Index

Analysis of Social and Economic Processes - ASEP 118R	
Progetto di ricerca **Research project**	**ITA:** "Oltre l'insegnare a scrivere e a far di conto: approcci di indagine innovativi per analizzare quantitativamente la condizione dei docenti italiani" **ENG:** "Beyond Teaching Literacy and Numeracy: Innovative Investigative Approaches to Quantitatively Analyse the Condition of Italian Teachers"
Tipo/Type	Borse finanziate da enti esterni / Scholarships funded by external organizations
Azienda o ente finanziatore / Funding Body	**Bolton for Education Foundation**
Borse/Scholarships	1
Abstract	**ITA**: Il candidato/la candidata è chiamato/a a sviluppare un progetto di ricerca che contribuisca a indagare, con metodi di indagine quantitativa, la popolazione degli insegnanti italiani, portando a significativi passi avanti nell'analisi di questo rilevante gruppo occupazionale. In particolare, si ritiene cruciale sviluppare studi quantitativi innovativi che indaghino da una prospettiva sociologica gli insegnanti italiani dei diversi gradi scolastici in uno o più tra i seguenti modi: i. analizzando longitudinalmente le loro opinioni e condizioni di impiego; ii. integrando più fonti informative, così da porre in relazione contesti scolastici, profili studenteschi e vissuti degli insegnanti stessi; iii. sfruttando le opportunità di dati esistenti a livello internazionale su questa componente del sistema educativo; iv. valutando con metodi controfattuali l'impatto di interventi o politiche che agiscono sul sistema scolastico. **ENG:** The selected candidate is expected to develop a research project that contributes to investigating the population of Italian teachers using quantitative research methods, making significant progress in the analysis of this important occupational group. In particular, it is considered crucial to develop innovative quantitative studies that explore, from a sociological perspective, Italian teachers across different school levels in one or more of the following ways: i. Longitudinally analysing their opinions and employment conditions; ii. Integrating multiple sources of information, in order to connect school contexts, student profiles, and the lived experiences of the teachers themselves; iii. Taking advantage of existing international data on this component of the education system; iv. Evaluating, through counterfactual methods, the impact of interventions or policies affecting the school system
Tutor	Tutor UNIMIB: Prof. Gianluca Argentin Supervisor aziendale: da definire
Abroad period	Da definire/to be defined
Specific rules	*No specific rules*

Business for Society 111R	
Progetto di ricerca **Research project**	**ITA:** "Citizen Science per il management: un nuovo paradigma partecipativo nella ricerca sociale" **ENG:** "Citizen Science for Management: A New Participatory Paradigm in Social Research"
Tipo/Type	Borse finanziate dal Dipartimento / Scholarships funded by the Department
Borse/Scholarships	1
Abstract	**ITA**: Negli ultimi anni, la Citizen Science (CS) si è affermata come una pratica innovativa di produzione collaborativa della conoscenza, ma il suo potenziale nelle scienze sociali e in particolare nel management resta ancora in larga parte da esplorare. Questo progetto di ricerca di dottorato si propone di indagare in che modo la citizen science possa essere integrata nei processi di ricerca e innovazione manageriale, contribuendo a ridefinire il ruolo della conoscenza nella gestione delle organizzazioni contemporanee. L'obiettivo principale è analizzare e sperimentare modelli di citizen science applicabili a quattro ambiti chiave del management: trasformazione digitale, imprenditorialità, lavoro ibrido e sport management. Il progetto partirà da una mappatura e analisi delle best practice già attive nelle scienze sociali e umane (SSH), per poi passare alla co-progettazione di casi studio in cui cittadini, lavoratori, imprenditori e altri stakeholder diventino attori attivi nel processo di ricerca. Il percorso si articolerà in quattro fasi: (1) review della letteratura e mappatura delle pratiche esistenti, (2) analisi qualitativa delle condizioni organizzative e tecnologiche che ne favoriscono l'adozione, (3) sperimentazione sul campo attraverso progetti pilota, (4) valutazione degli impatti generati e definizione di raccomandazioni operative. Questo progetto si inserisce in un'iniziativa più ampia di sviluppo di una infrastruttura di ricerca sulla citizen science, contribuendo a estendere questo approccio anche alla comunità accademica e professionale del management. L'obiettivo è duplice: da un lato, generare conoscenza teorica e metodologica sul potenziale della citizen science nel management; dall'altro, proporre modelli operativi scalabili e replicabili per una ricerca più aperta, inclusiva e socialmente rilevante. **ENG:** In recent years, Citizen Science (CS) has established itself as an innovative practice for the collaborative production of knowledge. However, its potential within the social sciences—and particularly in the field of management—remains largely unexplored. This PhD research project aims to investigate how citizen science can be integrated into managerial research and innovation processes, contributing to a redefinition of the role of knowledge in the management of contemporary organizations.The main objective is to analyze and experiment with citizen science models applicable to four key areas of management: digital transformation, entrepreneurship, hybrid work, and sport management. The project will begin with a mapping and analysis of best practices already adopted in the social sciences and humanities (SSH), followed by the co-design of case studies in which citizens, workers, entrepreneurs, and other stakeholders become active participants in the research process.The research will be structured into four phases: (1) literature review and mapping of existing practices, (2) qualitative analysis of the organizational and technological conditions that facilitate their adoption, (3) field experimentation through pilot projects, (4) impact assessment and development of operational recommendations. This project is part of a broader initiative to develop a research infrastructure on citizen science, helping to extend this approach to the academic and professional management communities. The goal is twofold: on one hand, to generate theoretical and methodological knowledge on the potential of citizen science in

	management; on the other, to propose scalable and replicable operational models for more open, inclusive, and socially relevant research.
Tutor	Da definire/to be defined
Abroad period	Da definire/to be defined
Specific rules	*No specific rules*

Fisica e Astronomia Physics and Astronomy 113R	
Progetto di ricerca **Research project**	**ITA:** "Caratterizzazione e modellistica di dispositivi a semiconduttore orientati alla progettazione di circuiti integrati ad alta frequenza" **(PROG.1**) **ENG:** "Characterization and modeling of semiconductor devices oriented to the design of high frequency integrated circuits" **(PROG.1**)
Tipo/Type	Borse finanziate da enti esterni / Scholarships funded by external organizations
Azienda o ente finanziatore / **Funding Body**	**Huawei Technologies Italia Srl**
Borse/Scholarships	1
Abstract	**ITA**: Lo sviluppo di circuiti ad alta frequenza per applicazioni spazio e sistemi di comunicazione prossima generazione, richiede la capacità estremamente sofisticata di caratterizzazione e modellizzazione sia di dispositivi elementari che di dispositivi complessi da poter utilizzare in fase di progetto di circuiti integrati. Nell'ambito delle attività del joint-lab MUSA, l'attività di ricerca del dottorando sarà incentrata principalmente sullo sviluppo di tecniche innovative di caratterizzazione e modellazione di dispositivi a semiconduttore (e.g., transistor in GaAs and GaN) operanti ad alta frequenza. I dispositivi realizzati con questi materiali soffrono dei cosiddetti effetti dispersivi, dovuti a fenomeni termici e di intrappolamento, che causano un inevitabile degrado delle prestazioni quando vengono utilizzati nelle reali condizioni operative (i.e., alta potenza e ad alta frequenza). Per questo motivo la caratterizzazione accurata in condizioni operative lineari e non lineari è cruciale per lo sviluppo di modelli accurati da usare nell'analisi e progetto di circuiti integrati monolitici (MMIC). Attraverso l'utilizzo dei più avanzati sistemi CAD di simulazione circuitale elettronica si vuole sviluppare un tecnica di estrazione di modelli da utilizzare nella progettazione di circuiti ad alta frequenza. Questa attività coinvolgerà diversi ambiti applicativi con particolare enfasi ai singoli transistor e ai circuiti analogici a microonde. Il lavoro di ricerca includerà sia attività di misure in laboratorio che attività di analisi e simulazione al CAD. **ENG:** The development of high-frequency circuits for space applications and next-generation communication systems requires highly sophisticated characterization and modeling capabilities for both basic and complex devices, which are essential for circuit design. As part of the MUSA joint-lab activities, the PhD student's research activity will mainly focus on the development of innovative characterization and modeling techniques for semiconductor devices (e.g., GaAs and GaN transistors) operating at high frequencies. Devices fabricated with these materials are affected by the so-called dispersive phenomena, due to traps and thermal effects, leading to inevitable performance degradation under actual operating conditions (i.e., high power and high frequency). Therefore, accurate characterization under both linear and nonlinear operating conditions is crucial for developing accurate models oriented to the analysis and design of monolithic microwave integrated circuits (MMICs). Through the utilization of advanced electronic circuit CAD, the aim is to develop a nonlinear model extraction technique for high-frequency circuit design. This activity will involve various application areas with a particular emphasis on transistors and microwave and millimeter-wave circuits. The research work will encompass both laboratory measurement activities and analysis and simulation activities using CAD tools.

Tutor	Da definire/to be defined
Abroad period	Da definire/to be defined
Specific rules	*Intellectual property clauses agreed with the Company apply to this scholarship*

Fisica e Astronomia Physics and Astronomy 113R	
Progetto di ricerca **Research project**	**ITA:** "Astrofisica delle Alte Energie, Strutture Cosmiche e Tecnologie Osservative" **(PROG.2**) **ENG:** "High-Energy Astrophysics, Cosmic Structures and Observational Technologies" **(PROG.2**)
Tipo/Type	Borse finanziate da enti esterni / Scholarships funded by external organizations
Azienda o ente finanziatore / Funding Body	**Istituto di Astrofisica Spaziale e Fisica Cosmica Milano (INAF IASF - Milano)**
Borse/Scholarships	1
Abstract	**ITA**: Il programma di ricerca del Dottorato verterà su una delle attività svolte all'Istituto di Astrofisica Spaziale e Fisica cosmica (IASF) di Milano, che includono l'astrofisica degli oggetti compatti con particolare interesse per l'emissione alle alte e altissime energie, la formazione ed evoluzione delle galassie lontane, gli AGN, la cosmologia osservativa, l'astrofisica e cosmologia con ammassi di galassie, lo sviluppo e applicazione di metodi di intelligenza artificiale in ambito di ricerche astronomiche, lo sviluppo di nuovi strumenti per osservazioni astronomiche. **ENG:** The PhD research program will focus on one of the activities carried out at the Istituto di Astrofisica Spaziale e Fisica cosmica (IASF) in Milan, which include the astrophysics of compact objects with a particular focus on highand very-high-energy phenomena, the formation and evolution of distant galaxies, AGNs, observational cosmology, astrophysics and cosmology with galaxy clusters, the development and application of artificial intelligence methods in astronomical research, and the development of new instruments for astronomical observations.
Tutor	Da definire/to be defined
Abroad period	Da definire/to be defined
Specific rules	*No specific rules*

