo per le borse che non risultino assegnate all'esito dello scorrimento della graduatoria.</u>
-----------------------------	---

Titoli valutabili	- Curriculum Vitae; - Diploma Supplement o certificato con voti del diploma di laurea magistrale; - Pubblicazioni riportate nel CV; - Research Proposal; - Letter of Purpose; - Ogni altro titolo riportato nel CV ritenuto utile dal candidato per qualificare l'esperienza accademica e professionale
Esiti della valutazione titoli	Gli esiti della valutazione titoli saranno pubblicati entro il giorno 21 settembre 2026 all'Albo della Scuola – Sezione Bandi e concorsi.
Calendario dei colloqui	I colloqui si svolgeranno a partire dal giorno 23 settembre 2026. Le modalità di svolgimento del colloquio saranno comunicate ai candidati interessati con preavviso.
Ausili	I candidati che avessero esigenza di specifici ausili o compensazioni possono farne richiesta in sede di candidatura.

Al colloquio i candidati e le candidate dovranno essere collegati mediante la piattaforma Teams sia con l'audio che con il video. Il mancato collegamento dei candidati nel giorno o nell'orario stabilito per le prove, ovvero la mancata esibizione del documento di riconoscimento, sono considerati **rinuncia alla partecipazione** alla selezione.

Art. 5 – COMMISSIONE GIUDICATRICE

La Commissione giudicatrice per l'ammissione al Corso di Dottorato è nominata dal Rettore con proprio decreto e la sua composizione è consultabile all'Albo della Scuola e nella Sezione Concorsi, bandi e selezioni/Bandi per Dottorato del sito istituzionale. La Commissione è articolata in Sottocommissioni, composte dai commissari di curriculum. Ogni Sottocommissione è preposta allo svolgimento dei colloqui dei candidati al curriculum e può essere integrata da un esperto di comprovata competenza della materia, anche appartenente al collegio dei docenti del dottorato, per ognuno dei temi di ricerca messi a bando.

Art. 6 – GRADUATORIE E ASSEGNAZIONE DELLE BORSE DI STUDIO

Al termine dei colloqui ed entro il **15 ottobre 2026**, sarà emanato un decreto di approvazione atti contenente la graduatoria finale formulata per curriculum, che sarà consultabile sul sito istituzionale della Scuola – Concorsi, bandi e selezioni/Bandi per Dottorato.

La graduatoria finale:

- è formulata in ordine di punteggio ottenuto dal candidato e in caso di parità di punteggio fra due o più candidati prevale la minore età;

- riporta le idoneità ai temi di ricerca attribuite dalla commissione secondo l'ordine di preferenza espressa dal candidato in sede di candidatura e le ulteriori idoneità assegnate dalla Commissione in sede di colloquio.

L'assegnazione delle borse è fatta seguendo il procedimento riportato di seguito:

1. ad ogni candidato, seguendo l'ordine della graduatoria di merito, è proposta mediante comunicazione all'indirizzo di posta elettronica inserito in sede di candidatura, la prima borsa disponibile, per la quale ha ottenuto l'idoneità, secondo l'ordine di preferenza espresso in sede di candidatura;
2. il candidato è tenuto ad accettare la borsa proposta rispondendo mediante posta elettronica entro 48 ore dalla comunicazione;
3. se il candidato accetta entro il termine indicato, la borsa è assegnata ed è tolta dal conteggio delle borse disponibili;
4. se il candidato rinuncia o non risponde entro il termine indicato di 48 ore, perde il diritto ad avere la borsa proposta ed una qualsiasi altra borsa. La borsa proposta non viene quindi assegnata e rimane disponibile per i candidati successivi nell'ordine di graduatoria.

La procedura prosegue fino all'assegnazione di tutte le borse, compreso lo scorrimento sulla base delle idoneità aggiuntive assegnate in sede di colloquio, e si concluderà entro la data di inizio del corso.

Art. 7 - IMMATRICOLAZIONE

7.1 Procedura di immatricolazione

La pubblicazione all'Albo della Scuola delle graduatorie ha valore di comunicazione ufficiale.

L'inizio del Corso di dottorato nazionale è fissato il **1 novembre 2026**.

I candidati e le candidate vincitori di borsa di studio dovranno provvedere all'immatricolazione entro la scadenza comunicata dagli uffici, pena la perdita del diritto all'iscrizione al dottorato.

Ai fini del perfezionamento dell'iscrizione, i candidati ammessi dovranno trasmettere i documenti necessari secondo le modalità comunicate dagli uffici per l'immatricolazione, tra i quali:

- a) Solo per i candidati che hanno conseguito il titolo di II livello all'estero: Dichiarazione di valore (o copia dell'avvenuta richiesta alle autorità competenti) oppure Diploma Supplement;
- b) Solo per i candidati con titolo di II livello conseguito successivamente alla scadenza del bando ed entro la data di inizio del corso: certificato o autocertificazione di conseguimento del titolo di secondo livello con relativa votazione, data e luogo di ottenimento.

Per effettuare l'immatricolazione è necessario completare la relativa procedura su piattaforma Servizi Esse3 – Area Riservata Studenti, secondo le modalità indicate dagli uffici.

Non saranno accettate immatricolazioni o pagamenti effettuati con modalità diverse da quelle

indicate.

7.2 Adempimenti ulteriori per candidati richiedenti visto

Per entrare in Italia, gli studenti cittadini NON UE devono richiedere il visto ai fini di studio avendo cura di effettuare la registrazione all'apposita procedura tramite portale [University](#) entro cinque **(5) giorni lavorativi dalla data di accettazione della borsa**. Una volta arrivati in Italia, gli studenti sono tenuti a presentare entro otto (8) giorni, domanda di permesso di soggiorno a fini di studio presso la Questura. **L'ingresso in Italia e la presa di servizio presso l'Università ospitante per gli studenti NON UE devono avvenire entro e non oltre il giorno 31 gennaio 2026, pena la decadenza dal corso di dottorato.**

Per ulteriori informazioni consultare la pagina dedicata sul [sito della Scuola IUSS](#).

7.3 Tassa regionale

I dottorandi sono tenuti a pagare la tassa regionale per ciascun anno accademico.

Il contributo richiesto, a carico di tutti i dottorandi, consiste nella tassa regionale per il diritto allo studio ed è comprensivo dell'imposta di bollo.

La rinuncia o l'esclusione dal corso di dottorato non danno diritto al rimborso della tassa versata.

7.4 Certificazione lingua inglese

I dottorandi dovranno conseguire, entro la fine del primo anno di corso (31 ottobre 2027), una certificazione di lingua inglese di livello B2 rilasciata da istituti di lingua riconosciuti.

Art. 8 - BORSE DI STUDIO

Le borse di studio hanno la durata del corso di dottorato e vengono assegnate per il 1° anno e confermate annualmente per l'ammissione agli anni successivi previa valutazione positiva da parte del Collegio dei docenti.

L'importo annuo delle borse di studio al lordo degli oneri a carico del dottorando è pari a **18.645,63 euro**.

La borsa di dottorato è esente dal pagamento dell'imposta locale sui redditi e sul reddito delle persone fisiche (IRPEF) ed è soggetta al versamento dei contributi previdenziali INPS a gestione separata nella misura di due terzi a carico dell'amministrazione e di un terzo a carico del dottorando.

Le borse non possono essere cumulate con altre borse di studio a qualsiasi titolo conferite, tranne quelle concesse da istituzioni nazionali o straniere, utili ad integrare con soggiorni all'estero l'attività di ricerca dello studente.

Non può beneficiare di borsa di dottorato chi ne abbia fruito in precedenza, anche se parzialmente.

Per i periodi di permanenza all'estero, autorizzati dal Collegio dei Docenti, la borsa può essere incrementata nella misura del 50%, per un periodo di norma pari a 6 mesi e, ad ogni modo, complessivamente non superiore a 12 mesi.

Inoltre, la Scuola mette a disposizione di tutti gli allievi Ph.D. un budget annuale di importo pari al 20% della borsa, da destinare alla copertura di spese per lo svolgimento di attività di ricerca in Italia e all'estero, secondo le modalità previste dal Regolamento interno.

La Scuola provvede ad assicurare gli allievi e alle allieve per l'intera durata del corso per infortuni e per responsabilità civile.

Art. 9 - COMPATIBILITÀ E INCOMPATIBILITÀ

L'ammissione al corso di dottorato comporta un impegno esclusivo e a tempo pieno.

I regimi delle compatibilità e delle incompatibilità con la frequenza ai corsi di dottorato sono disciplinati dall'art. 17 del [Regolamento per i corsi di dottorato](#), al quale si rinvia.

ART. 10 - TRATTAMENTO DEI DATI PERSONALI

Ai sensi della normativa della normativa in materia di protezione dei dati personali (D. Lgs. 196/2003 e ss.mm.ii nonché dell'art. 13 del Regolamento (UE) 2016/679) la Scuola, in qualità di Titolare (con sede in piazza Vittoria, 15, 27100 Pavia PV – PEC direzione@pec-iusspavia.it) informa che il trattamento dei dati personali, raccolti presso gli uffici amministrativi della Scuola, è finalizzato all'espletamento del concorso e dell'eventuale procedimento di gestione alla carriera accademica dei vincitori; avverrà nel rispetto delle condizioni di liceità previste dal Regolamento (UE) 2016/679, da parte di personale autorizzato, con l'utilizzo di procedure anche informatizzate, nei modi e nei limiti necessari per proseguire le predette finalità. I dati saranno trattati in conformità alle norme sulla conservazione della documentazione amministrativa. Il conferimento di tali dati è necessario per valutare i requisiti di partecipazione e il possesso dei titoli e la loro mancata indicazione può precludere tale valutazione, con conseguente esclusione dalla procedura. Le graduatorie saranno pubblicate secondo la normativa vigente. I dati potranno essere comunicati alle amministrazioni pubbliche direttamente interessate alla posizione giuridico-economica del candidato positivamente valutato e a tutti quei soggetti pubblici ai quali, in presenza dei relativi presupposti, la comunicazione è prevista obbligatoriamente. Gli interessati hanno il diritto di ottenere dalla Scuola, nei casi previsti, l'accesso ai dati personali e la rettifica o la cancellazione degli stessi o la limitazione del trattamento che li riguarda o di opporsi al trattamento (artt. 15 e ss. del Regolamento). L'apposita istanza è presentata al Titolare. Ulteriori informazioni sono disponibili al seguente link: <https://www.iusspavia.it/it/protezione-dati-personali>.

Amministrazione trasparente:

La Scuola opera nel rispetto della normativa relativa alla prevenzione della corruzione (L.190/2012) applicando le misure individuate nel Piano Integrato pubblicato nella sezione "Trasparenza" del sito istituzionale all'indirizzo: <http://www.iusspavia.it>.

Art. 11 - NORME DI RIFERIMENTO

Per quanto non previsto dal presente bando si rinvia al [Regolamento per i Corsi di dottorato della Scuola](#), emanato con D.R. n. 743/2025 e al [Regolamento del Corso di Dottorato Nazionale in Sustainable development and Climate change](#), emanato con D.R. 292/2026.

La presentazione della domanda di partecipazione alle selezioni attraverso la procedura di cui all'art. 3 implica l'accettazione da parte del candidato delle norme contenute nel presente bando e nel Regolamento per i Corsi di dottorato.

Responsabile del procedimento amministrativo

Dott.ssa Giovanna Spinelli, Responsabile Area Didattica, Orientamento e Alumni – Palazzo del Broletto, Piazza della Vittoria n. 15 – 27100 Pavia – tel. +39 0382375811, fax +39 0382375899, e-mail: info@iusspavia.it.

**Call for Applications for Admission to the National Course
in Sustainable Development and Climate Change (SDC)
42nd Cycle – Academic Year 2026/2027
APPLICATION DEADLINE 26 August 2026, 13.00 (Italian Time)**

Any amendments and/or additions to this Call for Applications will be published
on the Scuola IUSS Institutional Website,
under Calls, Notices and Selection Procedures → PhD Calls for Application

TABLE OF CONTENTS

Art. 1 - ESTABLISHMENT OF THE DOCTORAL COURSE IN SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE	3
1.1 Course description and course aims/objectives	3
1.2 Affiliated bodies	5
1.3 Scholarships	5
Art. 2 – ADMISSION REQUIREMENTS	5
Art. 3 - APPLICATIONS	5
3.1 Application procedure	5
3.2 Required accompanying documents	6
Art. 4 – ADMISSION PROCEDURE	9
Art. 5 – SELECTION BOARD	11
Art. 6 – RANKING AND SCHOLARSHIP ASSIGNMENT	11
Art.7 – ENROLMENT	11
7.1 Enrolment procedure	11
7.2 Additional requirements for visa applicants	12
7.3 Registration fee	12
7.4 English language proficiency certificate	12
Art.8 – SCHOLARSHIPS	12
Art. 9 – EMPLOYMENT RESTRICTIONS	13
Art. 10 – MANAGEMENT OF PERSONAL DATA	13
Transparent administration	13
Art 11 – REFERENCE RULES	13
Procedure Supervisor	13
Disclaimer	14

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 **42nd cycle of the National Doctoral Course in Sustainable Development and Climate change** (hereafter PhD-SDC) for the **2026/2027 academic year**.

PhD Programme Coordinator: **Professor Roberto Buizza** – 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 doctoral program is divided into three interconnected curricula and based on the collaboration with several universities uniformly distributed over the Italian territory. To ensure that PhD students follow a multi- and interdisciplinary educational path, the program uses two interconnected networks:

- A network of curricula covering the specific disciplinary fields
- A network of universities, public research institutions, and institutions involved in the PhD program, coordinated by a national committee that integrates and manages the complexity by establishing interaction between the curricula.

The doctoral program focuses on a single theme, but develops it under three curricula to allow for in-depth study in different disciplinary areas. Thus, the theme of sustainable development and climate change defines the direction of the program: it can be thought of as the doctoral program's mission, which, through the resources, the skills, and the tools characteristic of the different disciplinary fields, will be achieved by defining concrete goals that will form the students' research topics. The interaction and the scientific collaboration between students from different fields will be fostered by a multidisciplinary approach implemented at two levels. The first one is centrally coordinated and connects all students from all curricula allowing the connection between different disciplinary fields. The second involves only PhDs from the specific curriculum to share goals and tools from the specific disciplinary field.

The PhD program, which lasts three years, is divided into the following three curricula, the description of which

(with the related SSD – Scientific-Disciplinary Sectors) is reported in the “Educational Programme” attachment and is an integral part of this announcement.

The PhD programme lasts 3 academic years and it offers three curricula, described in detail in the “Educational Programme”. The three curricula are:

- CU ALPHA - ONE HEALTH: EARTH SYSTEM AND HUMAN LIFE
- CU BETA - HUMAN SOCIETY: SOCIO-ECONOMIC IMPACTS, INSTITUTIONS AND THEORIES
- CU GAMMA - TECHNOLOGY AND TERRITORY: SUSTAINABLE STRATEGIES AND SOLUTIONS FOR THE TRANSITION

1.2 Affiliated bodies

1. *Politecnico di Milano*
2. *Politecnico di Torino*
3. *Scuola Normale Superiore di Pisa*
4. *Scuola Universitaria Superiore Pisa Sant'Anna*
5. *Università degli Studi di Bari Aldo Moro*
6. *Libera Università di Bolzano*
7. *Università Cattolica del Sacro Cuore*
8. *Università degli Studi Insubria Varese-Como*
9. *Università degli Studi Mediterranea di Reggio Calabria*
10. *Università degli Studi di Messina*
11. *Università degli Studi di Napoli Federico II*
12. *Università degli Studi di Napoli L'Orientale*
13. *Università degli Studi di Palermo*
14. *Università degli Studi di Perugia*
15. *Università di Pisa*
16. *Università degli Studi di Torino*
17. *Università degli Studi di Trento*
18. *Consiglio Nazionale delle Ricerche (CNR)*

1.3 Scholarships

The attached document describes the **35** scholarships available. The number of scholarships may be increased if further funding should be available before the beginning of the PhD course. 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 <https://www.phd-sdc.it> 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. **The required degree must be obtained by no later than the start of the PhD program (November 1st, 2026).**

Art. 3 - APPLICATIONS

3.1 Application Procedure

Applications must be submitted exclusively online by **26 August, 2026 at 13:00 Italian time**. The application fees are **30 euro** to be paid before the deadline to avoid exclusion. The application fees cannot be reimbursed under any circumstances.

