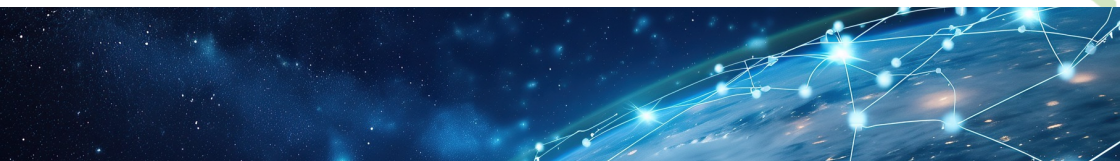




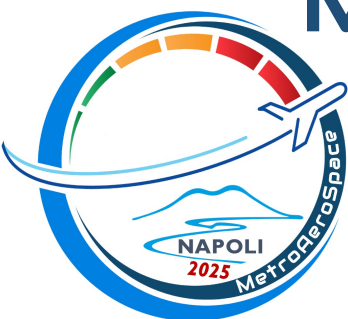
IEEE



2025 IEEE INTERNATIONAL WORKSHOP ON

Metrology For AeroSpace

NAPLES, ITALY - JUNE 18-20, 2025



[FINAL PROGRAM]

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Welcome Message from the General Chairs

On behalf of the Organizing Committee, we welcome you to the 2025 IEEE International Workshop on Metrology for AeroSpace (MetroAeroSpace). We are proud to highlight that this edition marks the 12th anniversary of the conference. Year by year MetroAeroSpace gain the position of the leading scientific event into field of measurement and instrumentation for aerospace. This result was achieved thanks to the efforts of the organizers of the previous editions and the colleagues that joint year by year the conference increasing the attendee number and spread information about it.

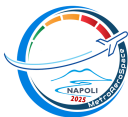
Since the first edition, MetroAeroSpace represents the international meeting place in the world of research in the field of measurement and instrumentation for aerospace involving institutions and academia in a discussion on the state-of-the-art concerning issues that require a joint approach by experts of measurement, instrumentation and industrial testing, typically professional engineers, and experts in innovation metrology, typically academics. The increasing number of scientists attending MetroAeroSpace and coming from fields, that can be very far from engineering, led to a positive hybridization of the workshop.

This 12th edition is organized at the University of Naples “*Federico II*”, the oldest public University in the World. Due to the COVID-19 outbreak, the 2021 MetroAeroSpace edition was not held in Naples and there was an effort by the Organizing Committee to prepare a virtual conference. This year, this edition moves back to Naples in presence, and it is organized at *Conference Centre of the University of Naples Federico II* - Via Partenope, 36 - Naples, Italy. The Congress Venue is located in the heart of Naples and overlooking the Gulf of Naples, near Castel dell'Ovo. Thus, we are really glad to welcome you to the historic and beautiful Naples.

As usual, this MetroAeroSpace edition will keep pursuing the state of the art and practice started over the past years. Attention is paid, but not limited to, new technology for metrology-assisted production in the aerospace industry, aircraft component measurement, sensors and associated signal conditioning for aerospace, and calibration methods for electronic test and measurement for aerospace.

MetroAeroSpace organization was a challenging task due to the large and increasing interest of our research and application areas. Efforts from many people were required to shape the technical program, arrange accommodation, manage the administrative aspects, and set up the social functions. We like to take this opportunity to thank all and each of them. We like also to thank the public and private organizations that supported the meeting in different ways. Special thanks go to **Athena Srl** for their day-by-day collaboration and precious support in the many complex details of the conference.

The MetroAeroSpace Technical Program consists of three keynote speeches, 26 technical oral sessions scheduled over three days, 2 poster sessions, and 3 parallel events. Among the oral sessions, we received the proposal of up to **20 Special Sessions** and we wish to thank the organizers of these Special Sessions for their cooperation and support to the Workshop organization. With the wide range of technical sessions covering the many fields of metrology



for aerospace, we are happy to welcome you to the variety of technical presentations that await you this year. Thanks to all of the Technical Program Committee members and the reviewers who have contributed to make this outstanding program possible.

We received 205 extended abstracts from all over the world. All contributions were peer-reviewed after a painstaking activity of the program committee and additional reviewers and acceptance was based on quality, originality and relevance. Due to the time limits of the workshop, only 164 papers have been selected. We like to thank all people who contributed to this review process with opinions, comments, and suggestions to choose the best papers and even improve their quality. After the workshop, accepted and presented papers will be submitted for inclusion into *IEEE Xplore Digital Library*.

As already mentioned, the technical program encompasses several events and activities. This year particular attention is paid to space. The keynote speeches will be held by experts in the field of metrology for aerospace.

- Claudio Gabellini, Italian Air Force Lieutenant General (retired) will present: *Space Situational Awareness: protecting our present and enabling our future*,
- Pascual Campoy, Centre of Automation & Robotics (CAR) - Universidad Politecnica de Madrid, Spain, will discuss about *Vision on Board the Drones*,
- Francesco Carlo Morabito, AI_Lab, University "Mediterranea" of Reggio Calabria, Italy, will deal with *Martian Images Segmentation and Classification through Green AI*.

We are honored to have them as plenary speakers and thank them in advance for coming to our conference to share their knowledge and experiences with us.

This edition of the Workshop also includes:

- A series of initiatives managed by Giovanni Savoldelli, Italian Air Force Gen. Pil. (retired) and Chair of AFCEA Chapter Naples on *Space economy and Human space exploration*. These initiatives include Claudio Gabellini's presentation, followed by the presentations of Col. Luigi Riggio, Italian Air Force *Italian Space policy way ahead: the Space economy law and the Government guidelines*. After these presentations a Round Table with Panelists: Vittorio Ancona, *Thales Alenia Space*, Pietro Ferraro, *National Research Council*, Barbara Negri, *Italian Space Agency*, Paola Verde, *Italian Air Force*, Caterina Bortolini, *Cyber&Space Rheinmetall*, Giancarlo De Viti, *Monitoring Systems srl*, Pier Luca Maffettone, *University of Naples Federico II*, will end these initiatives.
- Special Track: *Concepts and Technologies for Next-generation Integrated Terrestrial–Non-Terrestrial Networks (CONNECT)*, organized by: Claudio Sacchi, University of Trento, Italy and Alessandro Guidotti, CNIT Research Unit of Bologna, Italy. CONNECT track aims at collecting scientific contributions dealing with the latest developments of non-terrestrial networks (NTNs).
- Panel on *5G Technology for Air Mobility* organized by Italy Section WiE Affinity Group. In line with the objectives of the WiE Commitment Chart "*Steering girls to STEM*" the purpose of the panel is to promote female models who are role models and who carry

out mentoring activities towards young minds in this emerging field. The panel is chaired by Claudia Conte, WIE Volunteer.

These events give more opportunities to contact Institutions and experts operating in different fields of *Metrology for AeroSpace*.

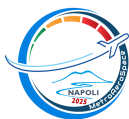
Several Awards offered by International Institution and Companies will be assigned, in particular to young researchers. The best contributions will be awarded, including the “*Best Conference Paper Award*”, dedicated to the memory of Prof. Stefano Debei whose passion, enthusiasm, and commitment for science will be of inspiration for all the recipients of this prize. The award celebrates his role as founding father of IEEE MetroAeroSpace Conference and emphasizes his role as inspirational educator and mentor with an immense influence on the careers of many generations of young researchers. Further awards will be offered for the “*Best Paper Presented by a Young Researcher*”, the “*Best Paper Presented by a Woman*”, the “*Best Poster Award*”, and the “*Best Paper Special Track*”, this last recognizes the best paper presented during the Special Track “*Concepts and Technologies for Next-generation Integrated Terrestrial–Non-Terrestrial Networks (CONNECT)*”. The Award is promoted by RESTART Foundation.

Enjoy the fellowship of colleagues and experts and spend some free time in the midst of natural and artistic beauty. We will appreciate your important feedback on the conference organization that represents for us the best way to improve the quality of the Workshop, and to achieve lasting excellence.

It is therefore with great honor and pride that we welcome you to Naples, Italy, and to the 12th International Workshop on Metrology for AeroSpace, 2025. We hope that you enjoy both your participation in the conference and your stay in Naples.

Domenico Accardo, University of Naples Federico II, Italy
Leopoldo Angrisani, University of Naples Federico II, Italy
Pasquale Daponte, University of Sannio, Italy
Robert Rassa, Raytheon, US

IEEE MetroAeroSpace 2025 General Chairs



IEEE MetroAeroSpace 2025 Committee

HONORARY CHAIR

Marina Ruggieri, University of Rome "Tor Vergata", Italy

GENERAL CHAIRS

Domenico Accardo, University of Naples Federico II, Italy

Leopoldo Angrisani, University of Naples Federico II, Italy

Pasquale Daponte, University of Sannio, Italy

Robert Rassa, Raytheon, US

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Claudia Conte, University of Naples Federico II, Italy

Alfonso Farina, Selex-ES (retired), Rome, Italy

David Martín Gómez, Carlos III University of Madrid, Spain

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TREASURER

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Lorenzo Ciani, University of Florence, Italy

Marcello Coradini, ASI/JPL

Walter Cugno, Thales Alenia Space

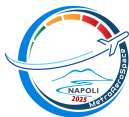
Gino Dardanelli, University of Palermo, Italy

Hubert Dębski, Lublin University of Technology, Poland

Murat Efe, Ankara University, Turkey

Giancarlo Ferrara, EUROCONTROL Innovation Hub

Pietro Ferraro, ISASI-CNR, Italy
Larry Fineberg, Embry Riddle Aeronautical University, US
Jesus Garcia, University Carlos III, Spain
Domenico Giunta, ESA - ESTEC, Netherlands
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Pasquale Longobardi, Swiss Federal Institute of Technology Lausanne, Switzerland
Andrzej Łukasiewicz, Białystok University of Technology, Poland
Karin Lundmark, ESA
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Walter Matta, Vitrociset, Italy
Dariusz Mika, The University College of Applied Sciences, Chełm, Poland
Daniele Mortari, Texas A&M University, US
Aldo Napoli, Centre de reserche sur les Risques, France
Felix Opitz, Airbus Defence & Space
Roberto Orosei, INAF, Italy
Pavel Paces, Czech Technical University, Czech
Mirosław Pajor, West Pomeranian University of Technology in Szczecin, Poland
Jacek Pieniążek, Rzeszów University of Technology, Poland
Marco Pisani, INRIM, Italy
Antonio J. Plaza, University of Extremadura, Spain
Małgorzata Poniątkowska, Białystok University of Technology, Poland
Mariagabriella Pugliese, University of Naples Federico II, Italy
William Prosser, NASA, US
Helena G. Ramos, Universidade de Lisboa, Portugal
Artur L. Ribeiro, Universidade de Lisboa, Portugal
Roberto Sabatini, RMIT University, Australia
Alessandro Sebastianelli, European Space Agency
Jacek Semaniak, Central Office of Measures, Warsaw, Poland
Jarosław Sęp, Rzeszów University of Technology, Rzeszów, Poland
Sanjiv Sharma, ECONSCIENCE-H2
Zbigniew Siemiątkowski, Casimir Pulaski Radom University, Poland
Nicolas Sklavos, University of Patras, Hellas
Jerzy Śladek, Kraków University of Technology, Poland
Cosimo Stallo, Moonlight/LCNS Navigation Principal System Engineer, ESA



Ephraim Suhir, Portland State University, US
Arkadiusz Tofil, The University College of Applied Sciences, Chełm, Poland
Silvia Liberata Ullo, University of Sannio, Italy
Fabrizio Francesco Vinaccia, MDBA Italia, Italy
Stefano Vitale, University of Trento, Italy
Wojciech Walendziuk, Białystok University of Technology, Poland
Mirosław Wendeker, Lublin University of Technology, Poland
Michał Wieczorowski, Poznań University of Technology, Poland
Graham Wild, RMIT University, Australia
Adam Woźniak, Warsaw University of Technology, Poland
Ruqiang Yan, P.R. China
Ho-Soon Yang, KRISS, Republic of Korea
Mark Yeary, University of Oklahoma, US
Magdalena Zawada - Michałowska, Lublin University of Technology, Poland
David Zucconi, SAB Aerospace, Italy

IEEE MetroAeroSpace 2025 Keynote Speakers

Plenary Session - Wednesday June 18 - H 14:20



Space Situational Awareness: protecting our present and enabling our future

Claudio Gabellini

Italian Air Force

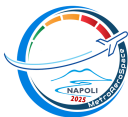
ABSTRACT

The increasing reliance on space-based services has made Space Situational Awareness (SSA) an indispensable component of modern society. From global communications and precision navigation to defense and economic activities, space assets play a vital role in ensuring stability and progress. However, the rapid expansion of space operations, the growing number of state and private actors, and the rising risks—both natural and intentional—have transformed space from an open frontier into a highly contested and congested domain.