Fisica e Astronomia Physics and Astronomy 113R	
Progetto di ricerca **Research project**	**ITA:** "Modelling girocinetico del bordo del plasma all'interno della separatrice di H-mode con seeding e plasmi con triangolarità negativa, per ottimizzare gli scenari di DTT." **(PROG.3**) **ENG:** "Gyrokinetic modelling of the plasma edge inside the separatrix of seeded H-modes and negative triangularity plasmas, for optimization of DTT scenarios" **(PROG.3**)
Tipo/Type	Borse finanziate da enti esterni / Scholarships funded by external organizations
Funding Body	**Eni S.p.A.**
Borse/Scholarships	1
Abstract	**ITA**: La fisica del bordo del plasma, ovvero della regione appena dentro alla separatrice, è considerevolmente meno compresa rispetto a quella dell'interno del core, nonostante essa determini sostanzialmente la performance del plasma. Infatti, il trasporto all'edge determina le propriatà del pedestal in H-mode, o i profili dell'edge degli L-mode e di altri scenari come quelli a triangolarità negativa. Questa regione di bordo è una condizione al contorno per la parte interna del core, influenzando sostanzialmente la pressione centrale. Non sono ancora disponibili modelli semplificati aIidabili per predire i profili nel bordo del plasma, e sono necessarie simulazioni girocinetiche. Questo progetto di dottorato si inserisce all'interno del lavoro di modelling per DTT, e verrà svolto all'ISTP-CNR di Milano, collaborando con istituzioni nazionali ed internazionali. Inizialmente si focalizzerà su Hmode con seeding, di interesse per lo scenario baseline di DTT con seeding di impurezze, considerando anche scariche di JET per avere un confronto con l'esperimento. Successivamente, verranno studiati plasmi a triangolarità negativa, anche considerando casi di TCV e ASDEX Upgrade, per predire le proprietà degli scenari di DTT con triangolarità negativa. L'analisi farà un uso estensivo di HPC e sarà connessa al lavoro di modelling dell'interno del core e dello scrape-oI layer, fatto da altri gruppi DTT. **ENG:** The physics of the plasma edge, i.e. the region just inside the magnetic separatrix, is far less understood compared with that of the inner core, although it heavily impacts the plasma performance. In fact, the edge transport sets the pedestal properties in H-mode, or the edge profiles of L-modes and other scenarios such those with negative triangularity. This edge region is a boundary condition for the inner core, substantially aIecting the central pressure. Reliable simplified models able to predict the plasma edge profiles are not yet available, and gyrokinetic simulations are needed. This PhD work will contribute to this modelling eIort for DTT and will be carried out at ISTP-CNR in Milan, collaborating with national and international institutions. Initially, it will focus on seeded H-modes, of interest for the baseline impurity-seeded DTT scenario, also considering JET pulses to compare with the experiment. Afterwords, negative triangularity plasmas will be studied, also considering TCV and ASDEX Upgrade cases, to predict the properties of DTT negative triangularity scenarios. The analysis will extensively make use of HPC and will be connected to the modelling of inner core and scrape-oI layer, done by other DTT groups.
Tutor	Da definire/to be defined
Abroad period	Da definire/to be defined
Specific rules	*Intellectual property clauses agreed with the Company apply to this scholarship*

Informatica Computer Science 114R	
Progetto di ricerca **Research project**	**ITA:** “Intelligenza Artificiale e Società” **(PROG.1**) **ENG:** “Artificial Intelligence and Society” **(PROG.1**)
Tipo/Type	Borse finanziate dal Dipartimento / Scholarships funded by the Department
Borse/Scholarships	3
Abstract	**ITA**: Il progetto deve prevedere lo sviluppo di ricerche in uno dei seguenti ambiti: "Intelligenza artificiale responsabile, affidabile, sicura e interpretabile”, "Intelligenza Artificiale per il miglioramento del benessere sociale e individuale”, "Applicazioni dell’Intelligenza artificiale alla ricerca biomedica e alla salute”, “Intelligenza Artificiale sostenibile” **ENG:** The research project must be developed within the scope of one of the following areas: "Responsible, dependable, secure and interpretable AI”, "Artificial Intelligence for the improvement of the individual and social well-being”. "AI Applications for Healthcare and Biomed Research”, “Sustainable Artificial Intelligence"
Tutor	Da definire/to be defined
Abroad period	Da definire/to be defined
Specific rules	*No specific rules*

Informatica Computer Science 114R	
Progetto di ricerca **Research project**	**ITA:** "Test di integrazione e continuous testing di applicativi embedded e testing di di trans-compilatori" **(PROG.2**) **ENG:** "Integration testing and continuous testing of embedded software and testing of transpilers" **(PROG.2**)
Tipo/Type	Borse finanziate dal Dipartimento / Scholarships funded by the Department
Borse/Scholarships	3
Abstract	**ITA**: Il progetto ha come obiettivo l'integrazione e successiva verifica e validazione di software embedded, come per esempio applicativi ferroviari model based. Tali applicativi sono ottenuti mediante generazione automatica di codice a partire da modelli definiti mediante suite di sviluppo model based (ad esempio, la toolchain ANSYS SCADE). In particolare, le attività del progetto considereranno come casi concreti due applicativi di RFI, ovvero gli applicativi European Vital Computer (EVC) e Traduttore LNC-SysML-C, con il fine di migliorare le attività di test di integrazione di software embedded, di abilitare attività di continuous development and continuous integration in ambiente target, e di migliorare le attività convalida di trans-compilatori per tradurre linguaggio naturale controllato in codice C. **ENG:** The project aims to integrate and perform verification and validation of embedded applications, such as, model-based railway applications. These applications are generated through automatic code generation from models developed using model-based development suites (e.g., the ANSYS SCADE toolchain). Specifically, the project activities will consider real case studies based on two applications provided from RFI: the European Vital Computer (EVC) and the LNC-SysML-C Translator. The goal is to improve the integration testing of embedded software, enable continuous development and continuous integration activities of embedded software on-target, and enhance the validation of transpilers used to translate controlled natural language into C code.
Tutor	Da definire/to be defined
Abroad period	Da definire/to be defined
Specific rules	*No specific rules*

Informatica Computer Science 114R	
Progetto di ricerca **Research project**	**ENG:** "Exploring and Implementing the Integration of Autonomous AI Agents for Enhanced Customer Service in Sports Technology" **PROG.3**
Tipo/Type	Contratti di apprendistato di alta formazione / High-level apprenticeship contracts
Azienda o ente finanziatore / Funding Body	**Soccerment s.r.l.**
Borse/Scholarships	1
Abstract	**ENG:** This research project aims to study and integrate an intelligent autonomous agent-based model designed to enhance customer service through real-time interaction, leveraging artificial intelligence (AI) and data analytics. Focused on the sports technology sector, specifically in collaboration with Soccerment, the project will investigate the integration of advanced AI techniques to create a self-learning, adaptive agent capable of autonomously handling customer inquiries and providing personalized support. The project will be executed over a span of 36 months and will be divided into three main phases: ● Design and Development of an Autonomous AI Agent (Months 1-12): The first year will focus on the conceptualization and development of the intelligent Agent-Based model, utilizing AI techniques such as natural language processing (NLP), LLM Techniques (Agentinc AI), and reinforcement learning to enable the agent to understand and respond to customer queries. The agent will be designed to simulate human-like interactions, ensuring it can adapt to a variety of customer service scenarios in real-time. ● Integration of Data Analytics and Predictive Models (Months 13-24): The second phase will focus on enhancing the AI agent's capabilities by incorporating predictive analytics and data-driven insights. By leveraging Soccerment's extensive datasets, the agent will be trained to predict customer needs and behaviors, providing more efficient and proactive support. Using LLM techniques (Agentinc AI) will be employed to continuously improve the agent's decision-making processes, enabling it to personalize its responses and optimize interactions based on previous customer data. ● Evaluation, Testing, and Optimization (Months 25-36): In the final year, the developed system will be rigorously tested and optimized in real-world environments. The agent will undergo performance evaluations in Soccerment's operational context, assessing its effectiveness in reducing response times, improving customer satisfaction, and handling a wide range of inquiries autonomously. Optimizations will be made to improve the agent's scalability, robustness, and adaptability to various customer service scenarios across different platforms. This research will contribute to the advancement of autonomous systems in customer service, combining state-of-the-art AI techniques with real-world data analytics. The goal is to not only create an intelligent agent capable of providing effective, real-time customer

	support but also to lay the groundwork for future applications of autonomous agents in the broader field of customer service.
Tutor	Prof. Stefania Bandini
Abroad period	Da definire/to be defined
Specific rules	Inquadramento professionale di partenza/ starting professional classification: 2° livello del vigente CCNL Metalmeccanica PMI Inquadramento professionale d'arrivo/ target occupational classification: 5° livello del vigente CCNL Metalmeccanica PMI Numero ore settimanali/ number of hours per week: 40 Retribuzione lorda annuale/ gross annual salary: 27000€ Retribuzione netta mensile/ net monthly salary: 1750€

Medicina Traslazionale e Molecolare – DIMET Translational and Molecular Medicine – DIMET 121R	
Progetto di ricerca **Research project**	**ITA:** "Funzionalizzazione sintesi di biomateriali per applicazioni biomediche" **(PROG.1**) **ENG:** "Functionalization and synthesis of biomaterials for biomedical applications" **(PROG.1**)
Tipo/Type	Borse finanziate dal Dipartimento / Scholarships funded by the Department
Azienda o ente finanziatore / Funding Body	2022-NAZ-0488/Dottorandi (U.A. Area del Personale - CUP: B53C22006670001) per un importo di 20.035,74 euro (responsabile Prof.Russo_DIMET) +2017-INTERNAZ-0042/PER (iNanoBIT-Personale) -codice CUP H45I17000380006 - per un importo di 44.954,38 euro (U.
Borse/Scholarships	1
Abstract	**ITA**: Il progetto sarà focalizzato sulla sintesi e formulazione di biomateriali e dispostivi medici per applicazioni di medicina personalizzata. In particolare, saranno sviluppati dispositivi medici e sistemi 3D printati/bioprinter per valutare o modulare specifici processi biologici. Questi biomateriali saranno utilizzati per la diagnosi, lo studio e la cura di stati patologici cronici e/o tumorali. Materiali organici, inorganici e ibridi basati su polimeri naturali o sintetici saranno opportunamente funzionalizzati utilizzando linker e molecole bioattive/bioresponsive utili per il riconoscimento molecolare e la modulazione del sistema biologico di riferimento. I materiali bioattivati saranno formulati attraverso le principali metodologie di additive manufacturing (stampa 3D, bioprinting 3D). Saranno inoltre ottimizzati mimetici tissutali 3D e organ-on-chip per la validazione biologica dei biomateriali ottenuti. **ENG:** The project will be focused on the generation of biomaterials for multifunctional applications in the biomedical field. In particular, medical devices and biosensors will be developed in order to detect, study or modulate specific biological processes. These biomaterials will be used for the diagnosis and drug testing of chronic pathological and/or tumoral states. Organic, inorganic and hybrid materials based on natural or synthetic polymers will be suitably functionalized using linkers and bioactive / bioresponsive molecules useful for biological recognition and cell fate modulation. The bioactivated materials will be formulated through the main production methodologies (3D printing, 3D bioprinting). 3D tissue mimetics and organ on-chip will be developed for the biological validation of the obtained biomaterials
Tutor	Tutor UNIMIB: Prof. Laura Russo
Abroad period	Da definire/to be defined
Specific rules	Da definire/to be defined

