



CONFERENCE PROGRAM



IEEE

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Universidad
Carlos III
de Madrid

2026 IEEE INTERNATIONAL WORKSHOP ON

Metrology for AeroSpace

CARLOS III UNIVERSITY OF MADRID, SPAIN

JULY 1 - 3, 2026

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David Zucconi, SAB Aerospace, Italy

IEEE MetroAeroSpace 2026 Keynote Speakers

Keynote Lecture - Wednesday July 1 - H 12:00



From the Stratosphere to Space: Radiation Monitoring

Bilge Demirköz

Middle East Technical University, Türkiye

ABSTRACT

Radiation environment around the Earth carries information from the Sun and other stars, such as pulsars in our galaxy and beyond. These charged-messengers at low energy are affected by the Sun's 11-year cycle and the Earth's geomagnetic environment (upto 10 GeV-scale). Above that, galactic cosmic rays are affected by production mechanisms in stellar environments and the propagation in the interstellar medium. The Alpha Magnetic Spectrometer on the International Space Station is a unique particle physics experiment that collects statistics since 2011 and measures charged cosmic rays upto TeV scale. AMS has published the cosmic ray flux of protons, electrons, light and heavy nuclei as well as positrons, where an excess at high energies is observed, which might hint at dark matter annihilation in the galactic halo. The METU-IVMER-AMS team analyzes positron spectrum using deep learning techniques.

This radiation environment penetrates deep into the atmosphere and the particle fluxes in the high in the stratosphere are similar to that in space. As particles enter the atmosphere and interact with air, they cause particle showers. As the multiplicity of particles increase, so does the dose rate, reaching a maximum called the Regener-Pfotzer maximum. The radiation dose rate decreases as the atmosphere gets thicker closer to ground level. Prediction of radiation dose and fault rate of electronics as well as radiation shielding and hardness assurance tests are crucial for space assets as well as high-altitude platform stations. METU-IVMER team has flown 9 balloon flights to measure radiation profiles in the stratosphere.

In this talk, I will first describe the space radiation environment, demonstrate the physics reach of AMS with published results and then show the potential of small radiation detectors for monitoring space weather and radiation in the stratosphere.

SPEAKER BIOGRAPHY

Prof. Bilge Demirköz is an astro-particle physics professor at the Ankara-based Middle East Technical University who is active in science diplomacy. She studied at MIT and Oxford for her undergraduate and graduate degrees respectively, worked at Cambridge University, IFAE Barcelona and CERN for 15 years on silicon detectors and data analysis for the ATLAS Experiment at CERN as well as the Alpha Magnetic Spectrometer (AMS) Experiment on the International Space Station. She is currently the director of the Research and Application Center for Space and Accelerating Technologies (IVMER), which performs space radiation tests as part of the RADNEXT collaboration, builds radiation detectors for the stratosphere and space and for medical facilities as well as analyze big data for space science. Her AMS research group uses deep learning to look for the tell-tale signature of dark matter in high-energy cosmic rays.

Prof. Demirköz was a Marie Curie Fellow under FP7, co-founded THE Port humanitarian hackathons at CERN and received multiple awards including the L'Oréal-UNESCO For Women in Science International Rising Talent fellowship. She served on the governing board of TUBITAK for three years and is a member of the Turkish Academy of Sciences and the Young Global Academy as well as a Young Global Leader of the World Economic Forum. Recently, she was selected to serve on the United Nations Independent Scientific Panel on AI.

Keynote Lecture - Thursday July 2 - H 12:00



Manned-Unmanned Teaming - The "Future" of Air Superiority

Alberto P. Martinez Borja

HO Air Power Integrated Portfolio & CapEx (AIRBUS SAU)

ABSTRACT

AIRBUS strategic vision for Unmanned Aircraft Systems (UAS) is defined by three core pillars: cutting-edge technologies, robust life-cycle support, and a diversified product portfolio. The paramount driver for achieving future air superiority is Manned-Unmanned Teaming (MuT), a paradigm shift engineered to dramatically enhance mission efficiency and minimize human operational risk.

Realizing this MuT capability is intrinsically linked to full autonomy, which offers enhanced safety envelopes, optimized mission performance, and unlocks entirely new operational concepts. Artificial Intelligence (AI) serves as the fundamental technology underpinning this autonomy; however, achieving trustworthiness and certifiability in AI is paramount for safe, widespread deployment across the aerospace domain.

The industry is rapidly advancing in decision-making techniques and enhanced perception methodologies. These two critical functional blocks face significant regulatory and operational challenges, particularly in certification, managing complex and contested environments, and seamlessly integrating advanced Human- Machine Teaming (HMT) interfaces. While full autonomous operations are rapidly progressing, they have not yet reached universal deployment.

This presentation underscores AIRBUS commitment to advancing these teaming capabilities, empowering assets to operate as a cohesive System of Systems (SoS). We will detail platform-agnostic solutions, such as the MARS mission system, which embody this future-focused approach. AIRBUS comprehensive UAS product portfolio ranging from tactical systems like Aliaca and SIRTAP to strategic assets like the European Eurodrone (MALE) and the ultra-persistent HAPS Zephyr demonstrates a stepped approach designed to satisfy highly diverse customer mission needs.

SPEAKER BIOGRAPHY

Prof.- Dr. Alberto P. Martínez Borja is currently HO Integrated Portfolio & CapEx in Air Power at AIRBUS Defence & Space.

Martínez-Borja began his aerospace career in 1991 at Boeing Defense & Space Division as system engineer for helicopter programs in Philadelphia (USA). In 1993, Alberto returned to Europe as Spanish National Airworthiness Authority (NAAR) for the FCS of EF-2000 at the Spanish National Aerospace Agency (INTA). In parallel, he became staff project engineer at the Guidance & Control Lab with management responsibilities for all UAS Programs.

In 2001 Martínez-Borja joined EADS as Technical responsible for the future UAS Programs to be developed at DS in Spain. In particular, he contributed to the UCAV Program Barracuda as Program Manager and managed with the Spanish MoD the successful first flight in Spain on 2nd April 2006.

From 2011 to 2015 he was Chief Engineer and Head of the ATLANTE TUAS Program in the PMO of AIRBUS DS leading the end-2-end first UAS CAT2 development in Europe certified for flight in segregated airspace. Since 2018, he leads the Air Power Portfolio Management organization being accountable for the overall R&D & CapEx investments aiming for the Air Power portfolio development in both products and services.

Alberto P. Martínez Borja graduated from ETSIA Madrid in 1990 with a master's degree in aerospace engineering. He also earned a master's degree in business administration from Widener University (Pennsylvania) in 1992, and went on to earn a Ph.D. in aerospace engineering from ETSIA, Madrid in 2003.

Keynote Lecture - Friday July 3 - H 11:50



A Philosophical Perspective: From Metrology and Aerodynamics to Aetiology and Nomology

Graham Wild

University of New South Wales, Australia

ABSTRACT

Metrology defines what can be known in science, yet its philosophical foundations are rarely applied to the study of aerodynamic lift, the most measured and misunderstood phenomenon in aerospace. This work will examine how the philosophy of metrology, with its emphasis on definition, traceability, and uncertainty, constrains and enables the formation of scientific explanations. Starting from what we, as metrologists, agree constitutes a valid measurement, the talk explores how different measurement strategies in aerodynamics, pressure fields, velocity fields, and wake diagnostics, determine what can legitimately be stated about lift. Through this lens, the metrological act becomes the bridge between aetiology (causal reasoning) and nomology (lawful description). By analysing which aspects of lift are empirically measurable and which remain inferential, this shows how metrology not only quantifies aerodynamic forces but also shapes the epistemology and ontology of aerodynamic explanation itself.

SPEAKER BIOGRAPHY

Dr Graham Wild is currently the Aviation Program Coordinator at UNSW Canberra. He completed his PhD in aerospace vehicle structural health monitoring at Edith Cowan University in Australia and, following initial training toward a pilot pathway, became a Lecturer in Aviation Systems at ECU. He later held the position of Senior Lecturer in Aerospace Engineering and Aviation at RMIT University before moving to UNSW Canberra as a Senior Lecturer in Aviation Technology. His core research centres on sensors and instrumentation, most commonly optical fibre systems, currently applied to high-speed fluid–thermal–structural interactions. Alongside this technical work, he has an unhealthy obsession with the history and philosophy of aerodynamics, particularly in how flight is explained and taught. He has authored and co-authored 250 articles with a diverse range of topics across aerospace and aviation.

IEEE MetroAeroSpace 2026 Venue



IEEE **MetroAeroSpace 2026** will be held at the Carlos III University of Madrid, in its "**Puerta de Toledo**" Campus located two minutes away from the beautiful historical center of Madrid.

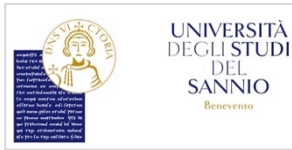
Founded in 1989, University Carlos III of Madrid (UC3M) is one of the most prestigious universities in Spain. With four Campus in Getafe, Leganés, Madrid-Puerta de Toledo and Colmenarejo, UC3M is an institution with a distinctly international profile. It is the first university in Spain and the third in Europe in the number of its students participating in the Erasmus student exchange programs and nearly 20% of the student body is made up of international students. The university has a strong reputation in business subjects and Economics, where it is regularly ranked amongst the top 50 institutions worldwide.

