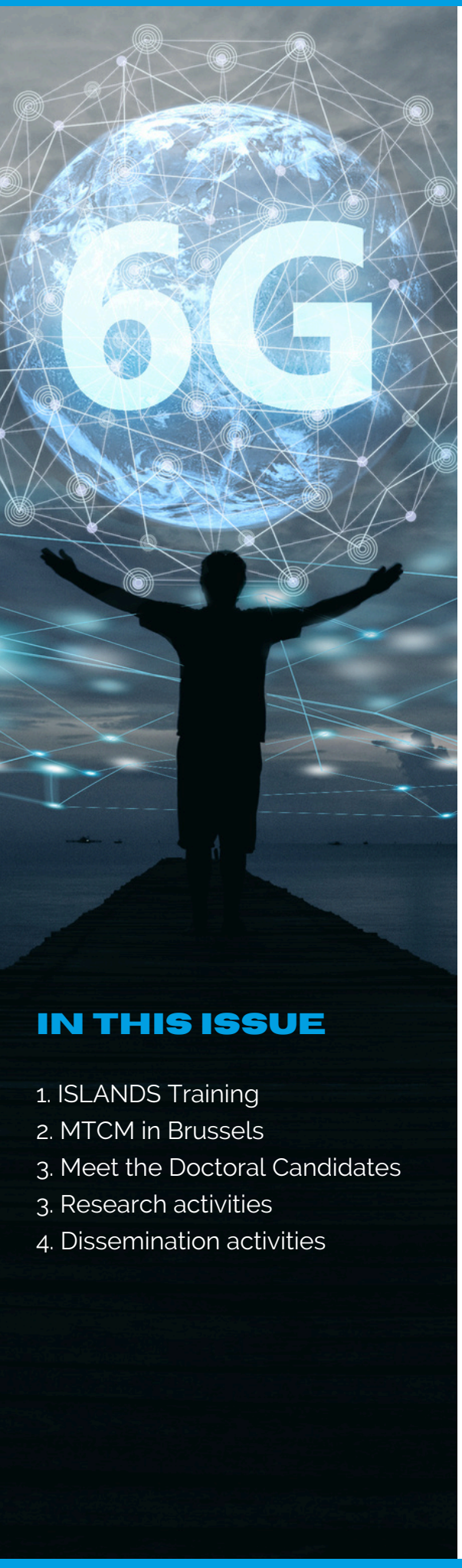


ISLANDS
MSCA DOCTORAL NETWORK

PROJECT NEWSLETTER

In this newsletter, we will keep you informed about our progress, milestones, and the people driving this project forward. From groundbreaking research to exciting real-world applications, we invite you to join us on this exciting venture as we shape the future of sensing communication and 6G wireless.

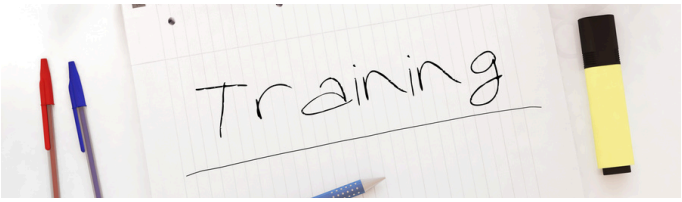
IN THIS ISSUE

PROJECT DATA

This project has received funding from the European Union Horizon Europe (HORIZON) Marie Skłodowska-Curie Actions Doctoral Networks (MSCA-DN).

Project acronym: ISLANDS
Call: HORIZON-MSCA-2022-DN-01
Topic: HORIZON-MSCA-2022-DN-01-01
Type of action: HORIZON TMA MSCA Doctoral Networks
GA Number: 101120544
Coordinator: CNIT (Consorzio Nazionale Interuniversitario per le Telecomunicazioni)
Coordinator person: Dr. Stefano Buzzi
Project starting date: Jan 2024
Project duration: 48 months

Funded by
the European Union



ISLANDS TRAINING

Training objectives

Alongside the research objectives, ISLANDS has the following main training objectives for the DCs:

Training Objective A: Providing a solid understanding of ISAC technologies, 6G, and CAM, from the fundamentals to the algorithmic, and to the practical experimental aspects, encompassing a large number of different disciplines.