Medicina Traslazionale e Molecolare – DIMET Translational and Molecular Medicine – DIMET 121R	
Progetto di ricerca **Research project**	**ENG:** "Use of polysaccharides in the pharmaceutical, medical device, and cosmetic fields: newformulations and their characterization." **(PROG.2**)
Tipo/Type	Borse finanziate da enti esterni / Scholarships funded by external organizations
Azienda o ente finanziatore / **Funding Body**	**Istituto di Ricerche Chimiche e Biochimiche G. Ronzoni**
Borse/Scholarships	1
Abstract	**ENG:** The aim of the project will be the production of biomaterials functionalized withpolysaccharides. Polysaccharides are a heterogeneous class of biopolymers extractedbay plants, algae, animals and bacteria sources and a study of their properties, such asmolecular distribution, viscosity, size and surface charge, is essential to determine andpredict their biological functions or applications. Natural polysaccharides have a high degree of biodegradability, biocompatibility, bio-adhesive capacity and able to mimic the natural extracellular matrix (ECM)microenvironment. Furthermore, they present a low toxicity and are available on alarge scale in a relative low cost. Natural or chemically modified polysaccharides can beused in pharmaceuticals, medical devices and cosmetic fields, due to their interactionwith several proteins. In this contest the PhD project will be focused on the research and development of newclass of functionalised biomaterials
Tutor	Tutor UNIMIB: Prof. Laura Russo Supervisor aziendale: Dr. Sabrina Bertini
Abroad period	Da definire/to be defined
Specific rules	*no specif rules*

Medicina Traslazionale e Molecolare – DIMET Translational and Molecular Medicine – DIMET 121R	
Progetto di ricerca **Research project**	**ITA:** "Intelligenza artificiale in reumatologia pediatrica" **(PROG.3**) **ENG:** "Artificial intelligence in paediatric rheumatology" **(PROG.3**)
Tipo/Type	Borse finanziate da enti esterni / Scholarships funded by external organizations
Azienda o ente finanziatore / Funding Body	**Fondazione Paediatric Rheumatology International Trials Organisation (Fondazione PRINTO) ONLUS/ETS**
Borse/Scholarships	1
Abstract	**ITA**: Il progetto di ricerca si propone di esplorare l'applicazione dell'intelligenza artificiale (IA) nel campo della reumatologia pediatrica con particolare riferimento all'artrite idiopatica giovanile e alle altre patologie reumatiche infantili, con un focus sull'integrazione di strumenti avanzati per il miglioramento della diagnosi, monitoraggio e gestione clinico/terapeutico delle malattie reumatiche infantili. L'obiettivo del progetto è sviluppare competenze specialistiche nella reumatologia pediatrica, sfruttando contemporaneamente l'apprendimento e l'utilizzo di tecnologie IA per supportare l'identificazione precoce di patologie, personalizzare i trattamenti e ottimizzare i risultati terapeutici. Il dottorando avrà l'opportunità di apprendere l'uso di algoritmi di machine learning, tecniche di analisi predittiva e strumenti di elaborazione dei dati clinici per affrontare le sfide della reumatologia pediatrica, come la varietà dei sintomi e la difficoltà nel processo diagnostico e terapeutico. Il progetto non solo arricchirà le competenze cliniche del candidato, ma contribuirà anche all'avanzamento della medicina personalizzata per i pazienti pediatrici, aprendo nuove prospettive per l'uso dell'intelligenza artificiale nella gestione delle malattie reumatiche infantili. **ENG:** The PhD project aims to explore the application of artificial intelligence (AI) in the field of paediatric rheumatology, with a focus on integrating advanced tools to improve the diagnosis, monitoring, and management of pediatric rheumatic diseases. The goal of the project is to develop specialized skills in pediatric rheumatology, while simultaneously learning and utilizing AI technologies to support early disease identification, personalize treatments, and optimize therapeutic outcomes. The PhD candidate will have the opportunity to learn how to use machine learning algorithms, predictive analysis techniques, and clinical data processing tools to address the challenges of paediatric rheumatology, such as symptom variability and difficulties in the diagnostic and therapeutic processes. The project will not only enhance the candidate's clinical skills but also contribute to the advancement of personalized medicine for pediatric patients, opening new perspectives for the use of artificial intelligence in the management of paediatric rheumatic diseases.
Tutor	Tutor UNIMIB: Prof. Adriana Balduzzi Supervisor aziendale: Prof. Nicolino Ruperto
Abroad period	Da definire/to be defined
Specific rules	*no specif rules*

Medicina Traslazionale e Molecolare – DIMET Translational and Molecular Medicine – DIMET 121R	
Progetto di ricerca **Research project**	**ENG:** "LEVERAGING PLANT-BASED DIETS TO PREVENT SMOLDERING MULTIPLE MYELOMA EVOLUTION" **(PROG.4**)
Funding Body	**Università Vita-Salute San Raffaele** *(su finanziamento AIRC, Codice di riferimento del progetto: "IG 28770"- "Exploiting plant-based diets to prevent smoldering multiple myeloma evolution")*
Borse/Scholarships	1
Abstract	**ENG:** Smoldering multiple myeloma (SMM) is an asymptomatic, and in principle curable phase that often precedes full-blown MM, a treatable but incurable B cell neoplasm. Only active surveillance is recommended for most SMM patients. Because SMM has an overall risk of progression to MM at 10% per year, this strategy leaves SMM patients in anxiety and frustration. We want to address this unmet clinical need by investigating the effects of different diets on gut microbiota, immunity and SMM evolution. Diet has profound effects on our health and the gut microbiota contributes to metabolism and absorption of dietary nutrients. For example, short chain fatty acids (SCFAs) generated from the fermentation of plant fibers exert local and systemic anti-inflammatory activity by modulating the function of dendritic cells (DCs) and limiting the expansion of T helper (Th)17 lymphocytes in favor of regulatory T cells. SCFAs also boost the effector function of cytotoxic T cells, providing a strong rationale to combine high-fiber diets with immunotherapy. Conversely high fat diets associate with increased risk of MM and poor response to therapy. Diets also impact the composition of the gut microbiota, which might eventually impact MM. In transgenic Vk*MYC mice invariably progressing from asymptomatic mouse SMM (mSMM) to symptomatic MM (mMM)8 microbiota-induced Th17 cells migrate from the gut to the BM and favor the expansion of neoplastic plasma cells thus fueling evolution to mMM. Similarly, in SMM patients, higher levels of BM IL-17 may predict accelerated progression to full blown MM. Thus, a link exists between gut microbiota, IL-17, and MM. Our hypothesis is that diet-induced gut microbiota modulation provides SMM patients with beneficial or deleterious metabolites depending on the relative content of plant fibers or fat and sugar. Our goal is to deeply characterize the crosstalk between commensal bacteria and immune cells in Vk*MYC mice fed different diets. More in details, we aim to: Aim 1. demonstrate that high-fiber or high-fat diets switch the gut microbiota and connected immunity of mSMM mice towards anti- or pro-tumor immunity, respectively; Aim 2. identify the mechanisms by which the gut microbiota affect disease evolution in mice affected by mSMM ; Aim 3. design therapeutic strategies that combine dietary intervention with immunotherapy and other therapies to prevent MM progression. The impact of diet on innate and adaptive immunity will be thoroughly investigated by high dimensional flow cytometry, transcriptomics, and single-cell RNA-Seq. Immunological findings will be correlated with disease progression and gut microbiota composition as well as stool content of metabolites. Our findings will extend knowledge on mechanisms regulating interactions between the gut microbiota and the immune system under dietary intervention in SMM and will provide the framework for new therapies combining gut microbiota modulation with immunotherapy.
Tutor	Tutor HSR: Dr. Matteo Bellone
Abroad period	Da definire/to be defined
Specific rules	*Intellectual property clauses agreed with the Company apply to this scholarship*

Medicina Traslazionale e Molecolare – DIMET Translational and Molecular Medicine – DIMET 121R	
Progetto di ricerca **Research project**	**ENG:** "Impact of high-fiber diets on the gut microbiota-immunity axis in patients affected by smoldering multiple myeloma" **(PROG.5**)
Tipo/Type	Borse finanziate da enti esterni / Scholarships funded by external organizations
Funding Body	**Università Vita-Salute San Raffaele** *(su finanziamento AIRC, Codice di riferimento del progetto: "IG 28770"- "Exploiting plant-based diets to prevent smoldering multiple myeloma evolution")*
Abstract	**ENG:** Smoldering multiple myeloma (SMM) is an asymptomatic precursor of multiple myeloma (MM), an incurable B-cell malignancy characterized by clonal plasma cell accumulation in the bone marrow (BM) and end-organ damage. Treatment is currently offered only to high-risk SMM patients, while others remain under active surveillance. Given the 10% annual risk of progression to MM, this "watch-and-wait" strategy leaves many patients feeling anxious and searching for proactive ways to influence their disease course. Emerging evidence suggests that diet can influence cancer progression by shaping the gut microbiota. The intestinal microbiome contributes to metabolism, immune regulation, and systemic inflammation. Specifically, plant-based diets rich in fibers and complex carbohydrates—promote the growth of beneficial gut bacteria that produce short-chain fatty acids (SCFAs) with anti-inflammatory and immune-modulating properties. Epidemiological data link vegetarian and vegan diets to a lower MM risk and improved survival. Despite strong interest from patients—more than 80% of individuals with plasma cell disorders ask for dietary guidance—most oncologists lack specific recommendations, leaving patients without clear direction. This underscores an urgent need for research on the role of diet. Recent evidence highlights the crucial interplay between diet, gut microbiota, and immune regulation in MM. SCFA-producing commensals have been associated with reduced inflammation and improved immune response. Conversely, specific gut microbiota compositions have been linked to increased inflammatory signalling, potentially accelerating MM evolution. We hypothesize that plant-based diets, by enriching SCFA-producing bacteria, create a metabolic and immunological environment that supports gut health, reduces systemic inflammation, and ultimately delays SMM progression. We want to demonstrate that shifting patients affected by SMM to a high-fiber diet substantially modulates the gut microbiota-immunity axis against the tumor. More in details we aim to: Aim 1. Demonstrate that high-fiber diets shift the gut microbiota of SMM patients toward increased SCFA production. Aim 2. Define the effects of high-fiber diets on immune composition of peripheral blood mononuclear cells. Aim 3. Demonstrate that high-fiber diets reduce the pro-tumoral potential of gut microbiota. Our findings will extend the knowledge on mechanisms regulating interactions between the gut microbiota and the immune system under dietary intervention in patients affected by SMM and will provide the framework for new therapies combining gut microbiota modulation with standard therapies. Skill that the student should acquire: Expertise in microbiome analysis and sequencing techniques. Proficiency in flow cytometry and immune cell profiling. Bioinformatics skills for microbiota and metabolomics data analysis. Understanding of tumor immunology and immunotherapy strategies. Critical thinking for translational research and clinical applications.
Tutor	Tutor HSR: Dr. Matteo Bellone
Abroad period	Da definire/to be defined
Specific rules	*Intellectual property clauses agreed with the Company apply to this scholarship*

