ORGANIZERS

Airi ASSOCIAZIONE ITALIANA PER LA RICERCA INDUSTRIALE

Nano Italy Associazione

SAPIENZA UNIVERSITÀ DI ROMA

Renaissance Cloister by Sangallo

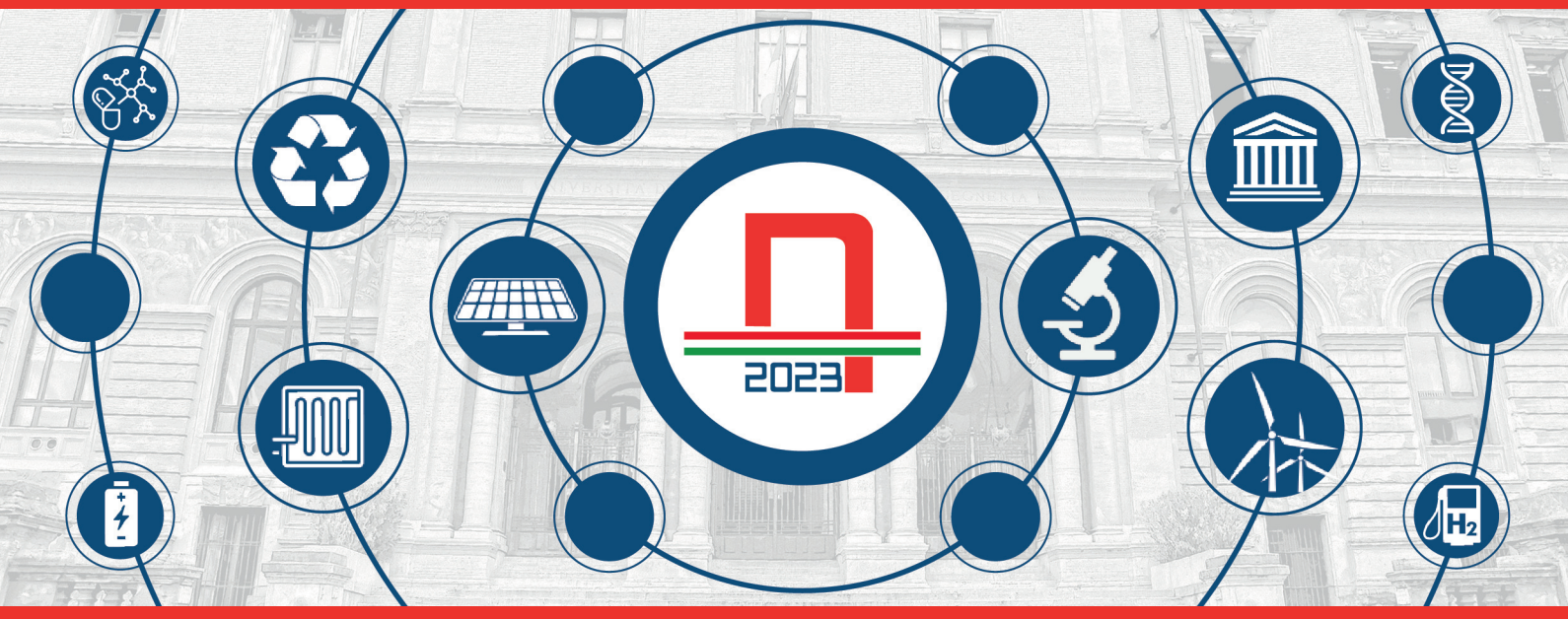
Faculty of Civil and Industrial Engineering

SEPTEMBER 18-22 2023

Nano Innovation 2023

Rome, 18-22 September

Conference & Exhibition



CO-ORGANIZERS

SAPIENZA UNIVERSITÀ DI ROMA

Politecnico di Torino

Università degli Studi di Reggio Calabria Mediterranea

DIIES Dipartimento di Ingegneria dell'Informazione, delle Infrastrutture e dell'Energia Sostenibile

UMG dubium sapientiae initium

UNIMORE Università degli Studi di Modena e Reggio Emilia

Fondazione Bruno Kessler Future Built on Knowledge

ENEA Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile

Fondazione Don Carlo Gnocchi Onlus

INAIL Istituto Nazionale per l'Assicurazione contro gli Infortuni sul Lavoro

INRiM Istituto Nazionale di Ricerca Metrologica

Istituto Superiore di Sanità

JEOL

ZEISS

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EDITORIAL PARTNERS

Journal of Experimental and Theoretical Analyses an Open Access Journal by MDPI

nanomaterials an Open Access Journal by MDPI

IN COOPERATION WITH

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PLATINUM research&innovation

www.nanoinnovation2023.eu

index

STAMPA: TIPOGRAFIA PALOMBI & LANCI S.R.L.

PROGETTO GRAFICO E SITO WEB: AZIMUTH DI PATRIZIA DE CASTRO

Institutional Patronages

APRE Agenzia per la Promozione della Ricerca Europea

DIPARTIMENTO PER LA TRASFORMAZIONE DIGITALE

Ministero degli Affari Esteri e della Cooperazione Internazionale

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Ministero delle Imprese e del Made in Italy

MUR Ministero dell'Università e della Ricerca

REGIONE LAZIO

Scientific Patronages

AICIng Associazione Italiana di Chimica per Ingegneria

2022 2023 IYBSSD International Year of Basic Sciences for Sustainable Development

Ordine Biologi Lombardia

SISM Italian Society for Microscopical Sciences

SILS

Società Chimica Italiana

Società Italiana di Agronomia S.I.A.

The printed version of NanoInnovation 2023 programme *is updated at September 10.*

Please, refer to the website for the updated version of the official programme.

You can access up-to-date information directly using QR codes present in the various pages of this program.

WELCOME

NanoInnovation is promoted by the **NanoItaly Association** and the **Italian Association for Industrial Research** (Airi), with the contribution of all the co-organisers, supporters and partners of the event.

The previous seven editions of NanoInnovation were successfully concluded with an average of more than 1200 participants from different countries and 60 thematic symposia and workshops with more than 400 speakers and chairpersons. Most of the leading national public and private research players in nanotechnologies participated.

Following the style adopted during the Pandemic, the VIII edition of NanoInnovation, scheduled from **18 to 22 September 2023**, will also be held in a hybrid format. To ensure broad participation, most of the initiatives will take place both online and in person. NanoInnovation will once again be held in the Renaissance cloister of Sangallo, at the Faculty of Civil and Industrial Engineering of the Sapienza University of Rome.

NanoInnovation is the national reference event for the broad and multidisciplinary community involved in the study and development of micro- and nanotechnologies and their integration with other enabling technologies (KETs) in all application areas. NanoInnovation has always been a unique and unmissable opportunity to bring together academia, research and the entrepreneurial system with the aim of presenting and exchanging innovative ideas, transferring know-how, and enabling the integration of knowledge and experience between different application areas of nanobiotechnologies.
In this eighth edition of NanoInnovation, the role of PNRR actions and their impact on the research, innovation and industrial ecosystems will be demonstrated and discussed. **NanoInnovation 2023** will:

- Provide a **meeting forum** for academia, research, business and economic operators;
- Showcase **state-of-the-art** developments in applied nanotechnology research;
- Act as a **stage for innovations** in nanotechnologies and KETs;
- Promote **knowledge transfer** between different R&D actors and sectors;
- Provide **capacity building** and **training** opportunities for scientists and professionals.

Promoting responsible research and innovation for sustainable development is one of the driving themes of the event. The programme of NanoInnovation 2023, increasingly focused on the application and market aspects of nanotechnology, KETs and innovation in all its aspects, includes highly qualified speakers and organisations.

NanoInnovation also offers students, PhD students and young researchers an excellent and unique opportunity to follow the latest developments in nanotechnologies and to meet leading players in the field.
A special thanks to all our co-organisers. Their scientific collaboration and economic support have been essential for the organisation of this VIII edition.

We would also like to thank the Sapienza University of Rome and its Faculty of Civil and Industrial Engineering for kindly hosting the conference, the Department of Basic and Applied Sciences in Engineering for logistical and scientific support, the Steering and Programme Committees for setting up the programme structure, the session chairs and the speakers who accepted our invitation to share their expertise.

Special thanks are due to the companies and organisations that have supported the event and once again made it possible to attend free of charge. We would like to thank all the people who worked hard to make NanoInnovation a valuable and informative experience.

The NanoInnovation 2023 Organising Committee

Marco ROSSI *(chair)*

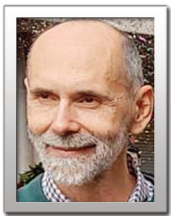
- Sapienza University of Rome

Pietro ASINARI

- INRIM

Massimo BERSANI

- FBK



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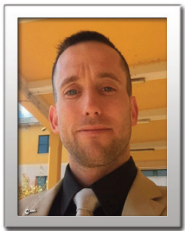
(chair)

- NanoItaly Association

Francesco BIANCARDI

- ZEISS



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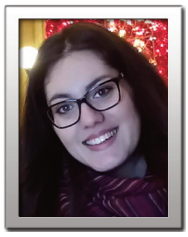
Local Technical Committee



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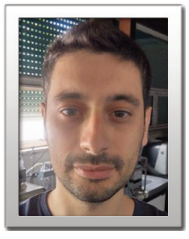

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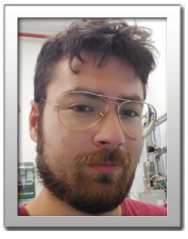

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Exhibitors' section

AIRI
Associazione Italiana per la Ricerca Industriale

Airi (Italian Association for Industrial Research) is a not-for-profit private organization, funded in 1974. Its mission is to promote industrial Research and Innovation and co-operation between the private and public sectors, to enhance the competitive position of the Country.