Training Objective B: Providing inter-sectoral experience, with training on both theoretical and applied research, as well as in standardization procedures, and the creation of intellectual property rights.

Training Objective C: Providing transferable skills training, (project management, entrepreneurship, gender issues, exploitation and dissemination of results, organization of outreach events, forming collaborations, etc.).

ISLANDS is the first training program focusing on 6G ISAC technologies for the automotive sector, spanning all related facets, from the fundamentals, to the algorithmic, to the practical experimental aspects.

In particular, in addition to specific one-day workshops, dissemination day and final conference, some Schools and Complementary courses will be organized. Schools, delivered by experts from industry/academia on specific topics of the project, will be organized to give to the DCs the time to learn and use the material for their individual project, while Complementary courses supplement those offered in academia.

Up to now, 2 complementary courses and 2 doctoral schools have been held, as specified below.

COMPLEMENTARY COURSES

Gender and underrepresented minorities issues

Title of the course: Gender and underrepresented minorities issues
Lead Organizer: CHAL
Date: May, 21-27, 2025
Instructor: Dr. Petros Bouchoris

Dr. Petros Bouchoris is an academic teacher and executive with rich international professional experience in marketing management, business development & brand management. He has a rich experience in training executives from all over the world in an online and offline environment through his collaboration with EU Business School, and City Unity College.

Course Overview

The course provided training for PhD candidates selected under the ISLANDS project on gender and minority issues in scientific research. Throughout the sessions, participants explored key factors that limit the involvement of underrepresented groups in science, learned practical strategies to address these challenges, and developed skills to organize inclusive public engagement events. The program highlighted how adopting a gender- and minority-inclusive approach not only enhances the quality of scientific research but also increases the impact and market reach of scientific outcomes.

Outline

1. Introduction to research and insight; Defining the research problem and developing a research approach; Research design
2. Secondary data collection and analysis; Internal secondary data and analytics
3. Primary data collection; issues in representing genders and minorities; Issues in Qualitative research; Emotion response by gender
4. Issues in Quantitative research; Sampling design and procedures: Representation of underrepresented minorities; Social Media research
5. Data integrity; Communicating research findings; Research ethics, privacy and trust; Limitations of research.

Scientific writing and presentation skills

Title of the course: Scientific writing and presentation skills
Lead Organizer: CNIT in collaboration with MSCA Doctoral Network INTEGRATE
Date: July, 01-03, 2025
Venue: Electronic and Telecommunications Department Politecnico di Torino

The course on Scientific Writing and Presentation Skills, held within the ISLANDS project, offered PhD candidates intensive training on how to communicate their research effectively. Over three days, participants refined their ability to produce well-structured and clear scientific texts, explored strategies for writing impactful articles and reports, and practiced techniques for delivering engaging and professional presentations. By combining practical exercises with expert guidance, the course highlighted how strong communication skills are key to increasing the visibility and impact of scientific results.

Program

1. How to make a technical presentation - A. Zappone, CNIT & University of Cassino and Southern Lazio
2. Introduction & How to write a technical paper - A. Zappone, CNIT & University of Cassino and Southern Lazio
3. How to write a technical paper - M. Di Renzo, CentraleSupelec
4. Interactive examples of technical presentations A. - Zappone CNIT & University of Cassino and Southern Lazio & M. Di Renzo, CentraleSupelec
5. Introduction & Interactive examples of technical paper writing - A. Zappone, CNIT & University of Cassino and Southern Lazio

SCHOOLS

Doctoral School 1 and 2

Title of the course: Schools 1 and 2
Lead Organizer: CNIT in collaboration with MSCA Doctoral Network INTEGRATE
Date: June, 21-27, 2025 and July, 1-3, 2025
Venue: University of Cassino and Lazio Meridionale, Italy

The first two Doctoral Schools of the ISLANDS project were held at the University of Cassino and Southern Lazio in June and July 2025. Organized by CNIT in collaboration with the INTEGRATE MSCA Doctoral Network, they provided PhD candidates with a week-long intensive training on wireless communications, sensing, and 6G technologies. Through expert-led lectures—spanning topics from MIMO communications to coherent imaging and radar detection—hands-on sessions, and networking events, participants deepened their theoretical knowledge and practical skills. The schools also included online modules, accessible to all participants, offering additional resources and recorded talks to consolidate the training experience.