This presentation will explore the evolution of space as a warfighting domain, driven by military, economic, and technological competition. The unchecked proliferation of space objects, coupled with growing threats such as orbital congestion, space debris, satellite collisions, and the development of anti-satellite (ASAT) weapons, underscores the urgent need for effective SSA capabilities. Beyond safeguarding critical infrastructure, SSA serves as a cornerstone for space security, economic sustainability, and the safe operation of commercial and government assets in orbit.

A key focus of this discussion will be the current state of SSA capabilities, highlighting Italy's capability through its active C-SSA center at Poggio Renatico Air Base. While this facility provides crucial support to national and allied space operations however, gaps in international cooperation and the absence of a comprehensive legal framework still pose significant challenges.

The role of emerging technologies in enhancing SSA will also be addressed, including the increased need for artificial intelligence, big data analytics, and global sensor networks. These innovations enable improved tracking, prediction accuracy, and orbital servicing, as well as active debris removal and enhanced protection of space assets. By harnessing these capabilities, the global space community can move toward a more resilient and secure orbital environment.



As we navigate the complexities of this rapidly evolving domain, SSA will not only be essential for mitigating threats and ensuring operational stability but also for shaping a sustainable future in space. Protecting our present capabilities is the key to enabling new opportunities and securing the next era of human activities beyond Earth.

SPEAKER BIOGRAPHY

Lieutenant General **Claudio Gabellini** is a retired senior officer of the Italian Air Force. After earning his pilot wings on the G.91T jet, he began his career as an instructor on the MB339A trainer, later serving as an operational pilot on the F-104 Starfighter and PA200 Tornado IDS. He held command positions at all levels, including Squadron and Wing Commander, Director of Operations, and Chief of Staff at the Air Force Command in Rome. He was the first Italian officer to serve as Chief of Staff at NATO's Allied Air Command in Ramstein, Germany.

From 2019 to 2024, he commanded the Italian Air and Space Operations Command, responsible for protecting Italian national airspace and for all operational activities of the Italian Air Force worldwide among which, operation “Aquila Omnia”, the successful evacuation of Afghan civilians from Kabul in 2021, and G7 meeting in Borgo Egnazia in 2024, are worth to be mentioned.

Lt. Gen. Gabellini took part in numerous military operations, including those in the Balkans and Libya. Notably, during the 2011 Libya campaign, he served aboard the USS Mount Whitney under Operation Odyssey Dawn, and later as Chief of Targeting at the Combined Joint Task Force – Unified Protector in Naples. With over 2,700 flight hours mainly on fast jets (MB339, G.91T, F-104, Tornado IDS/ECR), he is now actively engaged in academic and strategic consulting, focusing on modern Command and Control, the legal aspects of the use of deadly force, and the role of airpower in contemporary conflicts.

Plenary Session - Thursday June 19 - H 11:00



Vision on Board the Drones

Pascual Campoy

Centre of Automation & Robotics (CAR)

Universidad Politécnica de Madrid, Spain

ABSTRACT

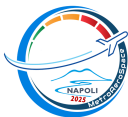
A large part of our cerebral cortex is dedicated to visual processing, but our sensors must be carried on our faces. What if we could have eyes in the air, flying, many of them, and interpreting what we see? This is what new drone technologies offer us, with onboard cameras and real-time intelligent interpretation of the environment.

This real-time visual interpretation of the environment enables the drone to achieve the autonomy necessary to carry out complex missions and perform maneuvers in relation to its immediate surroundings, positioning itself where needed to acquire information. This information can be transmitted to the ground for real-time decision-making, while at the same time, a large amount of information - both visual and from other sensors - can be stored onboard for later processing and interpretation on the ground.

This talk provides a general overview of the various technologies involved in carrying out autonomous drone missions using onboard sensors, with a particular focus on Intelligent Image Interpretation. It will showcase different industrial applications developed by the Research Group in Computer Vision and Aerial Robotics at the Center for Automation and Robotics (CSIC-UPM), as well as the current scientific and technological challenges faced by the international scientific community.

SPEAKER BIOGRAPHY

Pascual Campoy is Full Professor on Automatics at the Universidad Politécnica Madrid UPM (Spain) where he lectures on Control, Machine Learning and Computer Vision. He has been visiting professor at DCSC Department in TUDelft (The Netherlands) from 2014 to 2019, and previously visiting professor at Tong Ji University (Shanghai-China) in 2013 and in Q.U.T. (Australia) 2011. He received his PhD in Automatics & Robotics at Universidad Politécnica Madrid in 1988, where he previously received his Master title in Automatics Engineering in 1983.



He is leading the Research Group on “Computer Vision and Aerial Robotics” at U.P.M. within the Centre of Automatics and Robotics (C.A.R.), whose activities are aimed at increasing the autonomy of the Unmanned Aerial Vehicles (UAV) by exploiting the powerful sensor of Vision, using cutting-edge technologies in Image Processing, Control and Machine Learning.

He has been heading director of over 50 R&D projects, including R&D European projects, national R&D projects and over 30 technological transfer projects directly contracted with the industry. He is author of around 200 international scientific publications and nine patents, three of them registered internationally. He is awarded in the top international UAV competitions: IMAV12, IMAV13, IARC14, IMAV16 and IMAV17, General Chair for IMAV 2019, coordinator of the international team awarded with the third place at the Grand Challenge MBZIRC20, as well as RAMI-IROS22, ICUAS 22, IMAV 22 and ICUAS23.

Plenary Session - Friday June 20 - H 11:30



Martian Images Segmentation and Classification through Green AI

Francesco Carlo Morabito

University "Mediterranea" of Reggio Calabria, Italy

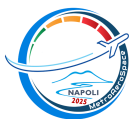
ABSTRACT

Artificial Intelligence (AI) approaches based on Machine and Deep Learning (ML/DL) are rapidly emerging in varied fields as a paradigm shift in solving complex problems. They are basically founded on huge data availability representing the phenomenon/process under analysis. From the data, that are supposed to include most of the relevant modes of the process, it is possible to extract pattern representative of what we are searching for. Once deployed on suitable hardware, this representation, alternative to the traditional model-based one, can be used to generalize on fresh data, potentially in real-time. However, the use of AI requires a systematic design in order to ensure efficiency, quality and reliability: this is particularly relevant in space applications (i.e. critical missions), where we need high performance coupled with trustworthiness and interpretability.

Recently, NASA's Perseverance Mars rover explored the surface of Mars by autonomously analyzing data to seek out and discover specific minerals in the rocks. It took autonomous decisions based on real-time analysis of rocks' composition.

In this talk, I will present a different application that aims to extract important information on the presence of specific objects in martian images. AI is trained on synthetic, augmented and real martian images to classify terrain characteristics (i.e., soil, rocks, sands, ...), by considering varied lighting conditions, inclination, texture and colors. Some Curiosity rover images are also analysed. The approaches here proposed are also designed to be energy-aware (Green-AI).

The presented methodological approaches and results are related to the project Standardizing Trustworthiness and Neural Development for AI (Stand4AI), funded by ASI, which we are developing in partnership with Thales Alenia Space Italia. The main objective here is to develop AI systems that can be space qualified in particular through the novel concept of explainability (xAI).



SPEAKER BIOGRAPHY

Francesco Carlo Morabito is a Full Professor (2001) of Electrical Engineering and Neural Engineering with the University “Mediterranea” of Reggio Calabria, Italy. He served there as Dean (Faculty of Engineering, 2001-2008), as President of the Courses in Electronic Engineering (1998) and Industrial Engineering (2015), as Vice-Rector for Internationalisation (2013-2022), and as Deputy Rector (2017-2018). He’s the founding Director of NeuroLab and AI_Lab, at DICEAM, UNIRC. He has authored or co-authored over 400 papers in international journals/conference proceedings in various fields of engineering (machine/deep learning, biomedical signal processing, radar data processing, nuclear fusion, nondestructive evaluation, artificial and computational intelligence). He has co-authored >25 intl. books (mostly focused on neural networks and machine learning) and held five international patents. Prof. Morabito is a Foreign Member for the Royal Academy of Doctors, Spain (2004-), a Foreign Member for the Royal Academy of Economic and Financial Sciences (RACEF, 2025-), a member of the Institute of Spain, Barcelona Economic Network (2017-). Senior Member of IEEE (2000), Life senior Member (2025-), and of INNS (2006). Governor of the International Neural Network Society (INNS), 2022-2024, and earlier for 12 years (2000-2012). President of INNS (2024-2026). He served as President of the Italian Network Network Society (SIREN), 2008-2014, and is co-chair of the Italian Conference on Neural Networks (WIRN). Editorial Board member for Neural Networks, International Journal of Neural Systems, and EiC for Artificial Intelligence in Neurology. He’s included since 2021 in the Top 2% researchers according to the University of Stanford/Elsevier database.

IEEE MetroAeroSpace 2025 Venue



IEEE MetroAeroSpace 2025 will be held at the **Conference Center of the University of Naples Federico II**.



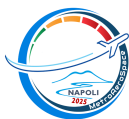
ADDRESS

Via Partenope, 36

Napoli

Use the QRCode to open the location on *Google Maps*





IEEE MetroAeroSpace 2025 Social Events

WELCOME PARTY

Wednesday June 18 - H 19:00

The IEEE MetroAeroSpace 2025 **Welcome Party** will be held at “*Galleria Navarra*” on Wednesday, June 18 - 19:00.

ADDRESS

Galleria Navarra ROSSOPOMODORO
Piazza dei Martiri, 23 - Napoli



GALA DINNER

Thursday June 19 - H 20:30

The IEEE TechDefense **Gala Dinner** will be held at “*La Bersagliera 1919*” Restaurant on Thursday, June 19 - 20:30.

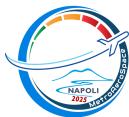
ADDRESS

Ristorante La Bersagliera 1919
Borgo Marinari, 10/11 - Napoli



IEEE MetroAeroSpace 2025 Patronages





IEEE MetroAeroSpace 2025 Sponsors



Program Schedule - Wednesday, June 18

WEDNESDAY - JUNE 18, 2025			
09:30 - 10:00	OPENING CEREMONY - WELCOME ADDRESSES		
	Aula Magna	Room A	Room B
10:00 - 11:20	S1.1 - General Track - PART I	S1.2 - Space based gravitational measurements: from the detection of Gravitational Waves to ultra-sensitive geodesy - PART I	S1.3 - The use of unmanned aerial vehicles for various sectors of the economy: problems and solutions
11:20 - 11:40	COFFEE BREAK		
11:40 - 13:00	S2.1 - Sensor Data Fusion for Aerospace Systems	S2.2 - Space based gravitational measurements: from the detection of Gravitational Waves to ultra-sensitive geodesy - PART II	S2.3 - General Track - PART II
13:00 - 14:15	LUNCH		
14:20 - 16:20	 Space economy and Human space exploration 	14:20 - 14:50 - KEYNOTE SPEAKER - Claudio Gabellini Space Situational Awareness: protecting our present and enabling our future	
		14:50 - 15:10 - Col. Luigi Riggio, Italian Air Force <i>Italian Space policy way ahead: the Space economy law and the Government guidelines</i> ROUND TABLE - Space Economy and Human Space Exploration Panellist: Vittorio Ancona, Thales Alenia Space Pietro Ferraro, National Research Council Barbara Negli, Italian Space Agency Paola Verde, Italian Air Force Caterina Bortolini, Cyber&Space Rheinmetall Giancarlo De Viti, Monitoring Systems srl Pier Luca Maffettone, University of Naples Federico II	
16:20 - 16:40	COFFEE BREAK		
	Aula Magna	Room A	Room B
16:40 - 18:20	S3.1 - Applied Metrology for Navigation and Precise Positioning in UAVs	S3.2 - Aerodynamic Measurement and Propulsion System Control of Aerial Vehicles	S3.3 - Aerospace systems monitoring through optical and innovative sensors networks
19:00	WELCOME PARTY - Galleria Navarra		

