



CONFERENCE PROGRAM

2025 IEEE INTERNATIONAL WORKSHOP ON

Metrology for Sustainability

BENEVENTO - DECEMBER 4-5, 2025



IEEE



UNIVERSITÀ
DEGLI STUDI
DEL
SANNIO
Benevento



UNIVERSITÀ DEGLI STUDI DI NAPOLI
FEDERICO II

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IEEE MetroSustainability 2025 Keynote Speakers

Plenary Session - Thursday December 4 - H 10:00



Metrology Institutes in Italy: from national standards to services offered to support sustainability

Massimo Pinto

INMRI-ENEA, Italy

ABSTRACT

This lecture will cover Italy's metrology organization, from national institutes to the accreditation system with ACCREDIA. Under the 1999 Mutual Recognition Agreement, Italy's Primary Metrology Institutes include INRiM in Turin, focusing on fundamental SI units, and ENEA-INMRI in Rome, specializing in quantities related to measurements of ionizing radiation. The role of both NMIs underpins sustainability by enabling accurate measurements. Focusing on ionizing radiation, for example, accurate measurements in environmental protection can guarantee the safe management of radioactive waste and contamination monitoring. Public health can also be sustained by accurate measurements with medical radiation devices both in diagnostic radiology and in the therapeutic uses of ionizing radiation.

Both INRiM and ENEA-INMRI provide traceability to national standards through calibrations and conduct inter-laboratory comparison campaigns to demonstrate competence. ENEA-INMRI's specialized focus directly enables the precise measurements that are essential for environmental stewardship, public health, and the advancement of sustainable technologies. Both are also active in offering inter-laboratory comparison campaigns, a necessary tool to demonstrate competence, and some recent notable examples will be described.

SPEAKER BIOGRAPHY

Massimo Pinto received his BSc degree in Physics in 1998 from the University of Naples Federico II and his PhD in Physics and Oncology in 2002, jointly from University College London and the Gray Laboratory Cancer Research Trust. His experience in metrology has been in developing and maintaining national standards of air kerma and absorbed dose to water for radiation dosimetry, and acting as provider of ILCs in Italy. He is the national contact person for Italy in EURAMET's Technical Committee on Ionising Radiation and Deputy Chair of the Consultative Committee on Ionizing Radiation of the BIPM. He has been the director of ENEA-INMRI since December 2024.

Plenary Session - Thursday December 4 - H 14:00



Advances in Measuring Toxicity and Exposure Towards Sustainability in the Chemical Economy

Russell S. Thomas

Chemical Insights Research Institute, US

ABSTRACT

It is estimated that there are over 350,000 chemicals and mixtures on the combined world-wide inventories across regulatory jurisdictions (Wang et al., 2020). Relatively few of the chemicals registered for commercial use have traditional toxicity and exposure measurements that enable an understanding of potential human health risks. In the US, it has been estimated that less than 20% have at least one traditional toxicity study or traditional exposure monitoring data (EPA 2023; Isaacs et al., 2022). Much of the gap in toxicity and exposure data is driven by the high cost, lengthy time, and limited throughput of the traditional toxicity testing and exposure monitoring methods as well as the corresponding regulatory requirements. A sustainable chemical economy requires toxicity and exposure measurements in order to understand the health risks and trade-offs associated with different chemicals and their uses. Advances in chemical toxicity testing and analytical chemistry methods have lowered their cost, reduced the time required, and increased potential throughput, but their application in a regulatory context has been limited. The estimated potential economic and human health benefits of more rapid toxicity testing are significant even when the uncertainty associated with the new tests is greater (EPA 2024). The plenary address will review the background on the current challenges in toxicity testing and exposure measurements, provide an overview of the new methods that are being developed, how performance of the methods can be evaluated, and a perspective on the potential human health and economic benefits for a more sustainable chemical future.

SPEAKER BIOGRAPHY

Russell Thomas is the Executive Director and Vice President of the Chemical Insights Research Institute. Chemical Insights is part of the non-profit Underwriters Laboratories Research Institutes with a mission to reduce and eliminate adverse human health impacts of environmental and chemical pollution, in everyday life, and on a global basis by researching, communicating, and providing tools for safer working, living, and learning environments. Dr. Thomas has over twenty-five years of chemical safety research experience in the public, private, and non-profit sectors. He has a broad, multidisciplinary background with an undergraduate

degree in chemistry, a master's degree in radiation ecology and health physics, and a doctorate in toxicology. He performed his postdoctoral training in molecular biology and genomics. Prior to joining Chemical Insights, Dr. Thomas worked for twelve years in the Office of Research and Development at the U.S. Environmental Protection Agency.

Plenary Session - Friday December 5 - H 11:00



Experimental deployment of decentralized sensor networks for dynamic loading of power lines

Alfredo Vaccaro

University of Sannio, Italy

ABSTRACT

In this talk we will discuss the potential role of self-organizing smart sensor networks for dynamic thermal rating assessment of overhead lines. The main idea is to decentralize the entire set of thermal rating processing and synchronization functions on a network of interactive smart sensors. The resulting computing architecture is expected to exhibit several advantages over traditional paradigms as far as built-in synchronization features, "in field" processing capabilities, less hardware complexities, less communication network requirements, easy to extend and reconfigure are concerned. Detailed experimental results obtained on real overhead lines of the Italian power system are presented and discussed to prove the effectiveness of the self-organizing sensor networks in the task of reliably estimating the real thermal ratings of the monitored lines.