Psicologia, Linguistica e Neuroscienze Cognitive Psychology, Linguistics and Cognitive Neuroscience Psicologia Sociale, Cognitiva e Clinica Social, Cognitive, and Clinical Psychology 127R	
Progetto di ricerca **Research project**	**ITA:** "Educazione affettiva e sessuale integrata nella scuola secondaria: effetti su conoscenze, atteggiamenti e comportamenti legati alla salute sessuale e relazionale negli adolescenti" **ENG:** "Integrated Emotional and Sexual Education in Secondary Schools: Effects on Adolescents' Knowledge, Attitudes, and Behaviors Related to Sexual and Relational Health"
Tipo/Type	Borse finanziate da enti esterni / Scholarships funded by external organizations
Azienda o ente finanziatore / Funding Body	**Reckitt Benckiser Healthcare (Italia) S.p.A**
Borse/Scholarships	1
Abstract	**ITA**: Il progetto di ricerca mira a valutare l'efficacia del programma scolastico di educazione affettiva e sessuale "A luci accese" - promosso da Durex e condotto da psicologi esperti nelle scuole secondarie di Milano - nell'aumentare la consapevolezza e la conoscenza dei ragazzi in materia di prevenzione, relazioni e sessualità. Compito del Dottorando sarà anche lo sviluppo di una strategia di digitalizzazione per la scalabilità del progetto su tutta Italia, che rappresenta un importante passo avanti nel garantire equità nell'accesso a materiali educativi in tema di affettività e sessualità di qualità, con potenziali implicazioni per le politiche educative italiane. **ENG:** The research project aims to evaluate the effectiveness of the school-based emotional and sexual education program "A luci accese"—promoted by Durex and delivered by expert psychologists in secondary schools in Milan—in increasing students' awareness and knowledge regarding prevention, relationships, and sexuality. The PhD candidate will also be responsible for developing a digitalization strategy to scale the project nationwide, representing an important step forward in ensuring equitable access to high-quality educational materials on emotional and sexual health, with potential implications for Italian educational policies.
Tutor	Tutor UNIMIB: Prof. Antonio Prunas Supervisor aziendale: Dr. Virginia Tucci
Abroad period	Da definire/to be defined
Specific rules	*Intellectual property clauses agreed with the Company apply to this scholarship*

Public Health Epidemiology, Statistics and Economics 129R	
Progetto di ricerca Research project	**ENG:** "Therapeutic advances in autoimmune diseases of the liver and bile ducts" **(PROG.1**)
Tipo/Type	Borse finanziate da enti esterni / Scholarships funded by external organizations
Azienda o ente finanziatore / Funding Body	**PIAM Farmaceutici S.p.A.**
Borse/Scholarships	1
Abstract	**ENG:** Autoimmune liver and biliary diseases, including autoimmune hepatitis, primary biliary cholangitis, and primary sclerosing cholangitis, remain challenging due to limited therapeutic options and the lack of precise biomarkers for diagnosis and prognosis. This research aims to explore novel pharmacological approaches, through intervententional and observational clinical trials. Additionally, the use of artificial intelligence techniques, such as machine learning and deep learning, will be employed to identify predictive biomarkers and optimize patient stratification. AI-driven analysis of multi-omics data and real-world evidence will facilitate precision medicine strategies, improving treatment efficacy and patient outcomes.
Tutor	Tutor UNIMIB: Prof. Marco Carbone Supervisor aziendale: Dr. Gabriele Nicolini
Abroad period	Da definire/to be defined
Specific rules	*No specific rules*

Public Health Epidemiology, Statistics and Economics 129R	
Progetto di ricerca **Research project**	**ITA:** "Un modello "patient-centered" di monitoraggio post-dimissione ospedaliera per soggetti con complessità cliniche e socio-assistenziali: il codice viola" **(PROG.2**) **ENG:** "A "patient-centred" model of post-discharge monitoring for individuals with clinical and social care complexity: the purple code." **(PROG.2**)
Tipo/Type	Borse finanziate dal Dipartimento / Scholarships funded by the Department
Borse/Scholarships	1
Abstract	**ITA**: Negli ultimi decenni, i progressi della medicina hanno determinato un significativo allungamento dell'aspettativa di vita. Tuttavia il progressivo invecchiamento della popolazione ha spostato il focus della cura dei pazienti dall'ambito acuto a quello cronico: sono infatti i soggetti anziani, fragili e pluripatologici ad assorbire la maggior parte delle risorse sanitarie, soprattutto a causa di frequenti ricoveri ospedalieri durante le riacutizzazioni delle condizioni croniche di cui soffrono. Ogni ospedalizzazione comporta per loro una perdita progressiva dello stato funzionale, con un conseguente aumento della fragilità e della complessità clinica, incidendo negativamente sulla qualità della vita. Alla dimissione dall'Ospedale, spesso si riscontrano difficoltà nel reinserimento del paziente nel proprio contesto familiare, anche per la mancanza di un adeguato inquadramento all'interno delle reti di dimissione protetta. Questa fase di ponte tra ospedale e domicilio rappresenta un momento particolarmente delicato, che può determinare una perdita dell'equilibrio clinico-assistenziale e condurre i pazienti a una nuova precoce ospedalizzazione, con importanti ripercussioni in termini di complessità e fragilità. Il progetto prevede l'identificazione precoce di questi pazienti, anche attraverso strumenti di valutazione multidimensionale in grado di determinare indici sintetici di fragilità e prognosi, dal momento dell'accesso in Pronto Soccorso, con l'assegnazione di un codice preferenziale di fragilità, il cosiddetto "codice viola", già in fase di triage. Inoltre, il progetto contempla la costruzione di un percorso assistenziale professionale integrato alla dimissione ospedaliera, sviluppato attraverso le Centrali Operative Territoriali, recentemente introdotte dalla normativa sulla riorganizzazione sanitaria territoriale (DM 77/2022), e costruito a partire dalla complessità clinica del paziente, adattandolo alle nuove complessità socio-assistenziali emerse. Ciò si avvale di un follow-up specialistico, in presenza o in telemedicina, con almeno 2 visite a distanza di 7-10 e 20-30 giorni dalla dimissione ospedaliera, durante le quali effettuare anche un passaggio di consegna al Medico di Medicina Generale; inoltre di un'assistenza socio-sanitaria a frequenza almeno bi-trisettimanale da parte di personale infermieristico, in collaborazione con i già esistenti servizi di dimissioni protette territoriali, che supporti il paziente e i caregiver nella cura personale, nella somministrazione della terapia e nell'identificazione di campanelli d'allarme clinici, nell'ottica di prevenire riacutizzazioni delle patologie croniche ed eventualmente impostare un trattamento precoce per evitare ulteriori ospedalizzazioni **ENG:** In recent decades, advances in medicine have led to a significant increase in life expectancy. However, the progressive ageing of the population has shifted the focus of patient care from acute to chronic conditions. It is, in fact, the elderly, frail, and multimorbid individuals who absorb the majority of healthcare resources, primarily due to continuous hospital admissions during exacerbations of their chronic conditions. Each hospitalisation leads to a progressive loss of functional status, increasing frailty and clinical complexity and negatively impacting quality of life. Upon discharge, these patients often experience difficulties reintegrating into their family environment, and there is often no precise framework within the protected discharge networks. This transition period between hospital and home is delicate and can lead to a loss of clinical and care balance, resulting in early

	rehospitalisation with significant consequences in terms of complexity and frailty. The project involves identifying these patients from the moment they arrive at the emergency department, using multidimensional assessment tools capable of determining synthetic indices of frailty and prognosis. A preferential frailty code, the 'purple code', is assigned during triage. The project also includes the creation of an integrated professional care pathway upon discharge from the hospital. This pathway is developed through the Territorial Operations Centres, recently introduced by the territorial healthcare organisation regulations (DM 77/2022). The pathway is tailored on the patient's clinical complexity and adapted to the new socio-care complexities that have emerged. This involves specialist follow-up, either in person or via telemedicine, with at least two visits, one 7–10 days after discharge and another 20–30 days after discharge. During these visits, the handover to the general practitioner is also carried out. Social and healthcare assistance is provided by nursing staff at least twice a week, in collaboration with existing local protected discharge services. This support aims to assist patients and caregivers with personal care, medication administration, and the identification of clinical warning signs. The goal is to prevent exacerbations of chronic conditions and, when necessary, to arrange early treatment in order to avoid further admissions.
Tutor	Tutor UNIMIB: Prof. Raffaella Dell'Oro
Abroad period	Da definire/to be defined
Specific rules	*No specific rules*

Public Health Epidemiology, Statistics and Economics 129R	
Progetto di ricerca **Research project**	**ITA:** "Valutazione Multidimensionale Geriatrica nei pazienti anziani fragili con malattie neoplastiche" **(PROG.3**) **ENG:** "Comprehensive Geriatric Assessment in Frail Older Adults with Cancer." **(PROG.3**)
Tipo/Type	Borse finanziate dal Dipartimento / Scholarships funded by the Department
Abstract	**ITA**: Con il progressivo invecchiamento della popolazione si osserva un aumento della prevalenza di neoplasie nelle persone anziane. Sebbene i recenti progressi delle terapie oncologiche abbiano migliorato la sopravvivenza in tutte le fasce d'età, nel paziente anziano la presenza di fragilità e multimorbidità possono condizionare significativamente il decorso di malattia, accelerando il declino funzionale e peggiorando gli esiti clinici. Un numero crescente di evidenze sottolinea l'importanza della Valutazione Multidimensionale Geriatrica (VMG) per orientare il percorso assistenziale dell'anziano con malattia oncologica. Cogliendo l'eterogeneità biologica dell'età anziana, infatti, la VMG si è dimostrata capace di predire, per molte condizioni morbose, il rischio di mortalità e di eventi avversi meglio dell'età cronologica e delle comorbilità. I risultati di questo progetto permetteranno di approfondire l'impatto prognostico della fragilità nel paziente anziano multimorbido con malattia oncologica. Lo studio renderà inoltre possibile valutare quanto gli esiti clinici siano influenzati non tanto dalla progressione della malattia neoplastica in sé, quanto dalle condizioni di vulnerabilità clinica e biologica in cui versano molti anziani. Una quota crescente di pazienti in età avanzata, infatti, va incontro a esiti sfavorevoli non tanto per l'aggressività della neoplasia, quanto per la fragilità estrema e la disabilità, che riducono la tolleranza ai trattamenti e la capacità di recupero. Comprendere questi aspetti è fondamentale per orientare le decisioni cliniche, con l'obiettivo di migliorare la qualità delle cure e personalizzare gli interventi terapeutici. **ENG:** The progressive aging of the population is associated with a growing prevalence of cancer among individuals aged 65 and older. Although advances in oncological therapies have improved survival across all age groups, in older patients, frailty and multimorbidity can significantly influence disease progression, accelerating functional decline and worsening clinical outcomes. Growing evidence highlights the importance of the Comprehensive Geriatric Assessment (CGA) as a foundational step in the management pathway of older adults with cancer. By capturing the biological heterogeneity of the older population, CGA can help predict the risk of mortality and other adverse outcomes, such as functional decline and hospital readmissions, in older adults with tumor. The findings of this project will provide deeper insight into the prognostic impact of frailty in older, multimorbid patients with oncological disease. Furthermore, the study will allow for an evaluation of the extent to which clinical outcomes are driven not so much by cancer progression itself, but by the underlying clinical and biological vulnerability that characterizes many older individuals. An increasing proportion of older patients, in fact, experience poor outcomes not due to cancer aggressiveness, but as a consequence of extreme frailty and functional impairment, which reduce both treatment tolerance and recovery capacity. Recognizing and addressing these aspects is key for informing clinical decisions, with the ultimate goal of improving care quality and promoting personalized therapeutic approaches.
Tutor	Tutor UNIMIB: Prof. Giuseppe Bellelli
Abroad period	Da definire/to be defined