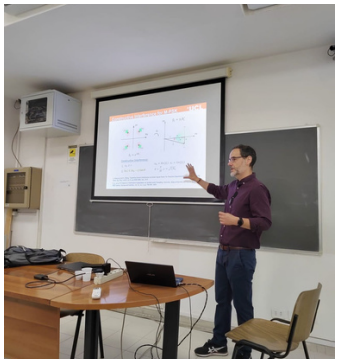
Program

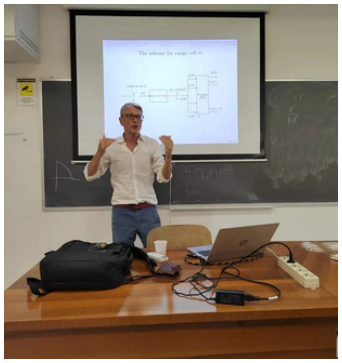
1. Fundamentals of MIMO Communications Stefano Buzzi (UNICAS/CNIT)
2. Enabling Technologies for Next Generation Terrestrial and Non-Terrestrial Networks - Constantinos Papadias (ACG-RC)
3. A Vision on Commercial 6G - David Lopez Pérez (UPV)
4. Cellular/5G Positioning: Fundamentals and Recent Advances - Jukka Talvitie (TAU)
5. Fundamentals of Radar Detection - Marco Lops (UNINA/CNIT)
6. Fundamentals of Optimization for Sensing and Communications - Alessio Zappone (UNICAS/CNIT)
7. Sustainable Networks for 6G and Beyond: What Signal Processing Can Do - Christos Masouros (UCL)
8. Matlab-based Implementation of Optimization Problems - Sergi Liesegang (Postdoc @ UNICAS)
9. Introduction to Advanced Cell-Free MIMO Deployments - Giovanni Interdonato (UNICAS/CNIT)
10. Status of V2X Communications in 3GPP - Harounabadi Mehdi (BOSCH)

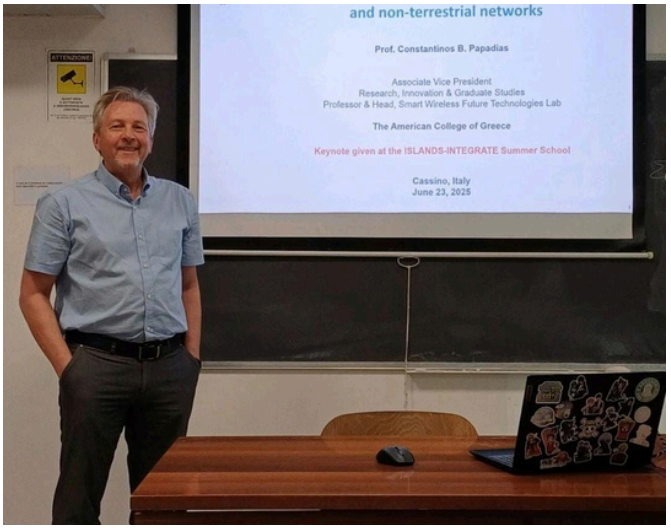
Online lectures

1. Introduction to Estimation Theory - Henk Wymeersch (CHALMERS)
2. From localization to coherent imaging: fundamentals, methods and challenges on the road to 6G - Dario Tagliaferri (POLIMI/CNIT)