ADDRESS

University Carlos III of Madrid - Puerta de Toledo Campus
Ronda de Toledo, 1 - Madrid



IEEE MetroAeroSpace 2026 Patronages





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Program Schedule - Wednesday, July 1

WEDNESDAY, JULY 1			
09:30 - 10:00	Auditorium - OPENING CEREMONY - WELCOME ADDRESSES		
	Auditorium	Room 02 - A.02	Room 03 - A.03
10:00 - 11:40	S1.1 - From satellites to small UAVs: radar instruments and techniques for microwave remote sensing of the environment	S1.2 - Space To Space: Scientific and Technological Challenges for Human and Robotic Space Exploration - PART I	S1.3 - Relative State Estimation and Sensing for Multi-Satellite Systems
11:40 - 12:00	COFFEE BREAK		
12:00 - 13:00	Auditorium - KEYNOTE LECTURE - Bilge Demirköz From the Stratosphere to Space: Radiation Monitoring		
13:00 - 14:20	LUNCH		
	Auditorium	Room 02 - A.02	Room 03 - A.03
14:20 - 15:40	S2.1 - Advances in measurements for autonomous space systems and for the development and testing of their subsystems - PART I	S2.2 - Space To Space: Scientific and Technological Challenges for Human and Robotic Space Exploration - PART II	S2.3 - General Session - PART I
15:40 - 16:00	COFFEE BREAK		
16:00 - 17:40	S3.1 - Advances in measurements for autonomous space systems and for the development and testing of their subsystems - PART II	S3.2 - Space To Space: Scientific and Technological Challenges for Human and Robotic Space Exploration - PART III	S3.3 - Applied metrology for navigation and precise positioning in autonomous vehicles
17:40 - 18:20	Auditorium - TUTORIAL - The use of high-payload drones for firefighting Ing. Pablo Flores Peña - Drone Hopper Company, Spain		
19:30	WELCOME PARTY - <i>Café del Rio</i> Av. de Portugal, 1, Moncloa - Aravaca, Madrid		

Program Schedule - Thursday, July 2

THURSDAY, JULY 2				
	Auditorium	Room 02 - A.02	Room 03 - A.03	Room 06 - A.06
09:00 - 10:20	S4.1 - Terahertz Technologies for Next-Generation Aerospace Communications and Sensing	S4.2 - Strengthening GNSS: Accurate Positioning, Timing Assurance, and Interference Mitigation - PART I	S4.3 - General Session - PART II	
10:20 - 10:40	COFFEE BREAK			
10:40 - 12:00	S5.1 - Moon Feasibility investigation: Lunar Soil Cultivation, Regolith-based Building and TLC Systems for Remote Operations	S5.2 - Strengthening GNSS: Accurate Positioning, Timing Assurance, and Interference Mitigation - PART II	S5.3 - Panel Wie - IEEE Women in Engineering	S5.4 - General Session - PART III
12:00 - 13:00	Auditorium - KEYNOTE LECTURE - Alberto P. Martinez Borja Manned-Unmanned Teaming - The "Future" of Air Superiority			
13:00 - 14:30	LUNCH			
14:30 - 15:40	Auditorium - ROUND TABLE "Dual technology for aerial security"			
15:40 - 16:20	COFFEE BREAK + POSTER SESSION #1			
	Auditorium	Room 02 - A.02	Room 03 - A.03	Room 06 - A.06
16:20 - 18:00	S6.1 - Metrology for underwater acoustics and applications	S6.2 - Complex Systems Operational Availability: Measurements, Methodologies and Requirements	S6.3 - Structural Health Monitoring And Nondestructive Testing For Aerospace	S6.4 - General Session - PART IV
20:00	GALA DINNER - <i>Hotel Riu Plaza España</i> Gran Vía, 84, Centro, Madrid			

Program Schedule - Friday, July 3

FRIDAY, JULY 3			
	Auditorium	Room 02 - A.02	Room 03 - A.03
09:30 - 11:10	S7.1 - Aerospace systems monitoring through optical and innovative sensors networks	S7.2 - Manufacturing and Metrology in the Aerospace Industry	S7.3 - Special Track - Concepts and Technologies for Next-generation Integrated Terrestrial–Non-Terrestrial Networks (CONNECT) - PART I
11:10 - 11:50	COFFEE BREAK + POSTER SESSION #2		
11:50 - 12:50	Auditorium - KEYNOTE LECTURE - Graham Wild A Philosophical Perspective: From Metrology and Aerodynamics to Aetiology and Nomology		
12:50 - 14:10	LUNCH		
	Auditorium	Room 02 - A.02	Room 03 - A.03
14:10 - 16:10	S8.1 - Automation and Control of UAVs	S8.2 - Aerodynamic Measurement And Propulsion System Control Of Aerial Vehicles	S8.3 - Special Track - Concepts and Technologies for Next-generation Integrated Terrestrial–Non-Terrestrial Networks (CONNECT) - PART II
16:15 - 16:30	CLOSING AND AWARD CEREMONY		

Technical Program - Wednesday, July 1

09:00 - 17:00 *Carlos III University of Madrid - Floor -1*
REGISTRATIONS

09:30 - 10:00 *Auditorium*
OPENING CEREMONY - WELCOME ADDRESSES

INSTITUTIONAL GREETINGS

Prof. Luis Enrique **García Muñoz**, *Vice Rector for Research and Transfer, Carlos III University of Madrid*

Dr. Gaetano **Telesio**, *Director General, Italian National Institute for Astrophysics*

Dr. José Miguel **Mas Hesse**, *Head of Astrophysics Department, Spanish Astrobiology Center*

Prof. Pasquale **Daponte**, *IEEE MetroAeroSpace 2026 General Chair, University of Sannio, Italy*

Prof. David **Martín Gómez**, *IEEE MetroAeroSpace 2026 General Chair, Carlos III University of Madrid*

10:00 - 11:40 *Auditorium*
S1.1 - From satellites to small UAVs: radar instruments and techniques for microwave remote sensing of the environment
Chairs: Giovanni Ludeno, *National Research Council, Italy*
 Carmen Esposito, *National Research Council, Italy*
 Stefano Perna, *Parthenope University of Naples, Italy*

10:00 **On the MIPS Airborne L-Band Interferometric SAR System: A First Assessment on Its Interferometric Capabilities**

Carmen Esposito (Consiglio Nazionale Delle Ricerche, Italy); Paolo Berardino (IREA-CNR, Italy); Jorge Andrés Rosero Legarda (Università Degli Studi di Napoli Parthenope, Italy); Antonio Natale (Research Council of Italy, Italy); Antonio Paucillo (IREA, CNR, Italy); Riccardo Lanari (IREA-CNR, Italy); Stefano Perna (Università degli Studi di Napoli Parthenope, Italy)

10:20 **Pixel-Wise Radio Frequency Interference Mitigation in L-Band Airborne SAR Data**

Alessandro Di Vincenzo (Università Degli Studi di Napoli Parthenope & IREA CNR, Italy); Antonio Natale (IREA CNR, Italy); Paolo Berardino (IREA CNR, Italy); Carmen Esposito (IREA CNR, Italy); Riccardo Lanari (IREA-CNR, Italy); Stefano Perna (Università degli Studi di Napoli Parthenope, Italy); Antonio De Maio (University of Naples "Federico II", Italy)

- 10:40 Detection of Leaks in Potable Water Pipelines in Urban Areas Using Drone-Borne TomoSAR Techniques**
 Gian Oré (University of Campinas, Brazil); Hugo Enrique Hernandez-Figueroa (University of Campinas (Unicamp), Brazil)
- 11:00 SAOCOM-1 L-Band DInSAR Time Series Performance Assessment Across Italian Volcanoes and Tectonic Areas**
 Yenni Lorena Belen Roa (IREA-CNR, Italy); Claudio De Luca (IREA-CNR, Italy); Manuela Bonano (IREA CNR, Italy); Valentina Bruno (National Institute of Geophysics and Volcanology, Italy); Francesco Casu (IREA-CNR, Italy); Prospero De Martino (National Institute of Geophysics and Volcanology, Italy); Marianna Franzese (University of Naples Federico II, Italy & IREA-CNR, Italy); Stefano Gandolfi and Eugenia Giorgini (University of Bologna, Italy); Michele Manunta (CNR-IREA, Italy); Mario Mattia (National Institute of Geophysics and Volcanology, Italy); Paquale Noli, Giovanni Onorato, Pasquale Striano and Riccardo Lanari (IREA-CNR, Italy)
- 11:20 Ground Displacement Monitoring of Volcanic and Seismic Areas Through Spaceborne SAR Sensors**
 Francesco Casu (IREA-CNR, Italy); Manuela Bonano (IREA CNR, Italy); Sabatino Buonanno and Claudio De Luca (IREA-CNR, Italy); Adele Fusco (CNR-IREA & University of Sannio, Italy); Riccardo Lanari (IREA-CNR, Italy); Michele Manunta (CNR-IREA, Italy); Mario Fernando Monteroso (IREA CNR, Italy); Paquale Noli and Giovanni Onorato (IREA-CNR, Italy); Yenni Lorena Belen Roa (IREA-CNR, Italy); Pasquale Striano (IREA-CNR, Italy); Yasir Muhammad (Università Degli Studi di Napoli Parthenope, Italy); Giovanni Zeni (IREA-CNR, Italy); Ivana Zinno (IREA, CNR, Italy)

10:00 - 11:40

Room 02 - A.02

S1.2 - Space To Space: Scientific and Technological Challenges for Human and Robotic Space Exploration - PART I

Chairs: Pietro Ferraro, *ISASI, National Research Council, Italy*

Sara Coppola, *ISASI, National Research Council, Italy*

Paolo Maggiore, *Politecnico di Torino, Italy*

Piero Messidoro, *Politecnico di Torino, Italy*

- 10:00 Scalable P-Jet Printed 2D nanoFRET Biosensor for Spaceflight TNF- α Real Time Monitoring**
 Stefania Carbone (University of Naples Federico II, Italy); Simone Russo (Università Degli Studi di Napoli Federico II, Italy); Anna Palma (Institute of Applied Sciences and Intelligent Systems E. Caianiello, Italy); Sara La Manna and Alessia Cugudda (University of Naples Federico II, Italy); Sara Coppola (CNR-ISASI, Italy); Pier Luca Maffettone (University of Naples Federico II, Italy); Simonetta Grilli (National Council of Research, Italy); Giuseppe Vitiello and Concetta Di Natale (University of Naples Federico II, Italy)
- 10:20 From 2D to 3D Polymeric Microstructures for Interface-Driven Sensing and Delivery in Ionizing Radiation-Related Cancer Applications**

Anna Palma (Institute of Applied Sciences and Intelligent Systems E. Caianiello, Italy); Elena Lagreca (UNINA, Italy); Sara Coppola (CNR-ISASI, Italy); Daniele Tammaro, Concetta Di Natale and Pier Luca Maffettone (University of Naples Federico II, Italy)

10:40 Transdermal Colorimetric Sensing via Microneedles: A Wearable Platform for Astronaut Health Monitoring

Anna Palma (University of Naples Federico II, Italy & ISASI-CNR, Italy); Concetta Di Natale and Daniele Tammaro (University of Naples Federico II, Italy); Elena Lagreca (UNINA, Italy); Gennaro Giordano (University of Campania Luigi Vanvitelli, Italy); Giuseppe Vitiello (University of Naples Federico II, Italy); Veronica Vespini (ISASI-CNR, Italy); Simonetta Grilli (National Council of Research, Italy); Pier Luca Maffettone (University of Naples Federico II, Italy); Sara Coppola (Institute of Applied Sciences & Intelligent Systems "E. Caianiello", Italy)

11:00 Controllable Formation of Ultrathin PLGA Membranes at Thin Liquid Film Interfaces

Zhe Wang (University of Naples Federico II, Italy); Vincenzo Ferraro (University of Parma, Italy); Pier Luca Maffettone (University of Naples Federico II, Italy); Sara Coppola (CNR-ISASI, Italy)

11:20 Unblocking Future Microgravity Studies of Hereditary Red Blood Cell Disorders Through Digital Holography