Please refer to the application procedure described below.

- Go to the following link: <https://pica.cineca.it/iuss/dottorato-42>
- 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

Once all the required documents have been uploaded, click "save" and return to the dashboard.

You will be asked to verify – through the "verify" button – the data you entered; only after verifying that the information present is correct, you can continue and finalize the registration payment.

You have to click on "payment" and follow the instructions provided by the platform in order to use the "PagoPA" system. You have to sign the application and submit it.

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 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; 7. List of exams undertaken and the associated grade awarded	Language: Italian, English, French or Spanish. For academic documents in 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 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; 7. 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)	<i>For applicants due to be awarded their master's degree:</i> Proof of exams taken and grades	Language: Italian, English, French or Spanish. For all other languages, applicants must provide an official translation provided by the university issuing the

	awarded.	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 - except bibliography) should focus on the scholarship research topic chosen as <u>first preference</u> 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 <u>first preference</u>, 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) and c) - or, for applicants due to be awarded their master's degree, in e) - 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 online in English 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 the platform. 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. <u>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.</u> 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). <u>If the assessment is positive, eligibility for the alternative scholarship will be taken into consideration only in case of unassigned scholarships after the final ranking.</u>
--------------------------	--

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 21 September 2026 .
Interview Schedule	The interviews will be conducted starting from 23 September 2026 . 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 online via Teams 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 **15 October 2026**.

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 within 48 hours;
3. Once scholarships are assigned, they are no longer obtainable by other candidates;
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 the beginning of the Phd course.

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 **1 November 2026**.

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) 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;

- b) for candidates awarded their master's degree ("laurea magistrale") after the deadline for applications to the course but no later than November 1st 2026, 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 the procedure on Service Esse3 – Reserved Area; more information will be provided to you by the secretariat.

Any different form of payment and enrollment from those specified in this document are not accepted.

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 [University portal](#) **within 5 days since the acceptance of the scholarship**. 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 any student the actual entrance in Italy and the arrival to the host University must occur before the 31st of January 2026 to avoid exclusion from the PhD course.

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 reimbursed the registration fee.

7.4 English language proficiency certificate

PhD candidates must obtain, by the end of the first year of the programme (31 October 2027), a B2-level English language certificate issued by a recognised language institution.

Art.8 – SCHOLARSHIPS

The scholarships cover the entire duration of the PhD program and are awarded for the first year. They are renewed annually for admission to the subsequent years, subject to a positive evaluation by the Academic Board.

The annual amount of the scholarship is **€ 18.645,63**, including National Social Security Contributions (INPS). This amount is exempt from the IRPEF tax and it is subject to the payment of National Social Security contribution (INPS "gestione separata"), of which two thirds are paid by the administration and one third by the PhD student.

The scholarships may not be cumulated with other scholarships granted for any reason, with the exception of those granted by national or foreign institutions to enhance the student's research activity with periods of stay abroad.

The scholarship cannot be awarded to those who have already benefited, even partially, from a doctoral scholarship in the past.

The scholarship may be increased by 50% for an average period of 6 months stay abroad and, in any case, until a maximum period of 12 months.

The School will also make an annual budget, amounting to not less than 20% of the scholarship, available to all PhD students pursuant to article 9 of Italian Ministerial Decree 226/2021 to cover research activity-related expenses in Italy and abroad, as provided for by internal rules.

The School shall insure the students against accidents and civil liability for the entire duration of the Programme.

Art. 9 – 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 per i corsi di dottorato della Scuola](#)” 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. 10 – 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 11 – 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. 743/2025 and the “[Regulation for the PhD in Sustainable Development and Climate Change](#)”, issued by the D.R. n. 292/2026.

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.



PhD SDC
SUSTAINABLE DEVELOPMENT
AND CLIMATE CHANGE

EDUCATIONAL PROGRAM – 42º ciclo

Educational program of the National PhD on Sustainable Development and Climate change (SDC)

Table of Contents

General information for the PhD course	3
Programme structure	4
Multi-Disciplinary Events (MD)	5
Curriculum events (CU)	6
Focused and disciplinary courses (FD)	6
Supporting inclusion and diversity	6
PhD program language	6
CUα: One health: Earth system and human life	6
Education aims and method	6
CU teaching modules	7
FD teaching courses	7
CUβ: Human society: socio-economic impacts, policies and institutions	8
Education aims and method	8
CU teaching modules	8
FD teaching courses	9
CUγ: Technology and Territory: sustainable strategies and solutions for the transition	9
Education aims and method	9
CU teaching modules	9
FD teaching courses	10



General information for the PhD course

This Italian inter-university and multi-disciplinary Doctoral Program in Sustainable Development and Climate Change (PhD-SDC) offered for 4 doctoral cycles (from XXXVII to XL) and counts already on almost 400 PhD students, a network of more than 60 partner universities and research institutes and +400 PhD courses offered.

The PhD-SDC aims to produce a new generation of experts and decision makers able to handle the complex issue of sustainability under climate change. On one hand, it is crucial to know and adapt to recent and future climate changes, which impact the earth and the human life within it. There is increased demand for actions to address climate change impacts especially in terms of extreme events and floods, to innovate production processes, to replace fossil-fuels with alternative sources of energy, and to implement sources of green energy. On the other, there is a need to reorganize economic growth according to a new paradigm which includes sustainable lifestyles that minimize use of natural resources and promote circular economies. The changes required must take account of the UN sustainable development goals and the impact on communities: the transformation to a green, sustainable future must ensure that no one is excluded and must guarantee fairer access to energy and natural resources.

The complexity of the sustainability theme and the interconnections of the different aspects impacted by climate change implies the need for a re-thinking of the education frameworks and the skills that will be required of future generations. Thus, a multidisciplinary education approach is required to produce experts able to propose effective development strategies, which take into account of the interactions between economic and technological aspects as well as societal issues, such as justice and migration, health, pollution and climate change, and access to water and food.

The PhD program is a unique inter-university, multi-disciplinary doctoral course and considers all of these aspects. As in the previous cycles, this PhD-SDC program has sustainability and climate change as its two key cross-disciplinary themes. Differently from the previous cycles, the program structure has been reviewed and the themes are now investigated under three main perspectives, called curricula:

1. One health: Earth system and human life (CUα). This curriculum focuses on the Earth system and its interactions with the natural ecosystems as well as human life. The CU activities aim, for example, to understand how climate and global changes impact the Earth system components, human health and ecosystem sustainability, to develop methods to monitor and predict future changes, to identify novel sustainable development models, and to develop strategies to adapt and mitigate climate and global changes.

2. Human society: socio-economic impacts, policies and institutions (CUβ). This curriculum explores the complex interplay between climate change and socio-economic systems, the role of institutions and law, the ethical and philosophical dimensions of climate discourse,



and how language and neuro-cognitive processes affect climate narratives and decision-making. The CU activities aim, for example, to understand and communicate the societal risks and opportunities posed by the environmental crisis, and to inform governance and policy-making for sustainable and inclusive societies.

3. Technology and Territory: sustainable strategies and solutions for the transition (CUY).

This curriculum focuses on resilience, sustainable development paradigms, circularity, and actions against climate change to be implemented in territories, communities, production processes and the consumption of resources and energy. The CU activities aim, for example, to address the complex and interconnected challenges arising from social and technological innovation. Considering technical and regulatory dimensions, the CU promotes a critical assessment of sustainability across research and solution development, integrating multi-scale, cross-sectoral perspectives to support sustainable, resilient transitions.

The PhD degree course aims to equip candidates with in-depth knowledge and technical expertise in their chosen specialty, as well as at high-level and cross-disciplinary level in the other curricula.

The PhD will be immerse in a strong network formed by partner university, research centres and companies working for a sustainable development. This will provide to all candidates with the opportunity to choose among the expertise available, not only in their host university, but also within a wider network and to work in inter-disciplinary teams on ‘hot topics’ related to sustainability and climate change. Students will be able to design their education programmes, to learn how to solve problems from different angles, and how to engage in effective discussion with experts in other domains.

The reality is complex and requires highly trained individuals able to find solutions to multi-faceted problems. The PhD structure and educational program aim to expose the PhD candidates to a range of real-life challenges, and provide an education experiences that as much as possible mirrors real-life.

Programme structure

It is expected that the PhD-SDC community will include between 30 and 50 PhD candidates, enrolled in the partner universities, along with their 30+ academic supervisors and the even more numerous individuals involved in delivering the lectures and training. This community plans to meet together for around 2 weeks annually to discuss and work on sustainability and climate change issues.

Candidates will be assigned a scholarship in one of the areas within the three curricula and will follow an education roadmap that includes activities at three levels:

- the multi-disciplinary PhD level;
- the multi-disciplinary level within the student’ specific curriculum;
- a more focused level related to the student specific disciplinary area.

EDUCATIONAL PROGRAM – 42° ciclo

The students' training will focus mainly on the own focal discipline, although about 50% of the training time is expected to be devoted to study in other disciplines.

To guarantee a multi-disciplinary and inter-university education experience, students will participate in three types of educational events (including seminars, courses, workshops):

- multi-disciplinary (MD) events, which will include all the PhD-SDC candidates;
- Curriculum (CU) events, which will include all PhD candidates enrolled in the curriculum;
- focused (mostly single-discipline) (FD) courses, to be agreed with supervisors, which will allow to deepen their knowledge on their specific field of research.

Table 1 summarizes the minimum hours devoted to MD, CU and FD events.

Apart from the final year multi-disciplinary workshop, all educational events and courses will engage students mainly at the beginning of the PhD course, so create a solid ground for the development of their doctoral research project.

Table 1: PhD-SDC education events at the three levels: multi-disciplinary, curriculum, and focused and mostly single-disciplinary and minimum number of hours.

Event		Organiser	Minimum number of hours
Multi-disciplinary (MD) events	MD-Workshop 1 (year 1)	PhD board	48 hours
	MD-Workshop 2 (year 3)		
Curriculum (CU) events	CU-Workshop (year 1)	Curriculum board	48 hours
	CU-Workshop (year 1)		
Focused and mostly single-disciplinary (FD) courses	Thematic courses	Supervisors	64 hours
Total			160 hours over 3 years

Multi-Disciplinary Events (MD)

The MD events aim to expose all PhD candidates to the full complexity of designing and implementing a transition towards a fairer, more sustainable, and zero net-emissions society to manage weather and climate-risks. These events will take the form of two MD workshops (MD-WS):

- Year 1 (MD-WS1): Complexity of sustainability and climate change: an overview
- Year 3 (MD-WS2): Complexity of sustainability and climate change: final report.

MD-WS1 will take place in the first months of the PhD course. It will include lectures delivered by academics and experts working in all curricular areas, which will provide candidates with high-level knowledge on the key themes of sustainability and climate change. This will add to their understanding of the multiple challenges faced, and will help to identify the most effective solutions. In MD-WS1, candidates will work in small multi-disciplinary teams on a research project, which will be completed and presented during the workshop.

MD-WS2 will include lectures delivered by academics working in the different areas and presentation of PhD research projects. Discussion, constructive criticism, comparison of methods, tools and ideas will help the students to conclude their doctoral research.

Curriculum events (CU)

The CU-events will include content and formats related to the relevant curriculum and will provide a broad overview of the curriculum research topics. The CU-events will be organized in two sessions:

- year-1 CU Seasonal School (CU-SS) will provide an opportunity for the PhD candidates to attend topical lectures on some of the themes related to their work;
- year-2 CU (CU-WS) will provide opportunities to attend topical lectures and present their doctoral research to colleagues to obtain feedback and trigger discussion.

Focused and disciplinary courses (FD)

These refer mostly to single-theme and single-disciplinary courses. FD courses will be selected by the PhD students, in agreement with their supervisors, according to their background and PhD research. They will involve a minimum of 64 hours to be completed ideally during the first 12 months of the PhD course. The courses can be chosen from all courses being offered by the universities contributing to the PhD-SDC program, thus including both courses provided by the CU of the students and by other CU courses.

Supporting inclusion and diversity

Inclusion and diversity are fundamental values required for education and scientific excellence. Scholars with diverse talents, backgrounds and perspectives will contribute insights and innovative approaches to tackle difficult scientific problems and societal challenges. Everyone involved in this PhD Program will promote and support inclusion and diversity, and foster an environment where the brightest, most creative minds from every segment of society and every part of the globe can achieve their full academic and professional potential.

PhD program language

All PhD candidates are expected to have a good knowledge of the English language. Note that all MU and CU events and most FD events will be conducted in English. The PhD thesis will also be in English.

CUα: One health: Earth system and human life

Education aims and method

The education plan for this curriculum aims to train the PhD candidates to deal with the challenges raised by climate change and sustainable development in the different fields included in this curriculum and to introduce them to the questions on which the scientific community is currently working. In particular, the focus will be on climate and global change impacts on the different earth components, on ecosystems health and biodiversity as well as on human activities, well-being and health.

CU teaching modules

The module will include lectures focusing on the different areas covered by the CU; they will provide general background information targeted at non-experts and also will explore some questions, specific to the curriculum areas, in great depth. The curriculum lectures will be mostly face-to-face. In addition, the students will be actively engaged in a range of activities including writing up notes from lectures not related to their chosen research theme and conducting team projects on some of the issues discussed in these lectures. The training module will foster interaction and collaboration among all participants, from lecturers to students, for building a common core of advanced knowledge.

Title	Hours	Abstracts/Objectives
Challenges and open questions on Earth system and environmental sciences	24	Introduction to open questions and directions currently being explored by the CU community to find concrete solutions to climate and global change and sustainable development issues. In-depth study on the climate and climate change drivers, numerical modelling and observations. The teaching methods will include lectures and open discussions.

EDUCATIONAL PROGRAM – 42° ciclo

Impact of climate and global change on one health	24	In-depth study on the impact of climate and global change on: ● earth components from land to forestry and from ocean to atmosphere ● on ecosystems health and biodiversity ● human activities, well-being and health
---	----	--

FD teaching courses

The specific CU course will span a wide range of topics on climate and climate change drivers, numerical modelling and observations, climate change impact on the different earth components, on ecosystems health and biodiversity as well as on human activities, well-being and health. Typical courses could be: climate dynamics and future projections, European directives overview, observation of radiatively active and species observations for modelling environmental processes, risk assessment and decision support system related to environmental impacts, environmental health engineering science, environmental and health system dynamics, health statistics and epidemiology, principles of ecology, ecology and marine environment monitoring, ecosystem conservation and management, animal biology, biodiversity analysis (including field and laboratory activities), zoocenosis and conservation of fauna, agricultural practice, forest management and climate change mitigation, sustainable animal production.

CUβ: Human society: socio-economic impacts, policies and institutions

Education aims and method

The overarching goal of this education plan is to provide the next generation of scholars with the tools to develop frontier research on issues that are at the crossroads for the sustainable development of the human society from different prospective, from economics to juridical regulations, and from social welfare to philosophical implications and linguistic evolution. The aim is to training scholars able to interact with academics from a range of other disciplines and develop sound scientific research that will inform practice and policy making. The PhD candidates' research projects should be aimed at current urgent sustainability and climate change issues.

CU teaching modules

The curriculum will adopt a transdisciplinary methodological approach based on knowledge sharing via: i) discussion of socio-economical sustainability from a cross-disciplinary and humanities and social sciences perspective; ii) analysis of specific topics in particular fields and using lenses from the other fields; iii) PhD candidates' presentations of their research projects to an interdisciplinary panel of their peers and experts in the field. The emphasis

EDUCATIONAL PROGRAM – 42° ciclo

will be on the assessment of environmental policies and analysis of public-private interactions in the social, economic and technological realms.

Teaching methods will include traditional and interactive lectures delivered by academics from the universities involved and external experts combined with individual and team activities, including essays, class discussion groups, laboratory-oriented activities and group data analysis.

Title	Hours	Abstracts/Objectives
Challenges and open questions on socio-economic sustainable development	24	Introduction to open questions and directions currently being explored by the CU community to find concrete solutions to Climate Change and Sustainable Development issues. In-depth study on the economical models, on the physical and transition risks and on the power of policies. The teaching methods will include lectures and open discussions.
Challenges and open questions on law, sociology, ethics, philosophy of language, aesthetics, epistemology and literature in a changing climate	24	In-depth study on the impact of climate change on the society, on the available law and regulatory tools as well as on philosophy and ethics. The teaching methods will include lectures and open discussions.