PHOTO GALLERY







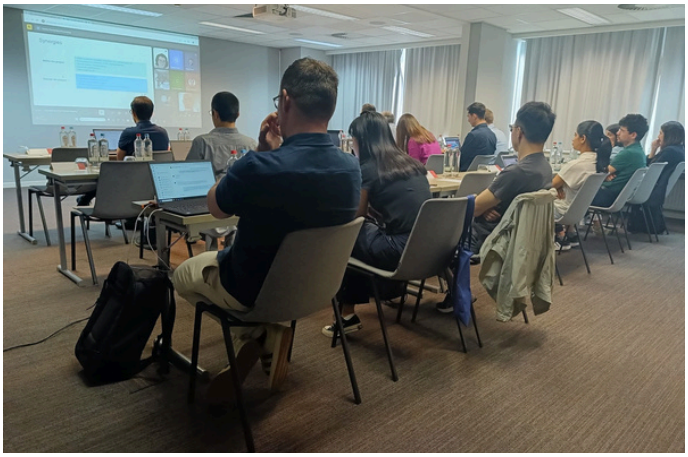
MID TERM CHECK MEETING IN BRUSSELS

On June 17, 2025, the ISLANDS project reached a significant milestone with the successful completion of its **Mid-Term Check (MTC) Meeting** in Brussels. The event brought together for the first time in person all the project's **doctoral candidates**, their **academic supervisors**, members of the **project management team**, and the **Project Officer** from the European Research Executive Agency (REA).

The meeting was hosted at the **NH Collection Brussels Centre**, organized by CNIT and coordinated by the General Coordinator Dr. Stefano Buzzi, and served as an important moment of reflection and exchange. Each fellow had the opportunity to **introduce themselves**, present the **background and objectives of their individual research projects**, and share their **experiences** within the ISLANDS network so far. The Project Officer provided valuable feedback and highlighted the importance of the fellows' training, supervision, and professional development under the **Marie Skłodowska-Curie Actions (MSCA)** framework. The day before the meeting, a **welcome dinner** was organized at the traditional Belgian restaurant **Het Kelderke** in the beautiful Grand Place, giving everyone the chance to meet in a more informal setting. The dinner fostered a sense of community and strengthened the bonds among the researchers and supervisors.

The Mid-Term Check was not only an administrative checkpoint, but also an opportunity to celebrate the progress made by the consortium and the motivation, creativity, and scientific curiosity demonstrated by our early-stage researchers. The fellows' presentations showcased the **diversity and richness of the interdisciplinary approaches** being pursued within ISLANDS, and their commitment to advancing research in their respective fields.

We are proud of the work accomplished so far and excited to support our fellows as they continue their academic journey. The MTC meeting has energized the entire network, and we look forward to the many achievements that lie ahead.



MEET THE DOCTORAL CANDIDATES

Here, you can learn more about the individuals driving cutting-edge research in our network, their backgrounds, and their contributions to advancing the goals of the project. Our diverse and dynamic team brings together expertise and innovation to address the challenges and opportunities of the future. Explore their profiles to discover the passion and dedication behind ISLANDS!

Mehri Nikzad

Host Institution: CNIT
Ph.D. Enrollment: UNICLAM
Supervisor: Dr. Luca Venturino
Name: Mehri
Surname: Nikzad
Nationality: Iranian
Birthday: 1995-08-27

Project Title
Automotive radar-centric ISAC system design

She was born in Iran. She received her B.Sc. degree in Electrical Engineering from the University of Tabriz and her M.Sc. degree in Telecommunication Engineering from the University of Tehran in 2021. Her master's thesis focused on hybrid beamforming with low-resolution phase shifters, using deep learning to optimize a dynamic subarray architecture. By estimating precoder weights through a CNN-based approach, the system improved robustness under varying channel conditions and outperformed traditional beamforming methods in both efficiency and performance.
Currently, Mehri is a Ph.D. candidate in the ISLANDS Doctoral Network, hosted at CNIT's Research Unit in Cassino, Italy. She is working under the supervision of Prof. Luca Venturino. Her research focuses on radar-centric Integrated Sensing and Communication (ISAC) systems in vehicular environments.
Her research interests include wireless communications, machine learning, positioning in vehicular networks, and integrated sensing and communication.