Risorse per La Nuova P.A.: Persone e Dati The New Public Administration: Data and Human Resources Selezione, gestione e valorizzazione del capitale umano nelle PP.AA Selection, Management, and Enhancement of Human Capital in Public Administrations 109R	
Progetto di ricerca **Research project**	**ITA:** "La disciplina giuridica del dottorato di ricerca in Italia" **(PROG.1**) **ENG:** "The Legal Framework of Doctoral Studies in Italy" **(PROG.1**)
Tipo/Type	Borse di Ateneo / University Scholarships
Borse/Scholarships	1
Abstract	**ITA**: La riforma del dottorato di ricerca era un obiettivo del Piano Nazionale di Ripresa e Resilienza. Il PNRR si è proposto in particolare di rafforzare la costruzione di percorsi dottorali non finalizzati alla carriera accademica e di intensificare la collaborazione tra università e imprese. La riforma è stata introdotta con il d.m. 14 dicembre 2021 n. 226 e accompagnata da cospicui investimenti. La ricerca dovrà indagare, anche avvalendosi della comparazione con la disciplina di altri paesi, quali siano dal punto di vista giuridico i principali problemi ancora aperti rispetto all'obiettivo di fare del dottorato il livello più alto della formazione in funzione di sbocchi professionali diversi da quello accademico e quali dovrebbero essere gli interventi normativi necessari a risolverli. **ENG:** The reform of the doctoral program was one of the objectives of the National Recovery and Resilience Plan (NRRP). The NRRP specifically aimed to strengthen the development of doctoral paths not exclusively oriented toward academic careers and to enhance collaboration between universities and businesses. The reform was introduced by Ministerial Decree No. 226 of December 14, 2021, and was supported by substantial investments. The research should investigate—also by drawing comparisons with regulations in other countries—the main legal issues that remain unresolved in relation to the goal of making the PhD the highest level of education oriented toward professional opportunities beyond academia, and identify the legislative measures needed to address these issues.
Tutor	Tutor UNIMIB: Prof. Alfredo Marra
Abroad period	Durante il secondo anno/During second year
Specific rules	*No specific rules*

Risorse per La Nuova P.A.: Persone e Dati The New Public Administration: Data and Human Resources Selezione, gestione e valorizzazione del capitale umano nelle PP.AA Selection, Management, and Enhancement of Human Capital in Public Administrations 109R	
Progetto di ricerca **Research project**	**ITA:** "Analisi e sviluppo di modelli di gestione del personale della P.A." **(PROG.2**) **ENG:** "Analysis and development of personnel management models within the context of public administration." **(PROG.2**)
Tipo/Type	Borse di Ateneo / University Scholarships
Borse/Scholarships	1
Abstract	**ITA**: Alla luce dei cambiamenti in atto nella P.A. e in particolare il sempre maggior impiego della tecnologia, il progetto di ricerca si propone di mettere a confronto diverse modalità e strumenti che all'interno della pubblica amministrazione possono essere utilizzati per favorire la gestione e la crescita del personale in chiave di sostenibilità, in tutto il ciclo di vita lavorativa. In particolare, il progetto dovrà poi verificare quanto la tecnologia può essere a supporto delle divisioni del personale, per promuovere la sostenibilità. **ENG:** In light of the ongoing changes within public administration, and in particular the increasing use of technology, this research project aims to compare various methods and tools that can be employed within the public sector to support personnel management and development through the lens of sustainability, across the entire working life cycle. Specifically, the project will examine the extent to which technology can support HR departments in promoting sustainability.
Tutor	Da definire/to be defined
Abroad period	Da definire/to be defined
Specific rules	*No specific rules*

Risorse per La Nuova P.A.: Persone e Dati The New Public Administration: Data and Human Resources Selezione, gestione e valorizzazione del capitale umano nelle PP.AA Selection, Management, and Enhancement of Human Capital in Public Administrations 109R	
Progetto di ricerca **Research project**	**ITA:** "Intelligenza Artificiale e Bilancio POP in sanità: nuovi linguaggi per la comunicazione pubblica orientata al cittadino" **(PROG.3**) **ENG:** "Artificial Intelligence and Popular Financial Reporting in Healthcare: New Languages for Citizen-Oriented Public Communication" **(PROG.3**)
Tipo/Type	Borse finanziate da enti / aziende convenzionati / Scholarships funded by partner organizations/companies
Azienda o ente finanziatore / **Funding Body**	**Università degli Studi di Torino**
Borse/Scholarships	1
Abstract	**ITA**: Il progetto di ricerca intende esplorare il potenziale dell'intelligenza artificiale per innovare la comunicazione pubblica nel settore sanitario, attraverso l'utilizzo del Bilancio POP (Bilancio di rendicontazione popolare) come strumento chiave di trasparenza e accountability. In un contesto in cui la comprensione delle scelte allocative e delle performance dei servizi sanitari è cruciale per i cittadini, la ricerca analizzerà come strumenti di AI (chatbot, assistenti virtuali, sintesi automatica e analisi semantica) possano rendere il bilancio sanitario più accessibile, interattivo e personalizzato. L'obiettivo è costruire modelli comunicativi che favoriscano la partecipazione informata, semplifichino i dati complessi relativi alla spesa, agli outcome clinici e all'equità di accesso, e rafforzino il dialogo tra amministrazioni sanitarie e cittadini. Il progetto si inserisce nel dibattito sulla riforma della comunicazione istituzionale in sanità, promuovendo una cultura della trasparenza digitale e della cittadinanza attiva. **ENG:** This research project explores the potential of Artificial Intelligence to innovate public communication in the healthcare sector, using Popular Financial Reporting (Bilancio POP) as a key tool for transparency and accountability. In a context where understanding resource allocation and healthcare service performance is crucial for citizens, the study investigates how AI-based tools (chatbots, virtual assistants, automatic summarization, and semantic analysis) can make healthcare reporting more accessible, interactive, and tailored to stakeholder needs. The project aims to develop communication models that promote informed participation, simplify complex data related to spending, clinical outcomes, and equity of access, and strengthen the dialogue between healthcare administrations and citizens. It contributes to the ongoing transformation of institutional communication in healthcare, fostering a culture of digital transparency and active citizenship.
Tutor	Da definire/to be defined
Abroad period	Da definire/to be defined
Specific rules	*No specific rules*

Risorse per La Nuova P.A.: Persone e Dati

The New Public Administration: Data and Human Resources

Dati, politiche e servizi nelle PP.AA.

Data, policies and services in public administrations

109R

Progetto di ricerca **Research project**	**ITA:** "Machine learning per la realizzazione di mappe predittive dei valori di fondo naturale di specie selezionate nelle acque sotterranee della Lombardia" **(PROG.4**) **ENG:** "Machine learning to create prediction maps of natural background levels of selected species in groundwater in Lombardy" **(PROG.4**)
Tipo/Type	Borse di Ateneo / University Scholarships
Borse/Scholarships	1
Abstract	**ITA**: Il Titolo V della Parte IV del D.Lgs. 152/06 disciplina la bonifica dei siti contaminati tramite la definizione di valori soglia di concentrazione che, se superati, portano all'identificazione di un potenziale sito contaminato (le cosiddette "Concentrazioni Soglia di Contaminazione - CSC"). Nel caso di aree ad alte concentrazioni di contaminanti per cause naturali, il D.Lgs. 152/06 indica che le CSC devono essere sostituite dai valori di fondo naturale (VFN), calcolati in funzione delle caratteristiche specifiche delle aree in questione. A quasi venti anni dall'entrata in vigore del D.Lgs. 152/06, in Lombardia non esistono ancora delle mappe ufficiali (validate dalle autorità regionali) di VFN a scala regionale per le acque sotterranee. Questa mancanza da un lato è dovuta alla complessità tecnico-scientifica di realizzazione di mappe di VFN robuste e affidabili. Negli ultimi anni, le tecniche di machine learning sono state utilizzate con successo per creare mappe predittive di concentrazione di contaminati in falda. L'obiettivo di questo progetto è quello di realizzare delle mappe predittive di VFN di specie selezionate nelle acque sotterranee del territorio lombardo applicando tecniche di machine learning. Per acquisire la mole di dati necessaria alla corretta applicazione del machine learning, il progetto vuole fare affidamento, oltre ai dati della rete di monitoraggio regionale di ARPA, anche a dati a scala sito-specifica derivanti dal monitoraggio dei siti potenzialmente contaminati. L'utilizzo di questi dati da un lato arricchisce la numerosità campionaria ma dall'altro lato necessità di complesse operazioni di omogeneizzazione e controllo qualità. Il progetto prevede quindi una stretta interazione con le autorità regionali per l'acquisizione, la contestualizzazione e l'omogeneizzazione di questi dati a scala sito specifica derivanti dal monitoraggio dei siti contaminati, dati per loro natura complessi ed eterogenei. L'utilità di questo progetto è quella di poter ottimizzare l'uso di dati già in possesso delle autorità regionali al fine di realizzare strumenti gestionali efficaci per il miglioramento e l'efficientamento della gestione dei siti contaminati in Lombardia. **ENG:** Title V of Part IV of Italian Legislative Decree 152/06 establishes the regulatory framework for the remediation of contaminated sites. The decree stipulates threshold concentration values that, once exceeded, necessitate the identification of a potential contaminated site (referred to as the "Contamination Threshold Concentrations - CSC"). In instances where areas exhibit high concentrations of contaminants due to natural causes, Legislative Decree 152/06 stipulates that the CSC should be substituted by Natural Background Levels (NBLs), calculated based on the specific characteristics of the respective areas. Almost twenty years after the entry into force of Legislative Decree 152/06, in Lombardy there are still no official maps (validated by regional authorities) of NBLs in groundwater at a regional scale. This is partly due to the technical and scientific complexity of creating robust and reliable NBL maps. However, recent advancements in machine learning techniques have enabled the successful creation of predictive maps of contaminant

	concentrations in groundwater. The aim of this project is to create predictive maps of NBL of selected species in the groundwater of the Lombardy region by applying machine learning techniques. To acquire the necessary data for the effective application of machine learning, the project will rely on data from the regional monitoring network of ARPA, as well as on site-specific data from the monitoring of potentially contaminated sites. The use of the latter type of data on the one hand enriches the sample size but on the other hand requires complex homogenization and quality control operations. The project will therefore involve close interaction with the regional authorities for the acquisition, contextualization and homogenization of these site-specific data derived from the monitoring of contaminated sites, data which are complex and heterogeneous. The usefulness of this project is to enhance the efficacy and efficiency of contaminated site management in Lombardy by leveraging the existing data held by regional authorities to create effective management tools.
Tutor	Tutor UNIMIB: Prof. Roberto Colombo (Supervisor: Prof. Marco Rotiroti)
Abroad period	6 mesi/6 months
Specific rules	*No specific rules*