FD teaching courses

The thematic courses of CU will cover a range of climate change (e.g., Urban planning for climate change, Transport decision making and sustainability, Transport planning and climate change: challenges and solutions, Innovation economics), environmental management (e.g., Environmental economics and policy, Behavioural economics for the environment, Economic analysis of global environmental issues,) and sustainability more generally (e.g., Stakeholder theory, Business and society, Policies for sustainability and local development). The courses will include also methodological courses on issues such as Big data analysis, Risk management, Data analytics for science and society, Applied econometrics of health decisions and Machine learning for quantitative economics. Moreover, course more linked to the fields of law, literature, philosophy and sociology, e.g. Legal tools for sustainability, Sociological approaches to sustainability, Ecological humanities, ecocriticism and ecolinguistics for sustainable development.

CUy: Technology and Territory: sustainable strategies and solutions for the transition

Education aims and methods

The training in this CU is based on a strong transdisciplinarity to develop exchanges among the various thematic and disciplinary approaches included in this curriculum. The focus being on resilience, sustainable development paradigms, circularity and actions against climate change to be implemented in territories, communities and production processes and in the consumption of resources and energy.

CU teaching modules

A bottom-up problem solving approach will be adopted to identify different analytical profiles and potential innovative methodologies. This will involve a recursive method of analysis of methodologies and the problems they raise, and the solutions proposed to address them. Teaching methods will include joint working sessions to examine real (technological/ territorial) problems and will include problem presentation, group work, comparison, collection and processing of common elements, transferability and exportability. The results of the training plan will be made explicit in the identification of the main themes of curricular training. The main themes chosen by the PhD students will be presented during the academic years of the programme and will be the topic of the final thesis.

Title	Hours	Abstracts/Objectives
Challenges and open questions in Cross-Sector Innovation for the Sustainable Transformation of Territories, Communities, and Production Systems	24	Introduction to open questions and directions currently being explored within the selected topic. Working groups, adopting a problem-solving approach, on the selected theme. Innovative methodological activities to identify problem solutions. Comparison, collection and elaboration of common elements. Assessment of transferability and potential for application to other areas (exportability).
From policies to pathways: a critical assessment of sustainability across research and solution	24	Introduction to open questions and directions currently being explored within the selected topic. Working groups, adopting a problem-solving approach, on the selected theme. Innovative



development through a multi-scale approach		methodological activities to identify problem solutions. Comparison, collection and elaboration of common elements. Assessment of transferability and potential for application to other areas (exportability).
--	--	--

FD teaching courses

The courses in this curriculum require an interdisciplinary perspective. Students can choose among the courses offered by the other universities involved. The synergies with the Technology and Territory curriculum will be highlighted on the PhD SSCC official website.

Curriculum: CU Alpha - One Earth: Earth System and Human life

Marine Physical Controls of Air–Sea CO₂ Exchange

Reference Person: Benetazzo Alvise (alvise.benetazzo@cnr.it)

Host University/Institution: Consiglio Nazionale delle Ricerche - Istituto di Scienze Marine (ISMAR), Venice

Research Keywords

Air–sea CO₂ transfer
Wind waves
Integrated observations and modelling

Reference ERCs:

PE10_8 Oceanography (physical, chemical, biological, geological)
PE10_2 Meteorology, atmospheric physics and dynamics

Reference SDGs:

GOAL 13: Climate Action
GOAL 14: Life Below Water

Description of Research Topic

The world's oceans play a crucial role in regulating Earth's climate by absorbing a substantial fraction of atmospheric CO₂. Air–sea CO₂ exchange, therefore, represents a fundamental component of the global carbon cycle, yet its understanding and quantification remain highly uncertain, particularly under energetic conditions and in regional seas. Observations indicate that enhanced CO₂ fluxes during high sea states cannot be explained by interfacial turbulence alone, pointing to a contribution from breaking wave processes. Wave breaking entrains air into the upper ocean in the form of bubble plumes, providing an additional pathway for gas transfer.

This PhD project aims to investigate how the physical control from ocean waves on the air–sea CO₂ exchange, by linking environmental forcing, surface whitecap coverage, air bubble production and penetration in the upper ocean. The research will be based on direct field observations collected from a marine research tower using innovative instrumentation. The analysis will quantify wave field properties, whitecap coverage, bubble penetration depth, water column conditions, and CO₂ bulk fluxes across different atmosphere and sea regimes. The goal is to derive a comprehensive formulation that represents the air–sea CO₂ exchange. Further, by combining observations with sea modelling, the project will advance the understanding of CO₂ transfer and contribute to improved quantification of CO₂ exchange in regional- and basin-scale models.

Research Team and Environment

The research activity will be coordinated by Dr Alvise Benetazzo within an interdisciplinary team at CNR with expertise in air–sea interaction, ocean observations, and carbon cycle processes. Dr Zenone will



contribute expertise on CO₂ probing and air-sea flux measurements; Dr Barbariol will assist the project by providing support on wave modelling, while Mauro Bastianini will support the interpretation of biological processes and marine carbon cycling. The research environment offers access to a permanent marine research tower, advanced observational instrumentation, and state-of-the-art numerical modelling tools, enabling strong integration between observations and modelling.

Suggested Skills for this Research Topic

The candidate will require a background in marine sciences or related topics. Preferential skills include the analysis of observational data, basic signal processing, and experience with oceanographic and atmospheric variables. Familiarity with numerical modelling as well as programming skills (e.g. MATLAB or Python) will be beneficial. The research requires good scientific writing and communication skills. Proficiency in English is required.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Alpha - One Earth: Earth System and Human life

Mechanisms of Seasonal Phase Shifts in Global Temperature and Precipitation

Reference Person: Bordoni Simona (simona.bordoni@unitn.it)

Host University/Institution: Università degli Studi di Trento

Research Keywords:

Climate dynamics

Seasonal cycle

Climate modeling

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 6: Clean Water and Sanitation

GOAL 13: Climate Action

GOAL 15: Life on Land

Description of Research Topic

Climate change is altering not only the magnitude of temperature and precipitation, but also their seasonal timing. Observations indicate earlier warming over extratropical land (e.g., Stine et al. 2009) and delayed monsoon onset (e.g., Song et al. 2021). These shifts have important implications for water security and ecosystems, yet their underlying mechanisms remain poorly understood. This project will investigate phase shifts in the annual cycle of temperature and precipitation using observations, reanalyses, and the climate model hierarchy. We will first characterize observed shifts using harmonic analysis and onset metrics. To isolate physical drivers, we will then leverage the model hierarchy starting with idealized aquaplanet simulations in a general circulation model. These simulations exhibit a rainy season delay in the tropics even without land-sea contrast, providing a controlled framework to test energetic and dynamical drivers. Emerging hypotheses will then be evaluated across increasing complexity, from simplified land-sea configurations to coupled CMIP6 simulations and large ensembles. This approach will allow us to distinguish thermodynamic from dynamical processes and identify common versus region-specific drivers. Finally, we will quantify the time of emergence of these signals and explore their potential as early indicators of regional climate change. This work will advance understanding of how and why seasonal timing is changing in a warming climate.

Research Team and Environment



The PhD candidate will work in the vibrant and diverse atmospheric physics group at the University of Trento, with skills and interests ranging from mountain meteorology to climate and large-scale atmospheric dynamics. Unitn hosts the Masters of Science program in Environmental Meteorology and Climate Physics joint with the University of Innsbruck and offers a wide range of training and seminar activities. The supervisor is involved in several international collaborations and activities, including the recently completed EU-funded NextGEMS project aimed at developing Storm- Resolving Earth System Models, whose output will be leveraged as part of the research project.

Suggested Skills for this Research Topic

The PhD candidate is expected to have a background in physics, math, earth and environmental sciences or related disciplines, as well as experience in the analysis of observational data and/or numerical simulations. Previous training in meteorology, atmospheric physics, oceanography and/or climate dynamics will be considered a plus.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.





Curriculum: CU Alpha - One Earth: Earth System and Human life

Climate-driven changes in marine biogeochemical dynamics and trophic structure across scales

Reference Person: Brandini Carlo (carlo.brandini@cnr.it)

Host University/Institution: Consiglio Nazionale delle Ricerche - Istituto di Scienze Marine (ISMAR)

Research Keywords:

Climate projections
Cross-scale processes
Trophic structure

Reference ERCs:

PE10_8 Oceanography (physical, chemical, biological, geological)
PE10_9 Biogeochemistry, biogeochemical cycles, environmental chemistry
PE10_21 Earth system modelling and interactions

Reference SDGs:

GOAL 11: Sustainable Cities and Communities
GOAL 13: Climate Action
GOAL 14: Life Below Water

Description of Research Topic

Marine ecosystems result from the interaction between physical and biogeochemical processes acting across a wide range of spatial and temporal scales. The cascade from mesoscale circulation to submesoscale dynamics plays a key role in controlling nutrient fluxes, primary production and the development of trophic structures, affecting feeding habitats and biodiversity patterns. Climate change is expected to modify circulation, stratification and nutrient availability, potentially altering these cross-scale interactions and their ecological consequences. However, the links between physical variability, biogeochemical processes and ecosystem responses are still not fully understood. This PhD aims to investigate how climate variability and future scenarios affect coupled physical-biogeochemical dynamics and trophic structure, with a focus on the propagation of variability across scales.

The work will combine high-resolution coupled models, data assimilation, and satellite and in situ observations, including HF radar, gliders (traditional and wave gliders) for frontal dynamics, passive acoustic monitoring of marine mammals (hydrophones, in collaboration with the University of Toulon), and drone-based observations with institutional partners.

The north-western Mediterranean Sea, including the Pelagos Sanctuary, will be used as a case study to explore the feasibility of feeding habitat forecasting for target species.

Research Team and Environment



The PhD will be carried out within the national doctoral programme, with scientific support from CNR-ISMAR (Florence), where the candidate will be embedded in a multidisciplinary team working on coastal and marine processes. The team integrates physical–biogeochemical modelling, ocean observations (HF radar, gliders, in situ platforms) and data analysis, in collaboration with the LaMMA Consortium. The research will benefit from national interactions with OGS, Universities of Pisa, Siena and Genoa, ARPAT, ARPAL, Fondazione CIMA and the Coast Guard, and from international collaborations with MIO (Marseille), University of Toulon and IFREMER.

Suggested Skills for this Research Topic

The candidate should have a background in environmental physics, environmental sciences or related disciplines, with a solid understanding of physical and biogeochemical processes. Good experience in ocean modelling and skills in programming (e.g. Python or MATLAB) and data analysis are desirable. Experience with environmental data (satellite and in situ) and willingness to work with observational tools and to contribute to the design and adaptation of measurement campaigns are considered assets. The candidate should be motivated to work in an interdisciplinary and collaborative environment, with good communication skills. English is required.

Period of Research Abroad

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





Curriculum: CU Alpha - One Earth: Earth System and Human life

Ecological modelling and omics to reveal multiple anthropogenic impacts on subterranean ecosystems

Reference Person: Ferrari Emanuele (emanuele.ferrari@cnr.it)

Host University/Institution: Consiglio Nazionale delle Ricerche - Istituto di Ricerca Sulle Acque (IRSA)

Research Keywords:

Ecological modeling
Omics approaches
Subterranean ecosystems

Reference ERCs:

LS8_1 Ecosystem and community ecology, macroecology
LS2_8 Proteomics
LS8_12 Microbial ecology and evolution

Reference SDGs:

GOAL 9: Industry, Innovation and Infrastructure
GOAL 14: Life Below Water
GOAL 15: Life on Land

Description of Research Topic

Human impacts on subterranean ecosystems are increasing, with surface-driven changes—especially climate shifts—affecting caves and groundwater habitats. Yet we still lack a mechanistic understanding of how highly specialized subterranean species respond to these pressures. How do they react to temperature changes underground? How will communities evolve over time and along the vertical gradient? And what will climate change mean for these hidden ecosystems?

Until recently, limited data and tools prevented us from addressing these questions. This PhD project uses new technological advances to investigate how subterranean biodiversity responds to climate change. We will develop a series of thermal tolerance experiments to investigate the responses of terrestrial and aquatic subterranean invertebrates across trophic levels (e.g., crustaceans, beetles, spiders) to altered temperature regimes. Through a multiOMICS approach, involving (meta)genomics and (meta)proteomics, we aim to identify the molecular adjustments employed by these species under thermal stress and to link these responses to their functional traits. We will then use species distribution models to explore the processes shaping species responses to climate change. Ultimately, this work will improve predictions of the future of these vulnerable ecosystems and strengthen the scientific foundation for their conservation.

Research Team and Environment



CNR-IRSA is a highly interdisciplinary and international research institute dedicated to the study of ecology, evolution, microbiology, conservation science, hydrogeology, meteorology, and chemistry. It offers a dynamic research environment with frequent exchanges of students and researchers. Within CNR IRSA Verbania, the PhD student will join Molecular Ecology Group (MEG - <http://www.meg.irsa.cnr.it/>), with four supervisors with complementary expertise (Emanuele Ferrari, Laura Garzoli, David Brankovits, and Stefano Mammola) MEG investigates groundwater ecosystems, microbial diversity, biogeochemical processes, with the help of multiple omics techniques.

Suggested Skills for this Research Topic

All work will be conducted in English as the primary language, with optional knowledge of Italian. The skills suggested for carrying out the proposed research include: basic knowledge of molecular laboratory techniques and analyses; familiarity with statistical methods and modelling; programming in R or equivalent languages; and fieldwork experience in mountainous and cave environments. While prior knowledge is highly appreciated, the candidate will receive training in all of these areas.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Alpha - One Earth: Earth System and Human life

Understanding Earth system processes with global and regional convection-permitting models

Reference Person: Giorgia Fossler (giorgia.fossler@iusspavia.it)

Host University/Institution: Scuola Universitaria Superiore IUSS Pavia

Research Keywords

Global and regional convection-permitting models
Climate change
Extremes

Reference ERCs:

PE10_3 Climatology and climate change
PE10_21 Earth system modelling and interactions
PE10_2 Meteorology, atmospheric physics and dynamics

Reference SDGs:

GOAL 3: Good Health and Well-being
GOAL 10: Reduced Inequality
GOAL 13: Climate Action

Description of Research Topic

Research over the past decade has shown that Regional Convection-Permitting Models (RCPMs) represent sub-daily precipitation statistics and extremes more realistically than coarser-resolution Global and Regional Climate Models (GCMs and RCMs), since kilometre-scale resolution allows convection processes to be resolved rather than parametrised. Recent advances in computing, together with programmes such as Destination Earth—a flagship initiative of the European Commission to develop a highly accurate digital model of the Earth—are now bringing GCMs towards convection-permitting resolution (GCPMs). However, their performance and realism at climatological scales remains poorly understood.

The purpose of the research will be to compare these new GCPMs against existing RCPMs as well as observation and reanalysis datasets to evaluate added value and disadvantages of the different models over different parts of the world. In addition, the study will investigate whether differences in the climate change signal among the different ensembles exist and eventually the reasons behind them. The project will use the three GCPMs (ICON, IFS-FESOM and IFS-NEMO) provided by Destination Earth and the RCPM ensembles run under the CORDEX umbrella. The focus will be on hourly precipitation statistics together with atmospheric and land/ocean processes relevant at climate scale.

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.

Suggested Skills for this Research Topic

The ideal candidate has a good experience with programming languages (in particular Python and/or R) and is familiar with atmospheric or/and ocean modelling. Knowledge of the climate physics, statistical analysis, large climate dataset will be beneficial.