Program Schedule - Thursday, June 19

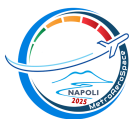
THURSDAY - JUNE 19, 2025			
	Aula Magna	Room A	Room B
09:00 - 10:40	S4.1 - Advances in measurements for autonomous space systems and for the development and testing of their subsystems	S4.2 - Special Track - Concepts and Technologies for Next-generation Integrated Terrestrial–Non-Terrestrial Networks (CONNECT) - PART I	S4.3 - Innovative technologies and solutions for Advanced Air Mobility and Urban Air Mobility
10:40 - 11:00	COFFEE BREAK		
11:00 - 11:40	KEYNOTE SPEAKER - Pascual Campoy Vision on Board the Drones		
11:40 - 13:00	S5.1 - Space To Space: Scientific and Technological Challenges for Human and Robotic Space Exploration - PART I	S5.2 - Special Track - Concepts and Technologies for Next-generation Integrated Terrestrial–Non-Terrestrial Networks (CONNECT) - PART II	S5.3 - Manufacturing and Metrology in the Aerospace Industry - PART I
13:00 - 14:20	LUNCH		
14:30 - 15:20	PANEL WIE - IEEE ITALY SECTION 5G Technology for Air Mobility	POSTER SESSION 1	
15:20 - 15:40	COFFEE BREAK		
	Aula Magna	Room A	Room B
15:40 - 17:20	S6.1 - Space To Space: Scientific and Technological Challenges for Human and Robotic Space Exploration - PART II	S6.2 - Special Track - Concepts and Technologies for Next-generation Integrated Terrestrial–Non-Terrestrial Networks (CONNECT) - PART III	S6.3 - Complex Systems Operational Availability: Measurements, Methodologies and Requirements
20:30	GALA DINNER - La Bersagliera Restaurant		

Program Schedule - Friday, June 20

FRIDAY - JUNE 20, 2025				
	Aula Magna	Room A	Room B	Room C
09:30 - 11:10	S7.1 - Structural Health Monitoring And Nondestructive Testing For Aerospace - PART I	S7.2 - Sustainable human space exploration: quantification and mitigation of radiation risk	S7.3 - Manufacturing and Metrology in the Aerospace Industry - PART II	S7.4 - Exploring GNSS: Precision Navigation and Timing Solutions for Aerospace Metrology
11:10 - 11:30	COFFEE BREAK			
11:30 - 12:10	KEYNOTE SPEAKER - Francesco Carlo Morabito Martian Images Segmentation and Classification through Green AI			
12:10 - 12:50	POSTER SESSION 2			
12:50 - 14:10	LUNCH			
	Aula Magna	Room A	Room B	Room C
14:10 - 15:50	S8.1 - Structural Health Monitoring And Nondestructive Testing For Aerospace - PART II	S8.2 - General Track - PART III	S8.3 - Metrology in Earth observation from aerospace	S8.4 - Space-Based Solutions for Global Challenges: Telemedicine, Earth Observation, and Sustainable Development in Remote Areas
15:50 - 16:10	COFFEE BREAK			
16:10 - 16:30	CLOSING AND AWARD CEREMONY			

Technical Program - Wednesday, June 18

09:00 - 18:00	Conference Center - University of Naples Federico II - Ground Floor REGISTRATIONS
09:30 - 10:00	Aula Magna - First Floor OPENING CEREMONY
10:00 - 11:20	Aula Magna - First Floor Session 1.1 - General Track - PART I Chair: Ioan Tudosa, <i>University of Sannio, Italy</i>
10:00	Applications of Galileo HAS to Maritime Buoys Francesco De Angelis, Alessandro Petrangeli and Giovanni B. Palmerini (Sapienza Università di Roma, Italy)
10:20	Lunar Lava-Tube Structures Characterization in Microwave Reverberating Environment Andrea Delfini (Sapienza University of Rome, Italy); Davide Micheli (Telecom Italia - TILAB, Italy); Roberto Pastore, Mario Marchetti, and Fabrizio Piergentili (Sapienza University of Rome, Italy); Marco Costanzi (TiFast srl, Italy)
10:40	Development of an Integrated System for Screening and Testing of Electrochemical Cells for CubeSats Alexander Solís Quesada (Instituto Tecnológico de Costa Rica, Costa Rica); Jesus Gonzalez-Llorente (École de Technologie Supérieure, Canada); Juan J. Rojas (Instituto Tecnológico de Costa Rica, Costa Rica)
11:00	Preliminary Design and PIL Testing of a Battery Monitoring System for eVTOL UAVs Based on an Extended Kalman Filter and Electro-Thermal Model Aleksander Suti and Gianpietro Di Rito (University of Pisa, Italy); Marc Budinger, Aurelien Reyssset and Ion Hazyuk (INSA-Toulouse, France); Roberto Di Rienzo (University of Pisa, Italy)
10:00 - 11:20	Room A - Ground Floor Session 1.2 - Space based gravitational measurements: from the detection of Gravitational Waves to ultra-sensitive geodesy - PART I Chairs: Carlo Sasso, <i>National Institute of Metrological Research, Italy</i> Edoardo Dalla Ricca, <i>University of Trento, Italy</i>



- 10:00 A Modal-Based Measurement of Adhesion Impulses in Space Mechanisms**
Francesco Marzari and Edoardo Dalla Ricca (University of Trento, Italy); Carlo Zanoni (TIFPA, Istituto Nazionale di Fisica Nucleare, Italy); Daniele Bortoluzzi (University of Trento, Italy)
- 10:20 Experimental and Model-Based Analysis of the LISA Pathfinder GPRM Force Sensor Interference**
Abraham Ayele Gelan, Matteo Tomasi, Francesco Marzari and Daniele Bortoluzzi (University of Trento, Italy)
- 10:40 Delta-Development of the LISA Release Mechanism**
Giuliano Agostini, Matteo Tomasi, Francesco Marzari and Daniele Bortoluzzi (University of Trento, Italy); Alessandro Moroni, Matteo Grespi and Riccardo Freddi (OHB Italia, Italy)
- 11:00 High Resolution Accelerometer with Interferometric Readout**
Massimo Zucco, Marco Pisani (Istituto Nazionale di Ricerca Metrologica, Italy)

10:00 - 11:20 *Room B - Ground Floor*
Session 1.3 - The use of unmanned aerial vehicles for various sectors of the economy: problems and solutions
Chair: Natalia Shyriaieva, *National Technical University "Kharkiv Polytechnic Institute", Ukraine*

- 10:00 Towards Visual Navigation Input Monitoring in Autonomous Aerial Vehicles**
Christian Kexel and Mark-Felix Schütz (SWIFT - Corporation for Data Acquisition Systems, Germany)
- 10:20 UAV-Based Territorial Surveillance System**
Vitaliy Zaytsev (Alfred Nobel University, Ukraine)
- 10:40 Broadband Rotor Noise Control Using Pre-Trained Audio Models**
Christian Kexel and Mark-Felix Schütz (SWIFT - Corporation for Data Acquisition Systems, Germany)
- 11:00 Real-Time Evaluation of Inner-Loop Controllers with NMPC-Based Outer-Loop for UAV**
Riccardo Enrico, Stefano Primatesta, Mauro Mancini and Elisa Capello (Politecnico di Torino, Italy)

11:20 - 11:40 *Coffee/Lunch Area - First Floor*
COFFEE BREAK

11:40 - 13:00

Aula Magna - First Floor

Session 2.1 - Sensor Data Fusion for Aerospace Systems

Chairs: Domenico Accardo, *University of Naples Federico II, Italy*

Claudia Conte, *University of Naples Federico II, Italy*

Flora Amato, *University of Naples Federico II, Italy*

11:40 Above-Ground Biomass Prediction in Agroforestry Areas Using Machine Learning and Multispectral Drone Imagery

Andsera Adugna Mekonen, Domenico Accardo and Alfredo Renga (University of Naples Federico II, Italy)

12:00 Improved UAS Distance Estimation via LiDAR-Radar Data Fusion Using Extended Kalman Filter

Gennaro Ariante, Luigi Farina and Francesco Lo Caso (University of Naples Parthenope, Italy); Aniello Menichino and Vittorio Di Vito (CIRA Italian Aerospace Research Center, Italy); Salvatore Ponte (University of Campania "L. Vanvitelli", Italy); Giuseppe Del Core (University of Naples Parthenope, Italy)

12:20 Radar-Aided Navigation for Precise Approach at Vertiports

Sinan Çimen and Manuel Storrer (University of Stuttgart, Germany); Dirk Dickmanns (Kymati GmbH, Germany); Klaus Kittmann (Airbus Urban Mobility GmbH, Germany); Walter Fichter (University of Stuttgart, Germany)

12:40 On Board Systems Configuration for High Precision Aerial Indoor Inspections

Vincenzo Donato, Alberto Moccardi, Claudia Conte and Giorgio de Alteriis (University of Naples Federico II, Italy); Pasquale Accardo and Michele Federico (ARIAS Group srl, Italy); Dalila Cesiro (Consortium MediTech, Italy); Rosario Schiano Lo Moriello, Flora Amato, Giancarlo Rufino, Domenico Accardo (University of Naples Federico II, Italy)

11:40 - 12:40

Room A - Ground Floor

Session 2.2 - Space based gravitational measurements: from the detection of Gravitational Waves to ultra-sensitive geodesy - PART II

Chairs: Carlo Sasso, *National Institute of Metrological Research, Italy*

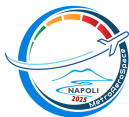
Edoardo Dalla Ricca, *University of Trento, Italy*

11:40 Advances in the Formulation of Minimal Thermodynamically Consistent Models for Dispersion Force-Driven High-Accuracy Inertial Nano-Sensors

Fabrizio Pinto (Izmir University of Economics, Turkey)

12:00 Investigation of the Surface Properties of the LISA Pathfinder Witness Samples and Their Implications on the LISA Discharge System

Teodoro Klaser (Università degli studi di Trento, Italy & TIFPA - Trento Institute for Fundamental Physics and Applications, Italy); Antonella Cavalleri (Università degli studi di Trento, Italy); Roberto Canteri (Fondazione Bruno Kessler, Italy); Davide Dal Bosco (Università degli studi di Trento & TIFPA-INFN, Italy); Rossana Dell'Anna (Fondazione Bruno Kessler, Italy); Vittorio Chiavegato, Francesco Dimiccoli, Rita Dolesi (University of Trento, Italy & INFN-TIFPA, Italy); Elena Missale (Fondazione Bruno



Kessler, Italy); Luca Pasquali (Università di Modena e Reggio Emilia, Italy); Andrea Pedrielli (Fondazione Bruno Kessler, Italy); Lorenzo Sala, Francesco Venturelli, William J. Weber (University of Trento, Italy & INFN-TIFPA, Italy)

12:20 A Functional Test Bed for Electrostatic Space Accelerometers

Carlo Sasso, Massimo Zucco, Christian Di Sannio, Marco Pisani (Istituto Nazionale di Ricerca Metrologica, Italy)

11:40 - 13:00 *Room B - Ground Floor*
Session 2.3 - General Track - PART II
Chair: Alfonso Farina, *Selex ES, Italy*

11:40 CFAR Analysis of Adaptive Detection Schemes for Multistatic/Polarimetric Radar Systems

Vincenzo Carotenuto, Augusto Aubry, Antonio De Maio (University of Naples Federico II, Italy); Luca Pallotta (University of Basilicata, Italy)

12:00 Cooperative Cross-Eye Jamming Against Advanced Radars: Effectiveness and Countermeasures

Massimo Rosamilia (University of Naples Federico II, Italy); Vittorio Calligaris, Dario Gabutti and Aurora Manfredi (Italian Air Force, Italy); Vincenzo Carotenuto (University of Naples Federico II, Italy)

12:20 Radar Cross-Section Analysis of in-Flight UAVs in X- and L-Band

Marianna Franzese (University of Naples Federico II, Italy & IREA-CNR, Italy); Vincenzo Carotenuto (University of Naples Federico II, Italy); Fausta Mattei (University of Study of Naples Federico II & University of Bergamo, Italy); Claudia Conte, Giancarlo Rufino and Domenico Accardo (University of Naples Federico II, Italy); Claudio De Luca, Paolo Berardino (IREA-CNR, Italy); Alessandro Di Vincenzo (Università Degli Studi di Napoli Parthenope & IREA-CNR, Italy); Carmen Esposito, Antonio Natale (IREA-CNR, Italy); G Palmese (Elettra Microwave Srl, Italy); Stefano Perna (Università degli Studi di Napoli Parthenope, Italy); Riccardo Lanari (IREA-CNR, Italy); Antonio De Maio (University of Naples Federico II, Italy)