Maria Pia Pierro (CNR-ISASI, Italy); Marika Valentino (Istituto di Scienze Applicate e Sistemi Intelligenti ISASI-CNR, Italy); Zhe Wang (University of Naples Federico II, Italy); Lisa Miccio, Vittorio Bianco, Pasquale Memmolo and Pietro Ferraro (CNR-ISASI, Italy)

10:00 - 11:40

Room 03 - A.03

S1.3 - Relative State Estimation and Sensing for Multi-Satellite Systems

Chairs: Alex Caon, *Delft University of Technology, The Netherlands*

Stefano Silvestrini, *Polytechnic of Milan, Italy*

Francesco Branz, *University of Padova, Italy*

10:00 Quaternion Bare Bones Particle Swarm Optimizer

Silas Fiore (University of Bern, Switzerland)

10:20 Benchmarking of PointNet-Based Architectures for Pose Estimation of Non-Cooperative Spacecraft from LiDAR Data

Clemente Tecchia, Alessia Nocerino, Giancarmine Fasano, Michele Grassi and Roberto Opromolla (University of Naples Federico II, Italy)

10:40 Reproducing Orbital Dynamics with Omnidirectional Robots

Jonathan Poot, Alex Caon and Jian Guo (Delft University of Technology, The Netherlands)

11:00 Self-Supervised Vision Transformers for Spacecraft Pose Estimation Across Domain Shift

Stefano Bergia (LINKS Foundation, Italy); Irene Caracciolo (Politechnic of Turin, Italy); Fabrizio Stesina (Politecnico di Torino, Italy); Maurizio Fantino (LINKS Foundation, Italy)

11:20 Development of a Vision-Based Navigation System for Rendezvous and for Metrological Purposes
 Pascal Dinjens, Alex Caon and Jian Guo (Delft University of Technology, The Netherlands)

11:40 - 12:00 *Carlos III University of Madrid - Floor -1*
COFFEE BREAK

12:00 - 13:00 *Auditorium*
KEYNOTE LECTURE
Chair: Pasquale Daponte, *University of Sannio, Italy*

From the Stratosphere to Space: Radiation Monitoring

Bilge Demirköz, Middle East Technical University, Türkiye

13:00 - 14:20 *Carlos III University of Madrid - Floor -1*
LUNCH

14:20 - 15:40 *Auditorium*
S2.1 - Advances in measurements for autonomous space systems and for the development and testing of their subsystems - PART I
Chair: Marco Pertile, *University of Padova, Italy*

14:20 Event-Camera-to-Body Extrinsic Calibration Using Accumulated Event Frames
 Vincenzo Quitadamo (Università Degli Studi di Padova, Italy); Sebastiano Chiodini, Marco Pertile, Lorenzo Olivieri and Andrea Valmorbida (University of Padova, Italy)

14:40 Design and Metrological Characterisation of an Ultra-Stable Power Conditioning and Distribution Unit for Smallsat Platforms
 David Marroquí (Miguel Hernández University of Elche, Spain); David Alcaraz, Lorena Caler and Miguel Martínez (Miguel Hernandez University of Elche, Spain); Ausias Garrigos, José Blanes and Cristian Torres (University Miguel Hernández of Elche, Spain)

15:00 Physical Validity of Nominal Telemetry in the OPS-SAT Satellite Anomaly Detection Dataset
 Jonathan Gadiel Ramirez Martinez (École de Technologie Supérieure, Canada & Instituto Politecnico Nacional, Mexico); Jesus Gonzalez-Llorente (École de Technologie Supérieure, Canada)

15:20 Escape from the Earth-Moon System to Aerocapture at Mars with a Solar Sail-Propelled CubeSat: Trajectory Design and Autonomous Optical Navigation
 Ozge Ozturk (Izmir University of Economics, Turkey); Sena Güven and Azra Görkem Kurt (Izmir Economic University, Turkey); Kıymet Yıldır (Izmir University of Economics, Turkey)

14:20 - 15:40

Room 02 - A.02

S2.2 - Space To Space: Scientific and Technological Challenges for Human and Robotic Space Exploration - PART II

Chairs: Pietro Ferraro, *ISASI, National Research Council, Italy*

Sara Coppola, *ISASI, National Research Council, Italy*

Paolo Maggiore, *Politecnico di Torino, Italy*

Piero Messidoro, *Politecnico di Torino, Italy*

- 14:20 Miniaturized Biohybrid Ecosystem for Autonomous Bioregenerative Processes and Long-Term Space Monitoring**
 Marco Griffa (*Scuola Superiore Sant'Anna, Italy*); Adriano Di Giovanni (*Gran Sasso Science Institute, Italy*); Cesare Stefanini (*Khalifa University of Science and Technology, United Arab Emirates*); Donato Romano (*Scuola Superiore Sant Anna, Italy*)
- 14:40 SPODS: SOLID-Pod Architecture for Secure Astronaut Health Data Management in Long-Duration Missions and Its Role in the Space Health Data Ecosystem**
 Ilaria Amelia Caggiano (*Università Degli Studi Suor Orsola Benincasa, Italy*); Biagio Boi and Christian Esposito (*University of Salerno, Italy*); Anna Anita Mollo (*Università degli Studi di Napoli Federico II, Italy*); Emiliano Troisi (*University of Naples Suor Orsola Benincasa, Italy*); Lucilla Gatt (*Università Degli Studi Suor Orsola Benincasa, Italy*)
- 15:00 Medical Devices in Outer Space: Liability, Risk Allocation, and Regulatory Challenges in the New Space Economy**
 Giovanna Capilli (*Universita' San Raffaele Roma, Italy*)
- 15:20 Data-Driven Deorbiting Compliance Classification of LEO Satellites: Framework and Sensitivity to Tracking Data Uncertainty**
 Gregorio Poggi (*University of Padua, Italy*); Giacomo Porcarelli (*University of Padova, Italy*); Alessandro Vignato (*CISAS G. Colombo, Italy*); Federico Toson (*University of Padova & CISAS G. Colombo, Italy*)

14:20 - 15:40

Room 03 - A.03

S2.3 - General Session - PART I

Chair: David Martín Gómez, *Carlos III University of Madrid, Italy*

- 14:20 Automatic Defect Detection on CFRP Panels Training Autoencoders on Raw Ultrasonic Data**
 Giuseppe Farano, Angelo Cardellicchio and Massimiliano Nitti (*CNR STIIMA, Italy*); Davide Chirico and Alessandra Metrangolo (*Leonardo S.p.A. Divisione Aerostrutture, Italy*); Valerio Denticò (*Leonardo S.p.A., Italy*); Vito Renò (*STIIMA CNR - Bari, Italy*)
- 14:40 Combined Active-Passive Strategy for Deorbiting Earth Remote Sensing Satellites in Low Earth Orbits**
 Berik Zhumazhanov (*Ghulam LLP & NJSC L.N. Gumilyov Eurasian National University, Kazakhstan*); Aigul Kulakayeva (*International Information Technologies University, Kazakhstan*); Kazbek Baktybekov (*Ghulam LLP, Kazakhstan*)

- 15:00 Parameter Identification of a Supercapacitor Under Dynamic Current Operating Conditions**
Abolfazl Movahedian (University of Sannio, Italy); Gianluca Marinaro and Clemente Serpico (CIRA, Italy); Emma Frosina (University of Sannio, Italy); Antonio Pagano (CIRA, Italy)
- 15:20 Experimental Implementation of a Thevenin Behavior Model of a DC-3AC Converter for Aerospace Applications**
Noan Artaud (SIAME E2S UPPA et ONERA, Université de Toulouse, France); Isabelle Junqua (ONERA, France); Jean-Marc Dienot (Laboratoire SIAME, E2S/ UPPA, Labceem, University of Toulouse & Institute of Technology, France); Robert Ruscassié (Laboratoire SIAME, Université de Pau et Pays de l'Adour, France)
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- 15:40 - 16:00 Carlos III University of Madrid - Floor -1*
COFFEE BREAK
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- 16:00 - 17:00 Auditorium*
S3.1 - Advances in measurements for autonomous space systems and for the development and testing of their subsystems - PART II
Chair: Marco Pertile, *University of Padova, Italy*
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- 16:00 SARGASSIA System Prototyping: From Hardware Specification to Laboratory Validation**
Alessandro Ferrario (European Commission, Italy); Andrea Piccolo (Joint Research Centre European Commission, Italy); Francesco Menzione (European Commission Joint Research Center, European Union); Fausto Bonavitacola (Energy Security, Distribution and Markets Unit, Joint Research Centre, EC, Italy); Domenico Di Grazia and Fabio Pisoni (STMicroelectronics, Italy)
- 16:20 Thermal Analysis and Design Study for the GENESIS Passive Laser Retroreflector (P-LRR) Unit**
Igor Di Varano (Inaf-laps, Italy); Mattia Tibuzzi (Laboratori Nazionale di Frascati (LNF) of Istituto Nazionale di Fisica, Italy); Simone Dell'Agnello (Laboratori Nazionale di Frascati (LNF) of Istituto Nazionale di Fisica Nucleare (INFN), Italy); Lorenzo Salvatori (Laboratori Nazionale di Frascati (LNF) of Istituto Nazionale di Fisica Nucleare, Italy)
- 16:40 A Shared-Core Control Architecture for Terrain-Adaptive and Waypoint-Sequenced Planetary Rover Navigation**
Agnese Maria Alfarano (Polytechnic Institute of Turin, Italy); Luca Ostrogovich and Giuseppe Puleo (Telespazio S.p.A, Italy); Luca Andolfi (Telespazio S.p.A, Italy); Federico Bunkheila (Telespazio S.p.A, Italy); Jacopo Sini and Massimo Violante (Politecnico di Torino, Italy)