Team working attitude and excellent knowledge of spoken and written English are required.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Alpha - One Earth: Earth System and Human life

Investigating Climate Change Impacts on Human Health Across Multiple Pathways

Reference Person: Moirano Giovenale (giovenale.moirano@unito.it)

Host University/Institution: Università degli Studi di Torino

Research Keywords:

Climate Epidemiology
Public Health

Reference ERCs:

LS7_9 Public health and epidemiology
LS7_11 Environmental health, occupational medicine
PE10_3 Climatology and climate change

Reference SDGs:

GOAL 3: Good Health and Well-being
GOAL 10: Reduced Inequality
GOAL 13: Climate Action

Description of Research Topic

Current understanding of the extent to which climate change affects human health remains limited, as most studies focus on single outcomes despite the fact that the same climate-related exposures can influence multiple health outcomes. This project will investigate the diverse health impacts of climate change by investigating multiple exposure-response pathways. Potential pathways that will be investigated are: (i) the association between extreme climate events (heatwaves, floods, wildfires) and daily mortality at the municipal level across Italy; (ii) the meteorological and environmental drivers of the spatio-temporal distribution of vector-borne diseases recorded in Italy; or (iii) the effects of cumulative exposure to extreme climate events during critical windows of susceptibility on individual health trajectories (e.g. growth, respiratory health) and molecular markers (e.g. DNA methylation), leveraging data from the NINFEA and PiccoliPiù birth cohorts. For the selected pathways, the project will aim to formally attribute health risks to anthropogenic climate change by integrating epidemiological approaches with climate attribution methods. Exposure-response functions will be applied under both factual and counterfactual scenarios to quantify the burden of multiple health outcomes attributable to climate change. The position is co-funded by the FIS-2 "E-CHANGE: boosting Epidemiological methods to assess human health risks in a CHANGing climatE", CUP D53C25002090001.

Research Team and Environment

The research team includes a multidisciplinary group working on environmental, social, life-course and molecular epidemiology and includes, among others, epidemiologists, biostatisticians, computer



scientists and molecular biologists. The team is based at the Cancer Epidemiology Unit of the Department of Medical Science (DMS) of the University of Turin. The DMS is an ideal place to carry out multidisciplinary projects thanks to the presence of shared facilities and collaborations among scientific domains with national and international research institutions.

Suggested Skills for this Research Topic

Background in epidemiology and/or biostatistics, with experience in epidemiological analysis and handling large datasets. Knowledge of a statistical software (e.g. R or Stata) is required. Experience in environmental or climate epidemiology is desirable, as is familiarity with geospatial and climate data integration. Familiarity with causal inference methods is a plus. Ability to work in interdisciplinary teams and communicate results effectively. Good command of English is required; knowledge of Italian is an advantage for data management and collaboration.

Source of fundings

This scholarship is cofunded by FIS-2 “E-CHANGE: boosting Epidemiological methods to assess human health risks in a CHANGing climatE”.

CUP D53C25002090001.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad



Curriculum: CU Alpha - One Earth: Earth System and Human life

Integrated computational-experimental assessment of climate metrics of greenhouse gases

Reference Person: Tasinato Nicola (nicola.tasinato@sns.it)

Host University/Institution: Scuola Normale Superiore

Research Keywords:

Radiative efficiency and global warming potential.
Atmospheric reactivity, kinetics and spectroscopy.
Quantum chemistry and FT-IR spectroscopy.

Reference ERCs:

PE4_18 Environment chemistry
PE4_2 Spectroscopic and spectrometric techniques
PE4_13 Theoretical and computational chemistry

Reference SDGs:

GOAL 9: Industry, Innovation and Infrastructure
GOAL 13: Climate Action

Description of Research Topic

Radiative efficiencies (REs) and global warming potentials (GWPs) are metrics used to assess the impact of greenhouse gases, and they guide private and public decision-making processes. They depend on the accuracy of infrared (IR) absorption cross-sections and atmospheric lifetimes, whose experimental determination can be particularly challenging. In such a situation, quantum-chemical (QC) calculations can be exploited to predict the IR spectra of the targeted compound and simulate its atmospheric reactivity to determine the rates for the main removal chemical processes. This research topic builds on previous outcomes achieved by the STARK research group in this field and aims at developing them further. In particular: the QC workflow for the determination of REs will be (a) refined by including the simulation of the actual band-shapes and (b) integrated with chemical kinetic protocols for estimating rate constants and, from these, atmospheric lifetimes. The in silico tool thus obtained will be adopted to evaluate REs and GWPs of a range of halogenated compounds for which no experimental values are available. The computational work will be integrated with laboratory experiments for measuring the IR absorption cross-sections of selected halocarbons, with particular focus on the frequency region below 500 cm⁻¹ that remains largely uncharacterized. The outcome of the project will provide more complete and accurate climate metrics offering new data for climate policy assessments.

Research Team and Environment

The research is carried out in the STARK group (<https://www.sns.it/it/stark-spectroscopy-thermochemistry-and-reaction-kinetics>) at Scuola Normale Superiore. STARK scientific activity aims at



the development and application of computational methodologies for characterizing the spectroscopic properties, the chemical reactivity and kinetics of molecular systems. The group manages the high-performance computing facilities of the Village Cluster, equipped with 100+ servers, 3000+ CPUs and 300 TB of storage.

Suggested Skills for this Research Topic

Basic knowledge in chemistry, thermodynamics and spectroscopy.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.





PhD SDC
SUSTAINABLE DEVELOPMENT
AND CLIMATE CHANGE

Scholarship code

C42.CU-Alpha.08

Curriculum: CU Alpha - One Earth: Earth System and Human life

Pollution and astroneuro interaction in brain health

Reference Person: Vercelli Alessandro (alessandro.vercelli@unito.it)

Host University/Institution: Università degli Studi di Torino

Research Keywords:

Astrocyte
Neuron
Pollution

Reference ERCs:

LS5_2 Glial cells and neuronal-glia communication
LS5_11 Neurological and neurodegenerative disorders
LS7_11 Environmental health, occupational medicine

Reference SDGs:

GOAL 3: Good Health and Well-being
GOAL 5: Gender Equality

Description of Research Topic

Brain health is increasingly taking center stage in the health system and among policymakers (WHO https://www.who.int/health-topics/brain-health#tab=tab_1): “Different determinants related to physical health, healthy environments, safety and security, life-long learning and social connection, as well as access to quality services influence the way our brains develop, adapt and respond to stress and adversity”. These give way to strategies for promotion and prevention across the life course. Brain health is strongly interconnected to One Health (WHO - https://www.who.int/health-topics/one-health#tab=tab_1), meaning that the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent. A fundamental issue in the nervous system consists in the neuron/astrocyte relationship, which is altered in the pathology of the CNS (epilepsy, stroke, PD, and AD). We will investigate in vitro and in animal models the effects of air pollutants and pesticides. We will aim to elucidating the neuroexposome and emphasizing the brain's distinctive responses to environmental exposures, by develop and/or validating better in-vivo, in-silico and in-vitro models. These insights will identify molecular signatures and neuron/dysfunctions, and establish biomarkers of exposure and disease risk.

Research Team and Environment

Our group studies the development and the normal and pathological aging of the nervous system at different scales (molecular, cellular, and neural network levels). We apply molecular, biochemical, and morphological methods to investigate neurodegenerative diseases (such as motor neuron diseases like SMA and ALS, as well as Alzheimer's and Parkinson's). In this context, we study:



- the role of excitotoxicity and autophagy;
- mitochondrial dysfunctions;
- neuroinflammation.

Some of these conditions are associated with frailty and muscle disorders. Our aim is not only to understand disease mechanisms but also to identify biomarkers and molecular pathways to develop new therapeutic strategies.

Suggested Skills for this Research Topic

Molecular biology, histology, anatomy of the nervous system, microscopy, behavioral tests for animal models, cell culture

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.





Curriculum: CU Alpha - One Earth: Earth System and Human life

Development of ocean reanalyses and use reanalyses to understand Arctic ocean dynamics

Reference Person: Yang Chunxue (chunxue.yang@cnr.it)

Host University/Institution: Consiglio Nazionale delle Ricerche - Istituto di Scienze Marine (ISMAR)

Research Keywords:

Ocean reanalyses and dynamics
Arctic Ocean
Artificial Intelligence

Reference ERCs:

PE10_8 Oceanography (physical, chemical, biological, geological)
PE10_3 Climatology and climate change
PE10_14 Earth observations from space/remote sensing

Reference SDGs:

GOAL 13: Climate Action

Description of Research Topic

The Ph.D candidate will improve the global ocean reanalyses that has been developed in CNR-ISMAR, for example by using recent developed technology such as AI. Additionally, the Ph.D candidate will use the reanalyses and additional data (e.g. satellite data and in situ) to investigate the Arctic ocean dynamics.

Research Team and Environment

The research team is based in CNR-ISMAR, Rome, lead by Chunxue Yang, composed with several Ph.D students and Postdocs. The main activities of the research group focus on ocean reanalyses development and use ocean reanalyses to investigate ocean dynamics including meso-scale eddies, large scale ocean circulation in North Atlantic and Arctic Ocean.

Suggested Skills for this Research Topic

The candidate should obtain certain knowledge of marine science, or climate science, or environment science. Additionally, the candidate should obtain knowledge on numerical models, machine learning or any technical skills.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Alpha - One Earth: Earth System and Human life

Earth observation to strengthen prevention and preparedness in civil protection activities

Reference Person: Andrea Taramelli (andrea.taramelli@iusspavia.it)

Host University/Institution: Scuola Universitaria Superiore IUSS Pavia

Research Keywords:

Earth Observation
Risk assessment
Civil protection

Reference ERCs:

PE10_14 Earth observations from space/remote sensing
PE10_20 Geohazards
PE10_13 Physical geography, geomorphology

Reference SDGs:

GOAL 11: Sustainable Cities and Communities
GOAL 13: Climate Action
GOAL 15: Life on Land

Description of Research Topic

Europe is experiencing more frequent and more severe disasters. This is not only because environmental conditions are changing, but also because societies themselves are changing. Climate change is making extreme events like floods, heatwaves, and storms more intense. At the same time, patterns of urbanization and population growth in risk-prone areas are altering exposure levels. More people and assets are now concentrated in coastal zones, river basins, and densely built urban regions, which makes the potential consequences of hazardous events more severe. Earth Observation (EO)-based information can play a key role in improving disaster management. EO services and products enable systematic hazard monitoring, rapid damage assessment, and support for response and recovery operations. The availability of current EO datasets, along with those expected from future EO missions, will further enhance these capabilities. The availability of data alone does not automatically ensure effective application. Satellite-derived datasets require careful processing, interpretation, and translation into user-oriented information products. Transforming complex EO data into decision-support tools remains a critical step. This PhD research aims to explore how EO data, starting from Copernicus products, can be integrated into risk assessment and disaster management to support operational tools and help authorities reduce the impact of natural hazards. The research activity will be carried out within the national project "Space for the sustainable development of the planet" (SpaceItUp!). This is a program aiming at enhancing the space technology of Italy to be used for space exploration and exploitation for the benefit of planet Earth and the entire humankind. The researcher will contribute to the development of the project's research lines within the macro-themes "Resilience to extremes" and "Experimental research for sustainable



Development”, developing thematic products based on innovative EO technologies to support risk assessment and disaster management,

Research Team and Environment

The research team comprises Dr. R. Boni, a senior researcher in Physical Geography, Geomorphology, and Applied Geology; Prof. A. Taramelli, a professor of Remote Sensing and Surface Coastal Processes; and Dr. S. Sapio, a postdoctoral fellow in Remote Sensing.

Suggested Skills for this Research Topic

Knowledge of Copernicus, Environmental remote sensing, Geospatial analysis of Earth observation

Source of fundings

This scholarship is funded by "SpaceItUp!"

Funded under the Collaboration Agreement pursuant to Article 15 of Italian Law No. 241/1990 for the joint application submitted in response to the funding call issued by the Italian Space Agency (ASI) – Protocol No. CI-2022-DSR042 of 18 July 2022 – for “Space Activities” (Topic 15), referred to in MUR Notice No. 341 of 15 March 2022, aimed at establishing “Extended Partnerships involving universities, research centres and companies for the funding of basic research projects” within the framework of the National Recovery and Resilience Plan (PNRR), Mission 4 “Education and Research” – Component 2 “From Research to Business” – Investment 1.3, funded by the European Union – NextGenerationEU. Project “Space It Up!” (CUP: D53C24000580005), and under the Addendum to the Collaboration Agreement pursuant to Article 15 of Italian Law No. 241/1990 – Contract No. 2024-5.E.O. (CUP: I53D24000060005).

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.





Curriculum: CU Alpha - One Earth: Earth System and Human life

Extreme winds and aerodynamic effects on ships and port environments*

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

Host University/Institution: Scuola Universitaria Superiore IUSS Pavia

Research Keywords:

Extreme winds
Experimental tests
Computational Fluid Dynamics

Reference ERCs:

PE8_3 Civil engineering, architecture, offshore construction, lightweight construction, geotechnics
PE8_7 Mechanical engineering
PE3_14 Fluid dynamics (physics)

Reference SDGs:

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

Description of Research Topic

Ports are important nodes that facilitate about 80% of the worldwide trade volume via sea. Accidents occurring in ports to vessels and infrastructures do not only imply huge economic losses but also high risk for the workers and people living nearby. Most of the documented accidents on vessels and cranes mainly occurred during severe storms. However, engineers and port operators currently rely mainly on atmospheric boundary layer (ABL) winds, while experimental data and numerical simulations on isolated vessels are limited and rarely accessible. In the absence of such analyses, semi-empirical functions derived from ABL data are used, but they may underestimate loads under non-synoptic winds, increasing the risk of accidents such as mooring line failure, collisions, and container stack collapse. The project aims to provide a reference experimental database on wind fields and aerodynamic coefficients for ships and port infrastructures under extreme wind conditions. Case studies involving an isolated containership and a containership moored in port will be investigated under four wind conditions: ABL winds, thunderstorm downbursts, downbursts embedded within ABL winds, and tornadoes. The experiments do not include wave-wind-ship interactions, which will instead be studied through Computational Fluid Dynamics (CFD) simulations. The results will be used to improve existing semi-empirical models and develop new ones for estimating loads on vessels under different wind scenarios.

Research Team and Environment

The PhD candidate will be part of a double PhD degree program, between IUSS of Pavia and University of Western Ontario. The student will be supervised by prof. Alessio Ricci from IUSS and prof. Girma



Bitsuamlak from University of Western Ontario, Canada, and will benefit from the extensive experience of the two groups in climatology, wind measurement and modeling; wind effects on infrastructures and environment; impact assessment of extreme natural events; risk management of natural and anthropogenic hazards.

For further information please contact alessio.ricci@iusspavia.it o phd-sdc@iusspavia.it

Suggested Skills for this Research Topic

The PhD candidate should have knowledge of Computational Fluid Dynamics, data analysis and statistics, structural engineering, programming skills in Matlab or Python and C++ as well as knowledge of signal processing. Team working attitude and excellent knowledge of spoken and written English are highly desirable.

* The scholarship will be activated only upon the signing of a cotutelle agreement between the IUSS School and Western Ontario University.



Curriculum: CU Alpha - One Earth: Earth System and Human life

Lunar IR/FIR Observations of Earth: Added Value for Climate and Weather

Reference Person: Alberto Ortolani (alberto.ortolani@cnr.it)

Host University/Institution: Scuola Universitaria Superiore IUSS Pavia

Research Keywords

Earth Observation from the Moon
Atmospheric modelling
Data Assimilation

Reference ERCs:

PE10_2 Meteorology, atmospheric physics and dynamics
PE10_14 Earth observations from space/remote sensing
PE6_12 Scientific computing, simulation and modelling tools

Reference SDGs:

GOAL 13: Climate Action

Description of Research Topic

The proposed PhD research project focuses on innovative approaches to Earth observation (EO) from a lunar platform and their exploitation in weather modelling. Its goal is to develop advanced methodologies to assess the scientific and operational impact of Medium and Far Infrared (MIR and FIR) observations of the Earth acquired from the Moon. The reference mission concept is the Lunar Earth Temperature Observatory (LETO), developed under the "Earth-Moon-Mars" Italian NRRP project. The concept is based on the ESA FORUM mission spectrometer (planned for launch in 2028), adapted to observe from the Moon, lacking the capability to spatially resolve Earth emission, but retaining full spectral resolution and enabling continuous observation of an entire Earth hemisphere.

The project integrates atmospheric modelling, satellite observations, and advanced Data Assimilation (DA) techniques. It includes the development of observation operators based on fast radiative transfer models to simulate LETO data and assimilate them into global atmospheric models, testing different approaches. The aim is to quantify the contribution of FIR and MIR observations from the Moon to improving atmospheric state estimation and weather forecasting, also exploring synergies with existing and future EO platforms. Computational challenges related to DA will be addressed, including the use of artificial intelligence in atmospheric and radiative transfer models.

Research Team and Environment

The PhD candidate will be based in Florence. The team consists of researchers from CNR (IFAC, INO, IBE), supported by colleagues of the Universities of Bologna and Basilicata, already cooperating in the context of projects and academic programs.