Risorse per La Nuova P.A.: Persone e Dati The New Public Administration: Data and Human Resources Dati, politiche e servizi nelle PP.AA. Data, policies and services in public administrations 109R	
Progetto di ricerca **Research project**	**ITA:** "La governance partecipata e le sue diverse declinazioni. Dall'amministrazione condivisa alle pratiche aperte di coinvolgimento della cittadinanza" **(PROG.5**) **ENG:** "Participatory governance and its various forms. From shared administration to open practices of citizen involvement." **(PROG.5**)
Tipo/Type	Borse di Ateneo / University Scholarships
Borse/Scholarships	1
Abstract	**ITA**: Il progetto ha l'obiettivo di studiare le forme emergenti di governance partecipata della pubblica amministrazione che si stanno affermando in Italia. Questo tema verrà studiato in due possibili forme. Da una parte si guarderà alla cosiddetta Amministrazione condivisa, cioè le forme di coprogrammazione e di coprogettazione contemplate nell'articolo 55 del Codice del Terzo Settore del 2017, sancito dalla Corte Costituzionale con la sentenza 131/2020 come modalità ordinaria di governance locale e poi proceduralizzate da DM 72 del 2021. Dall'altra la governance partecipata verrà studiata come pratica effettiva che viene praticata anche in modo meno strutturato e più aperto dalle amministrazioni pubbliche locali, tramite forme di coinvolgimento non solo delle organizzazioni formalizzate come ETS ma anche della cittadinanza attiva e dei singoli cittadini, tra cui le modalità di progettazione personalizzata dei singoli interventi. **ENG:** The project aims to study emerging forms of participatory governance of the public administration that are becoming established in Italy. This topic will be studied in two possible ways. On the one hand, we will look at so-called shared administration, i.e., the forms of co-programming and co-designing contemplated in Article 55 of the Third Sector Code of 2017, established by the Constitutional Court in its ruling 131/2020 as the ordinary form of local governance and then proceduralized by Ministerial Decree 72 of 2021. On the other hand, participatory governance will be studied as an effective practice that is also implemented in a less structured and more open way by local public administrations, through forms of involvement not only of formalized organizations such as ETS but also of active citizens and individual citizens, including in the design of individual customized interventions.
Tutor	Tutor UNIMIB: Prof. Emanuele Polizzi
Abroad period	Da definire/to be defined
Specific rules	*No specific rules*

Risorse per La Nuova P.A.: Persone e Dati **The New Public Administration: Data and Human Resources** **Dati, politiche e servizi nelle PP.AA.** **Data, policies and services in public administrations** **109R**	
Progetto di ricerca **Research project**	**ITA:** "Sistemi di istruzione e formazione terziaria: autonomia, regolazione, governance, valutazione e finanziamento" **(PROG.6**) **ENG:** "Higher education and higher VET systems: autonomy, regulation, governance, evaluation and funding." **(PROG.6**)
Tipo/Type	Borse finanziate da enti / aziende convenzionati / Scholarships funded by partner organizations/companies
Azienda o ente finanziatore / Funding Body	**Università degli Studi di Milano**
Borse/Scholarships	1
Abstract	**ITA**: La definizione e l'implementazione di politiche pubbliche riguardanti i sistemi di istruzione terziaria hanno assunto un ruolo sempre più strategico nelle agende dei governi nazionali e nella creazione di nuove competenze per consentire alle imprese e alle pubbliche amministrazioni di rispondere più efficacemente alle sfide globali, quali la transizione digitale ed ecologica. Si è assistito, altresì, a trasformazioni riguardanti i meccanismi di regolazione e finanziamento, prevedendo modalità di allocazione delle risorse pubbliche in relazione alle performance conseguite (performance-based funding). In generale, il sistema di istruzione terziaria si connota per poter essere analizzato, regolato e governato sulla base dei dati che esso genera e, tuttavia, utilizzati ad oggi solo parzialmente, anche per le difficoltà connesse, dall'unione di fonti differenti. Il progetto di ricerca si concentrerà sull'analisi dell'evoluzione e degli andamenti dei sistemi di istruzione e formazione terziaria, in riferimento ai processi di regolazione, valutazione e finanziamento, con una particolare attenzione all'analisi di dati provenienti da database inerenti all'istruzione secondaria e terziaria. Particolare enfasi sarà posta sull'utilizzo di modelli statistici e tecniche di visualizzazione avanzata per l'esplorazione e l'interpretazione di dati complessi, integrando fonti eterogenee. Il progetto di ricerca si svilupperà in sinergia con le attività dell'Osservatorio MHEO (Milan Higher Education Observatory). **ENG:** The definition and implementation of public policies in higher education sector have assumed an increasingly strategic role in the national government agendas and in the creation of new competencies for private companies and public administrations to respond more effectively to global challenges, such as digital and climate transitions. In some cases, there have also been changes in regulation and funding mechanisms, establishing performance-based funding (PBF). The higher education system has the potential to be analyzed, regulated, and managed based on the data it generates. However, this possibility is only partially realized, due to challenges in integrating different data sources. The research project will focus on the analysis of the evolution and trends of higher education and higher VET systems, with reference to the processes of regulation, evaluation, and funding. It will focus on analyzing data from databases related to secondary and tertiary education. Emphasis will be placed on the use of statistical models and advanced visualization techniques for the interpretation of complex data, integrating heterogeneous sources.

	The research project will develop in synergy with the Milan Higher Education Observatory (MHEO).
Tutor	Tutor UNIMI: Prof. Matteo Turri Supervisor aziendale: Dr. Marcella Gargano
Abroad period	Da definire/To be defined
Specific rules	*Intellectual property clauses agreed with the Company apply to this scholarship*

Risorse per La Nuova P.A.: Persone e Dati The New Public Administration: Data and Human Resources Dati, politiche e servizi nelle PP.AA. Data, policies and services in public administrations 109R	
Progetto di ricerca **Research project**	**ITA:** "Interoperabilità all'interno dei sistemi della pubblica amministrazione" **(PROG.7**) **ENG:** "Interoperability within public administration systems" **(PROG.7**)
Tipo/Type	Borse finanziate da enti / aziende convenzionati / Scholarships funded by partner organizations/companies
Azienda o ente finanziatore / Funding Body	**Università Cà Foscari Venezia**
Borse/Scholarships	1
Abstract	**ITA**: L'obiettivo della ricerca è indagare le sfide e le soluzioni relative all'interoperabilità nei sistemi della pubblica amministrazione. Con la crescente adozione di tecnologie digitali da parte delle diverse amministrazioni pubbliche, diventa fondamentale garantire uno scambio fluido di dati tra di esse. Il progetto mira a identificare le barriere tecniche, semantiche, organizzative e legali che ostacolano l'interoperabilità. Verrà utilizzato un approccio misto, che combina casi di studio e analisi dei sistemi esistenti, in diversi contesti del settore pubblico. Lo studio valuterà i framework e gli standard esistenti. I risultati principali includeranno una tassonomia delle barriere all'interoperabilità e l'identificazione di policies da suggerire a livello politico. **ENG:** This PhD research investigates the challenges and solutions related to interoperability within public administration systems. As governments increasingly adopt digital technologies, the seamless exchange of data across departments, agencies, and jurisdictions becomes critical. The project aims to identify technical, semantic, organizational, and legal barriers that hinder interoperability. A mixed-methods approach will be employed, combining case studies and the analysis of actual systems, across multiple public sector contexts. The study will also evaluate existing frameworks and standards. Key outcomes will include a taxonomy of interoperability barriers and practical policy recommendations.
Tutor	Tutor UNIVE: Prof. Agostino Cortesi
Abroad period	Da definire/To be defined
Specific rules	*No specific rules*

Risorse per La Nuova P.A.: Persone e Dati The New Public Administration: Data and Human Resources Dati, politiche e servizi nelle PP.AA. Data, policies and services in public administrations 109R	
Progetto di ricerca **Research project**	**ITA:** "La performatività della misurazione dell'impatto sociale" **(PROG.8**) **ENG:** "The performativity of social impact measurement" **(PROG.8**)
Tipo/Type	Borse finanziate da enti / aziende convenzionati / Scholarships funded by partner organizations/companies
Funding Body	**Università degli Studi di Bergamo**
Borse/Scholarships	1
Abstract	**ITA**: La misurazione dell'impatto sociale ha acquisito un'importanza crescente, rispondendo alla necessità di rendere conto degli effetti generati dalle attività di aziende pubbliche e private. Negli ultimi anni, si è assistito a una proliferazione di strumenti per il calcolo e la valutazione degli impatti, caratterizzati da una forte valenza normativa e performativa. Sebbene presentati come dispositivi tecnici neutrali, questi strumenti sono anche costruzioni socio-materiali che non solo incorporano e modellano significati e rappresentazioni, ma influenzano anche i comportamenti e le relazioni tra gli attori coinvolti nel processo di misurazione. Questo progetto si propone di analizzare tali strumenti nel contesto degli enti del terzo settore e nell'ambito delle relazioni con i loro stakeholder anche alla luce della introduzione della Valutazione di Impatto Sociale (VIS) con il Codice del Terzo Settore (D.Lgs. 117/2017). In particolare, il progetto intende mappare gli strumenti di misurazione di impatto impiegati e analizzarli in quanto dispositivi dotati di agency, esplorandone il funzionamento e gli effetti, comprese eventuali distorsioni, in termini di accountability, governance, trasparenza e relazioni di potere **ENG:** The measurement of social impact has gained increasing importance in response to the need to account for the effects generated by the activities of public and private organizations. In recent years, there has been a proliferation of tools for calculating and evaluating impacts, characterized by a strong normative and performative dimension. Although presented as neutral technical devices, these tools are, in fact, socio-material constructions that not only incorporate and shape meanings and representations but also influence behaviors and power dynamics among the actors involved in the measurement process. This project aims to analyze these tools in the context of third-sector organizations and their relationships with stakeholders, in light of the introduction of Social Impact Assessment (SIA) in the Third Sector Code (D.Lgs. 117/2017). Specifically, the project intends to map the experiences and techniques of impact measurement, exploring them as devices endowed with agency, in order to analyze their functioning and effects, including potential distortions, in terms of accountability, transparency and power relationships.
Tutor	Da definire/To be defined
Abroad period	Da definire/To be defined
Specific rules	*No specific rules*