- 16:00 - 18:00 *Room 02 - A.02*
S3.2 - Space To Space: Scientific and Technological Challenges for Human and Robotic Space Exploration - PART III
Chairs: Pietro Ferraro, *ISASI, National Research Council, Italy*
 Sara Coppola, *ISASI, National Research Council, Italy*
 Paolo Maggiore, *Politecnico di Torino, Italy*
 Piero Messidoro, *Politecnico di Torino, Italy*
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- 16:00 High-Fidelity Simulation of Probe-and-Drogue Docking System: Alignment, Soft Capture, and Hard Lock**
 Martina Ferrauto, Annamaria Sambrini, Lucrezia Soldato, Erica Scantamburlo, Davide Sorli and Stefano Mauro (Politecnico di Torino, Italy)
- 16:20 Wireless Power Transmission: Controlled Spillover Architectures for Thermal Dissipation of the Pointing Mirror**
 Stefano Mauro, Domenico Edoardo Sfasciamuro and Francesco Lopez (Politecnico di Torino, Italy)
- 16:40 Microfluidic Droplet Platforms for Cell and Drug Encapsulation as Enabling Technologies for Space Medicine**
 Lilia Losco De Cusatis, Giancarlo Esposito, Raffaele Crispino, Daniele Tammaro, Concetta Di Natale and Pier Luca Maffettone (University of Naples Federico II, Italy)
- 17:00 Ethical-Legal Assessment in the Adoption Process of New Defence Technologies in Space**
 Biagio Boi (University of Salerno, Italy); Ilaria Amelia Caggiano (Università Degli Studi Suor Orsola Benincasa, Italy); Christian Esposito (University of Salerno, Italy); Lucilla Gatt (Università Degli Studi Suor Orsola Benincasa, Italy)
- 17:20 Evaluation of Cell Deformability Using Extensional Flow for Space Health Monitoring**
 Gaia Russo and Raffaele Crispino (University of Naples Federico II, Italy); Gennaro Giordano (Isasi-CNR, Italy); Giusy Giugliano (Institute of Applied Sciences and Intelligent Systems E. Caianiello, National Research Council, Italy & University of Campania Luigi Vanvitelli, Italy); Lisa Miccio (Isasi-CNR, Italy); Daniele Tammaro, Concetta Di Natale, Massimiliano Villone and Pier Luca Maffettone (University of Naples Federico II, Italy)
- 17:40 Planetary Protection and Microbiological Control in Human Space Modules: Challenges for Bioregenerative Architectures from Lunar to Martian Scenarios**
 Angelica Apuzza Vittori (University of Roma "La Sapienza", Italy); Angelo Fabbrizi (Sapienza University of Rome, Italy); Rita Carpentiero (Italian Space Agency, Italy); Francesca Ferranti (ASI, Italy); Cristina Baldetti (Italian Space Agency, Italy); Giulia Savino, Andrea Delfini and Paolo Marzioli (Sapienza University of Rome, Italy); Fabrizio Piergentili (DIMA SAPIENZA, Italy)

16:00 - 17:40 *Room 03 - A.03*
S3.3 - Applied metrology for navigation and precise positioning in autonomous vehicles
Chair: David Martín Gómez, *Carlos III University of Madrid, Spain*

- 16:00 Hyperbolic Tangent and Fibonacci Numbers Matter to Nonlinear Beneš Filtering: Applications to Drones**
 Alfonso Farina (Leonardo Company Consultant, Italy); Marco Evangelista (Leonardo Cyber & Security Solutions, Italy); Salvatore Ponte (University of Campania "L. Vanvitelli", Italy)
- 16:20 Integration of PPP-HAS and IMU Using Low-Cost Hardware for Precision UAV Navigation**
 Luigi Farina, Luca Garbarino, Gianluca Corrado and Giovanni Cuciniello (CIRA, Italy)
- 16:40 Indoor Navigation and Attitude Estimation for UAS Using Inertial Sensors and Extended Kalman Filtering**
 Salvatore Ponte (University of Campania "L. Vanvitelli", Italy); Gennaro Ariante (University of Naples Parthenope, Italy); Aniello Menichino (Italian Aerospace Research Centre - CIRA, Italy); Vittorio Di Vito (CIRA Italian Aerospace Research Center, Italy); Giuseppe Del Core (University of Naples Parthenope, Italy)
- 17:00 Beyond Perfect-Conductor Parametric Amplification Models in Dispersion Force-Driven Quantum Vacuum Accelerometers for Deep Space Navigation**
 Fabrizio Pinto (Izmir University of Economics, Turkey)
- 17:20 Dual Pose-Graph Semantic Localization for Vision-Based Autonomous Drone Racing**
 David Perez-Saura (Universidad Politécnica de Madrid, Spain); Miguel Fernandez Cortizas (University of Luxembourg, Luxembourg); Alvaro Gaona and Pascual Campoy (Universidad Politécnica de Madrid, Spain)

17:40 - 18:20 *Auditorium*
TUTORIAL
Chair: David Martín Gómez, *Carlos III University of Madrid, Spain*

The use of high-payload drones for firefighting

Pablo Flores Peña, *Drone Hopper*

19:30 *Café del Río - Av. de Portugal, 1, Moncloa - Aravaca, Madrid*
Metro Station: Príncipe Pío
WELCOME PARTY

Technical Program - Thursday, July 2

08:30 - 17:00 *Carlos III University of Madrid - Floor -1*
REGISTRATIONS

09:00 - 10:20 *Auditorium*
S4.1 - Terahertz Technologies for Next-Generation Aerospace Communications and Sensing
Chairs: *Ilaria Marasco, Polytechnic University of Bari, Italy*
Ernestina Cianca, University of Rome Tor Vergata, Italy

09:00 Parametric Analysis of Beam Wander in Turbulent Atmosphere for Satellite Optical Receivers
Marcello Asciola (Politecnico di Bari, Italy); Rodrigo Blazquez-Garcia (Universidad Politécnic de Madrid, Spain); Francesco Dell'Olio (Micro Nano Sensor Group Polytechnic University of Bari, Italy)

09:20 A Graphene-Based Frequency Selective Surface for Transmission and Reflection Control in the Sub-THz Frequency Band
Ilaria Marasco, Luciano Lops, Giovanni Magno and Antonella D'Orazio (Politecnico di Bari, Italy)

09:40 UAV Stereoscopic Video Streaming: Experimental Wi-Fi Bandwidth Analysis and THz Scalability Assessment
Enrico Boffetti, Giuseppe Piro and Gennaro Boggia (Politecnico di Bari, Italy)

10:00 Transfer Learning Evaluation of a Neural Receiver Using over-the-Air Measurements at 3.7 GHz and 122.5 GHz
Alessandro Nordio (CNR-IEIIT, Italy); Daniel Gaetano Riviello (Politecnico di Torino, Italy & Consiglio Nazionale delle Ricerche, Italy); Fabio Paonessa (Consiglio Nazionale Delle Ricerche (CNR-IEIIT), Italy); Giuseppe Virone (Consiglio Nazionale delle Ricerche, Italy); Alberto Tarable (National Research Council, Italy); Francesco Malandrino (CNR-ieiit, Italy)

09:00 - 10:20 *Room 02 - A.02*
Strengthening GNSS: Accurate Positioning, Timing Assurance, and Interference Mitigation - PART I
Chairs: *Andrea Piccolo, European Commission, Joint Research Centre*
Francesco Menzione, European Commission, Joint Research Centre

09:00 Robust GNSS-ISL Synchronization in LEO Constellations for Space-Based Aircraft Multilateration: Assessment Using Real Data
Mauro Leonardi, Mahsa Mohebbi and Giulio Sidoretti (University of Rome Tor Vergata, Italy)

- 09:20 Strengthening GNSS Receivers via Authentication and High-Accuracy Overlays**
Emmanouil Papadakis (Universitat Autònoma de Barcelona, Spain); Ivan Rey García, Iulian Diaconescu and Rafael Terris Gallego (Universitat Autònoma de Barcelona (UAB), Spain); Gonzalo Seco-Granados (Universitat Autònoma de Barcelona, Spain); José A. López Salcedo (Universitat Autònoma de Barcelona, Spain); Víctor Gracia, Arnau Pena, Sílvia Navarta and Marc Solé (Indra, Spain)
- 09:40 Synchronisation and Signal Delay Calibration in Passive Satellite Tracking**
Ricardo Piriz, Francesc Vilardell Sallés and Alberto Águeda Maté (GMV, Spain)
- 10:00 Real-Time Multi-GNSS P2OD Performance Assessment During High-Dynamic Attitude Manoeuvres in LEO Orbit Raising**
Miguel Pérez (Indra Space, Spain); Bruno Cardeira (Indra Space, Portugal); Massimo Bardella and Stefano Casotto (University of Padua, Italy); Andrea Piccolo and Francesco Menzione (European Commission Joint Research Centre, Italy)

09:00 - 10:20

Room 03 - A.03

General Session - PART II

Chair: David Martín Gómez, *Carlos III University of Madrid, Spain*

- 09:00 The Research on Temperature Gradient and Temperature-Dependent Emissivity Characterization of Conical Cavity Blackbody**
Zegang Yin (China Jiliang University, China); Huanxin Li (National Institute of Metrology, China); Xiangjun Li (China Jiliang University, China); He Chen (National Institute of Metrology China, China); Xiaohai Cui and Kejia Zhao (National Institute of Metrology, China); Chongyang Zhang (Beijing University of Posts and Telecommunications, China)
- 09:20 Design of an Aeronautical Test Equipment Facility Exploiting a Model-Based Systems Engineering Approach for Aircraft Maintenance**
Vincenzo Donato and Gabriele Giangreco (University of Naples Federico II, Italy); Fausta Mattei (University of Study of Naples Federico II, Italy); Pasquale Basso (CeSMA, University of Naples Federico II, Italy); Claudia Conte and Giancarlo Rufino (University of Naples Federico II, Italy); Domenico Accardo (Università degli Studi di Napoli FEDERICO II, Italy)
- 09:40 Neural-Network-Based Algorithm for Fault Detection and Identification in PMSM Drive for UAV Electric Propulsion**
Alessandro Mazzone and Gianpietro Di Rito (University of Pisa, Italy); Valerio Bonini and Eugenio Rovera (Leonardo S.p.A., Italy); Aleksander Suti (INSA Toulouse, France)
- 10:00 Lunar Dust GRID System: Thermomechanical Study of a Charged Dust Analyser for the Lunar Surface**
Abdelrahman Mohamed Ragab M Ahmed, Diego Scaccabarozzi and Chiara Martina (Politecnico di Milano, Italy)

10:20 - 10:40 *Carlos III University of Madrid - Floor -1*
COFFEE BREAK

10:40 - 12:00 *Auditorium*
S5.1 - Moon Feasibility investigation: Lunar Soil Cultivation, Regolith-based Building and TLC Systems for Remote Operations
Chair: *Andrea Delfini, Sapienza University of Rome, Italy*

10:40 Assessment of Plant Cultivation Performance in Lunar Regolith Simulants for ISRU-Based Bioregenerative Systems
Angelica Apuzza Vittori, Massimo Silvestri, Angelo Fabbrizi, Lorenzo Mazzetti, Gabriele Agresti, Michelangelo Milanese, Beatrice Curti and Andrea Delfini (Sapienza University of Rome, Italy); Luca Nardi (ENEA, Italy); Rita Carpentiero (Italian Space Agency, Italy); Francesca Ferranti (ASI, Italy); Cristina Baldetti (Italian Space Agency, Italy); Paolo Marzioli (Sapienza University of Rome, Italy); Fabrizio Piergentili (DIMA SAPIENZA, Italy)