Airi members are large industrial enterprises and SMEs, universities, public research institutions, technology clusters and financial organizations. Due to its broad representative base, Airi is acknowledged as a key opinion leader in Technology forecasting and Research-policy design.

Airi publishes since 1995 the report "Key Technologies for the Italian Industry", on the basis of the work of more than two hundred R&D Managers, providing an analysis of the impacts of future innovations on key economical industrial sectors.

During its lifetime, Airi has built competences in Key Enabling Technologies and Nanotechnologies, Research and Innovation policies and strategies, sustainability and social responsibility, co-creation and open innovation practices, and the exploitation and dissemination of scientific knowledge.

Over the past 15 years Airi has been very active in participating in European, national and regional initiatives and cooperative projects on these themes, and organizing events on Key Enabling Technologies and their applications.

www.airi.it - www.nanotec.it

NanoItaly Association

The NanoItaly Association has been established with the aim of promoting, enhancing and supporting the role of bio-nano technologies in the Italian and European societies in all applicative, social and economic contexts, with particular reference to the development of technologies of industrial interest and to the social impact on the population of product innovations based on nano aspects.

NanoItaly is a cultural no-profit, non-political association, organized on the sovereignty of the members' assembly and whose corporate offices are elective and held without charge.

The main purpose of the Association is to promote and support the integration of the scientific and industrial communities relating the wide field of bio-nano technologies, composed of researchers, technologists and professionals from public research and industrial laboratories, in order to discuss innovative ideas, exchange knowledge and enhance transfer of know-how, in order to allow the integration of ideas and knowledge between different areas of application.

We strongly believe that the encounter and integration of scientific and technological communities traditionally separated from each other to build a new reality able to define new goals and influence the transfer of skills and knowledge from laboratories to businesses and markets, is an absolute need for a profitable development of nanotechnology in our country.
The Association aims to support and encourage collaboration between research institutions and industry, in order to jointly contribute to the regional, national and European programs, to promote the creation of research networks and infrastructure for the needs of research in nano-bio-technology and nanoscience.

The Association membership is open to both individuals and organizations interested in participating in the development of the variegated world of nano-bio-technology.
For more information and adhesion please refer to the Association website: www.associazione-nanoitaly.it.

SAPIENZA UNIVERSITY OF ROME

The Largest University in Europe
The Oldest University in Rome

Sapienza University of Rome, founded in 1303 by Pope Boniface VIII, is one of the oldest universities in the world and a high performer among the largest universities in international rankings. It is the first University in Rome and the largest University in Europe: a city within a city, with over 700 years of history. With more than 115,000 students, more than 3,300 professors and nearly as many administrative and technical staff, Sapienza represents a vast knowledge community, with more than 18,000 graduates per year.

Since its establishment over 700 years ago, Sapienza has played an important role in Italian history and has been directly involved in key changes and developments in society, economics and politics. It has contributed to the development of Italian and European science and culture in all areas of knowledge.

The University offers a vast array of courses including 290 degree programmes, over 80 PhD courses, over 200 professional courses and 120 Specialization Schools in Medicine and Health, run by 58 Departments, 2 Hospitals and 11 Faculties. There are 59 libraries and 21 museums, as well as comprehensive student services. The student body includes over 10,000 enrolled international students from all over the world. Ciao and Hello (the welcoming centre for foreign students), SoRT (Counselling and tutorship services) and assistance for disabled students.

Sapienza plans and carries out important scientific investigations in almost all disciplines, achieving high-standard results both on a national and on an international level, thanks to the work of its faculties, departments and centres devoted to scientific research. Sapienza has active partnerships with other universities in 86 countries and 1422 international cooperation agreements. The first University in Rome is proud to have had many famous scholars among his students. Dealing with the field of Physics' students, members of the so called 'Via Panisperna' group – including the scientists Enrico Fermi, Edoardo Amaldi and Emilio Segrè – gave a crucial contribute to Physics and left an important heritage in subjects like Quantum Physics, Physics of Disordered Systems and Astrophysics. Sapienza enhances research by offering opportunities also to international human resources. Thanks to a special programme for visiting professors, many foreign researchers and professors periodically come to Sapienza, consolidating the quality of its education and research programmes. 21 disciplines ranked in the last Top 100 QS World University Ranking.

Sapienza University of Rome is a public, autonomous and free university, involved in the development of society through research, higher level of education and international cooperation.

The future of Sapienza starts today thanks to its rich past and the contribution of the entire University community.

Faculty of Civil and Industrial Engineering

The Faculty was founded in 1817 by Pope Pius VII, following the model of the most famous Parisian and Viennese School of Engineering of the time; in 1935, due to the Gentile's reform, the School became the Faculty of Engineering. The Faculty was founded with the aim of training professionals of high cultural background, qualified to meet the real needs of training and research company, possessing the ability to promote and to develop technological innovation processes in different cultural environments. The ancient Faculty of Engineering has a long educational tradition which is appreciated all over the world. This rich experience has allowed the Faculty to offer a very innovative syllabus today, including also a specific program on Nanotechnology Engineering. It aims particularly at satisfying local engineering needs, yet also at preparing graduates for employment in an increasingly globalised and international job market. Recently, a more general internal reorganization of Sapienza required a thematic splitting of the research and teaching activity, with the consequent born of the new Faculty of Civil and Industrial Engineering, the headquarter of which remained in the pristine site, and of the new Faculty of Information Engineering, Informatics and Statistics.
The Faculty of Civil and Industrial Engineering is spread among various buildings in the area of via Eudossiana, the most representative is the old monastery of the church of San Pietro in Vincoli (San Peter in Chains), also known as basilica Eudossiana, but educational and scientific activities are also held in other locations in Rome and Lazio, like Latina and Rieti.

An ancient tale

An ancient tale connects the name of Eudossia and San Pietro in Vincoli: the empress Eudossia, wife of Teodosio II (408-550), emperor of the East, sent from Costantinoples to her daughter Eudossia part of the chains ("vincoli") of San Peter which she found in Jerusalem. These chains were donated to the Pope Leone Magno. He put them near the ones that hold San Peter during his roman captivity, and the miracle happened: The two chains melted together.

CNIS - SNN Lab

Research Centre for Nanotechnology applied to Engineering of Sapienza University of Rome

Sapienza Nanotechnology & Nanoscience LAB

Center of Nanotechnology for Engineering of Sapienza

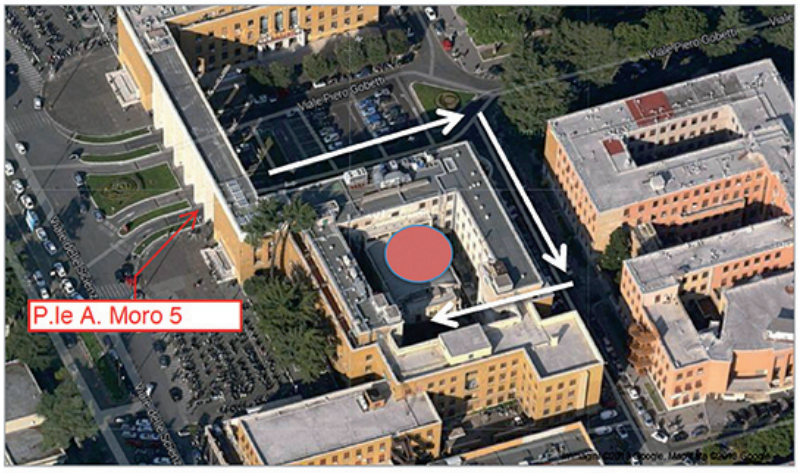
(Centro per le Nanotecnologie applicate all'Ingegneria di Sapienza Università di Roma)

The CNIS was enstablished in 2006, and now involves more than 90 professors and researchers, coming from various Departments of the Faculties of Engineering, Sciences and Medicine. The vision and goal of CNIS is to embrace and support a multidisciplinary user base of researchers of Sapienza and co-workers of other universities or private laboratories. CNIS activities are now developed in the new (2012) Sapienza Nanotechnology & Nanoscience Laboratory (SNN Lab), which is the core-facility at Sapienza dedicated to nanoscience and nanotech multidisciplinary applications in materials science, life sciences, engineering and solid state physics. It brings together state-of-art instrumentation for nanotechnology with an experienced staff that will perform the structural and functional characterization of all the materials, devices and systems in the framework of the foreseen project activities.

In particular, a wide range of microscopy and nanoscopy techniques are available. The facility also offers our users a variety of sample preparation equipment, a light microscopy lab with image analysis, an X-ray lab, and a materials testing lab.