Suggested Skills for this Research Topic

- Master's degree in one of the following disciplines: physics, engineering, mathematics, computer science
- Basic experience in developing and running numerical codes
- Basic knowledge of atmospheric physics and radiative transfer processes
- Knowledge of at least one programming languages among Fortran, C++, Python, Matlab
- Knowledge of the operating systems Linux and Windows or MacOS
- Ability to work within a team
- Attention to detail and organizational skills
- Excellent interpersonal and communication skills

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Beta: Human society: socio-economic impacts, policies and institutions

Climate-driven flood risk assessment and adaptation of urban drainage systems in Northern Italy

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

Host University/Institution: Scuola Universitaria Superiore IUSS Pavia

Research Keywords:

Urban flood risk
Climate change projections
Socio-economic impacts

Reference ERCs:

PE8_3 Civil engineering, architecture, offshore construction, lightweight construction, geotechnics
PE1_14 Mathematical statistics
SH1_1 Macroeconomics; monetary economics; economic growth

Reference SDGs:

GOAL 6: Clean Water and Sanitation
GOAL 9: Industry, Innovation and Infrastructure
GOAL 11: Sustainable Cities and Communities

Description of Research Topic

The research aims to assess the impacts of future climate projections on the probability of extreme precipitation events and their implications for urban drainage systems. The study focuses on the Province of Monza and Brianza (Northern Italy), a highly urbanized area exposed to pluvial flooding. The work will leverage existing hydrological and hydraulic modelling results based on historical data, adapting them to future climate conditions through the integration of projected changes in rainfall intensity and frequency.

The research will quantify both direct and indirect socio-economic impacts of flooding, including as example damage to building, infrastructure, disruption of services, and business interruption. A risk-based framework will be adopted to link hazard, exposure, and vulnerability, enabling the estimation of expected annual losses and system criticalities. Finally, the project will explore and evaluate adaptation strategies for urban drainage systems, assessing their effectiveness and associated benefits in reducing risk. The overall goal is to support risk-based design and decision-making processes for climate-resilient infrastructure planning.

Research Team and Environment

The research will be conducted within an interdisciplinary environment combining expertise in hydrology, hydraulic engineering, climate risk assessment, and socio-economic analysis. The team is



based at IUSS Pavia and is actively engaged in research on flood risk and systemic impacts, with strong experience in modelling and quantitative risk assessment. The project is co-funded by BrianzAcque, ensuring access to local data, operational knowledge, and stakeholder interaction, strengthening the applied relevance of the research.

Suggested Skills for this Research Topic

The candidate should have a background in civil or environmental engineering, hydrology, or related fields. Required skills include hydrological and hydraulic modelling, data analysis, and basic knowledge of climate projections. Familiarity with GIS tools and programming (e.g. Python, MATLAB) is desirable. An interest in risk assessment and socio-economic impact analysis is expected. Good communication skills in English are required; knowledge of Italian is considered an advantage for interaction with local stakeholders and data collection.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.





Curriculum: CU Beta: Human society: socio-economic impacts, policies and institutions

Institutions and governance of climate change

Reference Person: Beretta Ilaria (ilaria.beretta@unicatt.it)

Host University/Institution: Università Cattolica del Sacro Cuore

Research Keywords:

Institutions
Interdisciplinarity
European Green Deal

Reference ERCs:

SH2_1 Political systems, governance
SH7_6 Environmental and climate change, societal impact and policy
SH7_5 Sustainability sciences, environment and resources

Reference SDGs:

GOAL 11: Sustainable Cities and Communities
GOAL 13: Climate Action
GOAL 16: Peace and Justice Strong Institutions

Description of Research Topic

The PhD program in 'Institutions and governance of climate change' focuses on the central role that institutions must play at all administrative and territorial levels in the transition to a sustainable and resilient society in front of climate change. Faced with the threat of increasing global risks, from health and environmental risks to financial and geo-political risks, the PhD program point to the creation of new administrative and business cultures based on a systemic interdisciplinary vision, which can drive innovative governance approaches and methods. The PHD in 'Institutions and governance of climate change' aims at generating the interdisciplinary skills (socio-economic, legal, political, administrative, methodological) that are essential to manage complexity and to adopt integrated perspectives for the governance of transformations related to climate change and sustainability. The PhD has a specific focus on the 'sustainable transition' led by the European Green Deal of the European Commission, which pursues climate neutrality by 2050, and to its implementation through the different levels of government and through the involvement of the actors from industry and finance.

Research Team and Environment

Università Cattolica (UCSC) is one the largest non-state universities in Europe. It offers 5 campuses, 98 courses, 147 post-graduate masters, 17 doctoral schools with 21 PhD programs in ten disciplinary areas. At present, the research portfolio includes more than 300 active projects getting funds from competitive calls. UCSC pursues multidisciplinary and interdisciplinary approaches to scientific research, in particular aiming at a synthesis between the responsible use of methodologies of empirical sciences and speculative



knowledge. The research team for the PhD program includes political scientists, sociologists, economists, and research methodologists.

Suggested Skills for this Research Topic

Skills required: strong motivation, flexibility, resourcefulness; no specific disciplinary backgrounds will be excluded; previous research and work experiences on.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Beta: Human society: socio-economic impacts, policies and institutions

Data driven solutions for economic and territorial sustainability and placed based policies

Reference Person: Bergantino Angela Stefania (angelastefania.bergantino@uniba.it)

Host University/Institution: Università degli Studi di Bari Aldo Moro

Research Keywords:

Applied economics
Data analysis
GIS, Satellite data
Machine learning and econometrics techniques

Reference ERCs:

SH7_7 Cities; urban, regional and rural studies
SH7_10 GIS, spatial analysis; big data in geographical studies
SH7_9 Energy, transportation and mobility

Reference SDGs:

GOAL 11: Sustainable Cities and Communities

Description of Research Topic

The proposed research project investigates how place-based policies shape regional productivity, firms' behaviour and territorial resilience in the face of climate, technological and geopolitical shocks. It combines Earth Observation (EO) data with administrative, survey, experimental and firm-level datasets to generate spatially detailed indicators of economic activity, accessibility, infrastructure performance, mobility and tourism flows, supporting the rigorous evaluation of place-based policies and their effects on long-run regional growth and competitiveness. A central theme concerns territorial resilience: the capacity of regions, firms and communities to absorb and adapt to shocks, including natural hazards, geopolitical crises, infrastructure failures and technological transformations. The successful candidate will develop original research questions within this framework, employing state-of-the-art methods such as causal inference, spatial econometrics, machine learning and experimental approaches, contributing to the literature on regional economics and sustainable territorial development.

Research Team and Environment

The research team is led by Professor Angela S. Bergantino, a full professor of Applied Economics at the University of Bari. She has held and currently holds senior positions in the transport sector at the national and international levels. The research team is composed of several researchers (specialized in transport economics, experimental economics, environmental economics, econometrics and tourism) and post-



doc and PhD students in economics. The PhD candidate will use the laboratories and research infrastructures equipped with computers and statistical software specific to research activities.

Suggested Skills for this Research Topic

Candidates should preferably have an academic background in economics and data analysis, analytical capabilities, the ability to handle and analyze large datasets and perform quantitative research in econometrics and social sciences. GIS competences are useful. Fluency in English is recommended.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.





Curriculum: CU Beta: Human society: socio-economic impacts, policies and institutions

Connecting Industries for industrial symbiosis: the role of open innovation and digitalization

Reference Person: De Chiara Alessandra (adechiara@unior.it)

Host University/Institution: Università degli Studi di Napoli L'Orientale

Research Keywords:

Industrial symbiosis
Open innovation
Digitalization

Reference ERCs:

SH1_9 Industrial organisation; entrepreneurship; R&D and innovation
SH1_10 Management; strategy; organisational behaviour
SH1_3 Development economics; structural change; political economy of development

Reference SDGs:

GOAL 9: Industry, Innovation and Infrastructure
GOAL 11: Sustainable Cities and Communities
GOAL 12: Responsible Consumption and Production

Description of Research Topic

The research aims to investigate how industrial symbiosis can support local companies in transitioning toward more sustainable and circular production models. Basing on an analytical model to assess the feasibility of industrial symbiosis within specific territories, the research identifies key enabling factors, as well as barriers and challenges affecting implementation and dedicates a central role to open innovation in supporting industrial symbiosis through the development of dynamic digital catalogs. These catalogs should be continuously updated with information on research infrastructures, innovations, and patents, so to enable cross-sector collaboration and to accelerate knowledge exchange among stakeholders. Finally, the project will include a comprehensive assessment of the social and economic impacts of industrial symbiosis initiatives, considering both direct and indirect effects, such as job creation, local economic development, and environmental sustainability.

Research Team and Environment

The research team includes the phd student who will interact with researchers, within the doctoral college and the university partner, and actors belonging to the local system.

Suggested Skills for this Research Topic



The candidate must be in possession of a master's degree or a suitable qualification obtained abroad. In the selection of the candidate will be taking into account specific competences on the topics of circular economy, sustainable development and innovation.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.





Curriculum: CU Beta: Human society: socio-economic impacts, policies and institutions

Understanding Hazardous Chemical Approvals in Consumer Products

Reference Person: Giuliani Elisa (elisa.giuliani@unipi.it)

Host University/Institution: Università di Pisa

Research Keywords:

Chemical products
Toxicity
Institutions

Reference ERCs:

SH1_3 Development economics; structural change; political economy of development
SH1_10 Management; strategy; organisational behaviour
PE4_13 Theoretical and computational chemistry

Reference SDGs:

GOAL 3: Good Health and Well-being
GOAL 11: Sustainable Cities and Communities
GOAL 12: Responsible Consumption and Production

Description of Research Topic

Regulatory frameworks governing the approval of chemical compounds—such as REACH in Europe and TSCA in the United States—aim to safeguard human and environmental health. Yet hazardous substances continue to enter the market, with risks often emerging only after approval. This PhD project investigates the drivers of such regulatory failures by asking: what factors lead to the authorization of chemical compounds that later prove harmful, despite available ex ante risk signals?

The project adopts a comparative, mixed-methods approach across two empirical settings: consumer chemical products (cosmetics, personal care, and household goods). For these products, it constructs a novel dataset enabling analysis of product–patent–chemical relationships across countries and products.

Using econometric analysis complemented by qualitative case studies and interviews, the project identifies systematic patterns in regulatory failure, including the role of firm-level characteristics, industry dynamics, and governance contexts. By focusing on the predictive value of pre-approval information, the study aims to uncover preventable sources of risk and to contribute to theories of regulatory governance, corporate accountability, and innovation under uncertainty. The findings will provide evidence-based insights to improve chemical regulation and strengthen the protection of public and environmental health.

The PhD project will be carried out as part of the ERC Synergy project “SUSTECH” GA 101224873.



Research Team and Environment

The research team is related to the ERC-SYG grant

Elisa Giuliani (UNIFI)

Federica Neri (UNIFI)

Marisol Manfredi (IUSS Pavia-UNIFI)

Arianna Martinelli (Scuola Superiore Sant'Anna)

Suggested Skills for this Research Topic

Master's degree in Chemistry or related field.

Demonstrated research or professional experience in patent analysis.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Beta: Human society: socio-economic impacts, policies and institutions

Rebalancing Transport Modal Share for Sustainable Mobility

Reference Person: Maggi Elena (elena.maggi@uninsubria.it)

Host University/Institution: Università degli Studi dell'Insubria

Research Keywords:

Sustainable transport
Transport mode choice
Policies for sustainable mobility

Reference ERCs:

SH7_9 Energy, transportation and mobility
SH7_6 Environmental and climate change, societal impact and policy
SH7_7 Cities; urban, regional and rural studies

Reference SDGs:

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

Description of Research Topic

Transport has wide-ranging impacts across environment, energy, and public health. It's a major source of greenhouse gases emissions, and one of the largest energy users globally, still heavily dependent on fossil fuel. Traffic noise affects urban populations, leading to stress, sleep disturbance, and reduced quality of life. Road traffic injuries are a leading cause of death worldwide, especially among young people. Overuse of private vehicles leads to congestion, wasting time and fuel, and lowering productivity. Car-dependent systems can limit accessibility for non-drivers and worsen inequality. Despite these significant negative externalities, we are still far from achieving the objective of rebalancing the modal share, shifting demand from road, that is still the predominant mode both for passenger and freight transport, toward greener modes, such as public transport, rail, cycling. The research aims to determine how to reduce reliance on private cars and road freight, identifying policy packages (including mobility management strategies) that rebalance modal share, cut emissions, and maintain accessibility and economic efficiency. The methodology will include both case studies' analysis and modelling. Quantitative data will be paired with qualitative insights from policy frameworks and user behavior studies. Scenario modeling will assess the impact of different categories of interventions, considering different geographical scales and different transport users.

Research Team and Environment

The PhD student will be involved in the research group on transport economics of the University of Insubria' Department of Economics (recognized as Department of Excellence 2023-2027 by the University and Research Ministry). She/he will work under the supervision of Elena Maggi, Full Professor



on Applied Economics and other research team members. The PhD student will have the chance to take part in the interdisciplinary research platform on Sustainability and to participate in the Ph.D. program in Methods and Models for Economic Decisions. The research group collaborates with several national and international universities, specialized in Transport Analysis, Sustainability and Policy.

Suggested Skills for this Research Topic

The PhD student should have good skills in data analysis and modelling. A background in economic studies and a good knowledge of Stata or other econometric software is particularly appreciated. Good quantitative skills and transport and sustainability knowledge are valuable assets. Fluency in English, both written and spoken, and, possibly, a good knowledge of Italian is required. Ability and willingness to work in collaborative, multi-disciplinary environment and experience of both quantitative and qualitative research work are also very appreciated skills.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Beta: Human society: socio-economic impacts, policies and institutions

Flood risk in alpine areas under climate change: risk management and flood resilience

Reference Person: Righetti Maurizio (maurizio.righetti@unibz.it)

Host University/Institution: Libera Università di Bolzano

Research Keywords:

Flood risk, river hydraulics
Hydrology, climate change, extreme events
Nature based solutions

Reference ERCs:

PE8_11 Environmental engineering, e.g. sustainable design, waste and water treatment, recycling, regeneration or recovery of compounds, carbon capture & storage
PE6_12 Scientific computing, simulation and modelling tools
PE6_11 Machine learning, statistical data processing and applications using signal processing (e.g. speech, image, video)

Reference SDGs:

GOAL 6: Clean Water and Sanitation
GOAL 11: Sustainable Cities and Communities
GOAL 13: Climate Action

Description of Research Topic

In the Alpine region, climate change is occurring at twice the global average rate, with temperatures rising by nearly 2°C since the late 19th century. This rapid warming significantly increases hydrogeological risks, making mountain hazards less predictable and more intense. The flood regime is altered in many aspects, such as: Winter Floods, Earlier Peaks, Snowmelt. While overall precipitation may decrease in summer, the frequency of short, intense rainfall events is increasing. The coupled hydrological-hydraulic simulations show that the increase in peak discharge is higher than the increase in precipitation. [Munz et al. 2024]. The flood impacts increase non-linearly with higher global warming levels. The estimated flood impacts may be underestimated in some scenarios or locations because bridges, which often limit the channel capacity locally, and driftwood, which could congest narrow sections, check dams, weirs, or bridges, are not included in the simulations. Such congestion can lead to levees overtopping upstream or a flood wave downstream if congestion is suddenly released.

The hydrological changes brought about by climate change require natural drainage systems to adapt to new meteorological and climatic conditions. This calls for an integrated approach that combines nature-based solutions with monitoring and spatial planning. Adaptation efforts must also (and not only) focus on slowing down runoff and improving the area's natural storage capacity.



Research Team and Environment

The PhD candidate will be part of the Faculty of Science and Technology at the Free University of Bozen-Bolzano. The research team he will join consists of various experts in the fields of hydraulics, ecosystems and hydraulic safety. The team consists of experienced researchers. There are many opportunities for contact with external public entities, which manage the hydrogeological risk in South Tyrol. The contact person for this research topic usually co-operates with provincial offices. This collaboration will facilitate the practical impact on the productive world of research results.

Suggested Skills for this Research Topic

The main skills required of the candidate are the willingness to participate in the working and interdisciplinary team, creating a relaxed environment but pursuing clear research aims. Furthermore, it is necessary that the candidate be willing to learn and to get to know and apply new aspects from different disciplines and to work in collaboration with public partners (e.g. Agenzia Protezione Civile Bolzano) on the analysis of real cases. From the point of view of technical skills, the candidate should have the basics of programming (Fortran and/or Matlab, Python,...) or the use of at least 2D hydraulic modelling software (Basement, Flow-2D, etc.).