11:00 DaedalusCAM Stereoscopic Immersive Imaging System for Lunar Lava Tube Exploration: Feasibility Design
Diego Scaccabarozzi, Kirill A. Potemkin, Chiara Martina, Marco Giovanni Corti, Andrea Appiani and Abdelrahman Mohamed Ragab M Ahmed (Politecnico di Milano, Italy)

11:20 Dielectric Characterization of Lunar Regolith Simulants in the Mobile Phone and WiFi Frequency Band
Andrea Delfini (Sapienza University of Rome, Italy); Davide Micheli (Telecom Italia - TILAB, Italy); Paolo Marzioli; Mario Marchetti; Fabrizio Piergentili (Sapienza University of Rome, Italy); Marco Costanzi (TiFast srl, Italy); Lorenzo Mariani and Christian Circi (Sapienza University of Rome, Italy)

11:40 Radiation Shielding Properties of Synthetic Lunar Regolith Analog: Gamma Attenuation Tests for ISRU-Based Habitat Design
Beatrice D'Orsi (ENEA, Italy); Riccardo Anzuini (Sapienza University of Rome, Italy); Rocco Carcione, Ilaria Di Sarcina, Emiliana Mansi, Jessica Scifo, Adriano Verna and Alessia Cemmi (ENEA, Italy)

10:40 - 12:00 *Room 02 - A.02*
S5.2 - Strengthening GNSS: Accurate Positioning, Timing Assurance, and Interference Mitigation - PART II
Chairs: *Andrea Piccolo, European Commission, Joint Research Centre*
Francesco Menzione, European Commission, Joint Research Centre

10:40 GNSS Independent Velocity Measurement for High Altitude Balloons Using LoRa SX1280
Batuhan Can Azakoğlu (Middle East Technical University, Turkey); Bilge Demirköz (METU-IVMER, Turkey); Mehlika Zeynep Arslan (Middle East Technical University &

IVMER (the Research and Application Center for Space and Accelerator Technologies), Turkey); Uğur Kılıç (METU-IVMER, Turkey)

11:00 Lunar Transfer Orbit Navigation Augmentation via Surface Beacon: Reimagining LuGRE

Lorenzo Sciacca (Polytechnic Institute of Turin, Italy); Luca Morichi (Politecnico di Toino, Italy & Politecnico di Torino, Italy); Vlad Silea, Oliviero Vouch, Andrea Nardin, Alex Minetto and Fabio Dovis (Politecnico di Torino, Italy)

11:20 Galileo Services for Timing and Synchronisation Applications

Emilio Javier González García-Consuegra (Spaceopal GmbH, Spain); Valeria Catalano (EUSPA, Italy)

11:40 Single and Multi-Objective Innovation-Driven EKF2 Tuning for UAV INS/GNSS Navigation

Juan Pedro Llerena (Universidad de Alcalá (UAH) Madrid, Spain); Jesus Garcia and Jose Manuel Molina (Universidad Carlos III de Madrid, Spain)

10:40 - 12:00

Room 03 - A.03

S5.3 - IEEE Women in Engineering Affinity Group Panel for MetroAeroSpace: “Sharing idea with experienced and early-stage researchers”

Moderators: Sara Coppola, *ISASI - National Research Council, Italy*
 Ilaria Marasco, *Politecnico di Bari, Italy*
 Chiara Martina, *Politecnico di Milano, Italy*

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.

To this end, the panel wants to highlight how, from the comparison between experienced and early-stage researchers on their respective experiences, it is possible to identify guidelines and prospects for growth and good practices that increase the presence of young women in the aerospace sector.

10:40 Welcome Addresses

Dr. Sara Coppola, Dr. Ilaria Marasco, Dr. Chiara Martina: WIE Volunteers and organizers of the panel

10:50 Introduction to IEEE WIE AG and Commitment Chart

Prof. Patrizia Lamberti, WIE AG Italy section chair

11:00 Prof. Paloma Diaz, Full Prof. Computer Science and Engineering Department, Global Engineering Deans Council Chair, Director of the Interactive Systems Research Group (DEI-Lab), Director of the UC3M-Telefónica Chair on Women&Technology, IEEE HKN Professional member

11:30 Young Researchers evidence

11:50 Q&A Session

10:40 - 12:00 *Room 06 - A.06*
S5.4 - General Session - PART III
Chair: David Martín Gómez, *Carlos III University of Madrid, Spain*

- 10:40 YİB-High Altitude Balloon-Radiation Monitoring and Test Platform: Developments in 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); Batuhan Can Azakoğlu (Middle East Technical University, Turkey)
- 11:00 Performance Assessment of a Fiber-Optic Wearable Strain Sensor for Cardiorespiratory Monitoring in Simulated Microgravity**
 Carlo Massaroni, Lorenzo Zoboli, Daniela Lo Presti and Alessio Gizzi (Università Campus Bio-Medico di Roma, Italy); Emiliano Schena (University Campus Bio-Medico of Rome, Italy)
- 11:20 Experimental Thermal Strain Measurement and Temperature Decoupling on a Heated Cantilever Using Optical Fiber Sensing Technologies**
 Peter Xinhao Li (University of New South Wales, Australia); Dan Handford (Hypersonic Chief Designer at University of New South Wales, Australia); Graham Wild (University of New South Wales, Canberra, Australia); Dylan Dooner (Research Associate, Australia); Andrew Neely (Associate Dean, IIP, Australia)
- 11:40 Characterization of UAV Detection by Event Camera Technology in Indoor Environments**
 Fausta Mattei (University of Study of Naples Federico II, Italy); Vincenzo Donato, Claudia Conte and Giancarlo Rufino (University of Naples Federico II, Italy); Domenico Accardo (Università degli Studi di Napoli FEDERICO II, Italy)

12:00 - 13:00 *Auditorium*
KEYNOTE LECTURE
Chair: José María Armingol Moreno, *Carlos III University of Madrid, Spain*

Manned-Unmanned Teaming - The "Future" of Air Superiority

Alberto P. Martinez Borja, *HO Air Power Integrated Portfolio & CapEx (AIRBUS SAU)*

13:00 - 14:30 *Carlos III University of Madrid - Floor -1*
LUNCH

14:30 - 15:40

Auditorium

ROUND TABLE

Moderator: David Martín Gómez, *Carlos III University of Madrid, Spain*

**Dual technology for aerial security:
from current innovations for civil purposes and law enforcement
authorities, to potential applications in military defense**

15:40 - 16:20

Carlos III University of Madrid - Floor -1

COFFEE BREAK - POSTER SESSION #1

- PS1.1 Acoustic Signal Characterization for Tool Wear Monitoring in Manual CFRP Drilling**
Giuseppe Farano (CNR STIIMA, Italy); Angelo Cardellicchio (National Research Council of Italy, Italy); Massimiliano Nitti (CNR STIIMA, Italy); Davide Chirico and Alessandra Metrangolo (Leonardo S.p.A. Divisione Aerostrutture, Italy); Valerio Denticò (Leonardo S.p.A., Italy); Vito Renò (STIIMA CNR - Bari, Italy)
- PS1.2 Numerical Modeling of the Deorbiting Stages of the KazEOSat-2 Satellite**
Aigul Kulakayeva (International Information Technologies University, Kazakhstan); Berik Zhumazhanov (Ghalam LLP & NJSC L.N. Gumilyov Eurasian National University, Kazakhstan); Aigerim Zylgara (JSC NC Kazakhstan Gharysh Sapary, Kazakhstan); Bagdat Kozhakhmetova (International Information Technologies University, Kazakhstan)
- PS1.3 Fault-Tolerant Compensation Method in EIT Based on Data Fusion for Aerospace Composites**
Ngoc Nam Pham (Brno University of Technology, Czech Republic); Jan Leuchter (Brno University of Technology; University of Pardubice); Martin Honig and Jan Vaclavik (AERO Vodochody Aerospace, Czech Republic); Erik Blasch (IEEE AESS)
- PS1.4 Studies of Differential- and Common-Modes of Conducted Emissions for on-Board Power Devices**
Jean-Marc Dienot (Laboratoire SIAME, E2S / UPPA, Labceem, University of Toulouse & Institute of Technology, France); Robert Ruscassié (Laboratoire SIAME, Université de Pau et Pays de l'Adour, France); Roman Leduc (Laboratoire SIAME, UPPA, France); Veronika Gavrilenko (Université de Pau et Pays de l'Adour, France); Noan Artaud (SIAME E2S UPPA et ONERA, Université de Toulouse, France)
- PS1.5 Ultra-Fine Attitude Stabilization for Earth Observation: The uFASTER Testbed**
Dario Modenini (Alma Mater Studiorum Università di Bologna & Interdepartmental Center for Industrial Research on Aerospace, Italy); Andrea Curatolo (Alma Mater Studiorum Università di Bologna, Italy); Alessandro Lotti (Department of Industrial Engineering Alma Mater Studiorum Università di Bologna); Nicolas Gagliardi (Alma Mater Studiorum Università di Bologna, Italy); Andrea Negri (IMT srl, Italy); Massimo Perelli, Giovanni Cucinella and Simone Di Filippo (IMT Srl, Italy); Giuseppe D'Amore (ASI - Italian Space Agency, Italy)

- PS1.6 Temporal Probabilistic Modeling with Uncertainty-Aware LSTM Networks for Self-Aware Fault Detection and Prognostics in Autonomous Aerospace Systems**
Rakesh Prakash (University of Colorado Boulder, USA); Soujanya Jagadeesh (UST Global, USA); Sunil Gentyala (HCLTECH, USA)
- PS1.7 Fine-Grained Aircraft Detection in Satellite Images via Deep Learning Feature Fusion**
Ivan Saetchnikov (Belarusian State University, Belarus)
- PS1.8 N-Gram-MoSE: Efficient Remote Sensing Super-Resolution via N-Gram Context and Mixture-of-Experts**
Yun-Hsuan Huang, Trong-An Bui and Chih-Hung Chuang (National Taipei University of Technology, Taiwan)
- PS1.9 Laser Interferometric Measurement and Calibration of Gas Pulse Pressure**
Li Bo (Changcheng Institute of Metrology& Measurement, China); Xia Wang (Beijing Institute of Technology, China); Xiaojie Shi (China Jiliang University, China); Heyu Zhang (Changcheng Institute of Metrology& Measurement, China); Zengyang Zhao (China Jiliang University, China)
- PS1.10 Microwave Tomography Imaging for Large-Scale Contactless GPR Surveys**
Giuseppe Esposito (Institute for Electromagnetic Sensing of the Environment - National Research Council of Italy, Italy); Gianluca Gennarelli (IREA-CNR, Italy); Giovanni Ludeno (Institute for Electromagnetic Sensing of the Environment, National Research Council of Italy, Italy); Carlo Noviello (IREA-CNR & University of Napoli Federico II, Italy); Francesco Soldovieri (CNR, Italy); Ilaria Catapano (IREA-CNR, Italy)
- PS1.11 PTSM-Based Inversion of Surface Parameters Through Polarimetric TOPSAR SAOCOM-1 Data**
Leonardo Euillades (National University of Cuyo, Argentina); Paolo Berardino (IREA-CNR, Italy); Carmen Esposito (IREA-CNR, Italy); Jorge Alejandro Euillades (Instituto CEDIAC, Universidad Nacional de Cuyo, Mendoza, Argentina); Pablo Euillades (National University of Cuyo, Argentina); Muhammad Javvad ur Rehman (IREA-CNR, Italy); Riccardo Lanari (IREA-CNR, Italy); Stefano Perna (Università degli Studi di Napoli Parthenope, Italy); Yenni Lorena Belen Roa (IREA-CNR, Italy); Patricia Alejandra Rosell (Instituto CEDIAC, Universidad Nacional de Cuyo, Mendoza, Argentina); Antonio Natale (IREA-CNR, Italy)
- PS1.12 A Study of a Rotating Eddy Current System for CFRP Defect Detection**
Alessandro Sardellitti (Universitas Mercatorum, Italy); Federico Carere (Telematic University Pegaso, Italy); Grzegorz Tytko and Tomasz Rogala (Silesian University of Technology, Poland); Silvia Sangiovanni (Sapienza University of Rome, Italy); Andrzej Katunin (Silesian University of Technology, Poland); Marco Laracca (Sapienza University of Rome, Italy)