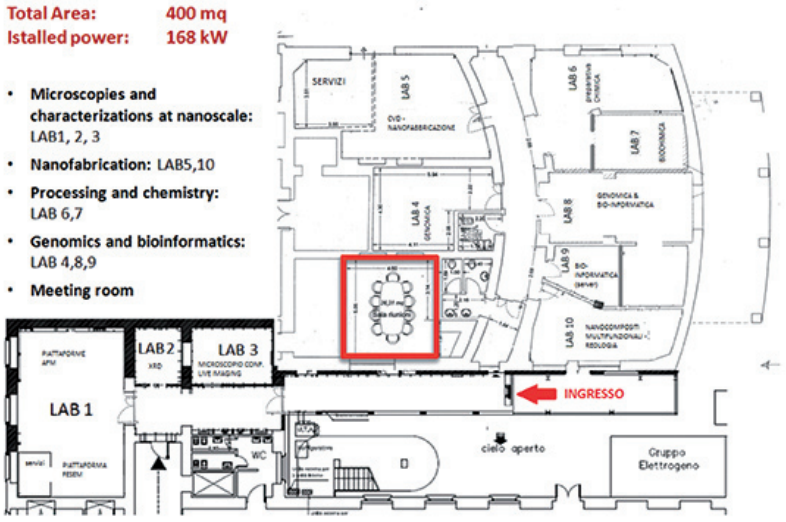
The SNN-Lab is finalized to:

- Integrate the multidisciplinary skills available at Sapienza University in the fields of nanotechnology and nanosciences, with the aim of creating synergies between research groups operating in different areas of science, engineering, medicine.
- Constitute a research infrastructure at Sapienza supportive the design, realization and characterization of nanostructures and innovative micro/nano-devices for different fields of applications.
- Provide instrumentation and services for high quality research in the field of: micro/nano-fabrication, micro/nano-manipulation, advanced characterization (functional and structural microscopy) of the chemical-physical properties of micro/nanostructured materials, engineerization of the designed micro/nanostructured devices and systems, nanomedicine and genomics.
- Create a reference structure the for "the territory" and enterprise, responding to the research and technological development needs of the research programs at regional, national and international levels.



Total Area: 400 mq
Istalled power: 168 kW

- **Microscopies and characterizations at nanoscale:** LAB1, 2, 3
- **Nanofabrication:** LAB5,10
- **Processing and chemistry:** LAB 6,7
- **Genomics and bioinformatics:** LAB 4,8,9
- **Meeting room**



The SNN-Lab has also been made possible thanks to the funding from the Lazio region to promote innovation and technological transfer. The Lab is located on the main campus of Sapienza University in an area of 400 mq.

More information on: **web.uniroma1.it/cnis/**

SNN Lab – CNIS
Sapienza University of Rome, P.le A. Moro n. 5 - 00185 Rome
Director: Prof. Antonio d'Alessandro (antonio.dalessandro@uniroma1.it)
Contact person: Prof. Marco Rossi (marco.rossi@uniroma1.it)

Masterplan

Break and visit of the exhibition area

Monday 18	Tuesday 19	Wednesday 20	Thursday 21	Friday 22
09:00 - 17:30	**09:00 - 11:00**	**09:00 - 10:30**	**09:00 - 10:30**	**09:00 - 10:30**
Guest Events Workshop on Imaging and Nanofabrication in Research for Electronics related Components Green Horizons: Embracing Sustainability through Life Cycle Assessment (LCA) Nanotechnology and innovation: labs & industries points of view	Welcome Session & Opening Session on Research and Innovation strategies at the PNRR Era	Multi-track sessions & Workshops Joint Events, Special Events & more	Multi-track sessions & Workshops Joint Events, Special Events & more	Multi-track sessions & Workshops Joint Events, Special Events & more
		10:30 - 10:50		
	11:00 - 11:30	**10:50 - 11:30** Parallel Lectures	**10:50 - 11:30** Parallel Lectures	**10:50 - 11:30** Parallel Lectures
	11:30 - 13:00	**11:30 - 13:00**	**11:30 - 13:00**	**11:30 - 13:00**
	Round table on Platforms and Open access Research Infrastructures for the Technology Transfer	Multi-track sessions & Workshops Joint Events, Special Events & more	Multi-track sessions & Workshops Joint Events, Special Events & more	Multi-track sessions & Workshops Joint Events, Special Events & more
	13:00 - 14:00			
	14:00 - 16:20	**14:00 - 15:30**	**14:00 - 15:30**	**14:00 - 15:30**
	Scientific Plenary Session	Multi-track sessions & Workshops Joint Events, Special Events & more	Multi-track sessions & Workshops Joint Events, Special Events & more	Multi-track sessions & Workshops Joint Events, Special Events & more
	16:20 - 16:50	**15:30 - 16:00**		
	16:50 - 17:20	**16:00 - 17:30**	**16:00 - 17:30**	**16:00 - 17:30**
	Guest Event PNRR Quantum Science and Technology initiative NQSTI	Multi-track sessions & Workshops	Multi-track sessions & Workshops	Multi-track sessions & Workshops
	17:20 - 18:30	Joint Events, Special Events & more	Joint Events, Special Events & more	Joint Events, Special Events & more
	Scientific Plenary Session	**17:45 - 19:15**	**17:45 - 19:15**	**17:45 - 19:15**
	NEST Prize announcement	BreakOut sessions	BreakOut sessions	BreakOut sessions

Exhibition, Satellite Events, Poster Session and Social Events

For the latest updates, please check the QRcode on the side

GUEST EVENT I

IMAGING AND NANOFABRICATION IN RESEARCH FOR ELECTRONICS RELATED COMPONENTS

Chairs: Antonio D'ALESSANDRO, *Sapienza University of Rome*,
Francesco BIANCARDI & Veronica SPARACINO, *ZEISS*

Co-organized with

The aim of the workshop is to highlight progress in research and technology related to microelectronics and novel structures where imaging and nanofabrication are indispensable methods steering the applications of these advanced devices. Over the workshop day, you can look forward to Latest technology insights from ZEISS, Kleindiek and Raith, Inspiring user presentations, a Get-together after the workshop for your networking.

Learn more about the workshop & book your place in presence at
https://www.zeiss.it/microscopia/local/eventi/nanoinnovation_workshop.html

Innovative research using nanofabrication plays crucial role in advancing manufacturing of new components for microelectronics and in development of novel devices based on nanostructures, nanophotonics or complex semiconductor integrated systems. Importantly, high-quality high- resolution imaging gives insights in the development process at each of the many steps to guide the researchers towards achieving their final goals. The aim of the workshop is to highlight progress in research and technology related to microelectronics and novel structures where imaging and nanofabrication are indispensable methods steering the applications of variety of novel advanced devices.

Topics:

- FE-SEM imaging and related techniques for electronics
- FIB-SEM workflows for electronics
- e-beam and i-beam nanolithography
- Microelectronics
- Integrated nanophotonics
- Single electronics
- Quantum information science
- Semiconductor Nanostructures for novel devices in electronics
- Inspection and failure analysis in electronics
- Nanoprobing
- Semiconductor lasers, optical interconnects

The participation is free, but the registration on the website of Nanoinnovation is mandatory.

For the latest updates, please check the QRcode on the side

10:45 - 18:00

GUEST EVENT I

10:45 - 11:00	**Registration**
11:00 - 11:30	Antonio d'ALESSANDRO, *Director of CNIS, Sapienza University of Rome* Giulio LA MEDICA, *Microscopy Director, ZEISS* Vittorio MORANDI, *Coordinator of the PNRR-RI project iENTRANCE@ENL, CNR* **Welcome**
11:30 - 12:00	Kirill ATLASOV, *ZEISS Microscopy* **Crossbeam-laser and Gemini imaging for semiconductor materials**
12:00 - 12:30	Pasqualantonio PINGUE, *NEST, Pisa* **Lithography and characterization of nanostructures by scanning electron microscopy based techniques**
12:30 - 13:00	Andrew SMITH, *Kleindiek* **The Prober Shuttle - a dedicated platform for performing nanoprobing tasks at low beam voltages addressing recent, current, and future technology nodes**
13:00 - 14:00 light lunch	
14:00 - 14:30	Frank NOUVERTNE, *Raith GmbH* **Applications of Advanced Nanofabrication Utilizing Electron, Ion and Laser Beams**
14:30 - 14:45	Andreas REMSHEID, *Raith GmbH* **Raith tools for nanofabrication**
14:45 - 15:15	Damiano GIUBERTONI, *FBK, Trento* **Multispecies FIB patterning: from nanometric prototypes to single defects in solids**
15:15 - 15:45 break	
15:45 - 16:15	Annamaria GERARDINO, *CNR-IFN, Rome* **Electron Beam Lithography: A Versatile Tool for Research and Industrial Applications**
16:15 - 16:45	Filippo ROMANATO, *University of Padua, Padua* **Design and nanofabrication techniques for micro-lenses**
16:45 - 17:15	Giorgio DIVITINI, *IIT, Genoa* **Investigating the local properties of optoelectronic devices using Electron Microscopy and related techniques**
17:15 - 18:00	*Open discussion and Closing remarks*
18:00	*Get together (drinks and fingerfood)*

For the latest updates, please check the QRcode on the side

GUEST EVENT II — 14:00 - 16:50

GREEN HORIZONS: EMBRACING SUSTAINABILITY THROUGH LIFE CYCLE ASSESSMENT (LCA)

Chair: Claudia BIANCHI, *University of Milan*

Co-organized with

UNIVERSITÀ DEGLI STUDI DI MILANO

14:00 - 14:30	Welcome Greetings
14:30 - 15:10	Claudia Letizia BIANCHI, *University of Milan* **Green Horizons: Embracing Sustainability through Life Cycle Assessment (LCA)**
15:10 - 15:30	Vincenzo FABBRIZIO, *University of Milan* **Lab-scale life cycle assessment: The hidden perspective**
15:30 - 15:50 break	
15:50 - 16:10	Serena BIELLA, *University of Milan* & Viviana ROSSI, *TODEMA srl* **Streamlining Sustainability in a Real Case: Optimizing Life Cycle Assessment (LCA) for a Machine for bottle closures production**
16:10 - 16:30	Vasilissa NIKONOVA, *University of Milan* **GHG emissions for Scope 1, 2, 3 – GRI standards**
16:30 - 16:50	Giulia CORRADINI, *IrisCeramica Group* **ESG e carbon footprint: il punto di vista di un gruppo industriale**