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Beta: Human society: socio-economic impacts, policies and institutions

Cities in the Dark: social impacts of urban system disruptions after earthquake-induced power outages

Reference Person: Varone Chiara (chiara.varone@cnr.it), Giuffré Margherita (margherita.giuffre@cnr.it)

Host University/Institution: Consiglio Nazionale delle Ricerche (CNR) - Istituto di Geologia Ambientale e Geoingegneria (IGAG)

Research Keywords:

Earthquake and prolonged blackouts
Social vulnerability
Urban functionality recovery

Reference ERCs:

PE10_20 Geohazards
SH7_10 GIS, spatial analysis; big data in geographical studies
SH7_6 Environmental and climate change, societal impact and policy

Reference SDGs:

GOAL 15: Life on Land
GOAL 17: Partnerships to Achieve the Goal

Description of Research Topic

This PhD project aims to investigate the complex interactions between seismic events and urban damage, focusing on critical infrastructure failures and their impact on urban system functionality. The research focuses on understanding how earthquake-induced damage to power grids, triggering prolonged blackouts and cascading disruptions across essential urban services, can impact the urban metabolism. By integrating perspectives from social sciences, urban studies, and infrastructure engineering, the project seeks to analyse both the immediate and long-term consequences of such compound hazards on urban populations and the functioning of cities. Starting from historical earthquake events, records of power grid failures, urban infrastructure vulnerability data, and socio-demographic information from affected cities, an integrated model will be developed to simulate cascading failures across critical services and assess how these disruptions affect urban functionality and resilience. A set of indicators, encompassing environmental, infrastructural, and socio-cultural dimensions, will be defined to evaluate the functionality of the urban system and monitor its recovery trends over time.

The generation of scenario-based analyses aims at identifying a system of essential urban functions whose preventive safety measures could reduce urban vulnerability and facilitate recovery.



Research Team and Environment

The group is composed of 25 researchers, including postdocs and collaborators, who work together on a variety of topics related to seismic risk and multi-risk. The research environment is young and dynamic, fostering collaboration, innovation, and the development of new ideas across different areas of expertise. The first is the LAB GIS, which focuses on GIS technologies, and GEALAB, a laboratory dedicated to applied geophysics. The research group also work in framework of inStabile where researchers collaborate to develop methodologies and tools for analysing the response capacity of urban settlements to disasters, both during the emergency phase and in the early stages of recovery.

Suggested Skills for this Research Topic

The ideal candidate should have strong analytical and quantitative skills, with experience in urban systems modelling and disaster risk assessment. Proficiency in handling socio-demographic and geospatial data, as well as simulation of cascading failures, is essential. Interdisciplinary thinking, combining social science, urban studies, and technical engineering perspectives, is required, along with strong communication skills for translating complex analyses into actionable insights for policy and planning.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Beta: Human society: socio-economic impacts, policies and institutions

Reasoning and Decision-Making Under Deep Uncertainty

Reference Person: Zanetti Luca (luca.zanetti@iusspavia.it)

Host University/Institution: Scuola Universitaria Superiore IUSS Pavia

Research Keywords:

Uncertainty
Decision-making
Technology

Reference ERCs:

SH4_13 Philosophy of science, epistemology, logic

Reference SDGs:

GOAL 3: Good Health and Well-being
GOAL 9: Industry, Innovation and Infrastructure
GOAL 16: Peace and Justice Strong Institutions

Description of Research Topic

Complex scenarios create deep uncertainty about the consequences of our actions. Outcomes are hard to predict and quantify, and uncertainty can also affect which options exist and how valuable they are for us or for others.

The PhD candidate is expected to investigate reasoning and decision-making under uncertainty from both theoretical and applied perspectives.

The theoretical component should aim to draw on analytic (including formal) epistemology, philosophy of science, and accounts of rationality and decision-making, aiming to refine our understanding of uncertainty and assess the limits of mathematical modelling under such conditions.

The applied component should focus on real-world case studies. Projects exploring emerging technologies, including (but not limited to) social robots as embodied systems for human-machine interaction and AI as decision-support tools in uncertain contexts, are particularly encouraged. The PHD candidate is also expected to contribute to and lead experimental activities using tools such as VR technologies, simulations, and AI.

Aviation is a priority application area, given its reliance on automation, heuristics, predictive models, and human factors, as well as its relevance to safety systems and risk mitigation. Other application domains will also be considered.

Research Team and Environment

The team specializes in epistemology, philosophy of mathematics and logic, and theories of risk, uncertainty, and decision-making, alongside philosophy of mind, affectivity, and technology. It includes professors, researchers, and postdocs, and organizes seminars, workshops, and masterclasses while



supporting international collaborations. Members contribute to competitive research projects and multidisciplinary MA and PhD programs. The PhD position is 50% funded by the project “Severe Uncertainty: Decisions, Evidence, and Probability (DeEP)” (FIS-2023-01696), led by Luca Zanetti - CUP I53C25000600001.

Source of funding

This scholarship is funded by the project “Severe Uncertainty: Decisions, Evidence, and Probability (DeEP)” (FIS-2023-01696), led by Luca Zanetti - CUP I53C25000600001.

Suggested Skills for this Research Topic

Candidates should have training or familiarity in at least one field relevant to the project. Strength in areas central to “Severe Uncertainty: Decisions, Evidence, and Probability” is an advantage, including analytic epistemology (formal or social), philosophy of science, reasoning, and decision-making. Background in logic or mathematics is useful. Applicants should be open to multidisciplinary work and applying philosophical methods to underexplored sustainability-related domains. Familiarity or experience with specific application areas (e.g., aviation) is beneficial.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Beta: Human society: socio-economic impacts, policies and institutions

Innovative and sustainable measures for reducing water footprint in cities

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

Host University/Institution: Università degli Studi di Messina

Research Keywords:

Urban water footprint
Sustainable water resources management
Rainwater harvesting

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 6: Clean Water and Sanitation
GOAL 11: Sustainable Cities and Communities
GOAL 13: Climate Action

Description of Research Topic

Freshwater scarcity is increasingly perceived as a global systemic risk. Europe is experiencing growing pressure on water resources due to urban expansion, climate change and increasing demand. These drivers affect cities in different ways, depending on local climatic, demographic, and infrastructural conditions. Although household water use represents a relatively small fraction of total water abstraction, nevertheless it is often the focus of public interest, as it corresponds to the water directly used by the population. Looking forward to the next few decades, further investments in urban water infrastructures are expected to address rising demand and supply variability. Owing to their strategic societal role, local communities and institutions as universities can influence behavioral changes and support decision-making by individuals, private and public organizations, and businesses. For this purpose, the proposed research topic intends to focus on water footprint accounting of direct water use in urban areas by studying innovative sustainable and multifaceted measures like rainwater harvesting, both at the household and the community level. This approach aims to support urban water managers by incorporating factors often overlooked in previous city-scale water footprint assessments, such as the current and future temporal variability of water demand, user behavior patterns, and the interaction between household- and community-scale solutions.

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, Brunella Bonaccorso, post-doc researchers and PhD students; the research activities cover research topics related to water resources management, sustainable urban drainage systems, water supply systems, hydrology and hydraulics. 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 sustainable urban drainage and water supply systems, applied hydrology and hydraulics. Familiarity with programming languages such as MATLAB, R, Python and commercial software as EPA-SWMM, EPANET, 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. Finally, willingness to international mobility is required.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Gamma: Technology and Territory: sustainable strategies and solutions for the transition

Functional foods and circular economy

Reference Person: Lucini Luigi (luigi.lucini@unicatt.it)

Host University/Institution: Università Cattolica del Sacro Cuore

Research Keywords:

Functional foods
Sustainable food productions
Bioactive peptides

Reference ERCs:

LS9_5 Food biotechnology and bioengineering
LS2_9 Metabolomics

Reference SDGs:

GOAL 3: Good Health and Well-being

Description of Research Topic

The project will focus on the identification, characterisation, and development of bioactive peptides and other functional components derived from dairy side streams and underutilised agri-food biomasses within a circular economy framework. Particular attention will be devoted to the valorization of cheese-derived fractions and protein-rich co-products as sustainable sources of health-promoting compounds for food and nutraceutical applications. The activity will include the optimisation of extraction, enzymatic hydrolysis and bioprocessing strategies aimed at generating peptide fractions with targeted biological activities, including (in silico) antioxidant, anti-inflammatory, antimicrobial and gut-modulating properties. Advanced analytical approaches based on high-resolution mass spectrometry, peptidomics, metabolomics and bioinformatics will be employed for compound profiling and molecular characterization. The project will also investigate the relationship between processing and ripening conditions, peptide structure and biological functionality, including sustainability-oriented process evaluation. Emphasis on the transition toward low-waste and competitive dairy systems. The research is positioned at the interface between food chemistry, sustainable food processing and functional ingredient development, contributing to the generation of innovative circular bioeconomy strategies for the dairy sector.

Research Team and Environment

The PlantFoodomics team at Università Cattolica del Sacro Cuore (Piacenza), coordinated by Prof. Luigi Lucini, focuses on plant, food and environmental metabolomics using high-resolution mass spectrometry and multi-omics approaches. Research activities include bioactive compounds, functional foods, plant stress physiology, biostimulants, sustainable agri-food systems, food quality and circular bioeconomy applications.



Suggested Skills for this Research Topic

The candidate must have a basis in food chemistry and analytical chemistry, and has to be motivated to learn in a dynamic environment. Bases of bioinformatics are also welcome.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Gamma: Technology and Territory: sustainable strategies and solutions for the transition

Whole-genome duplication as a plant adaptive strategy to changing environments

Reference Person: Albertini Emidio (emidio.albertini@unipg.it)

Host University/Institution: Università degli Studi di Perugia

Research Keywords:

Plant resilience
Polyploidy
Sustainable agriculture

Reference ERCs:

LS9_8 Applied plant sciences, plant breeding, agroecology and soil biology
LS2_5 Genomics
LS9_8 Applied plant sciences, plant breeding, agroecology and soil biology or LS2.4 gene regulation

Reference SDGs:

GOAL 13: Climate Action
GOAL 2: Zero Hunger
GOAL 15: Life on Land

Description of Research Topic

Polyploidy, resulting from whole genome duplication (WGD), is a major driver of plant evolution and adaptation, underlying key traits such as resilience to environmental stress and enhanced productivity. Since all seed plants have undergone at least one WGD event, understanding polyploidization is central to advancing sustainable agriculture. This project addresses key knowledge gaps by investigating autopolyploid and segmental allopolyploid species across different genera, as well as ancient paleopolyploidy events, to elucidate genome evolution and adaptation mechanisms.

A core focus is the relationship between polyploidy and apomixis, a reproductive strategy enabling clonal seed production and stable transmission of elite genotypes. By integrating genomic, transcriptomic, and evolutionary approaches, the project aims to distinguish diploid and polyploid systems, identify genes associated with stress tolerance and agronomically relevant traits, and uncover the genetic bases of apomixis.

Aligned with the One Health perspective, this research contributes to sustainable crop improvement, biodiversity conservation, and resilience of agroecosystems under climate change. By linking plant genomic innovation to environmental sustainability and food security, the project supports the broader Earth system–human life nexus, fostering interdisciplinary collaboration at European and global levels to develop next-generation breeding strategies.



Research Team and Environment

The research team at UNIPG includes leading experts in plant genetics, genomics, and biotechnology, with strong experience in polyploidy, epigenetics, and plant reproduction. The group is led by senior scientists with extensive coordination of international projects and multidisciplinary expertise. The research environment is supported by advanced facilities, including molecular biology and sequencing platforms, real-time PCR, plant transformation systems, greenhouses, growth chambers, and experimental fields. Fully independent and well-equipped, UNIPG provides a highly collaborative and competitive setting for cutting-edge research.

Suggested Skills for this Research Topic

The candidate should have a solid background in plant reproductive biology, plants genetics, and biotechnology, with basic knowledge of genetic and molecular biology techniques. Skills in bioinformatics (R/Python, data analysis) and willingness to learn omics approaches are also desirable. The candidate should demonstrate critical thinking, problem-solving ability, and capacity to work in interdisciplinary and international teams. Fluency in English is required.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.





Curriculum: CU Gamma: Technology and Territory: sustainable strategies and solutions for the transition

Integrated IoT and AI Solutions for Climate-Resilient and Sustainable Environments

Reference Person: Dallo Federico (federico.dallo@cnr.it)

Host University/Institution: Consiglio Nazionale delle Ricerche - Istituto Scienze Polari (ISP)

Research Keywords:

Technology and territory
Climate-resilient smart environments
Air pollution and indoor environmental quality

Reference ERCs:

PE10_1 Atmospheric chemistry, atmospheric composition, air pollution
PE6_12 Scientific computing, simulation and modelling tools
SH7_6 Environmental and climate change, societal impact and policy

Reference SDGs:

GOAL 3: Good Health and Well-being
GOAL 9: Industry, Innovation and Infrastructure
GOAL 11: Sustainable Cities and Communities

Description of Research Topic

This research focuses on the development of integrated technological solutions to support sustainable territorial transitions, with particular attention to climate resilience and public health. The project combines IoT-based environmental monitoring, wireless sensor networks (WSN), and advanced data analytics using artificial intelligence and machine learning (AI/ML) to collect, process, and interpret high-resolution environmental data. A key objective is the development of predictive models to assess the impact of climate hazards, such as air pollution and heatwaves, on human health, building on existing models for indoor exposure. The research also explores the use of large language models (LLMs) to create user-friendly interfaces that facilitate access to complex environmental information for both experts and non-expert stakeholders. Through collaboration with local authorities and industry partners, the project aims to translate scientific results into practical solutions, including technologies for improving indoor air quality while optimizing energy efficiency and thermal comfort. By integrating technological innovation with territorial needs, the research contributes to the design of resilient, healthy, and sustainable living environments.

Research Team and Environment

I am establishing a dedicated laboratory at ISP-CNR in Bologna focused on Health, Environment, and Technology. The lab currently hosts a postdoctoral researcher with expertise in chemistry and computer science. One additional postdoctoral researcher will be recruited within the healthRiskADAPT project to



develop co-created strategies for urban resilience in collaboration with municipalities. The lab benefits from strong international collaborations (e.g., UC Berkeley, University of Sydney) and an extensive Horizon network, alongside industry partnerships (e.g., FIAMM, Lucam-Air) supporting applications in environmental monitoring, smart control, energy efficiency, and indoor air quality.

Suggested Skills for this Research Topic

The candidate should be motivated to contribute to positive societal impact, open-minded, and inclusive, with a strong STEM background. Experience in computer science, data analysis, and modeling is highly desirable. Knowledge of environmental sciences, epidemiology, or public health would be an added value. Strong problem-solving skills and the ability to work in interdisciplinary and collaborative environments are essential. Proficiency in English is required; knowledge of additional languages is not mandatory but may be beneficial for stakeholder engagement.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Gamma: Technology and Territory: sustainable strategies and solutions for the transition

Maximizing the Value of Geothermal Resources: Integrating Energy, Heat, mineral CCS and Critical Raw Materials

Reference Person: Dini Andrea (andrea.dini@cnr.it)

Host University/Institution: Consiglio Nazionale delle Ricerche - Istituto di Geoscienze e Georisorse (IGG)

Research Keywords:

Geothermics
Critical Raw Materials
Energy

Reference ERCs:

PE10_10 Mineralogy, petrology, igneous petrology, metamorphic petrology
PE10_11 Geochemistry, cosmochemistry, crystal chemistry, isotope geochemistry, thermodynamics
SH7_9 Energy, transportation and mobility

Reference SDGs:

GOAL 7: Affordable and Clean Energy
GOAL 12: Responsible Consumption and Production
GOAL 13: Climate Action

Description of Research Topic

The PhD project aims to develop an integrated framework to enhance the value of geothermal resources through the co-production of electricity, district heating, and critical raw materials contained in geothermal fluids (e.g., lithium, boron), coupled with mineral CCS (Carbon Capture and Storage). The objective is to evaluate the technical, economic, and environmental sustainability of multifunctional geothermal systems, moving beyond traditional power-only approaches.