SPEAKER BIOGRAPHY

Alfredo Vaccaro (IEEE Fellow) received the M.Sc. degree (Hons.) in electronic engineering from the University of Salerno, Italy, and the Ph.D. degree in electrical and computer engineering from the University of Waterloo, Waterloo, ON, Canada. From 1999 to 2002, he was an Assistant Researcher with the Department of Electrical and Electronic Engineering, University of Salerno. From March 2002 to October 2015, he was an Assistant Professor of electric power systems with the Department of Engineering, University of Sannio, Benevento, Italy, where he is currently a Full Professor of electrical power systems. His research interests include soft computing and interval-based methods applied to power system analysis, and self-organizing paradigms for smart grid computing. He is the Editor in Chief of the -Smart Grids and Sustainable Energy- Ed. Springer Nature, Chair of the Power System Operation, Planning and Economics Committee—Technologies and Innovations (T&I) SC, and Associate Editor of IEEE Transactions on Power Systems and IEEE Transactions on Smart Grids.

IEEE MetroSustainability 2025 Tutorials

Tutorial Session - Friday December 5 - H 14:10



AI on the Edge as a way to reduce power consumption and improve sustainability: an embedded application case study

Giovanni Gogliettino

STMicroelectronics

ABSTRACT

AI power consumption is increasing due to both the growing performance of machine learning models and the rising demand from users. One way to reduce this consumption is to move some processing to the edge, i.e., to embedded devices. In this talk, we will discuss the application of machine learning algorithms in embedded systems, focusing on their use in Global Navigation Satellite Systems (GNSS) receivers. A study will be described and analyzed: it presents a machine learning framework aimed at improving GNSS functional safety by detecting and mitigating system anomalies, thereby enhancing the reliability of satellite-based navigation. This study illustrates the potential of artificial intelligence in advancing GNSS robustness and efficiency, with implications for automotive and other critical applications.

SPEAKER BIOGRAPHY

Giovanni Gogliettino is a Senior Member of Technical Staff at STMicroelectronics, where he is involved in software research and development in the GNSS field. He obtained his master's degree in Computer Engineering from the University of Naples "Federico II" in 1999. In 2000, he began working at the IPM group SpA, where he dealt with cryptography and digital signatures. From 2002 to 2008, he worked for Incard SpA, where he initially focused on cryptography and digital signatures and later on the development of secure operating systems for smart cards. Since 2008, he has been working at STMicroelectronics.

IEEE MetroSustainability 2025 Venue



IEEE MetroSustainability 2025 will be held at the University of Sannio - Palazzo San Domenico - Piazza Guerrazzi, 1 - Benevento.

Palazzo San Domenico is a historic building located in the heart of Benevento and serves as one of the main sites of the University of Sannio. Originally part of a Dominican convent, the palace has been carefully restored and now hosts administrative offices, lecture rooms, and institutional spaces. Its blend of historical architecture and modern functions makes it a symbolic landmark for the university and the city.



ADDRESS

University of Sannio - Palazzo San Domenico
Piazza Guerrazzi, 1
Benevento

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



IEEE MetroSustainability 2025 Social Events

SOCIAL DINNER

Thursday December 4 - H 20:00



The IEEE MetroSustainability 2025 **Social Dinner** will be held at “*Il Casone e le sue volte*” Restaurant on **Thursday, December 4 - 20:00**.

ADDRESS

Il Casone e le sue volte
C.da Casone, 82020 - Pesco Sannita BN

SHUTTLE SERVICE

A shuttle service will be provided for conference participants. The meeting point is at **19:15** in **Via del Pomerio 3**, in front of “Centro Clinico Morgagni” - 300 m from the Traiano Arch.

GUIDED TOUR OF BENEVENTO

Friday December 5 - H 17:10

On **Friday, December 5**, at the end of the conference (17:10), a guided visit to the city of Benevento will take place with the kind support of FAI (Fondo Ambiente Italiano – Benevento section). The tour will be a unique opportunity to admire some highlights of Benevento’s historical heritage, including the majestic Arch of Trajan and the renowned church of Santa Sofia.



IEEE MetroSustainability 2025 Patronages



IEEE MetroSustainability 2025 Sponsors



Program Schedule - Thursday, December 4

THURSDAY, DECEMBER 4		
09:30 - 10:00	OPENING CEREMONY	
10:00 - 10:45	Keynote Lecture - Massimo Pinto, INMRI-ENEA, Italy Metrology Institutes in Italy: from national standards to services offered to support sustainability	
10:45 - 11:00	COFFEE BREAK	
	Sala dell'Assunta	Sala Convegni - First Floor
11:00 - 12:40	S1.1 - Sustainable Innovation within the context of Industry and Health 5.0	S1.2 - General Session - PART I
12:40 - 14:00	LUNCH / POSTER SESSION	
14:00 - 14:45	Keynote Lecture - Russell S. Thomas, Chemical Insights Research Institute, US Advances in Measuring Toxicity and Exposure Towards Sustainability in the Chemical Economy	
	Sala dell'Assunta	Sala Convegni - First Floor
14:50 - 16:10	S2.1 - Smart devices, biomedical technologies, and automated diagnostics for sustainable and intelligent healthcare	S2.2 - Towards sustainable civil structures and infrastructures: innovative strategies for structural monitoring and identification
16:10 - 16:30	COFFEE BREAK / POSTER SESSION	
16:30 - 17:30	S3.1 - Geomatics for sustainability: from remote sensing and survey techniques to maps and Geographical Information System (GIS)	S3.2 - From Bio-Waste to Bio-Value: Sustainable Valorization of Agri-Food Resources for Health
19:15	Bus Departure for Social Dinner	
20:00	SOCIAL DINNER - Il Casone e le sue volte Restaurant	