GUEST EVENT III — 18:00 - 19:00

NANOTECHNOLOGY AND INNOVATION: LABS & INDUSTRIES' POINTS OF VIEW

Chair: Roberto GIANNANTONIO, *University of Milan*

Organized in collaboration with

KLOPMAN INTERNATIONAL — QUALITY THAT WORKS

INL INTERNATIONAL IBERIAN NANOTECHNOLOGY LABORATORY

18:00 - 18:30	Andrea CAPASSO, *INL - Int. Iberian Nanotechnology Lab., Braga, Portugal* **Graphene-based technologies by solution processing**
18:30 - 19:00	Antonio ANDRETTA, *Klopman* **Nanotechnology Innovation at Klopman: vision and roadmap of a leading workwear company**

COCKTAIL BREAK

19 SEPT MORNING

For the latest updates, please check the QRcode on the side

09:00 - 11:00

WELCOME SESSION

Chair: **Maria Sabrina SARTO**, *Sapienza University of Rome, Deputy Rectress for Research*

Greetings

PS.I.1	**Antonella POLIMENI**, *Sapienza University of Rome, Rectress (to be confirmed)*
PS.I.2	**Gilberto DIALUCE**, ENEA, *President*
PS.I.3	**Emanuele MONTI**, IX Standing Committee of the Lombardy Region, *President*
PS.I.4	**Andrea PICCIOLI**, *ISS, General Director*
PS.I.5	**Giovanni CUDA**, *University Magna Graecia of Catanzaro, Elected Rector*
PS.I.6	**Giuseppe ZIMBALATTI**, *The Mediterranean University of Reggio Calabria, Rector*
PS.I.7	**Andrea SIMONI,** *FBK, General Secretary*
PS.I.8	**Carlo Massimo CASCIOLA**, *Sapienza University of Rome, Faculty of Civil and Industrial Engineering, Dean*

OPENING SESSION
Research & Innovation Strategies at the PNRR Era

Chair: Marco VITTORI ANTISARI, *NanoItaly Association*

PS.II.1	**Giorgio GRADITI**, *ENEA, Dept. TERIN Director* PNRR and innovation, the challenge of the ecological and digital transition
PS.II.2	**Angelo RICCABONI**, *University of Siena, President of Fondazione Sclavo and Fundación PRIMA*
PS.II.3	**Caterina PETRILLO**, *University of Perugia, President of Area Science Park and Chair of ELI-ERIC General Assembly* The Trieste research and innovation system: the case of Area Science Park
PS.II.4	**Rudy Alexander ROSSETTO**, *President of Professional Order of Biologists in Lombardy* The role of biologists in the life sciences and nanotechnologies: insights and challenges of the Lombardy Region model
PS.II.5	**Francesco MATTEUCCI**, *EISMEA* How to stimulate the scientific entrepreneurship culture ?

For the latest updates, please check the QRcode on the side

11:30 - 13:00

ROUND TABLE

PLATFORMS and OPEN ACCESS RESEARCH INFRASTRUCTURES for the TECHNOLOGY TRANSFER

Coordinators:
Vittorio MORANDI, *IMM-CNR* & Marco ROSSI, *Sapienza University of Rome*

Moderators:
Chiara LICO, *Caposervizio presso Rai* & Franco FOSSATI, *Scientific director of Rome Technopole*

In recent years, the significance of research infrastructures, as providers of advanced instrumentation and specialized skills, has dramatically increased due to the necessity for optimal management of highly complex and costly instruments.

In an ever-evolving landscape of scientific and technological advancement, the pivotal role of research infrastructures is undergoing a significant transformation. These infrastructures are not just repositories of cutting-edge instrumentation and specialized expertise; they have become catalysts for innovation, driving progress through optimal management of high-cost, complex equipment.

This shift in research activity management, where laboratory results must be integrated with experiments conducted in large, publicly accessible research infrastructures, presents not only new opportunities but also new and often uncharted challenges. Optimizing interactions among various structures and research teams, managing intellectual property, and coordinating time and access modes are essential aspects. The creation of decentralized research infrastructures, organized as a network of independent laboratories, adds another layer of complexity. Furthermore, recent funding initiatives under the Next Generation EU Plan (PNRR) have significantly accelerated investments in Italy in both Research Infrastructures and Technological Infrastructures for Innovation. It is crucial to align these new initiatives with existing national efforts in a coordinated, inclusive, and synergistic manner, promoting best practices and effective governance.

The Round Table aims to be one occasion to facilitate a dialogue among all stakeholders involved in the establishment, management, and operation of research infrastructures, and those potentially interested in utilizing these infrastructures. It will provide information on both technological and organizational-managerial characteristics essential for creating a network of research infrastructures while collecting opinions and suggestions on the most effective management approaches.

The themes on the table span from the needs in terms of operative structure, operator skills, to the instrument characteristics and their evolution strategy.

By doing so, we hope to further stimulate the interests of operators, fostering a greater awareness of the potential offered by individual infrastructures and their integration.

Overall, this initiative aims to create a collaborative environment to address the pressing challenges faced by the research community in managing and optimizing the use of research infrastructures. By sharing knowledge, experiences, and suggestions, we can work towards a more integrated and efficient network of research infrastructures, ultimately contributing to the acceleration of technology transfer and innovation.

Panelists	
Pietro ASINARI	INRIM, *Scientific Director*
Andrea CAPASSO	International Iberian Nanotechnology Laboratory, Braga
Ennio CAPRIA	ESRF, Grenoble - FR, Deputy Head of Business Development
Marco CRESCENZI	ISS - Core Facilities Technical-Scientific Service, *Director*
Giovanni CUDA	University Magna Graecia of Catanzaro, *Elected Rector*
Gilberto DIALUCE	ENEA, *President*
Giorgio GRADITI	ENEA, Dept. TERIN Director
Emanuele MONTI	IX Standing Committee of the Lombardy Region, *President*
Andrea PICCIOLI	ISS, *General Director*
Fabrizio PIRRI	Politecnico di Torino & IIT, *Director of the Center for Sustainable Future Technologies*
Angelo RICCABONI	University of Siena, *President of Fondazione Sclavo and Fundación PRIMA*
Rudy Alexander ROSSETTO	Professional Order of Biologists in Lombardy, *President*
Andrea SIMONI	FBK, *General Secretary*
Giuseppe ZIMBALATTI	The Mediterranean University of Reggio Calabria, *Rector*

14:00 - 16:10

SCIENTIFIC PLENARY SESSION

Chair: Fabrizio PIRRI, *Politecnico di Torino & IIT*

PS.III.1	Carlo REITA, *Director Strategic Partnership and Planning at CEA-LETI* **EU Chips ACT: an opportunity to structure and strengthen the EU R&D infrastructure**
PS.III.2	Umberto CELANO, *Arizona State University* **Challenges for Nanomaterials in the Semiconductor Industry of the Post-nanometer Era**
PS.III.3	Renzo CAPELLI, *Carl Zeiss SMT GmbH* **EUV development @ ZEISS SMT: enabling the new era of EUV lithography**
PS.III.4	Mohammed Y. BASHOUTI, *Ben-Gurion University of the Negev* **Surface Optoelectronic Properties of Hybrid Silicon**

16:40 - 17:20

PNRR Quantum Science and Technology initiative NQSTI: opportunities for industrial research and innovation

Co-organized with Scuola Normale Superiore
Chair: Fabio Beltram, *SNS, Pisa*

PS.IV.1 **GE.IV.1**	Fabio BELTRAM, *SNS, Pisa* **National Quantum Science and Technology Institute: structure and objectives**
PS.IV.1 **GE.IV.1**	Francesco CATALIOTTI, *INO-CNR and University of Firenze* Fabio SCIARRINO, *Sapienza University of Rome* Fabio BELTRAM, *SNS, Pisa* **NQSTI technological platforms and their system integration**
PS.IV.1 **GE.IV.1**	Gaia Raffaella GRECO, *ICAR-CNR, Napoli* **NQSTI programs for industrial research and innovation**

17:20 - 18:30

SCIENTIFIC PLENARY SESSION

Chair: Beatrice VALLONE, *Sapienza University of Rome*

PS.V.1	Alexandre CECCALDI, *Secretariat of European Technologh Platform for Nanomedicine (ETPN)* **Nanomedicine: unleashing the true potential of nanotechnologies for patients**
PS.V.2	Antonio GIORDANO, *President of Sbarro Health Research Organization | Thomas Jefferson University, Philadelphia* **Genes, environment, cancer**

Announcement NEST PRIZE
Pasqualantonio PINGUE, *Scuola Normale Superiore*

social break

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TT.I Symposia list

09:00 - 10:30

TT.I.A **WS.IX.1**	**Nanoethics: Navigating Ethical Challenges in the New Research and Innovation Age - Part I** *Co-organized with FBK, Trento* Chair: Massimo BERSANI, *FBK, Trento* *The symposium is part of the Workshop WS.IX*
TT.I.B **WS.II.1**	**Towards Sustainable Mobility: Unlocking Future Solutions - Part I** *Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM* Chair: Stefano BIANCO, *Polytechnic University of Turin* *The symposium is part of the Workshop WS.II*
TT.I.C	**Thermal energy storage - Part I: High-temperature processes** *Co-organized with ENEA* Chair: Raffaele LIBERATORE, *ENEA*
TT.I.D	**NanoInnovation in UNMET clinical needs - Part I** *Co-organized with Don Gnocchi Foundation, University of Modena and Reggio Emilia* Chair: Alexandre CECCALDI, *Secretariat of European Technologh Platform for Nanomedicine (ETPN)*
TT.I.E **WS.I.1**	**Computational methods in the presence of nanoscopic structures and phenomena** *Co-organized with Sapienza University of Rome* Chair: Patrizia TROVALUSCI, *Sapienza University of Rome* *The symposium is part of the Workshop WS.I*
TT.I.F **SE.I.1**	**Exploring the Future: Advances in 3D Bioprinting for Tissue Engineering and Regenerative Medicine** *Co-organized with University Magna Graecia of Catanzaro and Sapienza University* Chair: Michele CONTI, *University of Pavia* *The symposium is part of the Special Event **YoungInnovation** (SE.I)*