Maryam Darabi

Host Institution: CNIT
Ph.D. Enrollment: UNICLAM
Supervisor: Dr. Stefano Buzzi
Name: Maryam
Surname: Darabi
Nationality: Iranian
Birthday: 1993-06-20

Project Title
Distributed cell-free vehicle-centric architectures for joint communications and sensing

She was born in Eslamabad Gharb, Iran. She received the B.E. degree in electrical engineering from Razi University, Kermanshah, Iran, in 2016 and the M.S. degree in telecommunication engineering from Shiraz University, Shiraz, Iran, in 2021. She is currently pursuing the Ph.D. degree with the Department of Electrical and Information Engineering, University of Cassino and Southern Lazio, Cassino, Italy, where she is supervised by Dr Stefano Buzzi. Her research interests include 6G networks, joint communications and sensing, machine learning and vehicular environments.

Ahmed Elloumi

Host Institution: CNIT
Ph.D. Enrollment: UNICLAM
Supervisor: Dr. Stefano Buzzi
Name: Ahmed
Surname: Elloumi
Nationality: Tunisian
Birthday: 2000-07-06

Project Title
ISAC in vehicular environments using holographic/XL-MIMO antennas

He was born in Tunisia in 2000, is an ICT Engineer specialized in Machine Learning. He graduated from the Higher School of Communications of Tunis (SUP'COM) in 2024, where he carried out numerous projects and research in AI and telecommunications, gaining experience in data engineering and AI-driven network optimization. After graduation, he worked as a Radio Frequency and Data Engineer at Huawei. Currently, he is a PhD student in the ISLANDS doctoral network, conducting research under the supervision of Prof. Stefano Buzzi.

Arya Kanathil Meethal

Host Institution: WUP
Ph.D. Enrollment: UNISI
Supervisor: Dr. Cristian Della Giovampaola
Name: Arya
Surname: Kanathil Meethal
Nationality: Indian
Birthday: 1999-01-11

Project Title

Beam steering metasurface-based vehicular antenna with single reconfigurability parameter

She was born in Kozhikode, India. She received her Bachelor's and Master's degrees in Physics from Government Arts and Science College, Calicut, and Government Victoria College, Palakkad, under the University of Calicut, Kerala, India, in 2019 and 2021, respectively. She previously worked as a Project Associate in the Centre for Electromagnetics division at CSIR–National Aerospace Laboratories, Bangalore, India. She is currently part of the ISLAND project, funded by the European Union's Horizon Europe Marie Skłodowska-Curie Actions Doctoral Networks, working at Wave Up s.r.l., Siena, Italy. She is also enrolled as a Ph.D. student in the Department of Information Engineering and Mathematical Sciences (DIISM) at the University of Siena.

DISSEMINATION ACTIVITIES

The ISLANDS dissemination strategy aims to ensure a significant impact on society, technological innovation, and the advancement of research in sustainable communication networks. Dissemination activities focus on sharing the scientific and technological knowledge generated within the project with a wide audience and targeted stakeholders. These activities highlight how the project's findings can be utilized to drive innovation and foster collaboration among academic, industrial, and policy-making communities.

ISLANDS activities and results are presented and promoted within the scientific community through: (i) publications in top-tier journals; (ii) presentations of results within major international conferences; (iii) participation and organization of dedicated workshops and public events; and (iv) uploading in open access repositories of research data and products (numerical databases and source codes). Below is the list of papers produced so far within the ISLANDS project in the last months.

Paper

P. Tosi, S. Schieler, M. Henninger, S. Semper, S. Mandelli, "Benchmarking CFAR and CNN-based Peak Detection Algorithms in ISAC under Hardware Impairments", [Submitted on 16 May 2025 (v1), last revised 21 May 2025 (this version, v2)], https://doi.org/10.48550/arXiv.2505.10969

In the next issue

The next issue will contain a description of the further training and dissemination activities carried out within the ISLANDS project.

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