Scienza e Nanotecnologia dei Materiali Materials Science and Nanotechnology 116R	
Progetto di ricerca Research project	**ENG:** "Development of new concepts for realizing IR-LEDs with increased Light Output Power" **(PROG.1**)
Tipo/Type	Borse finanziate da enti esterni / Scholarships funded by external organizations
Azienda o ente finanziatore / Funding Body	**Vishay Semiconductor GmbH**
Borse/Scholarships	1
Abstract	**ENG:** Current epitaxial designs used in IR-LEDs and VCSELs utilize a tunnel junction for connecting two or more active areas and therefore can achieve much more Light Output Powe than conven-tional single junction designs. In these multi-junction devices, all utilized layers play their own role for achieving low forward voltage, high reverse voltage and high LOP amongst other parameters. The thesis is devoted to achieving best possible single layer design for the multi-junction device. Simulations as well as prototype fabrication and test will be performed during the thesis.
Tutor	Tutor UNIMIB: Prof. Stefano Sanguinetti
Abroad period	Da definire/To be defined
Specific rules	*Intellectual property clauses agreed with the Company apply to this scholarship*

Scienza e Nanotecnologia dei Materiali Materials Science and Nanotechnology 116R	
Progetto di ricerca **Research project**	**ENG:** "Optimization and Development of Formulations of Lubricant for Steel Wire Drawing Process" **(PROG.2**)
Tipo/Type	Borse finanziate da enti esterni / Scholarships funded by external organizations
Funding Body	**Tecnovo S.r.l.**
Borse/Scholarships	1
Abstract	**ENG:** The process of metal and steel drawing, which involves the progressive deformation of metal wire through a die to reduce its diameter or change its shape, is essential in numerous industrial applications, such as automotive, electronics, and construction. Despite their potential contribution to energy savings as well as wire quality, lubricants in wire drawing are not widely studied and are therefore poorly understood. This is mainly because wire drawing is associated with very complex conditions, such as high speeds (up to 25 m/s), contact pressures in the GPa range, and use of unconventional lubricants such as powdered soaps. The key properties of these lubricants are excellent adhesion to the wire surface, thermal resistance and consistent coverage throughout the drawing process, preventing metal-to-metal contact and improving the operation efficiency. However, these characteristics are influenced by several factors, including the type of steel (i.e. carbon content), the drawing speed and the specific requirements of the application. Among the most commonly used lubricants in steel wire drawing, Ca-based and Na-based stearate solid soaps are widely employed owing to their excellent adhesion and high thermal stability. These materials undergo a temperature dependent phase change, behaving plastically at low T and as a non-Newtonian viscous fluid at higher T. Their tribological performance, thermal resistance and adhesion, can be upgraded by the addition of ceramic or inorganic filler (e.g. TiO2, borax, lime, various salts like sulfites, chalk etc.). However, the effectiveness of the resulting lubricant is largely affected by the specific formulation, which is obviously not disclosed or explained in the available recipes. Moreover, looking at scientific literature, very little attention is devoted to dry-wire drawing with solid soaps. In this scenario, the objectives of this PhD project in collaboration with Tecnovo Srl are the optimization and development of lubricant formulations with improved adhesion, coverage, thermal resistance and overall efficiency in the multi-step steel wire drawing process. The research activity will first explore the state of the art of raw materials already used for solid lubricants production and their influence on friction behavior. The potential inclusion of filler additives such as natural clays, graphite or other lamellar systems to further enhance lubrication performance will be then explored, within a feedback framework derived from the results of the tests performed by the company. Aspects related to the recovery and possible re-introduction in high- added value products of Ca and Na-based waste powders will be also considered. As a third ambitious target, the research will aim at the development of innovative lubricants with enhanced physicochemical properties, precise regulation, and long-term service life, thus increasing cost-efficiency and sustainability. In this context, the possibility to exploit water-based nanolubricants and solvent free nanofluids (SFN), ideal lubricants which combine the advantages of both liquids and solid lubricants, will be investigated. The project will be developed also in collaboration with other University groups in Italy (e.g. prof. Collina and prof. Antonini, University of Trento) and abroad offering educational and professional tools.
Tutor	Tutor Unimib: Prof. Massimiliano D'Arienzo

Abroad period	Da definire/To be defined
Specific rules	*Intellectual property clauses agreed with the Company apply to this scholarship*

Scienze Chimiche, Geologiche ed Ambientali Chemical, Geological and Enviromental Sciences Scienze Geologiche Geological Sciences 124R	
Progetto di ricerca **Research project**	**ENG:** "Multi-scale Multi-observable Seismic Model of the Centro-Mediterranean region"
Tipo/Type	Borse finanziate da enti esterni / Scholarships funded by external organizations
Azienda o ente finanziatore / **Funding Body**	**Istituto Nazionale di Geofisica e Vulcanologia**
Borse/Scholarships	1
Abstract	**ENG:** Lithospheric structure of the Centro-Mediterranean region (along the lines of the following INGV objectives: OST1.1 Dalla struttura profonda alla modellazione dei processi; OST1.2 Modello strutturale e cinematico litosferico della regione centro mediterranea; OST1.3 Implementazione Rete Sismica Nazionale) Many open questions feed the intense debate on the evolution of continental subduction; particularly, on how deeply the lithosphere penetrates and its impact on surface field deformation. In this context, variations (increase) in the buoyancy of the subducting lithosphere, given by the presence of low-density materials in the subducted crust, and/or age and temperature of the subducting mantle, are thought to control both subduction rate and slab dip. The central Mediterranean area constitutes a key case study for understanding the long-term development of continental subduction, where many different structural elements concur in the subduction process and play an active role in its evolution (e.g. rollback, retreat, along-trench extension and so on). The Apennines and the Dinarides orogenic belts are two distinct examples of how this process evolved differently from the subduction of the same Adria microplate (Doglioni et al., 2007; Royden and Faccenna, 2018). The main goal of the PhD is to try to understand how the structural, rheological and compositional heterogeneities of the lithosphere at different spatial scales affect the continental subduction.
Tutor	Tutor UNIMIB: Prof. Nicola Piana Agostinetti Supervisor aziendale: Dr. Pasquale De Gori
Abroad period	Da definire/To be defined
Specific rules	*No specific rules*

Strategic Innovation for Sustainable and Smart Ecosystems 134R	
Progetto di ricerca **Research project**	**ENG:** "Sustainable Artificial Intelligence and Machine Learning" **(PROG.1**)
Tipo/Type	Borse finanziate dal Dipartimento / Scholarships funded by the Department
Borse/Scholarships	1
Abstract	**ENG:** Recent advances in AI have emphasized its role in addressing sustainability challenges. However, an urgent need emerges: to ensure the sustainability of AI itself by rethinking its entire lifecycleThis PhD research aims to develop novel energy-efficient and eco-friendly Machine Learning (ML) methods, integrating uncertainty estimation (e.g., conformal prediction) and optimization methods to improve the reliability of predictions in resource-constrained environments. A key aspect of the research involves reinforcement learning and sequential experiment design to optimize high-dimensional experimentation, enhancing adaptability while reducing computational costs. Additionally, the project will explore methods underlying generative AI, such as learning and optimization methods over probability measures spaces, like those used for solving PDEs and SDEs, diffusion processes, and distillation. By integrating these approaches, the research seeks to advance AI methodologies that are both statistically robust and energy/environmental-aware, fostering a new paradigm for sustainable AI development.
Tutor	Tutor UNIMIB: Prof. Matteo Manera
Abroad period	Da definire/To be defined
Specific rules	*No specific rules*

Strategic Innovation for Sustainable and Smart Ecosystems 134R	
Progetto di ricerca **Research project**	**ENG:** "New "Carbon-negative" Functional Fillers for Green Tyres: investigation of Biochar materials" **(PROG.2**)
Tipo/Type	Borse finanziate da enti esterni / Scholarships funded by external organizations
Azienda o ente finanziatore / **Funding Body**	**Corimav**
Borse/Scholarships	1
Abstract	**ENG:** A key element in rubber compounds is represented by Functional Fillers, which represent the "skeleton" of the compounds, largely determining their stiffness and abrasion resistance. In this context, the most used filler for rubber is Carbon Black, a material derived from fossil sources (e.g. heavy oil) and characterized by a significant surface area for interaction with the polymer and by a sufficient electrical conductivity. The ultimate target of this research project is the development of a sustainable alternative to Carbon Black: the family of biochar materials derived from diverse waste biomasses will be investigated, aiming at the definition of materials and processes that could fit the above purpose. The research activity will encompass the synthesis and functionalization of biochar materials, compounding activities to create new compounds based on the biochar and comprehensive chemical, physical and mechanical characterization of the biochar and the related green and cured compounds. The research activity will include 6 months spend abroad and a strong interaction with the company laboratories.
Tutor	Prof. Carlo Santoro (Scientific Supervisor) Prof. Barbara Di Credico (University Tutor), Dr.ssa Silvia Guerra (Pirelli Tyre)
Abroad period	Da definire/To be defined
Specific rules	*Intellectual property clauses agreed with the Company apply to this scholarship*