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11:30 - 13:00

TT.II Symposia list

TT.II.A WS.IX.2	**Nanoethics: Navigating Ethical Challenges in the New Research and Innovation Age - Part II** *Co-organized with FBK* Chair: Richard HALL WILTON, *FBK* *The symposium is part of the Workshop WS.IX*
TT.II.B WS.II.2	**Emerging technologies for clean energy production and distribution** *Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM* Chair: Marco FONTANA, *Polytechnic University of Turin* *The symposium is part of the Workshop WS.II*
TT.II.C	**Thermal Energy Storage - Part II: Low and Medium temperature processes** *Co-organized with ENEA* Chair: Raffaele LIBERATORE, *ENEA*
TT.II.D	**NanoInnovation in UNMET clinical needs - Part II** *Co-organized with Don Gnocchi Foundation, University of Modena and Reggio Emilia* Chairs: Marzia BEDONI, *Don Gnocchi Foundation* & Giovanni TOSI, *University of Modena and Reggio Emilia*
TT.II.E SE.II.1	***Session Flagship Project FP1:* Decarbonization and digitalization in research on new green energy sources** Chair: Juan Andres BUONADONNA, *ENI S.p.A. (to be confirmed)* *The symposium is part of the Special Event **Rome Technopole** (SE.II)*
TT.II.F SE.I.2	**Bioengineering for biomedical applications of microfluidics** *Co-organized with University Magna Graecia of Catanzaro and Sapienza University* Chair: Francesco PASQUALINI, *University of Pavia* *The symposium is part of the Special Event **YoungInnovation** (SE.I)*
TT.II.G WS.I.2	**The use of nonclassical/non-local continuua for describing heterogeneous media from nano to macro scales** *Co-organized with Sapienza University of Rome* Chair: Reuven SEGEV, *Ben-Gurion University of the Negev, Israel* *The symposium is part of the Workshop WS.I*

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TT.III Symposia list

14:00 - 15:30

TT.III.A	**Prevention-through-design in the industrial scale up of nanomaterials and advanced materials: the "NanoKey Advanced" framework** *Co-organized with INAIL* Chairs: Fabio BOCCUNI, *INAIL* Stefania SABELLA, *IIT*
TT.III.B **WS.II.3**	**Smart and sustainable materials for circular and augmented industrial products and processes** *Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM* Chair: Giulia MASSAGLIA, *Polytechnic University of Turin* *The symposium is part of the Workshop WS.II*
TT.III.C	**Hybrid energy storage systems - Part I: DEFINITIONS and KPIs** *Co-organized with ENEA, EERA-ES, UNIPd and CNR-ITAE* Chair: Margherita MORENO, *ENEA*
TT.III.D	**NanoInnovation in UNMET clinical needs - Part III** *Co-organized with Don Gnocchi Foundation, University of Modena and Reggio Emilia* Chairs: Marzia BEDONI, *Don Gnocchi Foundation* & Giovanni TOSI, *University of Modena and Reggio Emilia*
TT.III.E	**Nanomaterials and nanotechnologies for medical applications Part I** *Co-organized with The Mediterranean University of Reggio Calabria, University Magna Graecia of Catanzaro* Chairs: Giuliana FAGGIO & Giacomo MESSINA, *The Mediterranean University of Reggio Calabria* - Donatella PAOLINO, *University Magna Graecia of Catanzaro*
TT.III.F **SE.I.3**	**Regenerative medicine: current applications, challenges and future directions** *Co-organized with University Magna Graecia of Catanzaro and Sapienza University* Chair: Francesca MEGIORNI, *Sapienza University of Rome* *The symposium is part of the Special Event* ***YoungInnovation*** *(SE.I)*
TT.III.G **WS.I.3**	**Discrete to continuum modelling of heterogenous materials and continuous media** *Co-organized with Sapienza University of Rome* Chair: Mahmood JABAREEN, *Technion - Israel of Technology, Haifa, Israel* *The symposium is part of the Workshop WS.I*
TT.III.H **SE.II.2**	***Session Flagship Project FP2:*** **Energy transition and digital transition in urban regeneration and construction** Chairs: To be defined by COIMA Rem s.r.l., To be defined from Universities and EPR *The symposium is part of the Special Event* ***Rome Technopole*** *(SE.II)*

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16:00 - 17:30

TT.IV Symposia list

TT.IV.A SE.II.3	***Session Flagship Project FP3:* Digital transition in the decarbonization process and in waste recycling processes** Chairs: Ezio PASQUALON, *Maire Tecnimont S.p.a.*, Antonio CARCATERRA, *University of Rome La Sapienza* *The symposium is part of the Special Event* ***Rome Technopole*** *(SE.II)*
TT.IV.B WS.II.4	**The role of Research and Technological Innovation Infrastructures in boosting Italian competitiveness** *Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM* Chair: Marzia QUAGLIO, *Italian Institute of Technology* *The symposium is part of the Workshop WS.II*
TT.IV.C	**Hybrid energy storage systems - Part II: USE CASE** *Co-organized with ENEA* Chair: Salvatore VASTA, *CNR-ITAE*
TT.IV.D	**Advances in additive manufacturing of metals and alloys** *Co-organized with Università Politecnica delle Marche, ENEA* Chaisr: Giuseppe BARBIERI, *ENEA* & Maria Chiara SPADARO, *Università Politecnica delle Marche*
TT.IV.E	**Nanomaterials and nanotechnologies for medical applications Part II** *Co-organized with The Mediterranean University of Reggio Calabria, University Magna Graecia of Catanzaro* Chairs: Giuliana FAGGIO & Giacomo MESSINA, *The Mediterranean University of Reggio Calabria* - Donatella PAOLINO, *University Magna Graecia of Catanzaro*
TT.IV.F SE.I.4	**Cell Models In Personalized Medicine** *Co-organized with University Magna Graecia of Catanzaro and Sapienza University of Rome* Chair: Christian CELIA, *University 'Gabriele d'Annunzio' of Chieti* *The symposium is part of the Special Event* ***YoungInnovation*** *(SE.I)*
TT.IV.G WS.I.4	**Multiphisics modelling for complex materials and structures** *Co-organized with Sapienza University of Rome* Chair: Raffaele BARRETTA, *University of Naples Federico II* *The symposium is part of the Workshop WS.I*

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TT.V Symposia list

09:00 - 10:30

TT.V.A	**The Italian Energy Materials Acceleration Platform (IEMAP): Automation and high throughput research - Part I** *Co-organized with ENEA* Chair: Massimo CELINO, *ENEA*
TT.V.B **WS.II.5**	**Towards Sustainable Mobility: Unlocking Future Solutions - Part II** *Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM* Chair: Stefano BIANCO, *Polytechnic University of Turin* *The symposium is part of the Workshop WS.II*
TT.V.C	**Scanning probe microscopy: a versatile tool to analyze different sample properties at nanoscale** *Co-organized with SAPIENZA e ISM-CNR, Roma* Chairs: Marco FORTUNATO, *Sapienza University of Rome* & Simone DINARELLI, *ISM-CNR*
TT.V.D	**State of art, results and scientific progression on materials in "GaN4AP", the European project for advanced power applications in smart mobility and energy consumption** *Co-organized with Distretto Sicilia Micro-nano Sistemi* Chair: Leoluca LIGGIO, *Distretto Sicilia Micro-nano Sistemi*
TT.V.E **JE.I.1**	**Single and comprehensive vesicle analysis: the new innovation in the extracellular vesicle research** *Co-organized with Sapienza University of Rome & EVita* Chairs: Luciana DINI & Annalisa RADEGHIERI, *Sapienza University of Rome* *The symposium is part of the Joint Event JE.I*
TT.V.F **SE.I.5**	**Catalyzing Tissue Engineering: Exploring the Microfluidic Frontier** *Co-organized with University Magna Graecia of Catanzaro & Sapienza University* Chairs: Carlo Massimo CASCIOLA, *Sapienza University of Rome* & Chiara SCOGNAMIGLIO, *IIT, Rome* *The symposium is part of the Special Event **YoungInnovation** (SE.I)*