- PS1.13 Thermal Characterization of Commercial Time-of-Flight Distance Sensors for Satellite Docking Applications**
 Dario Delbono (University of Padua, Italy); Martina Imperatrice, Marco Lorenzo D'agostini and Giorgia Franchin (University of Padova, Italy); Mattia Peruffo (Stellar Project Srl, Italy); Giorgio Ammirante and Federico Parigi (Tyvak International, Italy); Camille Pirat (European Space Agency (ESA), The Netherlands); Francesco Branz (University of Padova, Italy)
- PS1.14 Interoperability Evaluation of Multiple GNSS Systems**
 Marco Pertile, Anna Fantoni, Joaquin Zurutuza, Sebastiano Chiodini, Andrea Valmorbida and Alessandro Caporali (University of Padova, Italy)
- PS1.15 A Modular Multi-Band IoT Gateway Testbed for Laboratory Evaluation of CubeSat M2M Communication**
 Abdellah Essetty (Mohammed V University in Rabat, Morocco); Leila Nahiri (Mohammed V & Mohammadia School of Engineers, Morocco); Fadwa Belali (EMI & ERCS, Morocco); Slimane Bah (Ecole Mohammadia d'Ingenieurs (EMI) & Mohammed V University, Morocco); Zouhair Guennoun (Ecole Mohammadia d'Ingenieurs, Morocco & Mohammed V University in Rabat, Morocco)
- PS1.16 Resilient GNSS/IMU Sensor Fusion for Spoofing Detection: Physical Constraints, Stochastic Modeling, and Fault Detection Architectures**
 Marco Antonio Mauro (Red Yard Research, Italy); Francesco Felicetti (University of Calabria, Italy); Gregorio Andria (Politecnico di Bari, Italy); Vincenzo Coniglio (Red Yard Research, Italy)
- PS1.17 Design and Preliminary Experimental Validation of a 3D-Printed Resistive Pressure Sensor for Embedded Aerospace Monitoring**
 Mattia Alessandro Ragolia and Gregorio Andria (Politecnico di Bari, Italy); Filippo Attivissimo (Politecnico of Bari, Italy); Nicola Conversano (Polytechnic University of Bari, Italy); Anna Maria Lucia Lanzolla (Polytechnic of Bari, Italy); Maurizio Spadavecchia (Polytechnic University of Bari, Italy)

16:20 - 18:00

Auditorium

S6.1 - Metrology for underwater acoustics and applications

Chair: Salvatore Ponte, *University of Campania L. Vanvitelli, Italy*

- 16:20 Modeling Underwater Sound Propagation: A Review**
 Salvatore Ponte (University of Campania "L. Vanvitelli", Italy); Alfonso Farina (Leonardo Company Consultant, Italy)
- 16:40 Accurate EKF-Based Underwater Navigation System with RSSI Validation and Delay-Compensated USBL Measurements**
 Kirolos Romany Anwar Kamel (Politecnico di Bari & University of Roma and Telespazio, Italy); Federico Fiorini (Telespazio, Italy); Alessandro Giuseppi (University of Rome

Sapienza, Italy); Giuseppe Tomasicchio (Telespazio S.p.A., Italy); Francesco Delli Priscoli (University of Rome, "La Sapienza", Italy)

17:00 Positioning Accuracy of a Swarm of Buoys as Sources for Sub-Sea Navigation Systems

Francesco De Angelis, Alessandro Petrangeli and Giovanni B. Palmerini (Sapienza Università di Roma, Italy)

17:20 TECHNICAL PANEL

Metrology for Underwater Acoustics: Modeling and Signal Processing

16:20 - 18:00

Room 02 - A.02

S6.2 - Complex Systems Operational Availability: Measurements, Methodologies and Requirements

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

Federico Fina, Roma Tre University of Rome, Italy

16:20 LED Multispectral Sensor in Soil Space Metrology

Federico Fina (Roma Tre University, Italy); Massimo Piotto (University of Pisa, Italy); Simone Contardi (University of Pisa, Italy & Sensichips Srl, Italy); Fabio Leccese ("Roma Tre" University, Italy)

16:40 Bending-Endurance Validation of an High Conformable PI/Cu Flexible Heater with Center-Enhanced Thermal Gradient for TPU Shape Memory Actuation in Soft Robotics

Luca Montaina (CNR-IMM, Italy); Denise Bellisario (University of Rome Tor Vergata, Italy); Luca Maiolo, Elena Palmieri and Ivano Lucarini (CNR-IMM, Italy); Francesco Maita (IMM-CNR, Italy)

17:00 Atmospheric Optical Propagation Analysis: A Comparison Between Analytical Models and Monte Carlo Simulations for FSO and LED Systems

Giorgia Satta (Università degli Studi Roma Tre, Italy); Fabio Leccese ("Roma Tre" University, Italy)

17:20 Adaptive Bearing Failure Diagnosis of CNC Machine Tools Based on BSS and Nonlinear-Convolutionary Modeling in ICA for Separation of Vibrations

Jerzy Józwick (Lublin University of Technology, Poland); Dariusz Mika (University College of Applied Sciences in Chelm, Poland); Fabio Leccese ("Roma Tre" University, Italy); Alessandro Ruggiero (University of Salerno, Italy)

17:40 An OpenThread Simulation Framework for Wireless Sensor Network Evaluation

Simone Argento (University of Rome "La Sapienza", Italy); Davide Polese (Consiglio Nazionale delle Ricerche, Italy); Alessandro Checco (University of Rome La Sapienza, Italy)

16:20 - 18:00

Room 03 - A.03

S6.3 - Structural Health Monitoring and Nondestructive Testing For Aerospace**Chairs:** Vittorio Memmolo, *University of Naples Federico II, Italy*
Alessandro Sardellitti, *Universitas Mercatorum, Italy*

- 16:20 Guided Wave Structural Health Monitoring of a Hydrogen Pressure Vessel During Burst Testing**
Octavio A. Marquez Reyes (Goethe University of Frankfurt Am Main, Germany); Daniel Lozano and David Pöhlig (BAM, Germany); Houssam El Moutaouakil (Universität des Saarlandes & Lab for Measurement Technology, Germany); Enes Savli (Fraunhofer IKTS, Germany); Jan Heimann (BAM, Germany); Vittorio Memmolo (Goethe University Frankfurt, Germany & University of Naples Federico II, Italy); Kilian Tschöke (Fraunhofer IKTS, Germany); Andreas Schütze (Saarland University, Germany); Jens Prager (BAM, Germany); Jochen Moll and Peter Kraemer (University of Siegen, Germany)
- 16:40 Preliminary Study on Multi-Parameter Estimation in Single-Frequency Eddy Current Testing via Dimensionless Analysis and Scaled Probes**
Angelo D'Aguanno and Marco Laracca (Sapienza University of Rome, Italy); Alessandro Sardellitti (Universitas Mercatorum, Italy); Vincenzo Mottola, Luigi Ferrigno and Antonello Tamburrino (University of Cassino and Southern Lazio, Italy)
- 17:00 From UAV-Based Sensing to Digital Twin Updating: A Traceable Framework for Aircraft Defect Inspection**
Carlotta Fontana (University of Salerno, Italy); Rosario Giordano, Giovanni Baglivo and Gianmarco Concilio (Proetico srl, Italy); Nicola Cappetti (University of Salerno, Italy)
- 17:20 Thermal Protection System Structural Health Monitoring with High-Temperature Guided Wave Sensing in High Speed Flight**
Shehar Bano and Paul Fraser (UNSW, Australia); Graham Wild (University of New South Wales, Canberra, Australia)
- 17:40 Similarity Assessment of Lamb Waves Behavior Due to Pseudo-Damages and Real BVID in CFRP by Statistical and Machine Learning Approaches**
Michele Mormone (University of Napoli "Federico II"); Ernesto Monaco (University of Napoli Federico II, Italy); Vittorio Memmolo (Goethe University Frankfurt, Germany & University of Naples Federico II, Italy); Tim Behrens, Maria Boix-Bonet and Peter Wierach (German Aerospace Center, Germany)