Program Schedule - Friday, December 5

FRIDAY, DECEMBER 5		
	Sala dell'Assunta	Sala Convegni - First Floor
09:00 - 10:40	S4.1 - Innovative approaches to health measurements and risk mitigation	S4.2 - From Nature to Function: Sustainable Polymer Platforms for Sensing, Health, Food Safety, and Cultural Preservation
10:40 - 11:00	COFFEE BREAK / POSTER SESSION	
11:00 - 11:45	Keynote Lecture - Alfredo Vaccaro, University of Sannio, Italy Experimental deployment of decentralized sensor networks for dynamic loading of power lines	
11:50 - 12:50	S5.1 - Development of Low-Cost, Low-Tech, Ultra-High-Precision Experimentation and Instrumentation for Research and Education	S5.2 - Air Cleaning Technologies : Sensing, Communication, Control Strategies
12:50 - 14:10	LUNCH / POSTER SESSION	
14:10 - 14:50	Tutorial - Giovanni Gogliettino, STMicroelectronics AI on the Edge as a way to reduce power consumption and improve sustainability: an embedded application case study	
	Sala dell'Assunta	Sala Convegni - First Floor
14:50 - 16:30	S6.1 - Radiation measurements and metrology for environmental sustainability	S6.2 - General Session - PART II
16:30 - 16:50	COFFEE BREAK	
16:50 - 17:10	CLOSING AND AWARD CEREMONY	
17:10	GUIDED TOUR OF BENEVENTO	

Technical Program - Thursday, December 4

08:30 - 18:00	Palazzo San Domenico REGISTRATIONS
09:30 - 10:00	Palazzo San Domenico - Sala dell'Assunta OPENING CEREMONY - WELCOME ADDRESSES
10:00 - 10:45	Palazzo San Domenico - Sala dell'Assunta PLENARY SESSION - KEYNOTE LECTURE Chair: Sergio Rapuano, <i>University of Sannio, Italy</i>

Metrology Institutes in Italy: from national standards to services offered to support sustainability

Massimo Pinto, *INMRI-ENEA, Italy*

10:45 - 11:00	Palazzo San Domenico COFFEE BREAK
11:00 - 12:40	Palazzo San Domenico - Sala dell'Assunta Session 1.1 - Sustainable Innovation within the context of Industry and Health 5.0 Chairs: Luigi Duraccio, <i>University of Naples Federico II, Italy</i> Immacolata Esposito, <i>University of Naples Federico II, Italy</i>

- 11:00 Innovative Strategy for Electrical Calibration Management - Laboratory Sustainability for Metrology 5.0**
Marija Cundeva-Blajer (Ss. Cyril and Methodius University in Skopje, Macedonia)
- 11:20 A Flexible Thermoelectric Power Source for Sustainable and Conformable Applications**
Carlo Trigona, Giuliano A. Salerno, Andrea D'Amico and Salvatore Baglio (University of Catania, Italy); Samuel Margueron (FEMTO-ST Institute University of Franche-Comte, France)
- 11:40 Sustainability of Telemedicine: A Comparative Analysis with in-Person Visitation**
Leopoldo Angrisani, Mauro D'Arco, Egidio De Benedetto, Luigi Duraccio, Immacolata Esposito and Annarita Tedesco (University of Naples Federico II, Italy)

- 12:00 Intelligent Indoor Air Quality System with Web-Application Based Monitoring and Real-Time Response to Household Pollutants Through a Dynamic Control System**
Jack D Hick (University of Galway, Ireland & Clover Hill, Ireland); Seán Hogan and Soumyajyoti Maji (University of Galway, Ireland)
- 12:20 IndoBERT-Based Framework for Sentiment Analysis of User-Generated Content on Social Media Platforms**
Kharisma, Aprilia, Rahajeng Sasi and Mohammad Imron (Universitas Amikom Purwokerto, Indonesia)

11:00 - 12:40 *Palazzo San Domenico - Sala Convegni - First Floor*

Session 1.2 - General Session - PART I

Chairs: Arman Neyestani, *CESMA - University of Naples Federico II, Italy*
Enrico Picariello, *University of Sannio, Italy*

- 11:00 Machine Learning for Air Quality Monitoring with Low-Cost Sensors: Evaluating Calibration Approaches Through Relative Expanded Uncertainty**
Evangelos Bagkis (Environmental Informatics Research Group, Greece); Theodosios Kassandros (Aristotle University of Thessaloniki, Greece); Kostas Karatzas (Aristotle University, Greece & Environmental Informatics Research Group, Greece)
- 11:20 A Life Cycle Assessment of Photovoltaic Integration in Future South Tyrol's Energy Scenarios**
Elisa Veronese and Cristina Polacchi (Eurac Research, Italy); Davide Prando (Edyna Srl, Italy); Anna Carassai (Alperia Spa, Italy); Alessandro Donadello (Edyna Srl, Italy); Grazia Barchi (EURAC Research, Italy)
- 11:40 Probabilistic Models for Photovoltaic Production Forecasting: A Case Study at the Politecnico di Torino Campus**
Antonio Costantino Marceddu, Jacopo Sini, Alessandro Ciocia, Gianluca Cardinale, Filippo Spertino, Gianfranco Chicco and Bartolomeo Montrucchio (Politecnico di Torino, Italy)
- 12:00 Star-Shaped SOI-AIN MEMS Thermoelectric Generators for Enhanced Thermal Gradient Conversion**
Suhail Ahmed, Sa, Carlo Trigona and Salvatore Baglio (University of Catania, Italy)
- 12:20 A Hybrid 6-DoF Pose Measurement System Using String Potentiometer and Dual IMUs**
Zhendai Huang and Zuyan Chen (University of Oulu, Finland); Ameer Tamoore Khan (University of Copenhagen, Denmark); Yu Gan (Stevens Institute of Technology, USA); Fei Hu (University of Alabama, USA); Juha Rönning (Oulu University Secure Programming Group, Finland); Shuai Li (University of Oulu, Finland)