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11:30 - 13:00

TT.VI Symposia list

TT.VI.A	**The Italian Energy Materials Acceleration Platform (IEMAP): Automation and high throughput research - Part II** *Co-organized with ENEA* Chair: Francesco BUONOCORE, *ENEA*
TT.VI.B **WS.II.6**	**The role of HPC in the discovery of new materials and processes for a sustainable society - Part I** *Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM* Chair: Francesca RISPLENDI, *Polytechnic University of Turin* *The symposium is part of the Workshop WS.II*
TT.VI.C	**The principle of the 3Rs in nanomedicine and drug delivery studies** *Co-organized with ISS, FARVA* Chairs: Giuseppina BOZZUTO & Agnese MOLINARI, *ISS*
TT.VI.D **WS.IV.1**	**IPCEI: the key role of Italy in the microelectronics, digital, health and energy large- scale EU industrial research projects** *Co-organized with AIRI, STM, Menarini, Iveco, FBK* Chair: Andrea PORCARI, *AIRI* *The symposium is part of the Workshop WS.IV*
TT.VI.E **WS.III.1**	**Nano-Enabled Agriculture: Agro-ecosystems Sustainable Management** *Co-organized with University of Tuscia and University of Parma* Chair: Marta MARMIROLI, *University of Parma* *The symposium is part of the Workshop WS.III*
TT.VI.F **SE.I.6**	**Precision Medicine: Unraveling New Frontiers with Advanced Models** *Co-organized with University Magna Graecia of Catanzaro and Sapienza University* Chair: Lia RIMONDINI, *Piemonte University Orient* *The symposium is part of the Special Event **YoungInnovation** (SE.I)*
TT.VI.G **JE.I.2**	**Application of innovative technologies to the study of extracellular vesicles** *Co-organized with Sapienza University of Rome and EVita* Chairs: Luciana DINI & Annalisa RADEGHIERI, *Sapienza University of Rome* *The symposium is part of the Joint Event JE.I*
TT.VI.H **SE.II.4**	**Session Flagship Project FP5: Digital transition through AESA (Active Electronically Scanned Array) radar technology, quantum cryptography and quantum communications** Chair: To be defined by Leonardo Spa, To be defined by Universities and EPR *The symposium is part of the Special Event **Rome Technopole** (SE.II)*

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TT.VII Symposia list

14:00 - 15:30

TT.VII.A	**Innovative Nanotechnological Approaches for Regenerative Medicine** *Co-organized with Distretto Sicilia Micro-nano Sistemi, University of Messina, CNR-IPCB & CNR-ISMN* Chairs: Sabrina CONOCI, *University of Messina* - Luigi AMBROSIO, *CNR-IPCB* & Alek DEDIU, *CNR-ISMN*
TT.VII.B WS.II.7	**The importance of recycling, recovery, and reuse of materials in the energy transition** *Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM, University of Genova* Chair: Marzia QUAGLIO, *Polytechnic University of Turin* *The symposium is part of the Workshop WS.II*
TT.VII.C	**Micro- and nanofluidic systems in cancer research** *Co-organized with ISS - OMM, National Research Council, University of Salento, University Polyclinic Foundation "A. Gemelli" IRCCS, React4Life* Chair: Fabrizio MATTEI, *ISS*
TT.VII.D WS.IV.2	**Managing digital assets in research and innovation: applications and impacts of Web 3.0 and blockchain techs** *Co-organized with AIRI, Fondazione Piemonte Innova & EU TechEthos project* Chairs: Laura MORGAGNI, *Fondazione Piemonte Innova* & Andrea PORCARI, *AIRI and TechEthos project* *The symposium is part of the Workshop WS.IV*
TT.VII.E WS.III.2	**Nano-Enabled Agriculture: Perspectives in Crop Protection** *Co-organized with University of Tuscia & University of Parma* Chair: Sara FRANCESCONI, *University of Tuscia* *The symposium is part of the Workshop WS.III*
TT.VII.F SE.I.7	**Revolutionizing Cancer Treatment: The Power of CAR-T Therapy** *Co-organized with University Magna Graecia of Catanzaro and Sapienza University* Chair: Maria Chiara CRISTIANO, *University Magna Graecia of Catanzaro* *The symposium is part of the Special Event **YoungInnovation** (SE.I)*
TT.VII.G	**Enable Technologies for Leading-edge Space Applications** *Co-organized with Thales Alenia Space* Chair: Mirko ROCCI, *Thales Alenia Space*
TT.VII.H	**The Italian Energy Materials Acceleration Platform (IEMAP): Automation and high throughput research - Part III** *Co-organized with ENEA* Chair: Maria Lucia PROTOPAPA, *ENEA*
TT.VII.I SE.II.5	***Session Flagship Project FP6:* Artificial intelligence, virtual reality and digital twin for advanced engineering and aerospace** Chairs: To be defined by Thales Alenia Space, To be defined by Universities and EPR *The symposium is part of the Special Event **Rome Technopole** (SE.II)*

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16:00 - 17:30

TT.VIII Symposia list

TT.VIII.A	**Innovative LabonChip Technologies for Medical Assessment** *Co-organized with Distretto Sicilia Micro-nano Sistemi, University of Messina, ASI, FBK, URT LabSENSE CNR* Chairs: Sabrina CONOCI, *University of Messina* - Costantino DEL GAUDIO, *ASI* - Leandro LORENZELLI, *FBK* & Alessia IRRERA, *URT LabSENSE CNR*
TT.VIII.B WS.II.8	**The role of HPC in the discovery of new materials and processes for a sustainable society - Part II** *Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM* Chair: Francesca RISPLENDI, *Polytechnic University of Turin* *The symposium is part of the Workshop WS.II*
TT.VIII.C	**Organ on chip and digital twin technologies for advanced healthcare** *Co-organized with Polytechnic University of Turin & CNR* Chairs: Simone MARASSO, *CNR* - Francesca FRASCELLA & Lucia NAPIONE, *Polytechnic University of Turin*
TT.VIII.D WS.IV.3	**Advanced materials and technologies for sustainable construction** *Co-organized with AIRI, EU SocKETs project* Chair: Andrea PORCARI, *AIRI and SocKETs project* *The symposium is part of the Workshop WS.IV*
TT.VIII.E WS.III.3	**Nanotechnology opportunities in the food sector: from ingredient functionalization and product stabilization to packaging design** *Co-organized with University of Tuscia & University of Udine* Chairs: Sofia MELCHIOR & Stella PLAZZOTTA, *University of Udine* *The symposium is part of the Workshop WS.III*
TT.VIII.F SE.I.8	**Unveiling the Potential of Advanced Nanostructured Materials in Biomedicine** *Co-organized with University Magna Graecia of Catanzaro & Sapienza University* Chairs: Luciano GALANTINI & Iolanda FRANCOLINI, *Sapienza University of Rome* *The symposium is part of the Special Event **YoungInnovation** (SE.I)*
TT.VIII.G	**Smart Multi-Energy Systems and Microgrids for Enabling the energy transition** *Co-organized with ENEA* Chairs: Martina CALIANO (remote) & Maria VALENTI, *ENEA*
TT.VIII.H SE.II.6	**Session Flagship Project: FP8** **Human-centric AI to deliver empowered customer experiences** *Co-organized with to be defined* Chairs: To be defined by Lead Industries, To be defined by Universities and EPR *The symposium is part of the Special Event **Rome Technopole** (SE.II)*

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TT.IX Symposia list

09:00 - 10:30

TT.IX.A WS.V.1	**Challenges in Health and biomedicine** *Co-organized with CNR - IIA* Chairs: Antonella MACAGNANO & Fabrizio DE CESARE, *CNR - IIA* *The symposium is part of the Workshop WS.V*
TT.IX.B	**Advancements in Nanotechnology and materials for bio-applications** *Co-organized with Sapienza University of Rome* Chairs: Giuseppina SANDRI, *University of Pavia* and Carlotta Marianecci, *Sapienza University of Rome*
TT.IX.C WS.VI.1	**Learnings on SSbD in industrial processes: comparing case studies from five EU projects on Safe and Sustainable by Design** *Co-organized with AIRI, ASINA Project, REPOXYBLE, SbD4Nano, Sabydoma & SAbyNA* Chair: *Lisa BREGOLI, Warrant Hub* *The symposium is part of the Workshop WS.VI*
TT.IX.D	**Stories of successful integration of spectrometry technologies and research in advanced and engineered materials** *Co-organized with ISS - FAST* Chairs: Marco CRESCENZI & Giorgia STENDARDO, *ISS*
TT.IX.E	**Aspetti della proprietà intellettuale: dalla tutela alla condivisione della conoscenza** *Co-organized with PRAXI, Sapienza University of Rome* Chair: Leonardo MATTIELLO, *Sapienza University of Rome*
TT.IX.F SE.I.9	**Artificial intelligence and Machine learning in digital health** *Co-organized with University Magna Graecia of Catanzaro and Sapienza University* Chair: Laura BONZANO, *University of Genova* *The symposium is part of the Special Event **YoungInnovation** (SE.I)*
TT.IX.G WS.VII.1	**The electrochemical approach for innovation in energetics and industrial processing through the control of active materials at the nm level** *Co-organized with ENEA and Sapienza University of Rome* Chair: Danilo DINI, *Sapienza University of Rome* *The symposium is part of the Workshop WS.VII*
TT.IX.H WS.VIII.1	**Hydrogen Valley and other Projects on Hydrogen Utilization in Italy - Part I** *Co-organized with ENEA and RINA-CSM* Chair: Paola GISLON, *ENEA* *The symposium is part of the Workshop WS.VIII*

For the latest updates, please check the QRcode on the side

11:30 - 13:00

TT.X Symposia list

TT.X.A WS.V.2	**Challenges in Environment & Energy** *Co-organized with CNR - IIA* Chairs: Antonella MACAGNANO & Fabrizio DE CESARE, *CNR - IIA* *The symposium is part of the Workshop WS.V*
TT.X.B WS.VIII.2	**Hydrogen Valley and other Projects on Hydrogen Utilization in Italy - Part II** *Co-organized with ENEA, RINA-CSM* Chair: Paola GISLON, *ENEA and (to be defined), RINA-CSM* *The symposium is part of the Workshop WS.VIII*
TT.X.C WS.VI.2	**ASINA project exploitation workshop: SSbD industrial application in cosmetics, textile and other sectors** *Co-organized with AIRI, ASINA Project, REPOXYBLE, SbD4Nano, Sabydoma & SAbyNA* Chair: Anna Luisa COSTA, *National Research Council and ASINA project Coordinator* *The symposium is part of the Workshop WS.VI*
TT.X.D	**Metrology and Nanomaterials for Energy** *Co-organized with INRIM, Fraunhofer-Gesellschaft* Chairs: Luca BOARINO & Natascia DE LEO, *INRIM*
TT.X.E WS.VII.2	**Electrochemical energy storage: Innovative systems and advanced materials - Part I** *Co-organized with ENEA, RSE and CNR-ITAE* Chair: Omar PEREGO, *ENEA* *The symposium is part of the Workshop WS.VII*
TT.X.F SE.I.10	**Nanotechnologies for precision medicine** *Co-organized with University Magna Graecia of Catanzaro and Sapienza University of Rome* Chair: Emanuela Fabiola CRAPARO, *University of Palermo* *The symposium is part of the Special Event **YoungInnovation** (SE.I)*