Strategic Innovation for Sustainable and Smart Ecosystems 134R	
Progetto di ricerca **Research project**	**ENG:** "AI Revolution: Shaping the Future of Banking Business Models"
Tipo/Type	Dipendenti aziende convenzionate / Employees of partner companies
Azienda	**Intesa Sanpaolo S.p.A.**
Borse/Scholarships	1
Abstract	**ENG:** Artificial Intelligence (AI) is changing the way industries operate, experts compare it to the Industrial Revolution for its global effects. But AI is more than just an advanced tool: it forces companies to rethink how they function, from their internal structures to their long-term strategies. With its ability to process massive amounts of data, automate decisions, and optimize processes, AI is shifting the entire logic of business. Those who fail to adapt risk falling behind in an increasingly competitive landscape. The world is now witnessing AI revolutionizing major sectors like finance by radically changing the way financial institutions operate, prompting a fundamental reconsideration of their business strategies. AI-driven banking innovation has paved the way for financial institutions to integrate AI into their strategies, but its impact extends beyond mere implementation. Recent developments in the field have highlighted the broader implications of this transformation and the critical decisions banks must make to remain competitive. This research will focus on how AI is driving a shift in banking business models, going beyond simple efficiency gains to examine the strategic adjustments that financial institutions need to make. Banks are not simply updating their systems; they are reimagining their value creation processes and how they differentiate themselves in a landscape increasingly shaped by AI. To support this analysis, computational tools such as data analysis and AI-driven simulations will be used, employing computer science to assess how different strategic choices may impact long-term business performance. This study will also examine AI-driven business models, including AI-as-a-Service (AIaaS) and autonomous banking systems, evaluating their impact on financial services and long-term business strategies. As these innovations impact banking operations, understanding their role in strategic decision-making becomes key. At the same time, banks must tackle challenges such as regulatory adaptation and workforce transformation. Effectively addressing these issues is crucial to integrate AI in a way that strengthens long-term competitiveness and ensures sustainable growth.Ultimately, this research aims to develop a strategic framework to help banks adapt their business models to the ongoing transformation. The goal is to provide practical insights into how financial institutions can leverage AI to refine their business strategies, optimize decisionmaking, and capitalize on new opportunities in an evolving industry. In addition, this study will consider how AI adoption aligns with broader objectives such as Sustainable Development Goals, ensuring that innovation also supports long-term sustainability. Banking is at a turning point, and those taking a proactive, strategic approach will be better positioned to shape the future of financial services.
Tutor	Da definire/To be defined
Abroad period	Da definire/To be defined

Strategic Innovation for Sustainable and Smart Ecosystems 134R	
Progetto di ricerca **Research project**	**ENG:** "Study on Refugee Integration within Education Complementary Pathways"
Tipo/Type	Dipendenti aziende convenzionate / Employees of partner companies
Azienda	**Fondazione AVSI-ETS**
Borse/Scholarships	1
Abstract	**ENG:** In response to global forced displacement, complementary pathways—such as educational, labor, and family-based entry programs—have emerged as safe and legal routes to facilitate the relocation of refugees to third countries, complementing traditional resettlement channels. These pathways aim to expand protection opportunities while supporting long-term integration. However, integration is a complex and dynamic process that goes beyond legal access, involving psychological, social, and cultural dimensions. The PhD project will investigate the adapting processes experienced by refugees engaged in complementary pathways, with a specific focus on the educational route. The study aims to explore how individuals progress from minimization—where cultural differences are overlooked—to adaptation, characterized by empathy and intercultural competence. The project is rooted in sociology, urban studies, and intercultural communication. The PhD candidate will have the opportunity to spend forth-month research period abroad in a selected country with established complementary pathway. The period spent at AVSI is expected to correspond to the full duration of the PhD project. Candidates should have a background in education or sociology, and a strong interest in refugee integration and intercultural dialogue.
Tutor	Tutor UNIMIB: Proff. Ida Castiglioni e Silvia Mugnano
Abroad period	Da definire/To be defined

Strategic Innovation for Sustainable and Smart Ecosystems 134R	
Progetto di ricerca **Research project**	**ENG:** "Evaluating the Impact of Carbon Credits-financed Clean Cooking projects on Women's Health in Rural Sub-Saharan African settlings"
Tipo/Type	Dipendenti aziende convenzionate / Employees of partner companies
Azienda	**Fondazione AVSI-ETS**
Borse/Scholarships	1
Abstract	**ENG:** Clean cooking—defined as the combined use of technologies and fuels that emit minimal levels of harmful pollutants—represents a critical intervention for public health and environmental sustainability in rural Sub-Saharan Africa (SSA). Alongside climate change, Household Air Pollution (HAP) from traditional cooking methods is a severe public health crisis in rural SSA, disproportionately affecting women and children: women, as primary cooks, experience prolonged exposure to fine particulate matter and other toxins, leading to a high prevalence of respiratory illnesses, cardiovascular diseases, adverse pregnancy outcomes, and certain cancers. Beyond health, the arduous daily task of fuel collection exacerbates time poverty and limits educational and economic opportunities for women. Despite the availability of clean cooking solutions, their widespread and sustained adoption is hampered by issues of affordability, cultural acceptance and unreliable supply chains. Traditional funding mechanisms have largely proven insufficient to bridge this critical gap, necessitating innovative financing models. From one side, carbon markets present a promising avenue to accelerate the transition to clean cooking: by demonstrably reducing greenhouse gas emissions, clean cooking projects can generate carbon credits, which companies can use as internal assets to offset their own carbon footprint. However, a significant research gap persists in understanding precisely how these financing mechanisms translate into tangible, measurable health and environmental benefits. From the other side, inefficiencies associated with carbon credit schemes do exist, such as issues of transparency and exaggerated claims of environmental benefit, resulting into loss of credibility and market frauds. Therefore, this project proposes to investigate how carbon credits translate into real—on-the-ground—health and environmental benefits. An essential component of this study is the integration of the author's field experience, which provides a valuable contextual understanding of local socio-economic and cultural dynamics. By way of example, the role played by men in such contexts for new projects acceptance will not be neglected. This experience ensures that the research accounts for the nuanced ways in which Clean Cooking interventions must be tailored to the specific needs and capabilities of different communities. Four distinct case studies have been chosen to highlight the diversity within Sub-Saharan Africa: Côte d'Ivoire, Sierra Leone, Republic of Congo, and Mozambique. The study aims to answer to four key questions: 1) To what extent do carbon credit-financed projects reduce HAP exposure and improve indoor air quality for women? 2) What are the specific health benefits experienced by women, alongside broader environmental gains? 3) How do socio-economic and cultural factors influence the adoption and sustained use of these technologies within carbon-financed frameworks? 4) What actionable policy recommendations can be formulated to assure solid carbon credit financing for health and environmental benefits for women? A mixed-methods approach will be employed, combining quantitative methods with qualitative interviews across the four study countries. Data collection will include personal HAP exposure monitoring (PM2.5, CO), health assessments, and socio-demographic data. Qualitative data will explore experiences, perceptions, and contextual factors. Statistical analysis will assess associations between specific devices quality, clean cooking adoption, HAP reduction, and health outcomes. The ultimate objective is to contribute to the development of impactful projects and to offer

	policy recommendations that enhance the efficacy of Clean Cooking initiatives, guiding future interventions that are scalable, sustainable, and genuinely beneficial to the communities they intend to serve.
Tutor	Da definire/To be defined
Abroad period	Da definire/To be defined

Tecnologie Convergenti per i Sistemi Biomolecolari – TeCSBi Converging Technologies for Biomolecular Systems - TeCSBi 117R	
Progetto di ricerca **Research project**	**ITA:** "Stimoli microbici e mobilizzazione di precursori staminali ematopoietici immunoregolatori: implicazioni per la simbiosi ospite-microbiota" **(PROG.1**) **ENG:** "Microbial stimuli and the mobilization of immunoregulatory hematopoietic stem cell precursors: implications for host-microbe interaction" **(PROG.1**)
Tipo/Type	Borse finanziate dal Dipartimento / Scholarships funded by the Department
Borse/Scholarships	1
Abstract	**ENG:** Microbial signals exert a significant regulatory effect on systemic immunity, partially through modulation of hematopoietic stem and progenitor cells (HSPCs) within the bone marrow microenvironment. Emerging evidence indicates that microbial-derived components, particularly structural elements such as lipopolysaccharides (LPS), shape the fate and the functional specialization of HSPCs by skewing differentiation trajectories towards immunoregulatory phenotypes.This project will investigate the impact of discrete microbial stimuli on the mobilization, transcriptional programming, and immunomodulatory capacities of hematopoietic stem cell precursors under both homeostatic and infectious conditions. Emphasis will be placed on: 1) The impact of microbial LPS structural variations (e.g., hypo-acylated forms) on HSPCs and TLR4-mediated signaling pathways within the bone marrow. 2) Investigating the mechanobiological responses of the bone marrow microenvironment niche in response to microbial stimuli, with a focus on inflammation-induced spatial and structural remodeling of hematopoietic niches. Utilizing antibiotic-treated murine models alongside genetically engineered bacterial strains, complemented by single-cell transcriptomic profiling and in vivo lineage tracing of HSPCs, we will systematically map the functional outcomes of host–microbe interactions on hematopoietic ontogeny. Moreover, we will evaluate the potential of bacterial-derived molecules to restore immune tolerance in models of inflammatory disease. Collectively, this work seeks to elucidate the immunoregulatory mechanisms by which microbial cues govern HSPC mobilization and maintain microbe-host homeostasis. These insights may lay the foundation for novel therapeutic strategies that manipulate microbial signals to correct immune imbalances in autoimmunity, infection, and cancer.
Tutor	Resp. Scient.:Prof. Simone Domenico Guglielmetti
Abroad period	Da definire/To be defined
Specific rules	*No specific rules*

Tecnologie Convergenti per i Sistemi Biomolecolari - TeCSBi Converging Technologies for Biomolecular Systems – TeCSBi 117R	
Progetto di ricerca **Research project**	**ENG:** "Systems metabolomics Approaches in Biomedical Research" **(PROG.2**)
Tipo/Type	Borse finanziate dal Dipartimento / Scholarships funded by the Department
Borse/Scholarships	1
Abstract	**ENG:** Changes in metabolite levels and their corresponding fluxes are sensitive indicators of biological systems' responses to genetic and environmental perturbations. Systems metabolomics integrates experimental and computational approaches to uncover the design principles of metabolic regulation. In this context The SYSBIO research network aims at utilizing systems metabolomics to: • Integrate metabolism, with cell mass growth and cell cycle progression into a low-granularity, multiscale computational model (from cell to population) to offer a framework for organizing molecular knowledge and predicting cell phenotypes under various genetic and environmental conditions. This will likely allow to refine predictions from the cellular to the molecular level by incorporating molecular details of cellular subsystems. • Investigate the links between metabolism and important physiological properties, such as cell proliferation or metastatic spread to establish a solid foundation for developing personalized precision oncology therapies. • Develop personalized mathematical models of metabolism that synergize with AI and deep learning methods to identify key regulatory mechanisms to be validated using advanced cellular models, including patient-derived cell lines, spheroids, organoids, organs-on-chip, and xenotransplants (PDXs). The objectives of this PhD project include: 1. Use the coarse-grained mathematical model described above for massive in silico experiments on populations describing both steady-state exponential growth and nutritional/genetic perturbations. 2. Develop reliable and reproducible 3D cancer models of solid tumors (such as heterotypic spheroids containing various cell types alongside ECM components) to investigate the morpho-functional and metabolic alterations occurring in these cellular models through the integrative application of spatial transcriptomic and metabolomic analyses, metabolic flux analysis, and high-content analysis/ quantitative imaging using confocal and multi-photon microscopy. 3. Integrate multi-omics data, including gene expression, proteomics, and metabolomics, at the single-cell and spatially resolved levels to develop a biologically informed framework that incorporates metabolic network architecture.
Tutor	Prof. Marco Vanoni
Abroad period	Da definire/To be defined
Specific rules	*No specific rules*