12:40 - 14:00 *Palazzo San Domenico*

LUNCH

12:40 - 14:00

Palazzo San Domenico

POSTER SESSION

Chair: Enrico Picariello, *University of Sannio, Italy*

PS-01 Measuring the Environmental Impact of ICT Products and Systems: An Initial Overview

Leopoldo Angrisani, Luigi Duraccio, Mauro D'Arco, Egidio De Benedetto, Immacolata Esposito and Annarita Tedesco (University of Naples, Federico II, Italy)

PS-02 Robotics in Sustainability: Opportunities and Challenges for a Holistic Environmental Assessment

Leopoldo Angrisani (University of Naples Federico II, Italy); Zuyan Chen (University of Oulu, Finland); Egidio De Benedetto, Luigi Duraccio and Immacolata Esposito (University of Naples Federico II, Italy); Zhendai Huang and Shuai Li (University of Oulu, Finland); Fabrizio Lo Regio and Annarita Tedesco (University of Naples Federico II, Italy)

PS-03 Sustainability Strategies: Life Cycle Assessment of Polyphenolic Extracts from Agro-Industrial by-Products

Giuseppina Forgione (University of Naples Federico II, Italy & University of Sannio, Italy); Daniela Sateriale, Libera Esposito and Marina Paolucci (University of Sannio, Italy); Andrea D'Anna and Paola Salvatore (University of Naples Federico II, Italy); Caterina Pagliarulo (University of Sannio, Italy)

PS-04 Sustainable Green Light LiDAR Metrology: Novel Measurement Techniques Maritime Environmental Monitoring and Port Security

Satyajit Lingras, Aruni Basu and Husain Ansari (USA)

PS-05 Pietra Leccese Stone as a Building Material: Radiometric and Radiation Protection Characterization of a Calcarenite for New Insights

Micaela Prisco (University of Naples Federico II, Italy); Gaetano Gagliardo (Fondazione Muto ETS, Italy & Radiotherapy, Emicenter, Naples, Italy); Mariagabriella Pugliese, Andrea D'Elia and Fabrizio Ambrosino (University of Naples Federico II, Italy); Chiara Imparato (University of Campania Luigi Vanvitelli, Italy); Giuseppe La Verde (University of Naples Federico II, Italy)

PS-06 Modified Gellan Gum Gels with Nanodiamonds, Tert-Butylammonium Borane and Calcium Propionate for the Cleaning Cultural Heritage Artifacts

Elena Palmieri (CNR-IMM, Italy); Silvia Cristofani, Claudia Mazzuca, Noemi Orazi and Silvia Orlanducci (University of Rome Tor Vergata, Italy)

PS-07 An Electrodermal Activity-Based Approach for the Assessment of Cognitive Stress

Vittorio Santoriello and Alfonso M Ponsiglione (University of Naples Federico II, Italy); Leandro Donisi (University of Campania Luigi Vanvitelli, Italy); Valeria Proietti Dante and Marco Bazzani (Teoresi S.p.A, Italy); Marco Cascella (University of Salerno, Italy); Maria Romano and Francesco Amato (University of Naples Federico II, Italy)

- PS-08 Performance Analysis of Thermoelectric Generators Coupled with Pietra di Modica for Thermal Gradient Enhancement**
Carlo Trigona, Mohamd Amine Karoui, Giuseppe Politi, Anna M Gueli and Cristina Maria Belfiore (University of Catania, Italy)
- PS-09 Development of Analytical Models for the Electromagnetic Field Analysis of a Three-Phase DD-PMSGs for Wind Turbine Applications**
Marjan Noroozi (University of Strathclyde, United Kingdom); Reza Reza Yazdanpanah (Yazdanpanah, United Kingdom); Abbas Mehrad Kazemi Amiri (University of Strathclyde, United Kingdom); Ziad Azar (Siemens Gamesa Renewable Energy, United Kingdom); Alasdair McDonald (University of Edinburgh, United Kingdom)
- PS-10 A Smart Hydroponic System for Sustainable and Health-Centric Agriculture**
Victor Huilca, Alexandra Macarena Flores, Juan Pablo Haro and Miguel Angel Osorio (Escuela Superior Politécnica de Chimborazo, Ecuador); Omar Dario Delgado Brito (University of Calabria, Italy)
- PS-11 A Metrological Framework for Sustainable Cyber-Physical Systems**
Maurizio Giacobbe and Salvatore Distefano (University of Messina, Italy)
- PS-12 Integrated Energy-Based Assessment of Settlement-Induced Crack Patterns of Pietà Dei Turchini Church in Naples**
Andrea Montanino (International Centre for Numerical Methods in Engineering, Spain); Antonino Iannuzzo (University of Sannio, Italy)
- PS-13 Assessing Seismic Vulnerability in Historic Masonry Aggregates: Limitations of Unit-Based Strengthening Approaches**
Generoso Vaiano, Francesco Fabbrocino (Pegaso Telematic University, Italy)
- PS-14 Green Metrology for Power Integrity: PSRR Characterization via Compressed Sensing**
Ioan Tudosa (University of Sannio, Italy); Francesco Picariello (Universitas Mercatorum, Italy); Eulalia Balestrieri (University of Sannio, Italy)

