

# REUNICE 1<sup>st</sup> Doctoral Summer School on Sustainable Science

Catania, Italy

From 10 to 14 July 2023

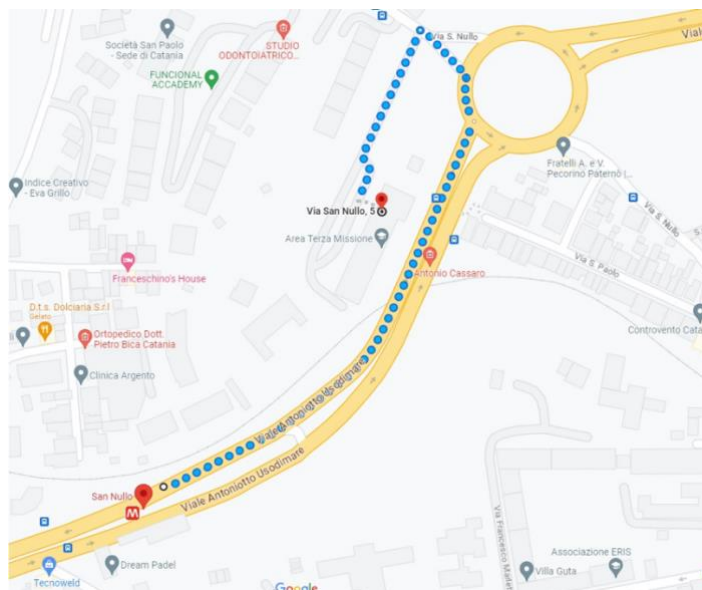
The **REUNICE 1<sup>st</sup> Doctoral Summer School** focuses on the different aspects of **Sustainable Science**, starting from the fundamental definition (day 1) and continuing with the crosslink of Sustainable Science with multidisciplinary and cross-disciplinary aspects of Artificial Intelligence (day 2). The school continues on various aspects of transversal skills of importance for a Doctoral Candidate, including how to tackle with current systemic challenges and being aware of team dynamics in decision making (days 3-4). In the last day practical, inspirational examples of innovation from the corporate and start-up worlds will be provided, with a focus on how the challenges of sustainability and social impact can be addressed in practical examples of sustainable science in Environment, ICT and social innovation (day 5).

#### Scientific Committee:

Prof. Alberto Fichera, Prof. Daniela Giordano, Prof. Salvatore Greco, Prof. Giuseppe Inturri,  
University of Catania, ITALY.

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<https://goo.gl/maps/UfLuiAb6fhmpTsBdA>





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## AGENDA

(hybrid mode: [click here](#) for connecting ONLINE)

### Day one (10 July)

**SUSTAINABLE SCIENCE General concepts.** In the first day the general concepts of Sustainable Science and the link with the ecosystem, energy and transportation, SDGs and monitoring will be addressed.

**9.00 – 9.30:** Welcome and introduction

**9.30 – 11.00: Session 1.** *“Ecosystem services and ecological sustainability”*- Christian Mulder (UNICT)

**11.00 – 11.30h:** Coffee Break

**11.30 – 13.00: Session 2.** *“Planning for Sustainable Mobility”*- Giuseppe Inturri (UNICT)

**13.00 – 14.30h:** Lunch Break

**14.30 – 16.00: Session 3.** *“Sustainable Development Goals: measurement, analysis and application”*- Rosaria Volpe (UNICT)

**16.00 – 16.30h:** Coffee Break

**16.30 – 18.00: Session 4.** *“Energy audits and monitoring according to the ISO 50001”*- Rosaria Volpe (UNICT)

### Day two (11 July)

**SUSTAINABLE SCIENCE & ARTIFICIAL INTELLIGENCE (AI):** In sessions 1-2 a general overview of selected methods for explaining predictions of such AI / ML models with respect to different criteria. The field of deep learning has witnessed significant advancements and achieved remarkable breakthroughs across various domains in recent years. From image recognition to natural language processing, deep learning algorithms have revolutionized the way machines understand and interpret complex data. However, as this technology continues to affect various aspects of our lives, concerns about its potential risks and implications have also arisen (sessions 3-4). In session 5 a presentation about the Horizon Europe programme, the Green Deal, and the sustainability aspects of EU projects with practical examples (proposals-evaluation and cordis database) will be given.