12:40 Efficient Phase-Only Transmit Beamforming: a Comprehensive Analysis

Alfonso Farina (Leonardo Company Consultant, Italy); Danilo Orlando (University of Pisa, Italy)

13:00 - 14:15 *Coffee/Lunch Area - First Floor*
LUNCH



14:20 - 14:50

Aula Magna - First Floor

PLENARY SESSION - KEYNOTE SPEAKER

Chair: Giovanni Savoldelli Pedrocchi, *AFCEA Chapter of Naples, Italy*

**Space Situational Awareness:
Protecting our Present and Enabling our Future**

Claudio Gabellini, Italian Air Force, Italy

14:50 - 15:10

Aula Magna - First Floor

INVITED TALK

Chair: Giovanni Savoldelli Pedrocchi, *AFCEA Chapter of Naples, Italy*

**Italian Space policy way ahead: the Space economy law and the
Government guidelines**

Luigi Riggio, Italian Air Force, Italy

15:10 - 16:20

Aula Magna - First Floor

ROUND TABLE - Space Economy and Human Space Exploration

Chair: Giovanni Savoldelli Pedrocchi, *AFCEA Chapter of Naples, Italy*

PANELISTS:

Vittorio Ancona, *Thales Alenia Space*

Pietro Ferraro, *National Research Council*

Barbara Negri, *Italian Space Agency*

Paola Verde, *Italian Air Force*

Caterina Bortolini, *Cyber&Space Rheinmetall*

Giancarlo De Viti, *Monitoring Systems srl*

Pier Luca Maffettone, *University of Naples Federico II*

16:20 - 16:40

Coffee/Lunch Area - First Floor

COFFEE BREAK

16:40 - 18:20

Aula Magna - First Floor

Session 3.1 - Applied Metrology for Navigation and Precise Positioning in UAVs

Chair: David Martín Gómez, *Universidad Carlos III de Madrid, Spain*

16:40 The Galileo-Based UAV Velocity: Doppler and Time-Differenced Carrier Phase

Giovanni Cappello (University of Naples Parthenope, Italy); Ciro Gioia, Andrea Piccolo (Joint Research Centre European Commission, Italy); Antonio Angrisano (Messina University, Italy); Salvatore Gaglione (University of Naples Parthenope, Italy)

17:00 The Issue of North: Determining Magnetic Heading Onboard a Drone

Alfonso Farina (Leonardo Company Consultant, Italy); Salvatore Ponte (University of Campania "L. Vanvitelli", Italy); Francesco De Angelis (Sapienza Università di Roma, Italy)

17:20 Methodology for Localizing an Indoor Drone Using Onboard Sensors and Validating by a Fixed Lidar

Giulia Slavic, Lucio Marcenaro (University of Genova, Italy); David Martín Gómez (Universidad Carlos III de Madrid, Spain); Carlo S Regazzoni (University of Genoa, Italy)

17:40 Characterisation of the Flight Chain for Sounding Balloon Missions

Federico Toson and Carlo Bettanini (University of Padova, Italy)

18:00 Kalman Filter-Based Position Estimation in UAV Swarms: Impact of Swarm Size, Flight Paths and Onboard Sensors

Sena Turan (Middle East Technical University & Roketsan Missile Inc., Turkey); Halil Ersin Söken (Middle East Technical University, Turkey)

16:40 - 18:20

Room A - Ground Floor

Session 3.2 - Aerodynamic Measurement and Propulsion System Control of Aerial Vehicles

Chairs: Zbigniew Czyż, *Polish Air Force University, Poland*

Paweł Magryta, *Lublin University of Technology, Poland*

Tomasz Zachorski, *Polish Air Force University, Poland*

16:40 Effect of Changing the Integral Parameter of the PI Controller on the Quality of Speed Control in a Helicopter Diesel Engine

Paweł Magryta and Grzegorz Barański (Lublin University of Technology, Poland)

17:00 Evaluation of Wind Effects on Synthetic Flow Angles Estimator ASSE

Andrea Patacchiola, Luca de Pasquale, Gabriele Tarascio and Angelo Lerro (Politecnico di Torino, Italy)

17:20 Assessment of Artificial Neural Networks' Performance for the Synthetic Model-Free Angle of Attack and Sideslip Estimator

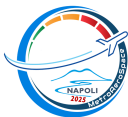
Gabriele Tarascio, Luca de Pasquale, Andrea Patacchiola and Angelo Lerro (Politecnico di Torino, Italy)

- 17:40 Wind Estimation in Urban Air Mobility Operations via Power Monitoring and Sensor Fusion**
Mewael A Abraham (Khalifa University, United Arab Emirates); Alessandro G M Gardi (Khalifa University, United Arab Emirates & RMIT University, Australia)
- 18:00 Energy Analysis of a Propeller in a Wind Tunnel for Different Airflow Velocities**
Jan Dawid Pytko (Lublin University of Technology, Poland); Zbigniew Czyż (Polish Air Force University, Poland); Krzysztof Skiba and Łukasz Grabowski (Lublin University of Technology, Poland)

16:40 - 18:20 Room B - Ground Floor
Session 3.3 - Aerospace systems monitoring through optical and innovative sensors networks
Chairs: Alessandro Aimasso, *Politecnico di Torino, Italy*
Paolo Maggiore, *Politecnico di Torino, Italy*

- 16:40 Development and Validation of a Passive Orbit Determination Method for the Estimation of Geostationary Satellites Maneuvering via Doppler and Optical Tracking Data Fusion**
Maj. Luca Rizzo, Capt. Roberto Errico, Lt. Antonio Vito Montalbò, Lt. Andrea Scardino, Col. Alessandro Galliani - CIGC SICRAL
- 17:00 Ground-Based Optical Observation Methods for Space Situational Awareness at the Astronomical Institute University of Bern**
Pascal Sauer, Silas Fiore, Nicola Cimmino, Pierre Lauber, Michael Ackermann, Alessandro Vananti and Thomas Schildknecht (University of Bern, Switzerland)
- 17:20 Laser-Based Multimodal Characterization Allows Quantitative Modeling for Fasteners**
Rufei Zou and Chen Cui (Beijing Taigee Co. Ltd, China); Yuexiang Peng and Tianlong Man (Beijing University of Technology, China)
- 17:40 Exploring Fiber Bragg Gratings for High-Sensitivity Pressure Monitoring Applications**
Matteo Bertone, Alessandro Aimasso, Matteo Davide Lorenzo Dalla Vedova and Paolo Maggiore (Politecnico di Torino, Italy)
- 18:00 UAV in-Flight Monitoring Approach Through Interaction Between AR Visualization and Embedded Optical Fiber Sensors**
Antonio C Marceddu, Alessandro Aimasso, Matteo Bertone, Bartolomeo Montrucchio, Paolo Maggiore and Matteo Davide Lorenzo Dalla Vedova (Politecnico di Torino, Italy)

19:00 Galleria Navarra ROSSOPOMODORO - P.zza dei Martiri, 23
WELCOME PARTY



Technical Program - Thursday, June 19

08:30 - 17:00	Conference Center - University of Naples Federico II - Ground Floor REGISTRATIONS
09:00 - 10:40	Aula Magna - First Floor Session 4.1 - Advances in measurements for autonomous space systems and for the development and testing of their subsystems Chair: Marco Pertile, <i>University of Padova, Italy</i>
09:00	Investigation of Attitude-Independent Magnetometer Calibration Approaches Under Various Conditions Mehmet Umut Türker and Demet Cilden-Guler (Istanbul Technical University, Turkey)
09:20	Low-Cost Approach of Ground-Based GNC Experiments of Distributed Space Systems Alex Caon (Delft University of Technology, The Netherlands); Stefano Silvestrini (Politecnico di Milano, Italy); Jian Guo (Delft University of Technology, The Netherlands)
09:40	Characterisation of the Thermal Control System for NIR Emitter of a Miniaturised Lidar for Mars Kirill A. Potemkin and Diego Scaccabarozzi (Politecnico di Milano, Italy)
10:00	A 2-DoF on-Line Template Matching Strategy for LIDAR-Based Pose Initialization of Non-Cooperative Spacecraft Matteo Palescandolo, Alessia Nocerino, Giancarmine Fasano, Roberto Opromolla and Michele Grassi (University of Naples Federico II, Italy)
10:20	Modelling and Verification of Optical Landmark Navigation for Nanosatellite Star Trackers Ming Q. Zhang, Emmanuel Buraga and John Enright (Toronto Metropolitan University, Canada)
09:00 - 10:40	Room A - Ground Floor Session 4.2 - CONNECT - Technical Session 1: Radio and optical transmission technologies for non-terrestrial networks Chair: Giulia Buttazzoni, <i>University of Trieste, Italy</i>

- 09:00 Power-Domain Non-Orthogonal Multiple Access for Distributed Non-Terrestrial Networks: a Semi-Analytical Throughput Estimation**
Massimiliano Comisso, Fulvio Babich, Giulia Buttazzoni, Alberto Carini, Sergio Carrato, Stefano Marsi (University of Trieste, Italy); Fabio Patrone (University of Genoa, Italy); Claudio Sacchi (University of Trento, Italy); Francesca Vatta (University of Trieste, Italy)
- 09:20 Experimental Emulation of LEO Downlink OFLs Affected by Turbulence and Pointing Jitter**
Ilaria Marasco, Carla Cantore, Davide Monopoli and Giovanni Magno (Politecnico di Bari, Italy)
- 09:40 Design of High Speed FSO Feeder Links for HAPS Based on COTS Components**
Sujit Basu, Giulio Cossu, Luca Oliviero, Ernesto Ciaramella (Scuola Superiore Sant'Anna, Pisa, Italy)
- 10:00 RF ISLs in LEO Mega-Constellations - Network Topology and Latency**
Mauro De Sanctis, Ernestina Cianca, Tommaso Rossi, Harshal More (University of Rome Tor Vergata, Italy)
- 10:20 UAV/HAPS Feeder Link in W and D Bands: a Feasibility Study**
Alberto Tarable (CNR-IEIT, Italy); Andrea Tani (University of Florence, Italy); Giuseppe Virone (Consiglio Nazionale delle Ricerche, Italy); Roberto Nebuloni (Ieii - Cnr, Italy); Ada Vittoria Bosisio (CNR-IEIT c/o Politecnico di Milano, Italy); Rudi Paganelli (CNR, National Research Council, Italy); Giulio Cossu, Ernesto Ciaramella (Scuola Superiore Sant'Anna, Italy); Claudio Sacchi (University of Trento, Italy); Simone Morosi (University of Florence, Italy & CNIT, Italy)

09:00 - 10:20 Room B - Ground Floor
Session 4.3 - Innovative technologies and solutions for Advanced Air Mobility and Urban Air Mobility
Chairs: Domenico Accardo, *University of Naples Federico II, Italy*
 Claudia Conte, *University of Naples Federico II, Italy*

- 09:00 Optimal Navigation and Obstacle Avoidance for UAV in Urban Canyons**
Yuquan Hu (University of Electronic Science and Technology of China, China); Alessandro G M Gardi (Khalifa University, United Arab Emirates & RMIT University, Australia)
- 09:20 Collision-Free Nonlinear Model Predictive Control for Quadrotors in Dynamic Outdoor Environments**
Beyza Acar (Middle East Technical University & ROKETSAN MISSILE INC, Turkey); Halil Ersin Söken (Middle East Technical University, Turkey)
- 09:40 A Robust Nonlinear MPC and Incremental Dynamic Inversion Control Framework for Quadrotors Under Rotor Failure**
Cihangir Mehmetcik Elif (Middle East Technical University & HSB SOLUTIONS, Turkey); Ozan Tekinalp (Middle East Technical University, Turkey)

10:00 Impact of Temperature and Humidity on a 3D LiDAR Sensor: Performance and Characterization

Francesco Lo Caso, Luigi Farina and Gennaro Ariante (University of Naples Parthenope, Italy); Aniello Menichino, Vittorio Di Vito (CIRA Italian Aerospace Research Center, Italy); Salvatore Ponte (University of Campania "L. Vanvitelli", Italy); Vincenzo Quaranta, Carmine Carandente Tartaglia (Italian Aerospace Research Centre - CIRA, Italy); Giuseppe Del Core (University of Naples Parthenope, Italy)