14:00 - 14:45*Palazzo San Domenico - Sala dell'Assunta***PLENARY SESSION - KEYNOTE LECTURE****Chair:** Leopoldo Angrisani, *University of Naples Federico II, Italy*

Advances in Measuring Toxicity and Exposure Towards Sustainability in the Chemical Economy

Russell S. Thomas, *Chemical Insights Research Institute, US*

14:50 - 16:10 *Palazzo San Domenico - Sala dell'Assunta*
Session 2.1 - Smart devices, biomedical technologies, and automated diagnostics for sustainable and intelligent healthcare
Chair: Vittorio Santoriello, *University of Naples Federico II, Italy & Reykjavik University, Iceland*

- 14:50 Synthetic Twins: Toward Sustainable, Tunable 3D Printed Models of Human Tissues**
Gianmarco Dolino and Damiano Coato (Reykjavik University, Iceland & University of Padova, Italy); Alice Berardo and Emanuele Carniel (University of Padova, Italy); Paolo Gargiulo (Reykjavik University, Iceland)
- 15:10 Generalizable and Sustainable Feature Selection for Medical Imaging: A Case Study in Knee Osteoarthritis**
Ida Maruotto, Federica Kiyomi Ciliberti, Marco Recenti and Halldór Jónsson jr and Paolo Gargiulo (Reykjavik University, Iceland)
- 15:30 A Transfer Learning Approach for Detecting Buds of Posterior Teeth**
Francesca Angelone (University of Sannio, Italy); Parisa Soltani (University of Naples Federico II, Italy); Homa Baninajarian, Shakiba Sadeghizadeh and Amirhossein Vedae (Isfahan University of Medical Sciences, Iran); Alessia La Rocca and Armando Ricciardi (University of Sannio, Italy); Mario Sansone, Maria Romano, Francesco Amato and Alfonso M Ponsiglione (University of Naples Federico II, Italy)
- 15:50 Electromyographic Signatures of Postural Control: Insights into Gender Differences**
Vittorio Santoriello (University of Naples Federico II, Italy); Ida Maruotto (Reykjavik University, Iceland); Lorena Guerrini (Reykjavik University & University of Campania L. Vanvitelli, Iceland); Federica Pescaglia (Institute of Biomedical and Neural Engineering, Iceland); Carmine Gelormini (Reykjavik University, Iceland); Giuseppe Cesarelli (University of Naples Parthenope, Italy); Carlo Ricciardi and Alfonso M Ponsiglione (University of Naples Federico II, Italy); Paolo Gargiulo (Reykjavik University, Iceland)

14:50 - 15:50 *Palazzo San Domenico - Sala Convegni - First Floor*
Session 2.2 - Towards sustainable civil structures and infrastructures: innovative strategies for structural monitoring and identification
Chairs: Michela Monaco, *University of Sannio, Italy*
Luciana Di Gennaro, *University of Campania L. Vanvitelli, Italy*

- 14:50 Acoustic Emission Monitoring for Structural Health Assessment: The Case of the Geiger Key Bridge**
Luciana Di Gennaro and Giorgio Frunzio (University of Campania Vanvitelli, Italy); Michela Monaco (University of Sannio, Italy); Giovanni Loreto (Kennesaw State University, USA)
- 15:10 A Low-Cost Vision-Based Monitoring System for Dynamic Testing of a Cantilever Beam**
Francesco Picariello (Universitas Mercatorum, Italy); Michela Monaco (University of Sannio, Italy); Arman Neyestani (University of Naples Federico II, Italy)

- 15:30 Structural Damage Identification Through PCA and Subspace Comparison**
Gianna Agrò (University of Palermo, Italy); Elio Lo Giudice and Giuseppe Mugnos (DISMAT Laboratory, Italy)

16:10 - 16:30 *Palazzo San Domenico*
COFFEE BREAK / POSTER SESSION
Chair: Enrico Picariello, *University of Sannio, Italy*

This session features the same papers presented during the poster session on Thursday, 4 September, from 12:40 to 14:00.

16:30 - 17:30 *Palazzo San Domenico - Sala dell'Assunta*
Session 3.1 - Geomatics for sustainability: from remote sensing and survey techniques to maps and Geographical Information System (GIS)
Chairs: Claudio Parente, *Parthenope University of Naples, Italy*
Pasquale Maglione, *Parthenope University of Naples, Italy*
Francesca Guastaferro, *Almaviva Digitaltec, Italy*

- 16:30 Automatic Mapping of Vegetated Areas in Benevento (Italy) from Sentinel-2 Images**
Francesca Guastaferro (Almaviva Digitaltec, Italy); Claudio Parente, Andrea Vallario and Vincenzo Verde (Parthenope University of Naples, Italy)

- 16:50 Coastline Automatic Extraction from Sentinel-2 Images: Different Methodological Approaches in Comparison**
Giuseppina Costanzo, Gianluigi Ferrara, Claudio Parente and Vincenzo Verde (Parthenope University of Naples, Italy)

- 17:10 Using GIS Tools for Mapping Sea Level Rise Impacts on Casal Velino Coast (Italy)**
Ugo Falchi and Pasquale Maglione (Parthenope University of Naples, Italy); Paola Mercogliano (Centro Euro-Mediterraneo sui Cambiamenti Climatici, Italy); Claudio Parente (Parthenope University of Naples, Italy)

16:30 - 17:30 *Palazzo San Domenico - Sala Convegni - First Floor*
Session 3.2 - From Bio-Waste to Bio-Value: Sustainable Valorization of Agri-Food Resources for Health
Chairs: Francesca Angelone, *University of Sannio, Italy*
Ida Ferrandino, *University of Naples Federico II, Italy*