**9.30 – 11.00: Session 1.** *“Explainable AI”*- Jerzy Stefanowski (PUT)

**11.00 – 11.30h:** Coffee Break

**11.30 – 13.00: Session 2.** *“Explainable AI”*- Jerzy Stefanowski (PUT)

**13.00 – 14.30h:** Lunch Break



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**14.30 – 16.00: Session 3.** “*Deep learning: should we be scared?*” – Joanna Jaworek-Korjakowska (AGH)

**16.00 – 16.15 h:** Coffee Break

**16.15 – 17.00: Session 4.** “*Unleashing the Power of Deep Learning: Bridging the Gap for Interdisciplinary Exploration*”- Joanna Jaworek-Korjakowska (AGH)

**17.00 – 18.00: Session 5.** “*Horizon Europe funding opportunities and sustainability aspects*” – Alessandro Brunetti (UMONS)

## Day three (12 July)

**“ECOISM”:** This workshop (sessions 1-4) will lead participants to reflect on how to shift from an ego-centric vision to a more eco-centric one, thereby developing skills for contributing to the ecosystem (meant in a general sense, not just limited to nature and the environment). Themes such as passion, talent, responsibility, and leadership will be explored, highlighting the need for different and more systemic approaches in today's world. The main result will be the development of new knowledge enabling new skills and behaviors that are more aligned with the demands of today's world.

*Workshop Leaders:* **Emanuele Rapisarda** (Senior Coach and Facilitator)

**9.30 – 11.00h: Session 1**

**11.00 – 11.30h:** Coffee Break

**11.30 – 13.00h: Session 2**

**13.00 – 14.30h:** Lunch Break

**14.30 – 16.00h: Session 3**

**16.00 – 16.30h:** Coffee Break

**16.00 – 18.00h: Session 4**

## Day four (13 July)

**“COLLABORATIVE DECISION MAKING”:** This workshop (sessions 1-4) will delve into various modes of collaborative decision making, exploring teamwork dynamics that facilitate the contribution of all team members, particularly in making complex decisions. In addition to sharing knowledge and approaches, a specific technique of collaborative decision making will be taught, which each participant can immediately use to address complex issues individually and, most importantly, in teamwork.

*Workshop Leader:* **Eric Camellini** (Senior Coach and Facilitator)

**9.30 – 11.00h: Session 1**

**11.00 – 11.30h:** Coffee Break

**11.30 – 13.00h: “Session 2**



This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No 101035813



**13.00 – 14.30h:** Lunch Break

**14.30 – 16.00h: Session 3**

**16.00 – 16.30h:** Coffee Break

**16.00 – 18.00h: Session 4**

## Day five (14 July)

**“SUSTAINABILITY CHALLENGES IN THE CORPORATE AND START-UP WORLD”:** The session 1 will provide the participants with perspectives and testimonials from the corporate, non-profit and start-up world illustrating, by means of case studies, how innovation, technology and creative organizational models can address various sustainability challenges (e.g., energetic, environmental, societal) and create opportunities for new products and services. The session 2 will offer a hands-on workshop in which participants will be challenged to think about how to consider and integrate sustainability aspects in their projects and provided with conceptual tools to do so.

**9.30 – 11.00h: Session 1** - Moderator: **Michele Spalletta**, *Innovation and Communication expert - Opinno Italy*

“SUSTAINABILITY & ENVIRONMENT: RENEWABLE ENERGIES, SCOUTING ON STARTUP” - *Antonio Biondi, Head of Enel Innovation Hub Italy, Enel*

“SUSTAINABLE GREEN CITIES: A TECH-DRIVEN APPROACH TO A HIGHER QUALITY OF LIFE” – *Nicola Mondello, Innovation Manager, JOLWAVE Lab*

“INNOVATION AND SOCIAL IMPACT: THE ‘ISOLA’ EXPERIENCE” – *Martina Magnano, Social impact manager, ISOLA*

**11.00 – 11.30h:** Coffee Break

**11.30 – 13.00h: Session 2**

“AN EXERCISE ON FITTING SUSTAINABILITY IN YOUR BUSINESS MODEL” – *Alessandro Brunetti, Founder & CEO iQrypto - EU project manager UMONS*

**13.00 – 14.30h:** Lunch Break **14.30 – 18.00h:** Guided Tour of Etna

## Bio Sketches

### **Antonio Biondi** *Head of Enel Innovation Hub Italy, Enel*

Since 2017 Antonio is the Head of the Enel's Hub in Italy. He manages all collaborations with startups within Enel Group and the presence in the innovation ecosystems at national level. Since joining Enel in 2015, he has gained relevant experience in the energy sector and in particular in renewable energy. Prior to Enel, Antonio worked for 6 years with Ernst&Young.

### **Alessandro Brunetti** *Founder & CEO: iQrypto - EU project manager: UMONS*

He obtained his PhD degree from the University of Oxford where he conducted research on CMOS image sensors. He is a multilingual and cross-functional professional who covered different job functions ranging from R&D to Business development in the Semiconductor industry. Since 2021 he is at UMONS where he supports researchers to submit EU projects. In addition, he is the founder and CEO of iQrypto (est. 2021) an ESA-incubated startup providing the next generation of Quantum Random Number Generators for cryptography applications.