A key component of the research will focus on the geochemical variability of geothermal fluids, recognizing that their composition, temperature, and ionic ratios are strongly controlled by geological setting. Volcanic systems, sedimentary basins, and metamorphic basement environments produce fluids with distinct chemical signatures and resource potential. Understanding the controls on metal concentration, speciation, and mobility during water-rock interaction will therefore be essential.

The project will integrate energy and exergy analyses with Life Cycle Assessment (LCA) and Life Cycle Costing (LCC), comparing conventional geothermal exploitation with integrated systems including metal extraction and cascade heat recovery. By combining geological, geochemical, thermal, economic, infrastructural, and regulatory parameters, favourability models will be developed to identify where integrated geothermal valorization can support a sustainable energy and industrial transition.



Research Team and Environment

The PhD project will be carried out within the geothermal and geochemical–petrologic research group of IGG-CNR (Institute of Geosciences and Earth Resources), which has long-standing expertise in geothermal systems, CRM, mineral CCS, fluid geochemistry, and water–rock interaction. The research environment provides access to advanced geochemical laboratories for fluid and rock analysis, facilities for 3D geological modelling, and numerical tools for thermal and reservoir modelling. The interdisciplinary setting of IGG-CNR fosters collaboration with experts in geochemistry, geology, and energy systems, offering a stimulating environment for research on geothermal resources and critical raw materials.

Suggested Skills for this Research Topic

A solid background in Earth Sciences, Environmental Sciences, Geological Engineering, or related disciplines is required. The candidate should have experience or strong interest in GIS and geospatial analysis, numerical modeling, and data-driven methods, including machine learning or AI applied to geoscientific and environmental systems. Familiarity with thermodynamic modeling, geochemical datasets, or energy system analysis will be considered an asset. Strong analytical skills, scientific curiosity, and the ability to work in interdisciplinary teams are essential.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Gamma: Technology and Territory: sustainable strategies and solutions for the transition

Integrated energy system optimization and life cycle assessment for building sector decarbonization

Reference Person: Famiglietti Jacopo (jacopo.famiglietti@polimi.it)

Host University/Institution: Politecnico di Milano

Research Keywords:

Building Decarbonization
Life Cycle Assessment
Energy System Optimization

Reference ERCs:

PE2_15 Thermodynamics
PE8_6 Energy processes 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 11: Sustainable Cities and Communities
GOAL 13: Climate Action

Description of Research Topic

The building sector is central to achieving the European Union's climate neutrality target by 2050, accounting for about 40% of final energy consumption and representing the largest energy-consuming sector in Europe. The recast Energy Performance of Buildings Directive (EPBD) strengthens the role of Life Cycle Assessment (LCA) in evaluating building performance, extending the focus beyond operational energy to include embodied emissions. This research aims to support the decarbonization of the building sector by addressing both operational and embodied impacts over the entire life cycle. Energy system optimization models will be used to identify optimal technological pathways for decarbonization in both buildings and construction-related industries. The resulting scenarios will be assessed through LCA to quantify environmental impacts and trade-offs among technological, economic, and policy options. The PhD will develop an integrated framework aligned with the EPBD, focusing on minimum energy performance standards and renovation trajectories (Article 9), targeting the worst-performing buildings and reducing energy demand. The methodology integrates bottom-up optimization models with scenario analysis to identify cost-optimal pathways. Environmental performance will be evaluated across all life cycle stages. Expected outcomes include optimal renovation strategies, policy recommendations, and a decision-support framework for a sustainable built environment.

Research Team and Environment



RELAB (Renewable Heating and Cooling Lab) research group at Politecnico di Milano, Department of Energy, led by Prof. Mario Motta. The research focuses on refrigerants and cycle configurations for heat pumps, including analysis, modelling, and validation. The group conducts research on energy systems for buildings and districts, including experimental activities, dynamic simulations, energy planning, and life cycle assessment (LCA). The research group collaborates with numerous companies, research centers, laboratories, and Italian and international universities through private contracts and national and international research projects.

Suggested Skills for this Research Topic

Strong analytical and quantitative skills are required, including knowledge of energy system modeling and Life Cycle Assessment (LCA). Familiarity with programming tools (e.g., Python) and data analysis is essential. A background in energy engineering, environmental engineering, or related fields is expected, along with the ability to work with policy frameworks such as the EPBD. Good communication and interdisciplinary research skills are necessary. Proficiency in English is required; knowledge of Italian is considered an asset.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Gamma: Technology and Territory: sustainable strategies and solutions for the transition

Sustainable crop management model for tropical fruit under climatic change in Mediterranean basin

Reference Person: Farina Vittorio (vittorio.farina@unipa.it)

Host University/Institution: Università degli Studi di Palermo

Research Keywords:

Sustainable tropical crop management
Climate stress adaptation strategies
Precision agriculture for resilience

Reference ERCs:

LS9_8 Applied plant sciences, plant breeding, agroecology and soil biology
LS9_9 Plant pathology and pest resistance
LS9_5 Food biotechnology and bioengineering

Reference SDGs:

GOAL 2: Zero Hunger
GOAL 12: Responsible Consumption and Production
GOAL 13: Climate Action

Description of Research Topic

Climate change is reshaping Mediterranean agriculture by altering temperature patterns, water availability, and the incidence of abiotic and biotic stresses. In this context, the cultivation of tropical and subtropical crops such as mango, papaya, avocado, and emerging species such as coffee is becoming increasingly relevant, requiring new strategies to ensure environmental, agronomic, and economic sustainability.

This PhD project aims to develop and assess sustainable crop management models for these species under climate change scenarios, with particular attention to irrigation management, the use of photoselective nets, and innovative cultivation techniques able to improve water-use efficiency, microclimate regulation, and plant performance. The research will also address plant responses to abiotic stresses, such as heat, drought, radiation excess, and wind, as well as the increasing pressure of pests and diseases favored by changing climatic conditions. The project will also integrate precision agriculture tools, such as field sensors, agroclimatic monitoring, and data-based decision support, to optimize resource use and improve the adaptive management of orchards.

The final goal is to identify climate-resilient and resource-saving production systems capable of supporting the sustainable development of tropical and emerging crops in Mediterranean environments.

Research Team and Environment



The research team consists of a principal investigator, who will act as a tutor to the PhD student and two post-doc who will supervise the research and field activities. The working area consists of some farms in Sicily where experimental fields and a network of weather stations are located to measure environmental variables. Laboratory activities can be carried out in the Department's pomology, ecophysiology, food chemistry and post-harvest units. The program can be enriched by the numerous collaborations with research organizations and Italian and foreign universities with which the research team has active partnerships and student exchanges.

Suggested Skills for this Research Topic

The candidate should have skills in sustainable crop management, plant physiology, and experimental field research, with particular interest in tropical and subtropical crops under Mediterranean conditions. Knowledge of irrigation management, abiotic and biotic stress responses, and basic principles of precision agriculture (sensors, agroclimatic monitoring, data analysis) will be beneficial. Competence in statistical analysis and scientific writing would be useful. knowledge of other languages than English are a plus.; knowledge of Italian would be useful for field and stakeholder activities.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.





Curriculum: CU Gamma: Technology and Territory: sustainable strategies and solutions for the transition

Development of sustainable controlled-release nutraceutical systems for pet animals

Reference Person: Fino Debora (debora.fino@polito.it)

Host University/Institution: Politecnico di Torino

Research Keywords:

Sustainable controlled-release nutraceuticals
Green nutraceutical encapsulation
Circular bio-based formulations

Reference ERCs:

PE8_13 Industrial bioengineering
LS9_4 Microbial biotechnology and bioengineering
PE11_8 Engineering of alternative established or emergent materials

Reference SDGs:

GOAL 3: Good Health and Well-being
GOAL 9: Industry, Innovation and Infrastructure
GOAL 12: Responsible Consumption and Production

Description of Research Topic

This PhD project aims to develop innovative nutraceutical capsules for pet animals, designed to preserve the integrity of active ingredients throughout the gastrointestinal tract and enable their controlled release at the target site. The research will focus on biodegradable and biocompatible encapsulation materials derived from renewable resources (e.g., polysaccharides, proteins, biopolymers), in line with circular economy and decarbonization principles. Controlled-release systems (e.g. pH- or enzyme-responsive) will be investigated to protect sensitive compounds during gastric transit.

Furthermore, the project will explore the use of active ingredients recovered from agro-food residues, valorized through innovative green extraction technologies (e.g., supercritical CO₂, ultrasound-assisted extraction, natural deep eutectic solvents), preserving their bioactivity. An additional objective is the development of sustainable, biodegradable or compostable packaging solutions as alternatives to conventional blister packs.

The integrated approach will combine chemical engineering, materials science, and sustainable processing to develop high-performance nutraceutical products with reduced environmental impact, in collaboration with Candioli Pharma.

Research Team and Environment



The research will be conducted within the multidisciplinary FERMAN group, focused on biotechnological and green extraction processes supporting circular economy models. The team has strong expertise in valorizing agro-industrial residues into high-value products using sustainable techniques such as ultrasound, enzymatic, and supercritical CO₂ extraction.

State-of-the-art laboratories (FERMAN, Blunox, GreEnLab1, Circle) support material development and process optimization. The group integrates chemical engineering, bioprocesses, and LCA, ensuring sustainable and scalable solutions in collaboration with Candioli.

Suggested Skills for this Research Topic

The candidate should have a background in chemical engineering with competencies in biotechnology and food engineering. Skills in formulation, transport phenomena, and process design are required, along with knowledge of biobased materials, encapsulation, and controlled-release systems. Experience in green extraction technologies and biomass valorization is desirable. Laboratory skills in material characterization and data analysis are essential. Familiarity with sustainability assessment (e.g., LCA) is an asset. Proficiency in English is required; knowledge of Italian is a plus.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Gamma: Technology and Territory: sustainable strategies and solutions for the transition

Fast-tracking offshore renewables: integrated dry, wet, and real-sea experimental framework

Reference Person: Giorgi Giuseppe (giuseppe.giorgi@polito.it)

Host University/Institution: Politecnico di Torino

Research Keywords:

Offshore Renewable Energy
Integrated Experimental Framework
Blue Growth and Energy Transition

Reference ERCs:

PE7_1 Control engineering
PE8_6 Energy processes engineering
PE8_3 Civil engineering, architecture, offshore construction, lightweight construction, geotechnics

Reference SDGs:

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

Description of Research Topic

The acceleration of Offshore Renewable Energy (ORE) is vital for global decarbonization. However, a major technical bottleneck persists: the disconnection between dry-lab simulations and wet-environment testing. This fragmentation often leads to ineffective deployment, increasing costs and stalling technology readiness. This PhD project aims to overcome these limits by developing a unified experimental framework that integrates dry and wet testing into a single, synchronized validation pipeline.

The architecture harmonizes data and scaling laws across three distinct stages. First, high-fidelity dry-testing—utilizing 6-DoF motion platforms for Hardware-in-the-Loop (HiL) emulation—refines control strategies and mechanical components. Second, wet-testing in naval tanks provides controlled hydrodynamic validation. Finally, the framework culminates in real-sea validation at offshore sites. By integrating these environments, the research builds a "digital-to-sea" bridge, ensuring structural and energy performance models are robust and consistent across all scales.

Aligned with the CU GAMMA (Technology and Territory) curriculum, this multi-scale project provides scalable solutions for clean energy (SDG 7) and climate resilience (SDG 13). Integrating currently disconnected facilities establishes a new methodological standard for accelerating the deployment of resilient offshore energy systems in the Mediterranean and beyond.



Research Team and Environment

The candidate will join the MOREnergy Lab, a multidisciplinary group with 20 years of experience and a strong international reputation in marine energy. The environment provides unique facilities: a 6-DoF Stewart platform for dry-testing, a new naval tank under construction, and a consented offshore test site in Pantelleria. With a vast portfolio of EU and national projects, the lab offers a high-impact atmosphere for the energy transition. The team includes experts in mechatronics and offshore engineering, enabling a complete "digital-to-sea" validation pipeline. This setting ensures the transition from models to real-world impact within the PhD SDC framework.

Suggested Skills for this Research Topic

Candidates should preferably hold a MSc in Mechatronic Engineering. A solid background in mechatronics, control theory, and hydrodynamics is essential. Practical experience with prototyping and experimental testing (including sensors, data acquisition, and HiL systems) is highly required to manage the multi-stage validation pipeline. The applicant must demonstrate strong abilities in working in multidisciplinary teams and managing tasks within complex research projects. Proficiency in numerical modeling (Matlab/Simulink or Python) is expected.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.





Curriculum: CU Gamma: Technology and Territory: sustainable strategies and solutions for the transition

Hyperspectral monitoring of fruit tree diseases for sustainable crop protection

Reference Person: Nali Cristina (cristina.nali@unipi.it)

Host University/Institution: Università di Pisa

Research Keywords:

Plant Pathology
Vegetation spectroscopy
Sustainable Crop Protection

Reference ERCs:

LS9_9 Plant pathology and pest resistance
LS9_8 Applied plant sciences, plant breeding, agroecology and soil biology
PE10_14 Earth observations from space/remote sensing

Reference SDGs:

GOAL 2: Zero Hunger
GOAL 3: Good Health and Well-being
GOAL 13: Climate Action

Description of Research Topic

Ensuring resilient, high-quality and safe fruit production requires new approaches to manage the increasing pressure of diseases in orchard systems while reducing environmental impacts. Fruit trees are strategic crops for food security, nutritional quality and rural economies, but their long production cycles and high phytosanitary vulnerability call for timely, accurate and non-destructive monitoring tools. In this context, vegetation spectroscopy represents a promising solution, as it enables rapid and cost-effective assessment of plant health status across multiple spatial scales. However, its application to fruit tree pathology and sustainable crop protection remains underexplored. The research aims to: (1) design and develop a multiscale protocol for hyperspectral data acquisition, from leaf to canopy, UAV and satellite levels, under both field and controlled conditions, in order to build a comprehensive dataset of spectral signatures associated with diseases affecting fruit trees; (2) develop spectral indices, predictive models and classification tools for the early detection and monitoring of disease incidence, severity and plant physiological responses; and (3) support the development of sustainable crop protection strategies by integrating hyperspectral information into decision-support approaches for targeted, timely and reduced-input interventions, consistent with integrated pest management principles.

Research Team and Environment



Led by Prof. Cristina Nali, the Plant Pathology Lab at the University of Pisa, includes two Associate Professors, two Researchers, five PhD students, and six technicians. The group's main research interests focus on vegetation spectroscopy, hyperspectral phenotyping of plant stress, and the physio-chemical responses of plants to biotic and abiotic stresses. The research environment includes greenhouses, ozone-exposure facilities and advanced controlled-environment platforms. The group also benefits from a wide range of field and laboratory instrumentation for morpho-physiological and biochemical analyses (e.g., photosynthesis systems, Chl a fluorometers, HPLC, GC-MS, and microbiology tools).

Suggested Skills for this Research Topic

The candidate will be required to develop a distinctive set of skills, including the ability to analyse both conventional data (e.g., ecophysiological measurements) and high-dimensional datasets (e.g. hyperspectral and multivariate data), to improve the monitoring of plants under biotic and abiotic stress. The ideal candidate should be highly motivated to carry out research at an advanced level. Previous experience in standard Plant Pathology approaches, and a sound background in plant sciences, is considered essential. Candidates holding a degree in Agricultural Sciences or a related discipline will be preferred. Good communication skills in both Italian and English are also required.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Gamma: Technology and Territory: sustainable strategies and solutions for the transition

AI-driven Life Cycle Assessment of industrial-level technological scale-up of BioSolutions

Reference Person: Niero Monia (monia.niero@santannapisa.it)

Host University/Institution: Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna

Research Keywords:

Prospective Life Cycle Assessment
Artificial intelligence
BioSolutions for the food sector

Reference ERCs:

SH7_5 Sustainability sciences, environment and resources
SH7_6 Environmental and climate change, societal impact and policy

Reference SDGs:

GOAL 9: Industry, Innovation and Infrastructure
GOAL 12: Responsible Consumption and Production
GOAL 17: Partnerships to Achieve the Goal

Description of Research Topic

The application of Artificial Intelligence techniques and prospective Life Cycle Assessment (LCA) represent two frontiers in LCA methodological development which, although still at the research stage, are attracting growing interest in the scientific community. Integrating these approaches offers the potential to evaluate the future environmental impacts of emerging technologies, currently at the laboratory scale.