10:40 - 11:00 *Coffee/Lunch Area - First Floor*
COFFEE BREAK

11:00 - 11:40 *Aula Magna - First Floor*
PLENARY SESSION - KEYNOTE SPEAKER
Chair: Claudia Conte, *University of Naples Federico II, Italy*

Vision on Board the Drones

Pascual Campoy, *Centre of Automation & Robotics (CAR)*
Universidad Politecnica de Madrid, Spain

11:40 - 13:10 *Aula Magna - First Floor*
Session 5.1 - Space To Space: Scientific and Technological Challenges for Human and Robotic Space Exploration - PART I
Chairs: Sara Coppola, *National Research Council, Italy*
Ilaria Caggiano, *University Suor Orsola Benincasa, Italy*
Paolo Maggiore, *Politecnico di Torino, Italy*

11:40 What Future Studies Hold for Humanity: the Cislunar
Gennaro Russo, *Center for Near Space of the Italian Institute for the Future*

11:55 Holographic Flow Cytometry Based on Sagnac Interferometer Integrates Single Cell Tomography and Spatiotemporal Analysis
Zhe Wang (University of Naples Federico II, Italy); Marika Valentino (ISASI-CNR, Italy); Giusy Giugliano (ISASI-CNR, Italy & University of Campania Luigi Vanvitelli, Italy); Massimiliano Villone (University of Naples Federico II, Italy); Silvia Mari and Francesca Ferranti (ASI, Italy); Pasquale Memmolo and Vittorio Bianco (CNR-ISASI, Italy); Pier Luca Maffettone (University of Naples Federico II, Italy); Lisa Miccio (CNR-ISASI, Italy)

12:10 Pyro-Electrohydrodynamic Approach for Biomarker Detection in Neurodegenerative Space-Related Disorders
Concetta Di Natale and Stefania Carbone (University of Naples Federico II, Italy); Sara Coppola (CNR-ISASI, Italy); Simone Russo, Giuseppe Vitiello and Giuseppina Luciani (University of Naples Federico II, Italy); Veronica Vespini, Volodymyr Tkachenko, Pietro Ferraro (ISASI CNR, Italy); Francesca Ferranti and Silvia Mari (ASI, Italy); Simonetta Grilli (National Council of Research, Italy)

- 12:25 Validation of Hazard Detection Strategies in a Moon Landing Scenario by an Advanced Simulation Framework**
Luca Ostrogovich (University of Naples Federico II, Italy & Telespazio S.p.A., Italy); Alfredo Renga (University of Naples Federico II, Italy); Simone Giannattasio, Luca Andolfi and Giuseppe Tomasichio (Telespazio S.p.A., Italy)
- 12:40 Smart Solar Panel Project: Modelling of the Self-Cleaning Strategy by Piezoelectric Patches**
Andrea Appiani and Diego Scaccabarozzi (Politecnico di Milano, Italy)
- 12:55 Size-Based Separation of MCF-7 Breast Cancer Cells and White Blood Cells Using a Custom-Made 3D-Printed Microfluidic Chip**
Daniele Tammaro, Martina Mugnano, Lisa Miccio (University of Naples Federico II, Italy); Mario Capasso, Vincenza Cerbone, Giulia Scalia and Anna Montella (CEINGE-Biotecnologie Avanzate Franco Salvatore, Italy); Massimiliano Villone (University of Naples Federico II, Italy); Silvia Mari and Francesca Ferranti (ASI, Italy); Pier Luca Maffettone (University of Naples Federico II, Italy)

11:40 - 13:00

Room A - Ground Floor

Session 5.2 - CONNECT - Keynote Speech and Panel Session

11:40 KEYNOTE SPEECH - Walking into 6G NTN

Carla Amatetti, *University of Bologna, Italy*

The integration of a Non-Terrestrial Network (NTN) component in the global 5G telecommunications infrastructure is now a reality, thanks to 3GPP Rel. 17, 18, and 19 (on-going), supported by massive industrial endeavours to provide connectivity from the sky. Building on this success, it is globally recognized that a further step will be made with the development of 6G communications; these systems, with the native support of NTN leading to a jointly optimized terrestrial/non-terrestrial infrastructure, bring the promise of unprecedented benefits to global Industry, Society, and Economy. In this framework, starting from the discussion of the potential architectures for 5G/5G-Advanced NTNs, this keynote will address NTN evolution in 6G exploring research challenges and trends.

12:15 PANEL SESSION - Toward a Cooperative and Integrated European Satellite Ecosystem

Panel Chair: Ernestina Cianca, *University of Rome Tor Vergata, Italy*

ABSTRACT

Recent social and political events have underscored the urgent need to rethink both the technical and business models behind ICT service delivery. The demand for global, ubiquitous connectivity - especially in the context of 6G - has renewed interest in satellite networks as critical enablers. However, the current landscape is dominated by vertically integrated, proprietary constellations (e.g., Starlink), raising significant concerns related to data sovereignty, network neutrality, resilience, and vendor lock-in - particularly in scenarios involving critical infrastructure and defense-grade communications.

For the past five decades, the dominant paradigm - what might be called the "kingdom of the monopoly" - has revolved around a few US-based operators offering closed, proprietary platforms to end users. This black-box model is increasingly inadequate for the ambitions of 6G

and beyond, from both technical and economic perspectives. On the other hand, the European Union is exploring alternative models for global networking.

The European Union is advancing a federated model for satellite networks that emphasizes openness, interoperability, and strategic autonomy. This approach envisions a shift from legacy, siloed architectures toward a unified ecosystem that integrates terrestrial and non-terrestrial networks (NTN) using open interfaces (e.g., Open RAN), cloud-native principles, dynamic spectrum management, and shared infrastructure frameworks. This “democracy of cooperation” envisions public-private synergy involving industry, service providers, space agencies, governments, and ultimately, EU citizens.

The ITA-NTN project—funded under the NextGenerationEU framework as part of the RESTART Italian program - aims to provide a reference technical architecture for the seamless orchestration of terrestrial and satellite network elements within a cooperative, multi-stakeholder environment. It addresses key challenges in interface standardization, cross-domain resource allocation, secure data routing, and service abstraction.

This panel will chart the path toward not only technical integration, but also the broader socio-economic transformation it requires. Panelists will examine unresolved challenges, barriers to implementation, and the opportunities that this shift presents for the future of European space communications.

PANELLISTS:

- Eng. Giampiero **di Paolo**, Deputy CEO, Senior Vice President Observation, Exploration and Navigation Domain at Thales Alenia Space and CEO of Thales Alenia Space Italia (online)
- Dr. Claudia **Rinaldi**, CNIT - National Inter-University Consortium for Telecommunications
- Dr. Ivan **Iudice**, Research Engineer, Italian Aerospace Research Centre (CIRA)
- Dr. Francesco **Menzione**, Technical and Scientific Officer at European Commission (EC) Joint Research Centre - Space Sector.
- Dr. Marta **Valsecchi** - Managing Director of the Research team at Digital Innovation Osservatori of the School of Management at Politecnico di Milano (online)

11:40 - 13:00

Room B - Ground Floor

Session 5.3 - Manufacturing and Metrology in the Aerospace Industry - PART I

Chair: Jerzy Jóźwik, *Lublin University of Technology, Poland*

11:40 Analysis of Impact of Selected Weather Parameters on Aircraft Takeoff and Landing Distance Using Kolmogorov-Arnold Network

Paweł Tomiło, Jan Laskowski, Agnieszka Laskowska and Joanna Michałowska (Lublin University of Technology, Poland); Roman Kochan and Orest Kochan (Lviv Polytechnic National University, Ukraine); Edward Kozłowski (Lublin University of Technology, Poland); Jonas Matijošius (Vilnius Gediminas Technical University, Lithuania)

12:00 Retention Mechanism Based Neural Network Model for Measuring Aircraft Landing Distance

Paweł Tomiło (Lublin University of Technology, Poland)

12:20 Surface Analysis of Two-Layer Aluminum-Silicone Structure After High-Pressure Abrasive Water Jet Cutting

Michał Leleń (Lublin University of Technology, Poland)

12:40 Analysis of the Chip Formation Process During Precision Milling of Magnesium Alloy

Jarosław Korpysa (Lublin University of Technology, Poland)

13:00 - 14:20 Coffee/Lunch Area - First Floor
LUNCH

14:30 - 15:20 Aula Magna - First Floor
PANEL SESSION ORGANIZED BY IEEE WIE ITALY SECTION AG
Chair: Claudia Conte, *University of Naples Federico II, Italy*

AGENDA

14:30 - Welcoming (Dr. Claudia Conte, WIE Volunteers)

14:35 - Introduction to IEEE WIE AG and Commitment Chart

14:45 - Olga D'Auria, TIM, S.p.A. - Angela Maiale, TIM, S.p.A.

14:55 - Dalila Cesiro, Consortium MediTech

15:05 - Q&A session, Closing remarks (Dr. Claudia Conte, WIE Volunteers)

14:30 - 15:20 Room A - Ground Floor
CONNECT - Keynote Speech and Demo

14:30 KEYNOTE SPEECH - Multi-Layer 6G Communications: the ITA NTN Vision
Simone Morosi, *University of Florence, CNIT, Italy*

This keynote speech explores the integration of Terrestrial Networks and Non-Terrestrial Networks (T/NTNs) as an enabler for the 6th Generation (6G) of communication systems. Starting from the 3rd Generation Partnership Project (3GPP) specifications and roadmap and from the results that have been achieved in the framework of the Restart Program and of the ITA NTN (Integrated Terrestrial And Non-Terrestrial Networks) Project, the speech investigates cutting-edge aspects of architectural designs, advanced transmission techniques, and cross-domain management strategies. In order to address challenges in seamless connectivity and optimized resource utilization, the proposed multi-layer approach combines terrestrial, aerial, and satellite components for improved coverage, scalability, and adaptability. The key and innovative contributions about modular waveform designs, efficient management of free-space optical links, and a comprehensive NTN framework are presented and discussed.

15:05 DEMO - 6G on flight: the ITA-NTN drone experiment
The demo will be showcased in the Poster Area.

14:30 - 15:20

First Floor - Poster Area

Poster Session #1

Chair: Vincenzo Donato, *University of Naples Federico II, Italy*

PS1.1 Integrating UAV LiDAR Terrain Mapping and Real Photogrammetry Data for Rapid Evaluation, Assessment and Analysis

Veaceslav Sprincean, Liviu Dontu, Aurel Zancu, Sergiu Pascari and Ion Rosca (Moldova State University, Moldova); Florentin Paladi (Moldova State University & ePhysMCS Research Laboratory, Moldova)

PS1.2 Design and Experimental Validation of a Hybrid Energy Storage System for Nanosatellites

Faiza Arezki (Algerian Space Agency, Algeria)

PS1.3 Design and Implementation of Balancing Platform for Nanosatellite Reaction Wheel Acuator

Aissa Boutte, Brahim Gueddache, El Yazid Belaidi, Kada Hadda, Mohamed Berroua Benzina, Salah Eddine Bentata (Satellite Development Centre, (CDS) Algerian Space Agency, (ASAL), Algeria)

PS1.4 From Concept to Orbit: Design, Development, and Testing of an Innovative PocketQube

Greta Rosa, Giacomo Porcarelli, Alessandro Vignato and Giovanni Pitacco (University of Padova, Italy); Federico Toson (University of Padova & CISAS G. Colombo, Italy); Giacomo Colombatti (University of Padova, Italy)

PS1.5 Design LED Sensors for Fire Prevention in Aircraft Cabins

Federico Fina (Roma Tre University, Italy); Iacopo Nannipieri (Sensichips Srl, Italy); Andrea Ria (University of Pisa, Italy); Fabio Leccese ("Roma Tre" University, Italy)

PS1.6 Availability and Maintainability of Medium and Low Complexity UAV: a New Approach

Enrico Petritoli (Università degli Studi "Roma Tre", Italy); Ruggero De Francesco (SeTeL, Italy); Fabio Leccese ("Roma Tre" University, Italy)

PS1.7 Effective and Simple Identification Indicators of Different Rolling Bearing Fault Types

Dariusz Mika (The University of Applied Sciences in Chełm, Poland); Jerzy Józwik (Lublin University of Technology, Poland); Arkadiusz Tofil and Paweł Pioś (University of Applied Sciences in Chełm, Poland); Alessandro Ruggiero (University of Salerno, Italy); Fabio Leccese ("Roma Tre" University, Italy)