- 16:30 From Grape Waste to Measurable Value: Metrological and Metagenomic Insights into Wine by-Products**
Michela Salamone and Federica Carraturo (University of Naples Federico II, Italy); Martina Annunziata (University of Campania Luigi Vanvitelli, Italy); Lucrezia Caboni (University of Naples Federico II, Italy); Silvia D'ambra (Slow Food di Ischia e Procida, Italy); Marco Guida and Ida Ferrandino (University Federico II of Naples, Italy)

- 16:50 Research for Sustainable Development: The Case Study of Grassland Ecosystems in the Central Apennines**
 Elena De Felice (University of Camerino, Italy); Francesca Mercati (University of Perugia, Italy); Federico Maria Tardella, Sabrina Romano, Andrea Catorci and Paola Scocco (University of Camerino, Italy)
- 17:10 Sustainable Cultivation of Arthrospira Platensis Using Aquaculture Wastewater: Bioremediation Potential, Biomass Quality, and Life Cycle Assessment**
 Eugenio Geremia (Parthenope University of Naples, Italy); Federica De Rosa (University of Naples Federico II, Italy); Elena Chianese and Silvio Del Pizzo (University of Naples Parthenope, Italy); Claudio Agnisola, Paola Venditti, Giovanna Salbitani (University of Naples Federico II, Italy); Gaetana Napolitano (University of Naples Parthenope, Italy)

20:00	<i>"Il Casone e le sue volte" Restaurant</i> SOCIAL DINNER
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SHUTTLE SERVICE

A shuttle service will be provided for conference participants. The meeting point is at **19:15** in **Via del Pomerio 3**, in front of "Centro Clinico Morgagni" - 300 m from the Traiano Arch.

Technical Program - Friday, December 5

08:30 - 15:00	Palazzo San Domenico REGISTRATIONS
09:00 - 10:40	Palazzo San Domenico - Sala dell'Assunta Session 4.1 - Innovative approaches to health measurements and risk mitigation Chairs: Mariagabriella Pugliese, <i>University of Naples Federico II, Italy</i> Giuseppe La Verde, <i>University of Naples Federico II, Italy</i>
09:00	Commissioning of RadCalc Monte-Carlo IDC Model for Clinical Plan Verification and EPID-Based in Vivo Dosimetry in Radiotherapy Rocco Mottareale, Valentina d'Alesio, Francesca Buonanno, Marcello Serra, Gianluca Ametrano and Cecilia Arrichiello (National Cancer Institute - IRCCS - G. Pascale Foundation, Italy); Gaetano Gagliardo (Fondazione Muto ETS, Italy & Radiotherapy, Emicenter, Naples, Italy); Vincenzo Ravo (National Cancer Institute IRCCS G. Pascale Foundation, Italy)
09:20	External Dosimetry Audit IAEA/WHO for Validation of Megavoltage X-Ray Beams Rocco Mottareale, Cecilia Arrichiello, Marcello Serra, Gianluca Ametrano, Francesca Buonanno and Valentina d'Alesio (National Cancer Institute - IRCCS - G. Pascale Foundation, Italy); Gaetano Gagliardo (Fondazione Muto ETS, Italy & Radiotherapy, Emicenter, Naples, Italy); Vincenzo Ravo (National Cancer Institute - IRCCS - G. Pascale Foundation, Italy)
09:40	GammaPodTM: A Novel Approach to Stereotactic Breast Cancer Radiotherapy Gaetano Gagliardo (Fondazione Muto ETS, Italy & Radiotherapy, Emicenter, Naples, Italy); Marcello Serra, Valentina d'Alesio, Gianluca Ametrano, Francesca Buonanno, Cecilia Arrichiello, Rocco Mottareale, Sara Falivene, Piera Ferraioli and Vincenzo Ravo (National Cancer Institute - IRCCS - G. Pascale Foundation, Italy)
10:00	LINACWatch®: An Advanced Patient and Machine Quality Assurance System Based on Logfile Gaetano Gagliardo (Fondazione Muto ETS, Italy & Radiotherapy, Emicenter, Naples, Italy); Caterina Muto, Ferdinando Francomacaro, Ivona Zlatkova and Vincenzo Iorio (Fondazione Muto ETS, Italy); Marcello Serra (National Cancer Institute - IRCCS - G. Pascale Foundation, Italy)
10:20	Phantom-Based Image Quality Assessment of the ImagingRing Scanner for Image-Guided 192Ir High-Dose-Rate Brachytherapy Planning Francesca Buonanno, Rocco Mottareale, Valentina d'Alesio, Cecilia Arrichiello, Gianluca Ametrano and Marcello Serra (National Cancer Institute - IRCCS - G. Pascale Foundation, Italy)

Foundation, Italy); Gaetano Gagliardo (Fondazione Muto ETS, Italy & Radiotherapy, Emicenter, Naples, Italy); Federica Gherardi, Eva Iannacone, Mario Petrazzuoli and Vincenzo Ravo (National Cancer Institute - IRCCS - G. Pascale Foundation, Italy)