For the latest updates, please check the QRcode on the side

TT.XI Symposia list

14:00 - 15:30

TT.XI.A SE.I.11	**Tumor microenvironment on the move: progress and challenges** *Co-organized with University Magna Graecia of Catanzaro and Sapienza University of Rome* Chair: Marilena LANZINO, *University of Calabria* *The symposium is part of the Special Event **YoungInnovation** (SE.I)*
TT.XI.B WS.V.3	**Challenges for sustainable life** *Co-organized with CNR - IIA* Chairs: Antonella MACAGNANO & Fabrizio DE CESARE, *CNR - IIA* *The symposium is part of the Workshop WS.V*
TT.XI.C WS.VII.3	**Electrochemical energy storage: innovative materials and systems - Part II (advanced materials)** *Co-organized with ENEA* Chair: Margherita MORENO, *ENEA* *The symposium is part of the Workshop WS.VII*
TT.XI.D WS.VIII.3	**Basic research in the hydrogen value chain** *Co-organized with ENEA* Chair: Paola GISLON, *ENEA* *The symposium is part of the Workshop WS.VIII*
TT.XI.E SE.II.7	**Session Flagship Project FP4: Development, innovation and certification of medical and non-medical devices for health** Chairs: Mauro CISLAGHI, *BV Tech* & Livia OTTOLENGHI, *University of Rome La Sapienza* *The symposium is part of the Special Event **Rome Technopole** (SE.II)*

For the latest updates, please check the QRcode on the side

16:00 - 17:30

TT.XII Symposia list

TT.XII.A WS.VIII.4	**Modellization of processes in the hydrogen value chain** *Co-organized with ENEA* Chair: Paola GISLON, ENEA *The symposium is part of the Workshop WS.VIII*
TT.XII.B WS.VII.4	**Electrochemical energy storage: innovative materials and systems - Part III (Systems)** *Co-organized with ENEA* Chair: Alessandra DI BLASI, *ENEA* *The symposium is part of the Workshop WS.VII*
TT.XII.C	**Advancements in nanomaterials synthesis and nano characterization for Electronic Applications** *Co-organized with Sapienza University of Rome* *Chair: Paolo POSTORINO, University of Rome*
TT.XII.D SE.II.8	**Session Flagship Project FP7: Advanced and automated innovation labs for diagnostic and therapeutic biopharma solutions** Chairs: To be defined by Lead Industries, To be defined by Universities and EPR *The symposium is part of the Special Event **Rome Technopole** (SE.II)*

I.A Nanoethics: Navigating Ethical Challenges in the New Research and Innovation Age - Part I

Co-organized with FBK, Trento
Chair: Massimo BERSANI, *FBK, Trento*

The symposium is part of the Workshop WS.IX

I.A.1 Massimo LEONE, *FBK, Trento*
The God of Small Devices

I.A.2 Livia DI BERNARDINI, *APRE*
The responsible development of emerging technologies in Europe: the FORGING experience

I.A.3 Sara HEJAZI, *Center for Religious Studies (ISR), Bruno Kessler Foundation*
In the beggining was the word. Narratives, words and silences implied in the relationship between humans and nanotechnologies

I.B Towards Sustainable Mobility: Unlocking Future Solutions - Part I

Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM
Chair: Stefano BIANCO, *Polytechnic University of Turin*

The symposium is part of the Workshop WS.II

I.B.1 Giuseppe SCELLATO, *Polytechnic University of Turin*
Public policies to support the development of innovation ecosystems: evidence from the PNRR NODES project

I.B.2 Paola RIZZI, *University of Turin*
Materials for hydrogen handling

I.B.3 Gabriele RICCHIARDI, *University of Turin*
Materials for sustainable vehicles, beyond the powertrain

I.B.4 Enrica FONTANANOVA, *CNR-ITM*
Development of proton exchange membranes using green solvents

I.C Thermal energy storage - Part I: High-temperature processes

Co-organized with ENEA
Chair: Raffaele LIBERATORE, *ENEA*

I.C.1 Raffaele LIBERATORE, *ENEA*
Introduction on PTR22_24 Project 1.2 concerning Thermal Energy Storage

I.C.2 Maria Anna MURMURA, *Sapienza University of Rome*
Methods and challenges of multiscale modelling of thermochemical energy storage systems

I.C.3 Anna Chiara TIZZONI, *ENEA*
Study and characterization of promising HT thermal energy storage materials

I.C.4 Annarita SPADONI, *ENEA*
CaO-Mayenite/$CaCO_3$ high temperature (600-900°C) thermochemical storage system

I.D NanoInnovation in UNMET clinical needs - Part I

Co-organized with Don Gnocchi Foundation, Univ. of Modena and Reggio Emilia
Chair: Alexandre CECCALDI, *Secretariat of European Technologh Platform for Nanomedicine (ETPN)*

I.D.1 Lorena DIÉGUEZ, *INL & CEO at RUBYnanomed*
Using nanodiagnostics to evaluate circulating biomarkers

I.D.2 Laurent LÉVY, *CEO at Nanobiotix*
European Technology Platform for Nanomedicine

I.D.3 Mareike WERLE, *William Harvey Research Institute/Queen Mary University London*
Polymer nanoparticles as a targeted drug delivery system for the treatment of rheumatoid arthritis

I.D.4 Ilaria OTTONELLI, *University of Modena and Reggio Emilia*
Nanomedicine evolution and perspective

I.D.5 Francesca RE, *University of Milano Bicocca*
Glioblastoma Tunneling Nanotubes as potential targets for nanomedicine: an in vitro investigation on advanced cellular model

I.E Computational methods in the presence of nanoscopic structures and phenomena

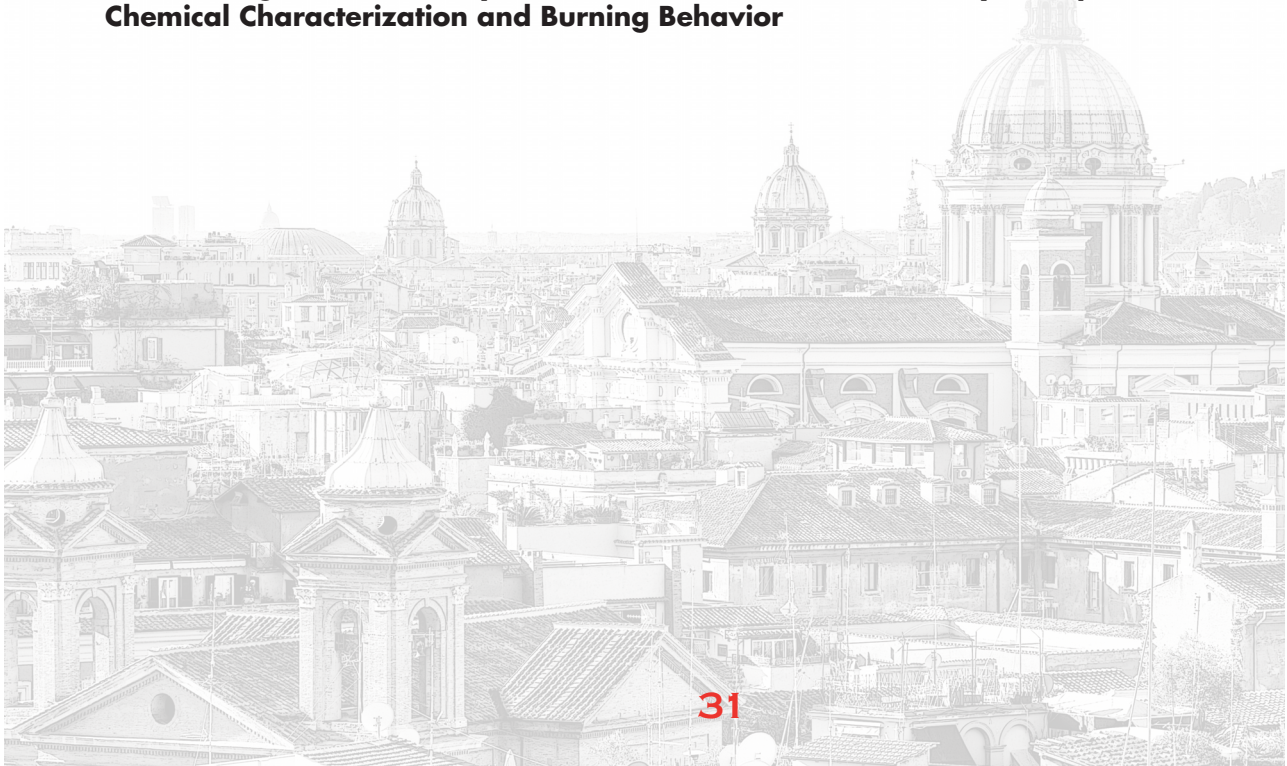
Co-organized with Sapienza University of Rome
Chair: Patrizia TROVALUSCI, *Sapienza University of Rome*
The symposium is part of the Workshop WS.I