### **Eric Camellini** *Senior Coach and Facilitator*

Eric received a master's degree cum laude in Computer Science and Engineering from Politecnico di Milano. He began his career as a Software Engineer at buildo.io, a consulting company based in Milan and as a team leader he has followed projects with Italian and international clients. He trained as a facilitator with Cocoon Pro and focused his work on the continuous improvement of communication and collaboration within the team, and on studying and applying collaborative decision-making processes. With over six years of practical experience as a team leader, Eric has gained solid expertise in facilitation techniques and collaborative decision-making in various international projects and contexts. As a trainer, he specifically focused on team dynamics. He adopts an approach based on collaborative work, creating a cohesive group and helping the team build the skills they need to continue their learning and growth journey.

### **Giuseppe Inturri**, *Department of Electric Electronic and Computer Engineering (DIEEI), University of Catania*

Associate Professor of Transport; he holds different classes on Sustainable Transport Engineering. He is member of the board at the Ph.D. course "Assessment and mitigation of urban and territorial risks". He is also Rector's delegate for Mobility Management, for Sustainability and for the Italian Network of Universities for the Sustainable Development, where is deputy national coordinator of the Mobility Team.

His main research interests are in transport planning, sustainable mobility, planning for accessibility and demand responsive transport. He published more 100 indexed papers, with 1700 citations and h index 25. He is currently Principal Investigator of a National research Project on Mobility Digitalization and component of different research teams of Next Generation EU Programs on Smart Mobility, such as Sicilian MicronanoTech Research And Innovation Center – SAMOTHRACE and National Centre for HPC, Big Data and Quantum Computing. He has been scientific responsible of many contracts for mobility plans, such as the Sustainable Urban Mobility Plan of Catania and feasibility studies of transport infrastructures, such as the railway metro line of Catania. He was also in charge as Technical Manager of Circumetnea Railway Company, participating at the project of the metro line.

He has been dealing with the topic of Transport Planning for Sustainable Mobility in different contexts, from teaching, to research, with many papers published in journal, presented at international conferences or as part of scientific reports of research project. Besides, the practical implications of sustainability in transport are part of the current professional experience as consultant of public administration and transport companies.

**Joanna Jaworek-Korjakowska** *Artificial Intelligence, AGH University of Science and Technology in Kraków*

Univ. Professor, director of the Centre of Excellence Artificial Intelligence and Deputy Head of the Department of Automatic Control and Robotics at the AGH University of Science and Technology, Cracow, Poland. In 2019 she obtained Habilitation in the field of technical sciences with emphasis in artificial intelligence. She is an expert at the Confederation of Laboratories for Artificial Intelligence Research in Europe (CLAIRE), member of IEEE, Polish Artificial Intelligence Society, and International Dermoscopy Society as well as an alumnus of the TOP 500 Innovator programme at Stanford University, USA. She has been involved in several national (NCN, NCBiR) and international research projects including EPSRC, FAST Healthcare Network Plus, DAAD, National Institutes of Health and NAWA Spinaker, Bekker programs. Prof. Jaworek has been awarded Bekker Fellowship to conduct research at the Stanford University, USA. Her main research interests focus on computer vision, data mining, artificial intelligence especially deep learning methods, anomaly detection as well as clustering. J. Jaworek has been awarded Honorable Mention Award during the CVPR'19 conference (ISIC workshop), MNiSW Scholarships for outstanding young scientists 2017-2020, and Individual award from the AGH-UST Rector for best publishing scientists.

**Martina Magnano** *Impact Strategist, Isola.Catania*

Graduated in International Relations, Martina Magnano is currently the Head of Institutional Relations and Impact Strategist in Isola Catania.  
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participatory citizenship and social entrepreneurship, she is specializing in building strategies with a positive social and environmental impact and in corporate reporting. For years he has been a volunteer in Legambiente Catania, working for the construction of a more welcoming and respectful urban ecosystem for people and animal and plant species.

**Nicola Mondello** *Innovation Manager, TIM Joint Open Lab WAVE*

Computer engineer and Innovation Manager with a passion for electronics and the world of the Internet of Things. In 2014 he began his work at TIM in the Joint Open Lab innovation sector, dealing with the creation of IoT solutions. Alongside academic Open Innovation, he also added entrepreneurial innovation by working in the world of TIM WCAP startup program. His vision is to be an enabler in the creation, integration and dissemination of innovative solutions that can benefit the community.

**Christian Mulder** *Department of Biological, Geological, and Environmental Sciences (DSBGA), University of Catania*

is full professor of Ecology and Rector's Delegate for the Climate Emergency at the University of Catania. Previously Principal Research Scientist at the Dutch Laboratory for Ecotoxicology, he still focuses on the roles of microbes, plants and soil invertebrates as monitor, motor and moderator of environmental changes, embracing the subtle interplay between landscape ecology and sustainability, up to statistical and ecological improvements in global change modelling. For three years he was the Royal Delegate of the Kingdom of The Netherlands at the United Nations (UN-IPBES). His goal is the refinement of diagnostic and prognostic parameters in the ecological modelling of soil systems to be used in trophic stress and resilience studies.