16:20 - 18:40

Room 06 - A.06

S6.4 - General Session

Chair: David Martín Gómez, *Carlos III University of Madrid, Spain*

- 16:20 Multisensor Horizontal Trajectory Reconstruction on SASS-C VERIFICATION System**
David Sánchez Pedroche and Daniel Amigo Herrero (Eurocontrol, Belgium); Jesus Garcia and Jose Manuel Molina (Universidad Carlos III de Madrid, Spain); Jekaterina Trofimova (Eurocontrol, Belgium)
- 16:40 An Explainable Bayesian Approach for RR Interval Anomaly Detection**
Ayesha Ashfaq, Abrham Shiferaw Alemaw and Pamela Zontone (University of Genoa, Italy); Lucio Marcenaro (Università degli Studi di Genova, Italy); Carlo S Regazzoni (University of Genoa, Italy); David Martín Gómez (Universidad Carlos III de Madrid, Spain)
- 17:00 Space Activities at the ENEA Calliope Gamma Irradiation Facility**
Alessia Cemmi (ENEA, Italy); Riccardo Anzuini (Sapienza University of Rome, Italy); Rocco Carcione, Beatrice D'Orsi, Ilaria Di Sarcina, Giuseppe Ferrara, Emiliana Mansi, Jessica Scifo, Giuliano Tiranti and Adriano Verna (ENEA, Italy)
- 17:20 Impact of Severe Geomagnetic Storms on PPP Applications**
Edoardo Montecchiani (Thales Alenia Space, Italy); Federica Turi (Thales Alenia Space Italy, Italy); Mattia Carosi (Thales Alenia Space Italia, Italy); Ileana Milani, Gabriele Paggi and Jacopo Capolicchio (Thales Alenia Space Italy, Italy)
- 17:40 Multimodal Assessment of UAV Pilot Attention: An Intra-Subject Study**
Raul Fernandez-Matellan and Alberto Jiménez Hormeño (Universidad Carlos III de Madrid, Spain); Grazia Iadarola (Polytechnic University of Marche, Italy); David Martín Gómez and Arturo de la Escalera (Universidad Carlos III de Madrid, Spain)
- 18:00 Inverse Drag Extraction for Sounding Balloon Ascent Trajectory Reconstruction**
Federico Toson (University of Padova & CISAS G. Colombo, Italy); Giacomo Porcarelli, Alessio Aboudan and Carlo Bettanini (University of Padova, Italy)
- 18:20 Distributed Coordination for Resilient Multi-UAV Remote Sensing: A Photovoltaic Inspection Case Study**
Guillermo García-Patiño Lenza (Universidad Politécnica de Madrid, Spain); Miguel Fernandez Cortizas (University of Luxembourg, Luxembourg); Martin Molina and Pascual Campoy (Universidad Politécnica de Madrid, Spain)

20:00

Hotel Riu Plaza España

Gran Vía, 84, Centro, Madrid

Metro Station: Plaza de España

GALA DINNER

Technical Program - Friday, July 3

09:00 - 15:00 *Carlos III University of Madrid - Floor -1*
REGISTRATIONS

09:30 - 11:10 *Auditorium*
S7.1 - Aerospace systems monitoring through optical and innovative sensors networks
Chair: Alessandro Aimasso, *Politecnico di Torino, Italy*

- 09:30 Comparison of Fiber Bragg Grating Interrogation Systems for Acceleration Measurements**
Alberto Vallan, Aurora Bellone and Guido Perrone (Politecnico di Torino, Italy)
- 09:50 Composite Structural Panel Natural Frequencies Estimation by Fiber Bragg Grating Sensors Network**
Alessandro Aimasso and Francesco Andronico (Politecnico di Torino, Italy); Giovanni Giordano (NewRoboticArm, Italy); Matteo Davide Lorenzo Dalla Vedova and Paolo Maggiore (Politecnico di Torino, Italy)
- 10:10 Modeling and Evaluation of Aircraft Flight Dynamics in Spatially Varying Atmospheric Conditions for Embedded Sensors Calibration**
Parid Alimhillaj (Polytechnic University of Tirana, Albania); Alessandro Aimasso, Matteo Davide Lorenzo Dalla Vedova and Paolo Maggiore (Politecnico di Torino, Italy); Spartak Pocari (Polytechnic University of Tirana, Albania); Edmondo Minisci (University of Strathclyde, United Kingdom)
- 10:30 Three-Dimensional Reconstruction of Bolts Based on Full-Angle Silhouette Scanning**
Rufei Zou (University of Naples Federico II); Chen Cui (Beijing Taigee Co. Ltd, China); Mo Chen and Caojin Yuan (Nanjing Normal University, China); Vincenzo Ferraro (University of Parma, Italy); Sara Coppola (National Research Council of Italy)
- 10:50 FBG-Based Monitoring and Hailstone Impact Assessment of an SLM Lattice Leading Edge for Aircraft de-Icing Applications**
Matteo Cafaro, Carlo Ferro, Alessandro Cellini, Davide Gravante, Alessandro Aimasso and Paolo Maggiore (Politecnico di Torino, Italy)

09:30 - 11:10

Room 02 - A.02

S7.2 - Manufacturing and Metrology in the Aerospace Industry

Chairs: Jerzy Józwiak, *Lublin University of Technology, Poland*

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

- 09:30 Digital Twin-Based in-Machine Metrology for Adaptive Manufacturing in Aerospace**
Borja De La Maza (Innovalia Metrology, Spain); Alicia Gonzalez (Innovalia, Spain); Toni Ventura Traveset (Innovalia Metrology, Spain)
- 09:50 Influence of Abrasive Water Jet Kinetic Energy on Cutting Quality and Interfacial Integrity of Aerospace Three Layer Composite**
Michał Leleń and Jerzy Józwiak (Lublin University of Technology, Poland); Angelos Markopoulos (National Technical University of Athens, Greece)
- 10:10 Study on Surface Condition of CFRP/Al/CFRP Composites After Abrasive Waterjet Cutting**
Jarosław Korpysa, Michał Leleń and Jerzy Józwiak (Lublin University of Technology, Poland); Paul Bere (University of Cluj-Napoca, Romania)
- 10:30 Evaluation of the Rotary Axes Position Errors of the Five-Axis CNC Machine Tools**
Daria Sałamacha and Jerzy Józwiak (Lublin University of Technology, Poland); Ivan Kuric (University of Zilina, Slovakia); Paweł Tomiño and Marcin Barszcz (Lublin University of Technology, Poland)
- 10:50 An Analysis of Cutting Force Component Signal in High Speed Cutting of Thin-Walled Element**
Magdalena Zawada-Michałowska and Paweł Pieško (Lublin University of Technology, Poland); Angelos Markopoulos (National Technical University of Athens, Greece)

09:30 - 11:30

Room 03 - A.03

S7.3 - Special Track - Concepts and Technologies for Next-generation Integrated Terrestrial-Non-Terrestrial Networks (CONNECT) - PART I

Chair: Giulia Buttazzoni, *University of Trieste, Italy*

- 09:30 INVITED TALK - Space Network as a Service - Technologies for Flexible and Sustainable Space Networks**
Ernestina Cianca, University of Rome Tor Vergata, Italy
- 10:10 A Reconfigurable Sequentially Fed Antenna Array Enabling Polarization Agility for Polarimetric SAR**
Mohamed Gaagai (Ecole Militaire Polytechnique, Algeria); Giulia Buttazzoni (University of Trieste, Italy); Abdelheq Boukarkar (École Supérieure Ali CHABATI, Algiers, Algeria); Nabil Haddad, Osama Mahfoudia and Azzedine Bouaraba (Ecole Militaire Polytechnique, Algeria)

- 10:30 Unlocking Fused PNT Potential in FR2 Using Multi-Beam Phased Array Antenna**
Ottavio M. Picchi (External consultant for JRC-EC); Nick A Cancrinus and Yanki Aslan (Delft University of Technology, The Netherlands); Francesco Menzione (European Commission Joint Research Center, European Union)
- 10:50 Inter-Satellite Links for 6G NTN: A Requirements-Driven RF/Optical Trade-off Analysis**
Ernestina Cianca, Albert Scala and Mansoor Jamal (University of Rome Tor Vergata, Italy); Tommaso Rossi (University of Rome "Tor Vergata", Italy); Ernesto Limiti, Silvello Betti and Mauro De Sanctis (University of Rome Tor Vergata, Italy)
- 11:10 Analysis of Outage Probability and Average Peak Age of Information for LEOSAT-Enabled NTFPs**
Massimiliano Comisso, Fulvio Babich and Giulia Buttazzoni (University of Trieste, Italy); Claudio Sacchi (University of Trento, Italy); Francesca Vatta (University of Trieste, Italy)

11:10 - 11:50 *Carlos III University of Madrid - Floor -1*
COFFEE BREAK - POSTER SESSION #2

- PS2.1 Consolidated Thermo-Mechanical Modelling of the ESA THESEUS Mission InfraRed Telescope**
Marco Giovanni Corti and Diego Scaccabarozzi (Politecnico di Milano, Italy); Bortolino Saggin (Università degli Studi di Padova, Italy); Andrea Appiani (Politecnico di Milano, Italy)
- PS2.2 Experimental Evaluation of the Seebeck Coefficient of a Commercial Thermoelectric Generator Under Vacuum Condition**
Abdelrahman Mohamed Ragab M Ahmed (Politecnico di Milano, Italy); Tamer Khattab (Qatar University, Qatar)
- PS2.3 Preliminary Feasibility Study of an Instrument for Dust Particle Detection Based on Laser Barrier and SiPM Sensing Unit**
Alessandro Vignato (CISAS G. Colombo, Italy); Giovanni Trevisanuto, Alessio Aboudan and Carlo Bettanini (University of Padova, Italy)
- PS2.4 Efficient Modeling of Flexible Metamaterials with Integrated Piezoelectric Sensors**
Jan Bajer, Vojtech Slaby and Zdenek Hadas (Brno University of Technology, Czech Republic)
- PS2.5 Research on 3D Coordinate Measurement Technology of Discrete Points Based on Photographic Angle Measurement and Microwave Ranging Methods**
Feihu Liu (Institute of Remote Sensing Satellite, China Academy of Space Technology, China); Kuai Yu (Institute of Remote Sensing Satellite, China Academy of Space Technology, China.); Lemiao Yang (Institute of Remote Sensing Satellite, China Academy of Space Technology, China)