09:00 - 10:40	<p><i>Palazzo San Domenico - Sala Convegni - First Floor</i></p> <p>Session 4.2 - From Nature to Function: Sustainable Polymer Platforms for Sensing, Health, Food Safety, and Cultural Preservation</p> <p>Chairs: Elena Palmieri, <i>National Research Council, Italy</i> Luca Maiolo, <i>National Research Council, Italy</i> Claudia Mazzuca, <i>University of Rome Tor Vergata, Italy</i></p>
09:00	<p>SERS Detection of Cypermethrin Using Gold-Coated MgFe Hydrotalcite Nanostructures on Sustainable Cellulose Substrate</p> <p>Rocco Carcione (ENEA, Italy); Elena Palmieri, Luca Montaina and Ivano Lucarini (CNR-IMM, Italy); Tamara Posati (Istituto per la Sintesi Organica e la Fotoreattività, Italy); Francesco Maita (Consiglio Nazionale delle Ricerche, Italy); Alessia Cemmi (ENEA, Italy); Luca Maiolo (CNR-IMM, Italy)</p>
09:20	<p>Gamma Irradiation Effect on Ethyl Cellulose Foils: Advancing Sterilizable and Sustainable Biopolymer Materials</p> <p>Elena Palmieri (CNR-IMM, Italy); Rocco Carcione (ENEA, Italy); Luca Maiolo (CNR-IMM, Italy); Beatrice D'Orsi and Alessia Cemmi (ENEA, Italy); Francesco Maita (Consiglio Nazionale delle Ricerche, Italy)</p>
09:40	<p>Cellulose Nanocrystals as Sustainable Consolidant for Fragile Paper Artworks: Synthesis, Characterization and Application</p> <p>Laura Spagnuolo (University of Pisa, Italy); Leonardo Severini (National Research Council, Italy); Claudia Mazzuca, Federica Tuzzolo and Laura Micheli (University of Rome Tor Vergata, Italy); Alessandra Terrei (Musei Vaticani, Italy); Angelo Restaino (Archivio di Stato di Roma, Italy); Simone Luciani (University of Rome Tor Vergata, Italy); Angelo Traina (Thermo Fisher Scientific, Italy); Alessandra Operamolla (University of Pisa, Italy)</p>
10:00	<p>Eco-Friendly Restoration of Parchment Using Nanodiamond-Enhanced Materials</p> <p>Elena Palmieri (CNR-IMM, Italy); Cristina Cicero, Noemi Orazi, Claudia Mazzuca, Fulvio Mercuri, Ugo Zammit, Beatrice Ercolani and Silvia Orlanducci (University of Rome Tor Vergata, Italy)</p>
10:20	<p>Development of Polyaniline-Based Polysaccharide Composite for Biomedical Applications</p> <p>Francesca Pescosolido and Luca Montaina (CNR-IMM, Italy); Rocco Carcione (ENEA, Italy); Felicia Carotenuto and Paolo Di Nardo (University of Rome Tor Vergata, Italy); Silvia Battistoni (Consiglio Nazionale delle Ricerche, Italy); Emanuela Tamburri (University of Rome Tor Vergata, Italy)</p>

10:40 - 11:00

Palazzo San Domenico

COFFEE BREAK / POSTER SESSION
Chair: Enrico Picariello, *University of Sannio, Italy*

This session features the same papers presented during the poster session on Thursday, 4 September, from 12:40 to 14:00.

11:00 - 11:45

Palazzo San Domenico - Sala dell'Assunta

PLENARY SESSION - KEYNOTE LECTURE
Chair: Eulalia Balestrieri, *University of Sannio, Italy*

Experimental deployment of decentralized sensor networks for dynamic loading of power lines

Alfredo Vaccaro, *University of Sannio, Italy*

11:50 - 12:50

Palazzo San Domenico - Sala dell'Assunta

**Session 5.1 - Development of Low-Cost, Low-Tech, Ultra-High-Precision
Experimentation and Instrumentation for Research and Education**
Chairs: Damien Fakra, *University of Lorraine / University of Antananarivo*
Ioan Tudosa, *University of Sannio, Italy*

11:50 Experimental Study and Affordable Instrumentation of a Piezo-Thermoelectric Hybrid Road Energy Harvester: Field Implementation

Ando Ny Aina Randriantho (Higher Institute of Technology of Antananarivo, Madagascar); Marcel Ramarolahy, Tsiry Fifaliana Rakotoniana, Vonjy Ramarozatovo and Rijalalaina Rakotosaona (University of Antananarivo, Madagascar); Luc Rakotondrajaona (Higher Institute of Technology of Antananarivo, Madagascar); Damien Ali Hamada Fakra (University of Lorraine, France & University of Antananarivo, Madagascar)

12:10 Signal Time-Advance Measurement with LP-NGD Circuit

Idriss Aweis Hussein (NUIST, China); Nathan B Gurgel (Federal University of Campina Grande, Brazil); Willys Noa (SERDI, Madagascar); Damien Ali Hamada Fakra (University of Lorraine, France & University of Antananarivo, Madagascar); Sébastien Lalléchère (Association Française de Science des Systèmes (AFSCET), France); Blaise Ravelo (NUIST, China)

12:30 Data-Driven Diagnosis of Building-Envelope Thermal Behavior in Real Time

Lahoucine Ouhsaine (CY Cergy Paris University, France & L2MGC, France); Damien Ali Hamada Fakra (University of Lorraine, France & University of Antananarivo, Madagascar); Mohammed El Ganaoui (University of Lorraine, France)

11:50 - 12:30 *Palazzo San Domenico - Sala Convegni - First Floor*
Session 5.2 - Air Cleaning Technologies: Sensing, Communication, Control Strategies
Chair: Livio D'Alvia, *Sapienza University of Rome, Italy*

11:50 **Air Quality Prediction in Indoor Environments: A Review of Methods and Limitations**
Arthur Lecras (ENSAM, France); Roozbeh Sadeghian Broujeny (CESI, France); Abhinandana Boodi (CESI School of Engineering, France); Jacques Courbier (SQLI, France); Karim Beddiar (CESI LINEACT, France)

12:10 **Influence of CO₂ Sampling Techniques on 14C- Based Biogenic Carbon Quantification in Waste-to- Energy Emission**
Luigi Sabino, Mauro Rubino and Carolina Allocca (Università Vanvitelli, Italy); Anna Di Palma (National Research Council (CNR), Italy); Fabio Marzaioli (Università Vanvitelli, Italy)

12:50 - 14:10 *Palazzo San Domenico*
LUNCH / POSTER SESSION
Chair: Enrico Picariello, *University of Sannio, Italy*

This session features the same papers presented during the poster session on Thursday, 4 September, from 12:40 to 14:00.