**Emanuele Rapisarda** *Senior Coach and Facilitator*

Graduated in Psychological Sciences and Techniques at the University of Catania with honors, he continued his training specializing in the dynamics of evolution of human systems, and is today Certified Facilitator of LEGO® SERIOUS PLAY® Method and Materials under the training of the Association of Master Trainers, and Certified and authorized host of the process of the Warm Data Lab under the training of the International Bateson Institute. In addition to consultancy and training as a freelancer, he collaborates with Cocoon Pro in the field of project management, planning and facilitation in organizational evolution paths, team development, coaching, research and development of innovation tools and processes; and with Skill Factor Academy & Talent Lab as Head of Team Building. He has followed strategic and organizational evolution projects for companies and institutions, such as: Unicredit, Leroy Merlin, United Nations Development Program, Enel, Almalaurea, Pfizer and Sky. With regard to the topics that will be covered during the Summer School, he has brought these



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tools and concepts to various contexts, both nationally and internationally. In particular, the theme of Ecoism has been dealt with in conferences such as Better Management in Pisa (Italy), Talent Planet in Bucharest (Romania) and Agile India in Bangalore (India). As far as the LEGO® SERIOUS PLAY® methodology is concerned, Emanuele has to his credit over 50 workshops involving almost 1000 people.

**Jerzy Stefanowski** *Institute of Computing Science, Poznan University of Technology*

Jerzy Stefanowski is a full professor at the Institute of Computing Science, Poznan University of Technology. He received the Ph.D. and Habilitation degrees in computer science from this university. Since 2021 he has been elected as a corresponding member of Polish Academy of Sciences. Since 2022 he established and heads the new Machine Learning Lab at Poznan University of Technology. previously he was also a head of the other lab of intelligent decision support systems at the same university.

His research interests include data mining, machine learning and intelligent decision support. Major results are concerned with: ensemble classifiers, learning from class-imbalanced data, online learning from evolving data streams, explainable AI, induction of various types of rules, data preprocessing, generalizations of rough set theory, descriptive clustering of texts and medical applications of data mining. He is an author or co-author of over 210 journal or conference papers. His paper are highly cited (he is listed among 10 best Polish researchers in Computer Science). He serves in numerous conference program committees and as a reviewer for many international journals.

Furthermore, he organized several workshops at international conferences or was a guest editor of 6 special issues in scientific journals. He received scientific awards from Foundation for Polish Science (for young researchers), Polish Ministry special awards and from the 4th Technical Sciences Division of Polish Academy of Sciences.

He was a visiting professor or researcher in several universities, mainly in France, Italy, Belgium, Spain and Germany. In addition to his research activities, he served in a number of organizational capacities: current vice-president of Polish Artificial Intelligence Society (vice-president since 2014); co-founder and co-leader of Polish Special Interest Group on Machine Learning, the Editor in Chief of Foundations of Computing and Decision Sciences.

**Rosaria Volpe**, *Department of Electrical, Electronic and Computer Engineering (DIEEI), University of Catania*

Graduated with honours in Management Engineering at the University of Catania. In 2018, she obtained her Ph.D. in "Systems, Energy, Computer and Telecommunications Engineering". Post-Doctoral Fellow at the University of Catania for the development of energy models for the efficient use of renewable sources in urban areas. From 2019, she is Assistant Professor in Energetics, Applied Thermodynamics and Heat Transfer at the University of Catania. In 2020 she was Visiting Researcher at the University of the



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Basque Country UPV/EHU, Biorefinery Processes (BIORP), San Sebastian – Eibar, Spain, where she dealt with the experimental study of biochemical, elementary composition, thermogravimetric analysis and decomposition of residual biomass during a pyrolysis process. She participated to several national and European projects and is now Leader of the Subtask C “Organizing principles and impact assessment” of the International Energy Agency (IEA), under the Energy Buildings and Communities (EBC) program, Annex 83 “Positive Energy Districts”. She is Member of the Editorial Board of several indexed Journals and co-authored studies on renewable energy, energy efficiency, energy monitoring and control, optimization models for energy exchanges in urban areas, biomass exploitation, computational fluid dynamics, carbon capture and storage. She participated to several international conferences, also as Member of the Organizing and Scientific Committee and Chair. She was General Chair, Host and Organizer of the Second Ph.D. Summer School on “Principles of energy system modelling for Positive Energy Districts”, held in Catania, 12-16 June, 2023. She is Leader of Subtask C in the IEA EBC Annex 83, where the sustainability assessment is declined for positive energy districts. She coordinated researches dedicated to the ISO 50001 on energy management and control strategies.