To support our aims, we are searching for a PhD student as a new member for our recent project, FrameBio (Multiscale Frameworks for BioSolutions), funded by the European Union through the Horizon Europe, Marie Skłodowska-Curie Actions (MSCA) grant. FrameBio's goal is to revolutionize biotechnologies by fostering the advancement of sustainable bioproducts production technologies for food applications (such as Single Cell Proteins). More specifically, the objective is to quantify the resource dependencies and environmental impact of relevant emerging technologies of the sector across various scales: Microorganism Design and Engineering - Fermentation Design of Experiments coupled with High Throughput Screening - Commercial Production Scheme Simulations - Supply Chain Design - Planetary Resource Utilization and its Impact on Earth's Geophysical Synergies, to predict the broad sustainability impacts of BioSolutions.

This full-time PhD position is part of a Doctoral Network (DN) that will train 13 PhDs in genomics, metabolomics, fermentation and process optimization, data science, and sustainability assessments in a unique venture. Applying LCA within this project is essential, given the central importance of environmental sustainability in the development of innovative BioSolutions.



This position is an exciting opportunity to work on a seminal topic and to study cutting-edge technologies towards our vision of a sustainable bioeconomy, focusing on the development of advanced environmental assessment models. Your specific tasks will be:

- Analyzing and interpreting materials and energy flows data collected from the experimental and computational laboratories of the partners and from the scientific literature.
- Creating explorative scenarios expressing realistic technical evolution trends in the production of BioSolutions while moving from laboratories to industry.
- Developing AI models that learn from the evolution of similar technologies in the past to simulate the progressive optimization pathways of current emerging technologies in terms of resource efficiency and scalability.
- Conducting a scenario-based prospective LCA analysis aimed at assessing potential environmental impact and benefits of BioSolutions in the food sector once they will be commercialized on a planetary-scale.
- Contributing to the methodological development of environmental impact assessment methodologies by improving the integrability between prospective LCA and AI.

Research Team and Environment

The PhD student will be part of the COGITO (Consumption-Oriented Green Innovation Tools platform for Life Cycle Assessment) lab, an interdisciplinary research team within the Sustainability and Climate Interdisciplinary Center at Sant'Anna School of Advanced Studies in Pisa led by Prof. Monia Niero specialized in the methodological development of LCA and its application across various research fields, including emerging technologies, to evaluate the environmental impacts of products and processes. The PhD student will be co-supervised by Dr. Federico Rossi

Scholarship Details

The DC Ph.D. student will receive a yearly gross salary:

- Living allowance of € 45.858,36 (including income tax and retirement pension contributions);
- Mobility allowance of € 8.520,00;
- Family allowance (If the DC Ph.D student has or acquires family obligations during the research programme) € 5.940,00.

Requirements

In order to fulfill the eligibility criteria of the Marie Curie MSCA Doctoral Networks at the date of recruitment, applicants must not have resided or carried out their main activity (work, studies, etc.) in Italy for more than 12 months in the 3 years immediately prior to their recruitment. Compulsory national service and/or short stays such as holidays are not taken into account. Italian candidates can apply if they have resided in another country for more than 2 years of the last 3 years. Furthermore, applicants must not already hold a doctoral degree.

Suggested Skills for this Research Topic

- University degree in engineering, environmental sciences, computer science, biology, chemistry, management, or equivalent programs.
- At the time of hiring, no more than 12 months of residence in Italy or main activity (work, study, etc.) in the last three years immediately prior to the date of hiring.
- Basic knowledge of environmental science and engineering. Familiarity with LCA methodology and software (e.g. SimaPro, openLCA, Brightway) will be an advantage.
- Basic knowledge of informatics, data management, and programming. Familiarity with AI



programming will be an advantage

- Good written and spoken English as well as presentation skills.
- interpersonal and organizational skills

Source of fundings

FrameBio - "Multiscale Frameworks for Biosolutions"

Project Number: 101227645

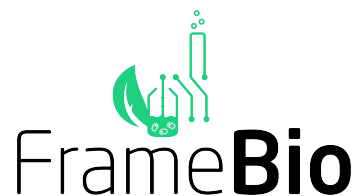
Call: HORIZON-MSCA-2024-DN-01

Type of Action: HORIZON-TMA-MSCA-DN

CUP: J53C25001610006

Period of Research Abroad

The DC Ph.D. student will undertake a secondment of six months at a beneficiary's or an associated partner's premises other than those of the beneficiary which has appointed the researcher under the project.



Curriculum: CU Gamma: Technology and Territory: sustainable strategies and solutions for the transition

Prospective Life Cycle Assessment of planetary-level market penetration of BioSolutions

Reference Person: Niero Monia (monia.niero@santannapisa.it)

Host University/Institution: Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna

Research Keywords:

Prospective Life Cycle Assessment
Planetary Boundaries
BioSolutions for the food sector

Reference ERCs:

SH7_5 Sustainability sciences, environment and resources
SH7_6 Environmental and climate change, societal impact and policy

Reference SDGs:

GOAL 9: Industry, Innovation and Infrastructure
GOAL 12: Responsible Consumption and Production
GOAL 17: Partnerships to Achieve the Goal

Description of Research Topic

Absolute sustainability assessment and prospective Life Cycle Assessment (LCA) represent two frontiers in LCA methodological development which, although still at the research stage, are attracting growing interest in the scientific community. Integrating these approaches offers the potential to evaluate the future environmental impacts of emerging technologies within the context of planetary boundaries.

To support our aims, we are searching for a PhD student as a new member for our recent project, FrameBio (Multiscale Frameworks for BioSolutions), funded by the European Union through the Horizon Europe, Marie Skłodowska-Curie Actions (MSCA) grant. FrameBio's goal is to revolutionize biotechnologies by fostering the advancement of sustainable bioproducts production technologies for food applications (such as Single Cell Proteins). More specifically, the objective is to quantify the resource dependencies and environmental impact of relevant emerging technologies of the sector across various scales: Microorganism Design and Engineering - Fermentation Design of Experiments coupled with High Throughput Screening - Commercial Production Scheme Simulations - Supply Chain Design - Planetary Resource Utilization and its Impact on Earth's Geophysical Synergies, to predict the broad sustainability impacts of BioSolutions.

This full-time PhD position is part of a Doctoral Network (DN) that will train 13 PhDs in genomics, metabolomics, fermentation and process optimization, data science, and sustainability assessments in a unique venture. Applying LCA within this project is essential, given the central importance of environmental sustainability in the development of innovative BioSolutions.



This position is an exciting opportunity to work on a seminal topic and to study cutting-edge technologies towards our vision of a sustainable bioeconomy, focusing on the development of advanced environmental assessment models. Your specific tasks will be:

- Analyzing and interpreting materials and energy flows data collected from the experimental and computational laboratories of the partners and from the scientific literature.
- Creating explorative scenarios expressing possible market penetration projections and technological development pathways of BioSolutions in the food industry.
- Conducting a scenario-based prospective LCA analysis aimed at assessing potential environmental impact and benefits of BioSolutions in the food sector once they will be commercialized on a planetary-scale.
- Performing an absolute sustainability analysis comparing to global environmental burdens of the analyzed BioSolutions with the planetary boundaries.
- Contributing to the methodological development of environmental impact assessment methodologies by improving the integrability between prospective LCA and Absolute Sustainability.

Research Team and Environment

The PhD student will be part of the COGITO (Consumption-Oriented Green Innovation Tools platform for Life Cycle Assessment) lab, an interdisciplinary research team within the Sustainability and Climate Interdisciplinary Center at Sant'Anna School of Advanced Studies in Pisa led by Prof. Monia Niero specialized in the methodological development LCA and its application across various research fields, including emerging technologies, to evaluate the environmental impacts of products and processes. The PhD student will be co-supervised by Dr. Federico Rossi

Scholarship Details

The DC Ph.D. student will receive a yearly gross salary:

- Living allowance of € 45.858,36 (including income tax and retirement pension contributions);
- Mobility allowance of € 8.520,00;
- Family allowance (If the DC Ph.D student has or acquires family obligations during the research programme) € 5.940,00.

Requirements

In order to fulfill the eligibility criteria of the Marie Curie MSCA Doctoral Networks at the date of recruitment, applicants must not have resided or carried out their main activity (work, studies, etc.) in Italy for more than 12 months in the 3 years immediately prior to their recruitment. Compulsory national service and/or short stays such as holidays are not taken into account. Italian candidates can apply if they have resided in another country for more than 2 years of the last 3 years. Furthermore, applicants must not already hold a doctoral degree.

Suggested Skills for this Research Topic

- University degree in engineering, environmental sciences, biology, chemistry, economics, management, or equivalent programs.
- At the time of hiring, no more than 12 months of residence in Italy or main activity (work, study, etc.) in the last three years immediately prior to the date of hiring.
- Basic knowledge of environmental science and engineering and market analyses. Familiarity with LCA methodology and software (e.g. SimaPro, openLCA, Brightway) will be an advantage.
- Basic knowledge of informatics, data management, and programming.



- Good written and spoken English as well as presentation skills.
- Interpersonal and organizational skills

Source of fundings

FrameBio - "Multiscale Frameworks for Biosolutions"

Project Number: 101227645

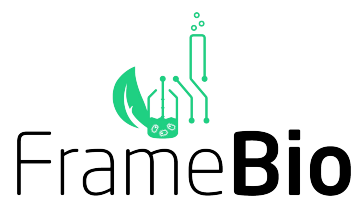
Call: HORIZON-MSCA-2024-DN-01

Type of Action: HORIZON-TMA-MSCA-DN

CUP: J53C25001610006

Period of Research Abroad

The DC Ph.D. student will undertake a secondment of six months at a beneficiary's or an associated partner's premises other than those of the beneficiary which has appointed the researcher under the project.



Curriculum: CU Gamma: Technology and Territory: sustainable strategies and solutions for the transition

Integrated Remote Sensing and Hydrological Modelling

Reference Person: Manfreda Salvatore (salvatore.manfreda@unina.it)

Host University/Institution: Università degli Studi di Napoli Federico II

Research Keywords:

Hydrological Modelling
Image based techniques
Remote Sensing
Citizen science
Water quality monitoring

Reference ERCs:

PE10_3 Climatology and climate change
PE10_17 Hydrology, hydrogeology, engineering and environmental geology, water and soil pollution
PE10_21 Earth system modelling and interactions

Reference SDGs:

GOAL 6: Clean Water and Sanitation
GOAL 9: Industry, Innovation and Infrastructure
GOAL 13: Climate Action

Description of Research Topic

The increasing variability of hydroclimatic conditions, water scarcity, and growing competition for water across sectors require advanced, scalable tools for monitoring water resources and supporting resilient, evidence-based decision-making. This PhD project aims to develop an integrated framework for monitoring and assessing rivers and inland waters. This framework will combine satellite remote sensing, camera-based systems, citizen science, in situ sensing, historical records and process-based hydrological modelling. It will support the assessment of water quantity and quality, as well as operational monitoring and water availability forecasting.

The project is based on the idea that combining multi-source Earth observation data with physically based models can help to overcome the current fragmentation of water monitoring data, reduce uncertainty in the assessment of river discharge and water quality, and improve our understanding of current and future water availability in the context of climate change. Copernicus Sentinel-2 and Sentinel-1 imagery, satellite altimetry (e.g. Sentinel-3 and SWOT), drone- and camera-based observations, and citizen science data will be combined to create consistent, higher-frequency information. This information will feed into process-based hydrological and water quality models, providing the evidence base and decision support indicators needed for cross-sectoral water management and nexus governance.



The research is organised around four components: (i) the harmonisation and integration of historical, in situ and catchment data into a coherent, multi-source database; (ii) the in situ and low-cost monitoring of river stage, discharge and water quality proxies via camera systems and citizen science observations; (iii) the satellite-based retrieval of hydrological and water quality variables, including water flux, suspended and floating material, turbidity and chlorophyll a, building on Copernicus Sentinel and related Earth observation products; and (iv) the integration of these variables into process-based hydrological and water quality modelling to reconstruct, forecast and assess scenarios for water quantity and quality. These components will converge to create a citizen-science-driven, multi-channel tool for large-scale water state assessment, designed to exploit the full potential of innovative monitoring systems.

Research Team and Environment

HydroLAB coordinated by Prof. Salvatore Manfreda is operating in the department DICEA of the University of Naples Federico II which is a leading institute in hydraulic construction and hydrological studies particularly devoted in the optimization of water management systems. HydroLAB is developing new innovative technologies for environmental monitoring using remote sensing and camera systems. The environment is a stimulating and challenging one with a strong and significant international dimension.

Suggested Skills for this Research Topic

Strong background in hydrology or water resources; experience with hydrological/hydraulic modelling;
Knowledge of climate change impacts on the hydrological cycle;
Familiarity with calibration and uncertainty analysis;
Understanding of stochastic methods for extremes;
Proficiency in Python, R or MATLAB;
Experience with GIS and remote sensing data;
Ability to work with alternative data sources (e.g., reanalysis, citizen science);
Good communication skills in English;
Capacity for independent research and interdisciplinary collaboration.

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.



Curriculum: CU Gamma: Technology and Territory: sustainable strategies and solutions for the transition

Sustainable weed control and microbial biostimulants to enhance crop resilience to climate stress

Reference Person: Elisa Pellegrino

Host University/Institution: Scuola Superiore di Studi Universitari e Perfezionamento Sant'Anna

Research Keywords

Climate-smart weed management
Weed/soil biodiversity and crop resilience
Microbial biostimulants

Reference ERCs:

LS8_12 Microbial ecology and evolution
LS2_6 Metagenomics
PE10_9 Biogeochemistry, biogeochemical cycles, environmental chemistry

Reference SDGs:

GOAL 12: Responsible Consumption and Production
GOAL 13: Climate Action
GOAL 15: Life on Land

Description of Research Topic

This research investigates integrated climate-smart strategies for sustainable weed management and crop adaptation across contrasting climatic regions. The central hypothesis is that electric weeding and mulching can reduce dependence on herbicides while maintaining effective weed control and improving soil health and agroecosystem resilience. Multi-site field trials will compare electric weeding, conventional chemical control, untreated plots or mulching systems in crop rotations under diverse temperature, rainfall and drought conditions.

The study will assess weed density, biomass and community composition, crop growth and yield, and tolerance to climate-related stress using physiological and molecular traits. It will also quantify impacts on soil microbial biodiversity, aggregate stability and organic matter. In parallel, beneficial microorganisms will be isolated from soils and plant-associated habitats in different climatic areas, screened for plant growth-promoting and stress-mitigating traits, and tested as microbial biostimulants, alone or in combination with the most effective weed-management practices.

By integrating agronomy, soil ecology, microbiology and climate adaptation, the project will develop evidence-based solutions to reduce chemical inputs, protect soil biodiversity and enhance the resilience and sustainability of cropping systems under climate change.



Research Team and Environment

The student will work with the main supervisor, Dr Elisa Pellegrino, and will have the opportunity to collaborate with other researchers at the Institute of Crop Science of the Scuola Superiore Sant'Anna, including Prof. Laura Ercoli, [i-](#)as well as with partner farms involved in field trials. The project will also benefit from an international network involving Prof. Marcelo Moretti at Oregon State University, Dr Christian Thierfelder at CIMMYT in Harare, Zimbabwe, Dr Bouba Traoré at International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in Bakomo, Mali, Dr Helena Gómez-Macpherson at CSIC in Córdoba, Spain, and Prof. Gernot Bodner at BOKU University in Vienna, Austria.

Suggested Skills for this Research Topic

The candidate should have skills in field experimentation, weed and vegetation surveys, plant identification, soil and plant sampling, and statistical analysis of ecological and agronomic data. Experience with R, GIS, biodiversity indices, multivariate analyses, systematic reviews, meta-analysis, software development using Python or other programming languages, and scientific writing for peer-reviewed publications is desirable. Laboratory skills in microbiology, including the isolation and screening of beneficial microorganisms, will be required or developed during the PhD. English is required; Italian is useful for fieldwork.

Source of fundings

Fondi del proponente fondo di progetto di ricerca Regolamento (UE) n. 2021/2115, art. 77 – Complemento per lo Sviluppo Rurale (CSR) 2023/2027 della Regione Toscana – Decreto Dirigenziale n. 20831 del 29 settembre 2025 – Intervento SRG01 – Annualità 2024, CUP ARTEA 1274819 – CUP CIPE J53C25003410002 e fondi propri

Period of Research Abroad

This scholarship requires a mandatory six-month research period abroad.