14:10 - 14:50 *Palazzo San Domenico - Sala dell'Assunta*
TUTORIAL SESSION
Chairs: Luigi Duraccio, *University of Naples Federico II, Italy*
Fiammetta Marulli, *University of Campania Luigi Vanvitelli, Italy*

AI on the Edge as a way to reduce power consumption and improve sustainability: an embedded application case study

Giovanni Gogliettino, *STMicroelectronics*

14:50 - 16:30 *Palazzo San Domenico - Sala dell'Assunta*
Session 6.1 - Radiation measurements and metrology for environmental sustainability
Chairs: Carlo Sabbarese, *University of Campania Luigi Vanvitelli, Italy*
Chiara Imparato, *University of Campania Luigi Vanvitelli, Italy*

14:50 **Sustainability Decommissioning of Radioactive Wastewater from Nuclear Power Plants by Means of Zeolite Materials**
Fabrizio Ambrosino (University of Naples Federico II, Italy)

- 15:10 Activity Concentration Measurements of Radon Gas in Indoor Environment of Benevento City, Campania Region - South Italy**
Chiara de Vita, Mariagabriella Pugliese and Giuseppe La Verde (University of Naples Federico II, Italy); Chiara Imparato (University of Campania Luigi Vanvitelli, Italy); Fulvio Coppola (CeSMA Laboratory, University of Naples Federico II, Italy); Misbah Javed and Carlo Sabbarese (University of Campania Luigi Vanvitelli, Italy); Fabrizio Ambrosino (University of Naples Federico II, Italy)
- 15:30 Reusing Phosphate Fertilizer by-Products in Construction: Balancing Circular Economy Benefits with Radiological Safety**
Chiara Imparato (University of Campania Luigi Vanvitelli, Italy); Marina Poje Sovilj (University Josip Juraj Strossmayer of Osijek, Croatia); Giuseppe La Verde and Chiara de Vita (University of Naples Federico II, Italy); Misbah Javed (University of Campania L. Vanvitelli, Italy); Fabrizio Ambrosino (University of Naples Federico II, Italy); Carlo Sabbarese (University of Campania Luigi Vanvitelli, Italy); Mariagabriella Pugliese (University of Naples Federico II, Italy)
- 15:50 Radon Exposure Monitoring and Dose Assessment for Workers in Drinking Water Distribution and Sewerage Plants in Naples, South Italy**
Fulvio Coppola (CeSMA Laboratory, University of Naples Federico II, Italy); Domenico Accardo and Fabrizio Ambrosino (University of Naples Federico II, Italy); Vincenzo D'Onofrio and Sergio De Marco (Acqua Bene Comune, Italy); Giuseppe La Verde and Mariagabriella Pugliese (University of Naples Federico II, Italy)
- 16:10 Quality Assurance of Radon Activity Concentrations Measurement in Wells and Water Supply Systems of Osijek-Baranja County, Croatia**
Marina Poje Sovilj and Vanja Radolić (University Josip Juraj Strossmayer of Osijek, Croatia); Mirjam Pavošević (University of Osijek, Croatia)

14:50 - 16:30 *Palazzo San Domenico - Sala Convegni - First Floor*
Session 6.2 - General Session - PART II
Chair: Francesco Picariello, *Universitas Mercatorum, Italy*

- 14:50 CloudChain: Decentralized Marketplace for AI Compute Resources**
Monika Malik (AT&T, USA)
- 15:10 Unlocking the Potential of Cloud Computing for Sustainable Energy and Cost-Efficient Artificial Intelligence Workloads**
Chaitanya Kumar Mankala (VilliTech, USA & Villanova University, USA)
- 15:30 Life Cycle Assessment of Private Blockchain-Based Solar Photovoltaic Traceability System**
Anete Kalnina, Maksims Feofilovs and Francesco Romagnoli (Riga Technical University, Latvia)

- 15:50 A Novel Heterogeneous Limit Analysis Framework for the Collapse Assessment of Curved Masonry Constructions Under Different Loading Scenarios**
 Mohammad Pourfouladi, Natalia Pingaro and Gabriele Milani (Politecnico di Milano, Italy)
- 16:10 Sustainability and Equity Challenges of Nuclear Fission and Fusion**
 Vittorio Ciardiello, Daniele Davino, Vincenzo Paolo Loschiavo and Carlo Silano (University of Sannio, Italy)

16:30 - 16:50 Palazzo San Domenico
COFFEE BREAK

16:50 - 17:10 Palazzo San Domenico - Sala dell'Assunta
CLOSING AND AWARD CEREMONY

17:10
GUIDED TOUR OF BENEVENTO
Meeting Point - Palazzo San Domenico

A short tour in the heart of Benevento begins at the splendid Lombard church of Santa Sofia, with its ancient bell tower, continues toward the impressive Arch of Trajan, and ends at the Sant'Agostino complex, the historic seat of the University of Sannio, which today hosts a modern digital multimedia museum.