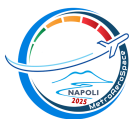
PS1.8 Calibration Accuracy of RCS Measurements in Free Space

Pathiraja Dewa Thusitha Wickramasinghe and Alessio Balleri (Cranfield University, United Kingdom)

PS1.9 Smart Landing Gear: a FBG-Based Approach for Weight on Wheel

Angela Brindisi and Antonio Concilio (Centro Italiano Ricerche Aerospaziali, Italy); Cristian Vendittozzi (SAPIENZA- Rome University, Italy); Lida Travascio, Marika Belardo, Michele Ignarra and Vincenzo Fiorillo (CIRA, Italy); Simone Proseccchi (Sapienza, Italy)

- PS1.10 Measurements of Aerodynamic Loads on a Model of a Selected Fighter Aircraft**
Kacper Szatkowski (Sunreef Yachts, Poland); Tomasz Zahorski and Zbigniew Czyż (Polish Air Force University, Poland)
- PS1.11 Efficiency Measurements of Propellers with Different Pitch in Electric Propulsion Systems**
Zbigniew Czyż (Polish Air Force University, Poland); Paweł Karpiński (University of Life Sciences in Lublin, Poland); Krzysztof Skiba (Lublin University of Technology, Poland)
- PS1.12 Experimental and Numerical Studies of the Effect of Icing on the Aerodynamic Characteristics of the WORTMANN FX 63-137 Airfoil**
Robert Bąbel, Zbigniew Czyż, Robert Szczepaniak (Polish Air Force University, Poland)
- PS1.13 On the Optimum Update of Satellite Constellations with AOA Receivers: a Comparative Analysis**
Marcello Asciola (Politecnico di Bari, Italy); Rodrigo Blazquez-Garcia (Universidad Politécnica de Madrid, Spain); Angela Cratere (Polytechnic University of Bari, Italy & The University of Arizona, USA); Francesco Dell'Olio (Micro Nano Sensor Group Polytechnic University of Bari, Italy)
- PS1.14 Exploring Stochastic Variational Gaussian Processes for Trustworthy Monocular Pose Estimation in Space**
Alessandro Lotti, Dario Modenini and Paolo Tortora (University of Bologna, Italy)
- PS1.15 Development and Testing of a Novel Graphene Based Thermal Strap**
Richard Högström (VTT Technical Research Centre of Finland Ltd, Finland); Shahin Tabandeh (VTT-MIKES, Finland); Henrik Sandberg, Jussi Hämäläinen, Tomi Viitanen, Anssi Järvinen and Virpi Korpelainen (VTT Technical Research Centre of Finland Ltd, Finland)
- PS1.16 Modelling the Oscillating Pattern of the Apparent Spin Period of Inactive GLONASS Satellites**
Nicola Cimmino, Alessandro Vananti and Thomas Schildknecht (Astronomical Institute of the University of Bern, Switzerland)
- PS1.17 PANCAM Panoramic Bifocal Acquisition and Processing System for the PNRR Infrastrutture (NRRP) Earth-Moon-Mars (EMM) Project**
Paolo Martini and Claudio Pernechele (INAF, Italy); Emanuele Simioni (INAF- Osservatorio di Padova, Italy); Francesca Esposito and Fabio D'amico (INAF, Italy); Ugo Cortesi (IFAC-CNR, Italy); Marco Gai (IFAC Cnr, Italy); Andrea Argan and Luigi Lessio (INAF, Italy); Immacolata Donnarumma and Alessandro Turchi (ASI, Italy); Giovanni Costa (INAF, Italy)
- PS1.18 MERCURIO, an Innovative Monitoring System for the Safety of Railway Infrastructure**
Chiara Abbundo (University of Naples Federico II & University of Rome Sapienza, Italy); Maria Daniela Graziano (University of Naples Federico II, Italy); Valerio Striano (Distretto Aerospaziale Campano, Italy); Pasquale Rovito, Andrea Vitiello and Luca Continisio (Ente Autonomo Volturmo, Italy); Mario Pucciarelli (Medinok SpA Company, Italy); Mariano Focareta (MAPSAT Srl, Italy); Giancarmine Fasano, Diego Di Martire, Flavia Causa, Gennaro Maria Crispino, Francesco Carotenuto, Ester Piegari, Enrico Cascella, Giacomo Russo and Luca Cozzolino (University of Naples Federico II, Italy)



- PS1.19 Deep Learning-Optimized Monocular Navigation for Autonomous Rendezvous and Proximity Maneuvers in Small Satellite Missions**
Lucrezia Lovaglio and Fabrizio Stesina (Politecnico di Torino, Italy)
- PS1.20 Inconel Thrust Chamber Comparison Between 3D Printing and Machined Prototypes**
Ludovica Canta (University of Roma Tre, Italy & MIEEG Srl, Italy); Daniele Ferrara (Roma Tre University, Italy); Angelo Minotti (MIPRONS Srl, Italy); Giorgia Fiori (Roma Tre University, Italy); Salvatore Andrea Sciuto (University of ROMA TRE, Italy); Andrea Scorza (Roma TRE University, Italy)
- PS1.21 A Neural Network Analysis of Single-Channel Light Curves for the Characterization of Resident Space Objects**
Pasquale Bencivenga, Matteo Anton Matacera, Giorgio Isoletta, Roberto Opromolla and Giancarmine Fasano (University of Naples Federico II, Italy)
- PS1.22 A Solar Sail-Propelled SmallSat Mission to Phobos: Gravitational Field Uncertainties, Trajectory Design, and Situational Awareness**
Ozge Ozturk, Burakcan Akçit and Cengiz Yildirim (Izmir University of Economics, Turkey)
- PS1.23 Vision-Based Sensor Package for Satellite Docking**
Marco Pertile, Francesco Branz, Sebastiano Chiodini, Andrea Valmorbida, Giovanni Paolo Maria Buonconsiglio and Alessandro Francesconi (University of Padova, Italy)
- PS1.24 Ensemble Deep Learning Approach for Object Recognition in Large-Scale Remote Sensing Imagery**
Ivan Saetchnikov, Elina Tcherniavskaia and Victor Skakun (Belarusian State University, Belarus)
- PS1.25 Experiment on Mission Planning of Wide-Aperture Antenna Test Using Unmanned Aircraft System**
Siarhei Liashkevich, Vladimir Saetchnikov and Halina Liashkevich (Belarusian State University, Belarus)
- PS1.26 Initial Orbit Determination Method for an Unknown Resident Space Object with a Matched Velocity Magnitude Association in the Frame Plane**
Vasilina Baranova, Alexander Spiridonov, Vladimir Cherny and Vladimir Saetchnikov (Belarusian State University, Belarus)
- PS1.27 Impact Assessment of Solar Activity on Low Earth Orbit Satellite Systems Using Advanced Machine Learning Techniques**
Evgeniy Gleba, Vasilina Baranova, Alexander Spiridonov, Vladimir Cherny and Vladimir Saetchnikov (Belarusian State University, Belarus)

15:20 - 15:40 *Coffee/Lunch Area - First Floor*
COFFEE BREAK

15:40 - 17:55	Aula Magna - First Floor Session 6.1 - Space To Space: Scientific and Technological Challenges for Human and Robotic Space Exploration - PART II Chairs: Pietro Ferraro, <i>National Research Council, Italy</i> Vittorio Ancona, <i>Thales Alenia Space</i>
15:40	Smart Solar Panel Project: Design of Compliant Supports to Operate on Mars Andrea Appiani and Diego Scaccabarozzi (Politecnico di Milano, Italy)
15:55	Holographic Characterization of Soft Matter Opens Up New Possibilities for the Creation of Functionalized Membrane Zhe Wang (University of Naples Federico II, Italy); Anna Palma (CNR-ISASI, Italy); Vincenzo Ferraro (University of Parma, Italy); Concetta Di Natale (University of Naples Federico II, Italy); Veronica Vespini (CNR-ISASI, Italy); Francesca Ferranti and Silvia Mari (ASI, Italy); Simonetta Grilli (CNR-ISASI, Italy); Pier Luca Maffettone (University of Naples Federico II, Italy); Sara Coppola (CNR-ISASI, Italy)
16:10	THz Rotational Coherent Scattering Super-Resolution Imaging Based on Deep Convolutional Neural Networks Jie Zhao, Chenyu Zhao, Yunxin Wang and Dayong Wang (Beijing University of Technology, China)
16:25	Commercial Satellite Operations: Measuring Their Overall Sustainability Lucilla Gatt, Ilaria Amelia Caggiano, Luigi Izzo (University of Naples Suor Orsola Benincasa, Italy); Carlo Campanile (Sapienza University of Rome, Italy)
16:40	Measure in Space: Present Solutions and Future challenges S. Mottini et Al. THALES ALENIA SPACE
16:55	EO Data, AI and Damage Measurement in the Insurance Industry Alessandra Fabrocini (University La Sapienza, Italy)
17:10	Wireless Power Transmission for Lunar Applications Domenico Edoardo Sfasciamuro, Stefano Mauro and Leonardo Pappalardo (Politecnico di Torino, Italy); Ivano Verzola (Lazzerio, Italy); Erica Scantamburlo and Marco Luigi Ottavi (Politecnico di Torino, Italy)
17:25	Modeling the Transition Between Orbital and Contact Phase in Rendezvous and Proximity Operations Erica Scantamburlo, Martina Ferrauto, Davide Sorli and Stefano Mauro (Politecnico di Torino, Italy)
17:40	Label-Free Holographic Imaging Flow Cytometry for White Blood Cell Analysis: a Step Toward Space Applications Giusy Giugliano (CNR-ISASI, Italy & University of Campania Luigi Vanvitelli, Italy); Daniele Pirone (CNR-ISASI, Italy); Jaromir Behal (Palacky University, Olomouc, Czechia); Lisa Miccio, Pasquale Memmolo, Vittorio Bianco and Pietro Ferraro (CNR-ISASI, Italy)

15:40 - 17:00

Room A - Ground Floor

Session 6.2 - CONNECT - Technical Session 2:

Selected topics on non-terrestrial networks

Chair: Carla Amatetti, *University of Bologna, Italy*

15:40 Non-Terrestrial Networks Supporting Internet of Remote Things for Smart Agriculture

Mauro De Sanctis, Ernestina Cianca (University of Rome Tor Vergata, Italy); Sara Pizzi and Giuseppe Araniti (University Mediterranea of Reggio Calabria, Italy); Arcangela Rago, Giuseppe Piro and Luigi Alfredo Grieco (Politecnico di Bari, Italy); Simone Morosi (University of Florence, Italy & CNIT - Research Unit of Florence University, Italy); Francesco Matera and Marina Settembre (Fondazione Ugo Bordonis, Italy)

16:00 NB-IoT Non-Terrestrial Network Path Loss Estimation with Precise 3D Modeling of Urban Environment

Najmeh Alibabaei, Antonello Calabrò, Pietro Cassarà, Alberto Gotta, Eda Marchetti (National Research Council, Italy)

16:20 Assessing 5G PRS Signal Interference in High Frequency NTN Fused PNT Applications

Alejandro Gonzalez Garrido (University of Luxembourg, Luxembourg); Ottavio Picchi, Francesco Menzione (European Commission Joint Research Center, European Union); Jorge Querol and Symeon Chatzinotas (University of Luxembourg, Luxembourg)

16:40 A Methodological Framework for Positioning of Wireless Sensors in New Generation Launchers

Ivan Iudice, Domenico Pascarella, Sonia Zappia, Giovanni Cuciniello (CIRA - Italian Aerospace Research Centre, Italy); Hernan M. Giannetta (SpaceLab SpA, Italy); Marta Albano and Enrico Cavallini (Agenzia Spaziale Italiana, Italy)

15:40 - 17:40

Room B - Ground Floor

Session 6.3 - Complex Systems Operational Availability: Measurements, Methodologies and Requirements

Chairs: Fabio Leccese, *Roma Tre University of Rome, Italy*

Dariusz Mika, *The University of Applied Sciences in Chelm, Poland*

Elena Palmieri, *National Research Council, Italy*

15:40 High Safety and Continuity of Operation of Low Voltage Plants

Roberto Paggi, Gian Luca Mariotti and Anna Paggi (ItalConsul, Italy); Eduardo De Francesco (SETEL, Italy); Cipriano Bartoletti (Università degli Studi Roma Tre, Italy); Fabio Leccese ("Roma Tre" University, Italy)