- PS2.6 A Low-Cost Multi-Camera System for Blue-Light Fraction Monitoring: Experimental Setup and Preliminary Validation**
 Javier González Paredes (Pontificia Universidad Católica de Valparaíso, Chile); Federico Toson (University of Padova & CISAS G. Colombo, Italy); Carlo Bettanini and Pietro Fiorentin (University of Padova, Italy); Sebastián Fingerhuth and Iván Kopaític (Pontificia Universidad Católica de Valparaíso, Chile)
- PS2.7 Experimental Investigation of Ageing Effects in Li-Po Battery Packs for Lightweight UAVs**
 Gianpietro Di Rito (University of Pisa, Italy); Aleksander Suti (INSA Toulouse, France); Aurelien Reyssat (INSA-Toulouse, France); Marc Budinger (INSA Toulouse, France); Marco Bassetto and Lorenzo Pezzullo (University of Pisa, Italy)
- PS2.8 Model-Based Oscillation Monitoring of a Redundant Electro-Mechanical Actuation System for Leading-Edge Slats**
 Marco Lucarini (UmbraGroup S.p.A., Italy); Gianpietro Di Rito (University of Pisa, Italy); Marco Nardeschi (UmbraGroup S.p.A., Italy)
- PS2.9 Optimized MFC Sensor Placement for Shape Sensing of Gradient Metamaterial Leading Edges**
 Vojtech Slaby, Jan Bajer and Zdenek Hadas (Brno University of Technology, Czech Republic)
- PS2.10 An Integrated System for CNC Machine Tool Rotary-Axis Error Diagnostics with Machine Learning Inference**
 Marcin Barszcz, Daria Salamacha, Jerzy Józwick and Paweł Tomiło (Lublin University of Technology, Poland); Ivan Kuric (University of Zilina, Slovakia); Angelos Markopoulos (National Technical University of Athens, Greece); Fabio Leccese ("Roma Tre" University, Italy); Alessandro Ruggiero (University of Salerno, Italy); Krzysztof Dziedzic (Lublin University of Technology, Poland)
- PS2.11 Outgassing Measurements with Quartz Crystal Microbalances: Preliminary Investigation of Sample Geometry**
 Chiara Martina and Diego Scaccabarozzi (Politecnico di Milano, Italy)
- PS2.12 Dynamics Model of Total Pressure Measurements**
 Jacek Pieniążek (Politechnika Rzeszowska, Poland); Marek Szumski (Rzeszów University of Technology, Poland); Piotr Ciecicki (Politechnika Rzeszowska, Poland)
- PS2.13 A Spiral Microfluidic Biochip for Label-Free Blood Cell Separation: Toward Metrological Assessment for Astronaut Health Monitoring in Space**
 Martina Mugnano (Institute of Genetics and Biophysics Adriano Buzzati-Traverso - National Research Council, Italy); Vincenza Cerbone (CEINGE-Biotecnologie Avanzate Franco Salvatore, Italy); Massimiliano Villone (University of Naples Federico II, Italy); Annalaura Montella (CEINGE Advanced Biotechnologies, Napoli, Italy); Giulia Scalia and Mario Capasso (CEINGE-Biotecnologie Avanzate Franco Salvatore, Italy); Achille Iolascon (CEINGE Advanced Biotechnologies, Napoli, Italy); Lisa Miccio (Isasi-CNR,

Italy); Pietro Ferraro (CNR-ISASI, Italy); Silvia Mari and Francesca Ferranti (ASI, Italy); Pier Luca Maffettone (University of Naples Federico II, Italy)

PS2.14 Integration of the DJI Matrice 350 RTK UAV Platform with DJI Terra, CloudCompare, and Agisoft Metashape for Mapping and 3D Modeling Applications: A Case Study of the National Botanical Garden

Veaceslav Sprincean, Liviu Dontu, Serghei Pascari, Ion Rosca and Marianna Savva (Moldova State University, Moldova); Florentin Paladi (Moldova State University & ePhysMCS Research Laboratory, Moldova)

PS2.15 The Use of UAV Technology in Monitoring the Exploitation of Mineral Resources

Serghei Pascari and Marianna Savva (Moldova State University, Moldova); Florentin Paladi (Moldova State University & ePhysMCS Research Laboratory, Moldova); Veaceslav Sprincean (Moldova State University, Moldova)

PS2.16 Experimental Studies of the Effect of Icing on Aerodynamic Characteristics of the WORTMANN FX 63-137 Airfoil Based on a 3D Printed Model

Robert Bąbel (Polish Air Force University, Poland); Robert Szczepaniak (Military University of Aviation, Poland); Zbigniew Czyż (Polish Air Force University, Poland)

11:50 - 12:50

Auditorium

KEYNOTE LECTURE

Chair: Pasquale Daponte, *University of Sannio, Italy*

A Philosophical Perspective: From Metrology and Aerodynamics to Aetiology and Nomology

Graham Wild, *University of New South Wales, Australia*

12:50 - 14:10

Carlos III University of Madrid - Floor -1

LUNCH

14:10 - 16:10

Auditorium

S8.1 - Automation and Control of UAVs

Chair: Mohamed Abderrahim, *Carlos III University of Madrid, Spain*

14:10 Inverse Kinematics of a UAM Based on a Combined Extended Jacobian Matrix and QP

Choukri Bensalah (Université Abou Bekr Belkaid, Tlemcen, Algeria); Rida Mokhtari (Ecole Supérieure En Sciences Appliquées de Tlemcen, Algeria); Ismat Meslouli and Amal Choukhou Braham (Université de Tlemcen, Algeria); Mohamed Abderrahim (Universidad Carlos III de Madrid, Spain)

- 14:30 Acceleration-Level QP for Aerial Manipulators Based Sliding Mode Control and Luenberger-Based Disturbance Observer**
 Ismat Meslouli (Université de Tlemcen, Algeria); Choukri Bensalah (Université Abou Bekr Belkaid, Tlemcen, Algeria); Amal Choukchou Braham (Université de Tlemcen, Algeria)
- 14:50 Adaptive Observer Based Robust Filtered Tracking Controller for UAVs Under Unknown Disturbances**
 Rida Mokhtari (Ecole Supérieure En Sciences Appliquées de Tlemcen, Algeria); Choukri Bensalah (Université Abou Bekr Belkaid, Tlemcen, Algeria); Amal Choukchou Braham (Université de Tlemcen, Algeria); Mohamed Abderrahim (Universidad Carlos III de Madrid, Spain)
- 15:10 Distributed Motion Capture-Based Testbed for Indoor UAV Navigation Research**
 Maciej Kurenda and Konrad Wojtowicz (Military University of Technology, Poland); Krzysztof Sibilski (Air Force Institute of Technology, Poland); Jakub Djabin (Military University of Technology Warsaw, Poland); Jakub Kochan and Adam Marut (Military University of Technology, Poland)
- 15:30 Adaptive Neural Control for Multi-UAV Swarm Coordination: Trajectory Tracking, Collision Avoidance, and Wind Disturbance Rejection**
 Rakesh Prakash (University of Colorado Boulder, USA); Soujanya Jagadeesh (UST Global, USA); Sunil Gentyala (HCLTECH, USA)
- 15:50 Altitude Stability of a Quadrotor Under Unstable Wind: Modeling and Control Using PID, Fuzzy Logic, and Deep Reinforcement Learning**
 Mohamad Hasan Hamza, Anthony Georges Alam, Manuel Elias Aouad, Sr and Gaby H Abou Haidar (American University of Science and Technology, Lebanon)

14:10 - 16:10

Room 02 - A.02

S8.2 - Aerodynamic Measurement and Propulsion System Control Of Aerial Vehicles

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

Tomasz Zahorski, *Polish Air Force University, Poland*

Paweł Magryta, *Lublin University of Technology, Poland*

- 14:10 Comprehensive Energetic and Aerodynamic Analysis of a High-Endurance UAV Flight Mission**
 Jan Dawid Pytka (Lublin University of Technology, Poland); Zbigniew Czyż (Polish Air Force University, Poland); Łukasz Grabowski (Lublin University of Technology, Poland); Szymon Jacek Kupaj (Farada Group, Poland)
- 14:30 Rotational Speed Control of a Helicopter Diesel Engine Using an Adaptive Algorithm with a Single Controller**
 Paweł Magryta (Lublin University of Technology, Poland)

- 14:50 Adaptive Empirical Measurement Technique for Maintenance Labor Estimation in Aerial Vehicles**
 Karol Kawka (Polish Air Force University, Poland); Mariusz Zieja (Air Force Institute of Technology, Poland)
- 15:10 Static and Wind-on Performance Characterization of Electric Ducted Fans for Uncrewed Aircraft**
 Mohammed Alqudah, Mohamed Nasr, Basel AlTawil and Vladimir Parezanovic (Khalifa University, United Arab Emirates); Alessandro G M Gardi (Khalifa University, United Arab Emirates & RMIT University, Australia)
- 15:30 Experimental Identification of Energy-Related Parameters of Hybrid VTOL-Autogyro Unmanned Aerial Vehicle**
 Zbigniew Czyż (Polish Air Force University, Poland)
- 15:50 Coupled Electrical and Aerodynamic Characterization of a Wire-NACA0024 Electrohydrodynamic Actuator Using PIV**
 Rafał Kliza (University of Life Sciences in Lublin, Poland); Krzysztof Skiba and Mirosław Wendeker (Lublin University of Technology, Poland)

14:10 - 16:10 *Room 03 - A.03*

S8.3 - Special Track - Concepts and Technologies for Next-generation Integrated Terrestrial-Non-Terrestrial Networks (CONNECT) - PART II

Chair: Claudio Sacchi, *University of Trento, Italy, The University of New Mexico, Albuquerque, NM*

- 14:10 INVITED TALK - CubeSat Revolution in Space and Communication**
 Chantal Cappelletti, University of Nottingham, UK
- 14:50 Connectivity on-the-Fly: A Proof of Concept of Resilient Aerial Networking**
 Simone Morosi (University of Florence, Italy & CNIT - Research Unit of Florence University, Italy); Fabrizio Gabrio Brasca (WindTre, Italy); Giuseppe Virone (Consiglio Nazionale delle Ricerche, Italy); Fabio Paonessa (Consiglio Nazionale Delle Ricerche (CNR-IEIIT), Italy); Daniel Gaetano Riviello (Politecnico di Torino, Italy & Consiglio Nazionale delle Ricerche, Italy); Andrea Berton (IGG-CNR, Italy); Enrico Scarabottolo (University of Padova, Italy); Massimiliano Giansesin (Athonet, Italy); Francesco Matera (Fondazione Ugo Bordoni, Italy); Arcangela Rago, Giuseppe Piro, Alessio Fascista and Luigi Alfredo Grieco (Politecnico di Bari, Italy); Claudio Sacchi (University of Trento, Italy)
- 15:10 An SNR-Based Experimental Characterization of a UAV-Mounted Metasurface for Integrated Terrestrial and Non Terrestrial Links**
 Ilaria Marasco, Enrico Boffetti, Giovanni Magno, Giuseppe Piro, Antonella D'Orazio, Luigi Alfredo Grieco and Gennaro Boggia (Politecnico di Bari, Italy)

15:30 Edge AI Empowered UAV with Onboard Semantic Extraction for Monitoring Applications

Paolo Adesso and Marco Carpentiero (University of Salerno, Italy); Nicola Garau (University of Trento, Italy); Giovanni Giambene (University of Siena, Italy); Fabrizio Granelli (University of Trento, Italy); Vincenzo Matta (University of Salerno, Italy); Phuc Tinh Vo and Riccardo Zambon (University of Siena, Italy)

15:50 Low-Cost UAV-Based Optical Imaging for Sea Surface Currents and Directional Wave Spectrum Retrieval

Giovanni Ludeno (Institute for Electromagnetic Sensing of the Environment, National Research Council of Italy, Italy); Ilaria Catapano (IREA-CNR, Italy); Giuseppe Esposito (Institute for Electromagnetic Sensing of the Environment - National Research Council of Italy, Italy); Francesco Soldovieri (CNR, Italy); Gianluca Gennarelli (IREA-CNR, Italy)

16:15 - 16:30

Auditorium

CLOSING AND AWARD CEREMONY