16:00 A Cellulose Based Biodegradable Humidity Sensor with Embedded Salts for Crop Monitoring and Nutrient Supply in Space Greenhouses

Elena Palmieri, Luca Montaina, Francesco Maita, Antonio Minotti, Ivano Lucarini and Luca Maiolo (CNR-IMM, Italy)

- 16:20 Design of a Wireless Multi-Sensor Crop Monitoring Platform**
Massimiliano Benetti, Massimiliano De Luca, Davide Polese (Consiglio Nazionale delle Ricerche - Istituto per la Microelettronica e Microsistemi, Italy); Alessandro Checco (University of Rome La Sapienza, Italy)
- 16:40 Application of Blind Source Separation Methods in the Diagnosis of Rolling Bearings**
Dariusz Mika (The University of Applied Sciences in Chełm, Poland); Jerzy Jóźwik (Lublin University of Technology, Poland); Arkadiusz Tofil (University of Applied Sciences in Chełm, Poland); Jarosław Pytka (Lublin University of Technology, Poland); Fabio Leccese ("Roma Tre" University, Italy); Alessandro Ruggiero (University of Salerno, Italy)
- 17:00 Advanced Measurement Technology for Military Aircraft Operational Availability**
Jarosław Pytka (University College of Applied Sciences in Chelm, Poland & Lublin University of Technology, Poland); Dariusz Mika (The University of Applied Sciences in Chełm, Poland); Jerzy Jóźwik and Paweł Tomiło (Lublin University of Technology, Poland); Krzysztof Dragan (Air Force Institute of Technology, Poland); Michał Dziendzikowski (Instytut Techniczny Wojsk Lotniczych, Poland); Paweł Pioś (University of Applied Sciences in Chełm, Poland)
- 17:20 Aircraft Diagnosis Based on Machine Learning Methods**
Karol Kawka (Polish Air Force University, Poland); Bartłomiej Głowczyk (Air Force Institute of Technology ITWL, Poland); Kinga Karwowska (Military University of Technology, Poland)

20:30	<i>La Bersagliera 1919 Restaurant - Borgo Marinari, 10/11</i> GALA DINNER
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Technical Program - Friday, June 20

09:00 - 16:00	Conference Center - University of Naples Federico II - Ground Floor REGISTRATIONS
09:30 - 11:10	Aula Magna - First Floor Session 7.1 - Structural Health Monitoring and Nondestructive Testing For Aerospace - PART I Chairs: Vittorio Memmolo, <i>University of Naples Federico II, Italy</i> Federico Carere, <i>Sapienza University of Rome, Italy</i> Leandro Maio, <i>The University of Manchester, UK</i>
09:30	Dimensional Analysis Approach for Lift-off Estimation Based on Eddy Current Testing Alessandro Sardellitti (Universitas Mercatorum, Italy); Vincenzo Mottola, Filippo Milano, Luigi Ferrigno, Antonello Tamburrino (University of Cassino and Southern Lazio, Italy); Marco Laracca (Sapienza University of Rome, Italy)
09:50	High-Frequency Modal Analysis via Low-Speed DIC: Mitigation of Harmonic Peaks in the FRF Lorenzo Esposito (University of Naples Federico II, Italy); Davide Mastrodicasa (Siemens Digital Industry Software, Belgium); Vittorio Memmolo (Goethe University Frankfurt, Germany & University of Naples Federico II, Italy); Emilio Di Lorenzo (Siemens Digital Industries Software, Italy); Fabrizio Ricci (University of Naples Federico II, Italy)
10:10	Characterization of SiC-Coated CMC by Means of Pulse Thermography and Deep Learning Approaches Giovanni Santonicola, Francesca Di Carolo, Tiziana Matarrese, Umberto Galietti and Ester D'Accardi (Politecnico di Bari, Italy); Mario De Cesare and Mario De Stefano Fumo (Italian Aerospace Research Centre, Italy); Davide Palumbo (Politecnico di Bari, Italy)
10:30	Development and Characterization of Graphene Nanoplatelet-Based Strain Sensors for Structural Health Monitoring Pegah Zarafshani (University of Naples Parthenope, Italy); Fabrizia Cilento (National Research Council, Italy); Flavio Esposito and Stefania Campopiano (University of Naples Parthenope, Italy); Lucia Sansone (National Research Council, Italy); Muhammad Zahid and Stefano G Corvaglia (Leonardo SPA, Italy); Agostino Iadicco (Università di Napoli Parthenope, Italy); Michele Giordano (National Research Council, Italy)

10:50 **Intelligent Damage Detection in Composite Pressure Vessels Under Varying Environmental and Operational Conditions**

Octavio Marquez Reyes (University of Siegen, Germany); Oliver Schackmann (University of Frankfurt, Italy); Vittorio Memmolo (Goethe University Frankfurt, Germany & University of Naples Federico II, Italy); Daniel Lozano (BAM, Italy); Jens Prager (BAM, Germany); Jochen Moll and Peter Kraemer (University of Siegen, Germany)

09:30 - 11:10

Room A - Ground Floor

Session 7.2 - Sustainable human space exploration: quantification and mitigation of radiation risk

Chairs: Francesca Ballarini, *University of Pavia, Italy*

Mariagabriella Pugliese, *University of Naples Federico II, Italy*

09:30 **Space Radiation: Risks and Simulations on Ground**

Marco Durante, *University of Naples Federico II, Italy*

09:50 **Irradiation Testing of Electronic Space Components in the Framework of ASIF Infrastructure**

Rita Carpentiero (Italian Space Agency, Italy); Alessia Cemmi, Beatrice D'Orsi, Andrea Colangeli and Guglielmo Pagano (ENEA, Italy); Corrado Altomare and Daniele Lazzaro (IMT srl, Italy)

10:10 **Calculation of Doses and Biological Damage for Astronauts Exposed to Space Radiation**

Francesca Ballarini (*University of Pavia, Italy*)

10:30 **Radiation Risk Models for Mars Exploration**

Chiara de Vita (*University of Naples Federico II, Italy*); Chiara Imparato (*University of Campania Luigi Vanvitelli, Italy*); Fabrizio Ambrosino, Giuseppe La Verde (*University of Naples Federico II, Italy*); Marina Poje Sovilj (*University Josip Juraj Strossmayer of Osijek, Croatia*); Mariagabriella Pugliese (*University of Naples Federico II, Italy*)

10:50 **High Altitude Balloon-Radiation Monitoring and Test Platform YİB: Design and Flight Results**

Bilge Demirköz (*METU-IVMER, Turkey*); Mehlika Zeynep Arslan (*Middle East Technical University & IVMER (the Research and Application Center for Space and Accelerator Technologies), Turkey*); Bahadır Han Demircan and Uğur Kılıç (*METU-IVMER, Turkey*)

09:30 - 10:50

Room B - Ground Floor

Session 7.3 - Manufacturing and Metrology in the Aerospace Industry - PART II

Chair: Magdalena Zawada-Michałowska, *Lublin University of Technology, Poland*

- 09:30 Integrated System for Intelligent Monitoring of Accuracy and Repeatability on Numerically Controlled Machine Tools Supported by Machine Learning Techniques**
Daria Sałamacha, Jerzy Józwik, Michał Leleń, Paweł Tomiło and Marcin Barszcz (Lublin University of Technology, Poland); Dariusz Mika (The University of Applied Sciences in Chełm, Poland)
- 09:50 Experimental Study on Automatic Locking of Repetition Rate in Optical Frequency Comb**
Zhitao Zhang (China Academy of Launch Vehicle Technology & Beijing Aerospace Institute for Metrology and Measurement Technology, China); Xiaoqiang Gao (Beijing Aerospace Institute for Metrology and Measurement Technology, China); Beibei Wang (Industry, China); Wu Weiwei and Xu Yongyao (Industry, China); Tieli Zhang (Beijing Aerospace Institute for Metrology and Measurement Technology, China)
- 10:10 The Application of an Optical Measurement System to Investigate Strains in a Thin-Walled Element During Milling**
Magdalena Zawada-Michałowska (Lublin University of Technology, Poland)
- 10:30 Reverse Engineering and Metrological Validation of Aircraft Fuselage Components: Experimental Insights from the NEMESI Project**
Cristina Mastrapasqua (Axist srl, Italy); Raffaella Prisco (Essematica SPA, Italy); Francesco Carangelo, Francesco Calleri and Luigi Berri (Axist srl, Italy); Salvatore Rampone (Università del Sannio, Italy)

09:30 - 11:10

Room C - Ground Floor

Session 7.4 - Exploring GNSS: Precision Navigation and Timing Solutions for Aerospace Metrology

Chairs: *Ciro Gioia, European Commission Joint Research Centre*

Andrea Piccolo, European Commission Joint Research Centre

Francesco Menzione, European Commission Joint Research Centre

- 09:30 Robust and Resilient GNSS Synchronization of LEO Satellites for Space-Based Aircraft Multilateration**
Mauro Leonardi, Mahsa Mohebbi and Giulio Sidoretta (University of Rome Tor Vergata, Italy)
- 09:50 Embedded RTK and PPP for the TeseoVI Next Generation GNSS Chipset**
Fabio Pisoni, Giovanni Gogliettino, Domenico Di Grazia, Lucas Yao, Salvatore Crasta (STMicroelectronics)
- 10:10 Toward New Space Applications and Services: the JRC Testing and Demonstration Hub**
Andrea Piccolo, Javier Tegedor, Luca Cucchi, *Ciro Gioia*, Francesco Menzione, Sophie Damy (European Commission, Joint Research Centre, Italy); Beatrice Motella (LINKS Foundation, Italy); Paolo Zoccarato (Joint Research Centre European Commission, Italy); Lukasz K Bonenberg, Matteo Sgammini, Matteo Paonni, Joaquim Fortuny-Guash (European Commission Joint Research Centre, Italy); Ottavio M. Picchi (MBI, Italy);

Fausto Bonavitacola (Energy Security, Distribution and Markets Unit, Joint Research Centre, EC, Italy); Tommaso Senni, Antoine Grenier (European Commission Joint Research Center)

10:30 Relative Velocity Estimation in a Cluster of CubeSats by Differential GNSS

Francesca Pelliccia, Alfredo Renga, Flavia Causa, Giancarmine Fasano (University of Naples Federico II, Italy); Andrea Piccolo, Francesco Menzione (European Commission Joint Research Center, European Union)

10:50 A Micro Radar-Based Low-Cost Solution for Positioning and Detection and Avoidance System

Gennaro Ariante (University of Naples Parthenope, Italy); Lucie Rocquelain (ENAC, France); Salvatore Gaglione, Silvio Del Pizzo and Giuseppe Del Core (University of Naples Parthenope, Italy)

11:10 - 11:30 *Coffee/Lunch Area - First Floor*
COFFEE BREAK

11:30 - 12:10 *Aula Magna - First Floor*
PLENARY SESSION - KEYNOTE SPEAKER
Chair: Alfonso Farina, *Selex-ES (retired), Rome, Italy*

Martian Images Segmentation and Classification through Green AI

Francesco Carlo Morabito
AI_Lab, University "Mediterranea" of Reggio Calabria, Italy

12:10 - 12:50 *First Floor - Poster Area*
Poster Session #2
Chair: Vincenzo Donato, *University of Naples Federico II, Italy*

PS2.1 Design and Development of an Interface for Picosatellites Space Qualification

Marco Peviani, Luca Dallago, Giacomo Porcarelli, Federico Toson, Giacomo Colombatti (University of Padova, Italy)

PS2.2 Evaluation of the Measurement Uncertainty of the R-Test System Enabling the Measurement of the Rotary Axes Position of Five-Axis CNC Machine Tools

Paweł Pieśko, Daria Sałamacha, Jerzy Józwik, Paweł Tomiło and Marcin Barszcz (Lublin University of Technology, Poland); Dariusz Mika (The University of Applied Sciences in Chełm, Poland)

PS2.3 Methodology for Assessing Aircraft Tire Wear

Jerzy Józwik (Lublin University of Technology, Poland); Paweł Pioś, Dariusz Mika (University of Applied Sciences in Chełm, Poland); Alessandro Ruggiero (University of Salerno, Italy); Fabio Leccese ("Roma Tre" University, Italy); Kacper Tomaszewski (University College of Applied Sciences Chełm, Poland)

PS2.4 Dielectric Characterization of High-Temperature Liquids via Resonant Cavity Perturbation Technique

Shuchao Liu (School of Integrated Circuits and Electronics, Beijing Institute of Technology, China); Jinkai Li (Tangshan Research Institute of BIT, China); Giovanni Gugliandolo (University of Messina, Italy); Mariangela Latino (Institute for Chemical and Physical Processes - IPCF CNR, Italy); Giovanni Crupi and Nicola Donato (University of Messina, Italy); Lili Fang and Liming Si (Beijing Institute of Technology, China); Xiue Bao (Beijing Institute of Technology, China & KU Leuven, Belgium)

PS2.5 A Straightforward Fitting Strategy Based on the Complex Lorentzian Function to Fully and Systematically Characterize the Kink Effect in the Output Reflection Coefficient of the GaN HEMT Technology

Giovanni Gugliandolo and Giovanni Crupi (University of Messina, Italy); Valeria Vadalà (University of Ferrara, Italy); Rocco Giofrè (University of Roma Tor Vergata, Italy); Antonio Raffo (University of Ferrara, Italy); Nicola Donato (University of Messina, Italy)

PS2.6 Testing Relativistic Gravity with Lunar Laser Retroreflectors and PEP

Roberto Campagnola (Istituto Nazionale di Fisica Nucleare-Laboratori Nazionali di Frascati (INFN-LNF), Italy)

PS2.7 Localization of Electromagnetic Emitters by Drone Swarms and Time-Difference-of-Arrival Techniques

Gioele Bucchioni, Flavia Causa, Giancarmine Fasano (University of Naples Federico II, Italy); Alfonso Masciavè (Italian Air Force, Italy)

PS2.8 Preliminary Analysis of European Underwater Infrastructure Security

Francesco De Angelis and Michele Fiorini (Leonardo S.p.A., Italy)

PS2.9 A Deep Learning-Based Multi-Modal Approach for Wake Detection

Angela Carmen Cristofano, Andrea Mazzeo, Maria Daniela Graziano and Alfredo Renga (University of Naples Federico II, Italy); Giuliano Vernengo (University of Genova, Italy); Davide Bonaldo (CNR-ISMAR, Italy); Diego Villa and Nicola Petacco (University of Genova, Italy); Gian Marco Scarpa, Federica Braga, Paolo Vavasori and Stefano Menegon (CNR-ISMAR, Italy); Amedeo Fadini (CNR-ISMAR & IUAV University of Venice Scuola di Dottorato, Italy)

PS2.10 Vectorized Thrust Measurement for Aerospace Propulsion Nozzles

Jehangir Hassan, Gaetano Maria Di Cicca, Michele Ferlauto and Roberto Marsilio (Politecnico di Torino, Italy)

PS2.11 New Figures of Conducted and Radiated Emissions of Electrical Power PCB with External Thermal Stress

Jean-Marc Dienot, Noan Artaud, Robert Ruscassié, Veronika Gavrilenko (Laboratoire Siame, Université de Pau et Pays de l'Adour)

PS2.12 Bright Shadow Detection in Cross-Polarized SAR Analysis for Moving Ships Discrimination

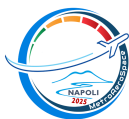
Roberto Del Prete (European Space Agency, France); Andrea Mazzeo, Martina Sciarra, Alfredo Renga, Angela Carmen Cristofano and Maria Daniela Graziano (University of Naples Federico II, Italy)

- PS2.13 Statistical Approach for the Definition of Satellite Pattern of Life**
Lorenzo Perugino, Giorgio Isoletta and Giancarmine Fasano (University of Naples Federico II, Italy)
- PS2.14 The Role of Pan-Sharpening in Coastline Extraction from High-Resolution Satellite Images**
Andrea Vallario and Emanuele Alcaras (Parthenope University of Naples, Italy)
- PS2.15 Shape Memory Alloy Actuator for the DORA Deployable Telescope**
Abdelrahman Mohamed Ragab M Ahmed and Diego Scaccabarozzi (Politecnico di Milano, Italy)
- PS2.16 BART-LISA: Beam-like Application of Radiation on Test-Masses of the Laser Interferometer Space Antenna (LISA)**
Francesco Dimiccoli (University of Trento, Italy & INFN-TIFPA, Italy); Antonella Cavalleri (Università degli studi di Trento, Italy); Rita Dolesi, Teodoro Klaser, Francesco Venturelli, William J. Weber, Davide Dal Bosco (Università degli studi di Trento & TIFPA-INFN, Italy); Valerio Ferroni (University of Trento, Italy)

12:50 - 14:10 *Coffee/Lunch Area - First Floor*
LUNCH

14:10 - 15:50 *Aula Magna - First Floor*
Session 8.1 - Structural Health Monitoring and Nondestructive Testing For Aerospace - PART II
Chairs: Vittorio Memmolo, *University of Naples Federico II, Italy*
Federico Carere, *Sapienza University of Rome, Italy*
Leandro Maio, *The University of Manchester, UK*

- 14:10 Rotating Eddy Current Testing: a Probe Optimization Analysis to Improve Test Performance**
Federico Carere (Telematic University Pegaso, Italy); Alessandro Sardellitti (Universitas Mercatorum, Italy); Silvia Sangiovanni (Sapienza University of Rome, Italy); Andrea Bernieri (University of Cassino, Italy); Marco Laracca (Sapienza University of Rome, Italy)
- 14:30 Experimental Application of a Reversible Reference Damage Model for Radar-Based SHM of Glass Fiber Reinforced Polymer Structures**
Manuel E. Rao (University of Siegen, Germany); Jochen Moll (Goethe University Frankfurt am Main, Germany); Peter Kraemer (University of Siegen, Germany); Viktor Krozer (Goethe University of Frankfurt am Main, Germany)
- 14:50 Modal Parameters Identification and Modeshapes Reconstruction for CFRP Panels with Operational Modal Analysis Performed with Digital Image Correlation**
Nicola Russo, Lorenzo Esposito, Ernesto Monaco (University of Napoli Federico II, Italy)



- 15:10 Syringe-Based Extruded Customized Crack Propagation Sensor Shape Tailoring and Thermography Manufacturing Defect Control**
Artur Kurnyta (Air Force Institute of Technology, Poland & Łukasiewicz Research Network - Institute of Aviation, Poland); Klaudia Olkowicz and Kacper Lewicki (Air Force Institute of Technology, Poland)
- 15:30 Porosity Assessment in Resin-Infused CFRP Laminates Through Ultrasound and Infrared Thermography**
Leandro Maio (The University of Manchester, United Kingdom)

14:10 - 15:50 Room A - Ground Floor

Session 8.2 - General Track - PART III

- 14:10 Temperature Measurement Accuracy of Thin-Film Heaters for Quartz Crystal Microbalances**
Chiara Martina and Diego Scaccabarozzi (Politecnico di Milano, Italy)
- 14:30 Preliminary Design of the InfraRed Telescope Instrument for the ESA THESEUS Mission**
Marco Giovanni Corti and Diego Scaccabarozzi (Politecnico di Milano, Italy); Bortolino Saggini (Università degli Studi di Padova, Italy)
- 14:50 Active Beamforming Implementation for CubeSat Antenna Arrays: Exploring Trade-Offs in IC Requirements, Power, and Performance**
Fatemeh Abbassi, Abdolhamid Noori and Saeid Karamzadeh (Silicon Austria Labs, Austria)
- 15:10 PLATA Martian Facility for Sand and Dust Mobilization Experiments (EMM Project)**
Gabriele Franzese, Giuseppe Mongelluzzo, Carmen Porto, Simone Silvestro, Francesca Esposito, Ciprian Popa (INAF - Istituto Nazionale di Astrofisica, Italy); Sofia Grusovin, Loris Todesco, Paolo Vagliasindi and Rolando Parmesani (ASSE srl, Italy); Martina Maselli (Opto Engineering, Italy); Gabriele Marzullo (ASSE srl, Italy); Giacomo Martinetti and Christian Nardella (Opto Engineering, Italy); Ugo Cortesi and Marco Gai (IFAC CNR, Italy); Andrea Argan (INAF, Italy); Alessandro Turchi and Immacolata Donnarumma (ASI, Italy); Fabio D'amico (INAF, Italy)
- 15:30 Resident Space Objects Detection and Tracking with a Multi-Camera Telescope**
Pasquale Bencivenga, Giorgio Isoletta, Roberto Opromolla and Giancarmine Fasano (University of Naples Federico II, Italy); Moreno Peroni (Flight Test Wing of the Italian Air Force, Italy)

14:10 - 15:50 Room B - Ground Floor

Session 8.3 - Metrology in Earth observation from aerospace
Chairs: Claudio Parente, *Parthenope University of Naples, Italy*
Pasquale Maglione, *Parthenope University of Naples, Italy*
Francesca Guastaferro, *Almaviva Digitaltec, Naples, Italy*

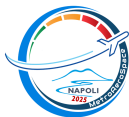
- 14:10 Neo-Pleiades Imagery for Posidonia Oceanica Mapping**
Valerio Baiocchi (Sapienza University of Rome, Italy); Alessandro Bosman (CNR, Italy); Flavia Cianfanelli and Chiara Magurano (Sapienza University of Rome, Italy)
- 14:30 Thermal Analysis for the Laser Microreflector Array Onboard CRISTAL Satellite (Copernicus Polar Ice and Snow Topography Altimeter)**
Igor Di Varano (INAF-IAPS Roma, Italy); Mattia Tibuzzi, Lorenzo Salvatori, Simone Dell'Agnello (Laboratori Nazionale di Frascati - Istituto Nazionale di Fisica Nucleare, Italy)
- 14:50 Drone-Based Laser Scanning for Improved Archaeological Surveys in Heavily Vegetated Zones: a Roman Coastline Case Study**
Luca Alessandri and Valerio Baiocchi (Sapienza University of Rome, Italy); Alberto Guarnieri (University of Padua, Italy); Anna Maria Ciardulli (Sapienza University of Rome, Italy)
- 15:10 Cloud Mask Application on Landsat 8 OLI Imagery for Performing Automatic Classification of Vegetation and Water Bodies**
Francesca Guastaferro (Almaviva Digitaltec, Italy); Pasquale Maglione, Claudio Parente, Giuseppina Prezioso, Vincenzo Verde (Parthenope University of Naples, Italy)
- 15:30 Land Surface Temperature from Landsat 9 Imagery Compared with in Situ Air Temperature Measurements**
Davide Morale, Ugo Falchi (Parthenope University of Naples, Italy); Paola Mercogliano (Centro Euro-Mediterraneo sui Cambiamenti Climatici, Italy); Claudio Parente (University of Studies of Naples Parthenope, Italy)

14:10 - 15:50

Room C - Ground Floor

Session 8.4 - Space-Based Solutions for Global Challenges: Telemedicine, Earth Observation, and Sustainable Development in Remote Areas
Chair: Antonio Pallotti, *Italian Space Agency*

- 14:10 From User Requirements to Operational Service Delivery: the Amazing Achievements of EUMETSAT Meteosat Third Generation - Lightning Imager**
Lt.Col. Daniele Biron, Italian Air Force
- 14:26 Resilience in Earth Observation Through the Ground Segment of the Luigi Broglio Space Center**
Antonio Pallotti, Giancarlo Santilli and Munzer Jahjah (Italian Space Agency, Italy)
- 14:43 Capacity Building and Space Education for Sustainable Development in Emerging Regions**
Antonio Pallotti, Giancarlo Santilli and Munzer Jahjah (Italian Space Agency, Italy)
- 15:00 Toward the Regional Earth Observation Center at the Broglio Space Center**
Antonio Pallotti, Giancarlo Santilli and Munzer Jahjah (Italian Space Agency, Italy)
- 15:16 Developing CubeSat Laboratories in Emerging Space Nations**
Antonio Pallotti, Giancarlo Santilli and Munzer Jahjah (Italian Space Agency, Italy)



15:33 Design of the Sensing Elements of LD-GRIDS, a Charged Dust Analyser for Lunar Surface in the EMM Project Framework
Abdelrahman Mohamed Ragab M Ahmed and Diego Scaccabarozzi (Politecnico di Milano, Italy)

15:50 - 16:10 Coffee/Lunch Area - First Floor
COFFEE BREAK

16:10 - 16:30 Aula Magna - First Floor
CLOSING AND AWARD CEREMONY