I.E.1 George STEFANOU, *University of Thessaloniki, Greece*
A stochastic multiscale framework for modeling graphene nanoplatelets

I.E.2 Mahmood JABAREEN, *Technion - Israel of Technology, Israel*
Computational homogenization of nearly incompressible composites

I.E.3 Aram CORNAGGIA, *University of Bergamo*
Computational elastoplastic structural analysis of carbon nanotubes

I.E.4 Milkan GAFF, *Mendel University in Brno, Czech Republic*
Enhancing Fire Resistance Properties of Thermally Modified Robinia Pseudoacacia Wood Using Natural and Synthetic Fire-Retardants, modified by nanoparticels: Chemical Characterization and Burning Behavior



I.F Exploring the Future: Advances in 3D Bioprinting for Tissue Engineering and Regenerative Medicine

Co-organized with University Magna Graecia of Catanzaro and Sapienza University of Rome
Chair: Michele CONTI, *University of Pavia*

The symposium is part of the Special Event SE.I

I.F.1 **Introductive Keynote**
Carmine GENTILE, *University of Technology, Sydney, Australia*
Bioengineering the human cardiac microenvironment uing patient-derived cardiac spheroid and 3D bioprinting technologies

I.F.2 Giuseppe Francesco RACANIELLO, *University 'Aldo Moro' of Bari*
Production of solide dosage forms via Direct Powder Extrusion 3D Printing

I.F.3 Pier Francesco GAZIANO, *University of Tor Vergata, Rome*
Cells in bioprinted hydrogel structures: insights from models and simulations

I.F.4 Elena DELGROSSO, *Univeristy of Pavia*
3D Bioprinting to Develop Neoplastic Biological Constructs for Experimental Boron Neutron Capture Therapy (BNCT) Applications

I.F.4 Michele MARINO, *University of Tor Vergata, Rome*
Cellular stress response in tissues: the good, the bad and the ugly

II.A Nanoethics: Navigating Ethical Challenges in the New Research and Innovation Age - Part II

Co-organized with FBK, Trento
Chair: Richard HALL WILTON, *FBK*

The symposium is part of the Workshop WS.IX

II.A.1 Massimo BERSANI, *FBK*
Ethics and Innovation

II.A.2 Diego COGLITORE, *APRE*
Horizon Europe for Responsible Artificial Intelligence: Ethical Guidelines

II.A.3 Martin GASTAL, CERN, *Geneva, Switzerland*
Science: towards inclusion and equality: involving and engaging developing countries *(to be confirmed)*

II.B Emerging technologies for clean energy production and distribution

Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM
Chair: Marco FONTANA, *Polytechnic University of Turin*

The symposium is part of the Workshop WS.II

II.B.1 Renzo VALENTINI, *University of Pisa*
Title in definition

II.B.2 Andrea LAMBERTI, *Polytechnic University of Turin*
Sustainable electrochemical energy harvesting and storage devices: development and integration

II.B.3 Walter GAGGIOLI, *ENEA*
CST/CSP hybridization with other renewable energies

II.B.4 Antonio POLITANO, *University of L'Aquila*
Quantum Materials and Thermoplasmonics: Revolutionizing Solar Desalination, Mineral Extraction, and Blue Energy Harvesting

II.C Thermal Energy Storage - Part II: Low and Medium temperature processes

Co-organized with ENEA
Chair: Raffaele LIBERATORE, *ENEA*

II.C.1 Marco PANTALEO, *University of Bari*
The potentials of thermal storage for energy systems flexibility

II.C.2 Franco DOMINICI, *University of Perugia*
New nanofluids and nano-enhanced phase change materials for concentrated solar energy applications

II.C.3 Daniele NICOLINI, *ENEA*
Study of the discharge phase of a hybridized thermocline thermal energy storage system with a nano-enhanced phase change material

II.C.4 Enrico PATRUCCO, *RSE*
Thermochemical Energy Storage process based on zeolite 13X

II.C.4 Gabriele SQUARZONI, *RSE*
Pre-feasibility analysis of a LT-ATES system using numerical simulations

II.D NanoInnovation in UNMET clinical needs - Part II

Co-organized with Don Gnocchi Foundation, Univ. of Modena and Reggio Emilia
Chairs: Marzia BEDONI, *Don Gnocchi Foundation* & Giovanni TOSI, *University of Modena and Reggio Emilia*

II.D.1 Silvia PESCINA, *University of Parma*
Cultivating Innovation: The Impact of the Controlled Release Society Italian Chapter

II.D.2 Paolo CALICETI, *ADRITELF, University of Padova*
Pharmaceutical Technology and Innovation

II.D.3 Alice GUALERZI, *Don Gnocchi Foundation - LABION*
Biophotonics for the characterization of liposomes for Glioblastoma and Alzheimer'snDisease treatment

II.D.4 Jason DUSKEY, *University of Modena and Reggio Emilia*
Biotechnologicals and Nanomedicine

II.D.5 Marcello BERTO, *University of Modena and Reggio Emilia | Carlo Bortolotti Group*
Organic Electronics for health monitoring

II.D.6 Marco MONOPOLI, *Royal College of Surgeon, Dublin, Ireland*
Glyco nanoparticles forget applications in nanomedicine

II.E *Session Flagship Project FP1:* Decarbonization and digitalization in research on new green energy sources

Chair: Juan Andres BUONADONNA, *ENI S.p.A. (to be confirmed), to be defined from Universities and EPR*

The symposium is part of the Special event SE.II

II.E.0 Introduction by the Chairs

II.E.1 Franco RISPOLI, *Sapienza University of Rome*
Development of advanced models and experimental testing of innovative, renewable and sustainable energy technologies applied to different scenarios, from the mobility sector to the renewable energy communities

II.E.2 Ginevra SALERNO & Laura MICHELI, *Roma Tre University*
SWEET (Sustainable Water Energy Environmental Technologies)

II.E.3 Marco FORTUNATO, *Sapienza University of Rome*
Flexible Nanogenerators based on Piezoelectric PVDF-TrFE Nanocomposites Poled via DC Magnetic Field

II.E.3 In definition

II.F Bioengineering for biomedical applications of microfluidics

Co-organized with University Magna Graecia of Catanzaro and Sapienza University
Chair: Francesco PASQUALINI, *University of Pavia*

The symposium is part of the Special Event SE.I

II.F.1 **Introductive Keynote**
Federica CASELLI, *University 'Tor Vergata', Rome*
Advanced microfluidic strategies for cytometry

II.F.2 Gianluca CIDONIO, Center for Life Nano and Neuro Science, IIT Rome
Novel aqueous two phase solutions for 3D microfluidic bioprinting applications

II.F.3 Marco BELLOTTI, *University of Pavia*
Use of numerical simulations to better understand the formation process of Nanoparticles

II.F.4 Chiara SCOGNAMIGLIO, *Center for Life Nano and Neuro Science, IIT Rome*
Ovarian cancer immunotherapy on a chip: a 3d preclinical model to test novel mi-RNA based therapies

II.F.5 Francesco SERPE, *IIT*
Foaming fibres with 3D microfluidic bioprinting for the engineering of bone-relevant implants: Hierarchical fabrication of skeletal substitutes

II.G The use of nonclassical/non-local continuua for describing heterogeneous media from nano to macro scales

Co-organized with Sapienza University of Rome
Chair: Reuven SEGEV, *Ben-Gurion University of the Negev, Israel*

The symposium is part of the Workshop WS.I

II.G.1 Meral TUNA, *Sapienza University of Rome*
Size-Dependent Mechanical Behaviour of Carbon Nanotubes: Non-Classical Micropolar Continuum and Molecular Dynamics Simulations

II.G.2 Emanuele RECCIA, *University of Cagliari*
Cosserat-point approach for material with internal structure

II.G.3 Avraam KONSTANTINIDIS (on line), *Aristotle University of Thessaloniki, Greece*
On combined gradient – stochastic models

II.G.4 Abdol Majid REZAEL, *Sapienza University of Rome*
Molecular dynamics simulation and multiscale micropolar modelling for 3D printed biodegradable polymers

II.G.5 Ugo GALVANETTO (online), *University of Padova*
New trends in applied computational peridynamics

III.A Prevention-through-design in the industrial scale up of nanomaterials and advanced materials: the "NanoKey Advanced" framework

Co-organized with INAIL
Chairs: Chairs: Fabio BOCCUNI, *INAIL* Stefania SABELLA, *IIT*

III.A.1 Stefania SABELLA, *IIT*
The Nanokey Advanced research project: a novel tiered testing strategy for hazard assessment

III.A.2 Francesco BONACCORSO & Antonio Esau DEL RIO CASTILLO, *BeDimensional*
Graphene and boron nitride manufacturing processes at BeDimensional

III.A.3 Fabio BOCCUNI, *INAIL*
The workplace exposure characterization for the prevention-through-design of nano and advanced materials

III.A.4 Cinzia Lucia URSINI, *INAIL*
The bio-monitoring of exposed workers

III.A.5 Tomi KANERVA, *FIOH*
The experience of FIOH and Graphene Flagship on the occupational exposure to graphene-based nanomaterials

III.B Smart and sustainable materials for circular and augmented industrial products and processes

Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM
Chair: Giulia MASSAGLIA, *Polytechnic University of Turin*

The symposium is part of the Workshop WS.II

III.B.1 Domenico CAPUTO, *University of Naples "Federico II"*
Innovative materials and disruptive technologies for the future challenges of the Made in Italy

III.B.2 Claudia FLORIO, *Stazione Sperimentale dell'Industria delle Pelli e delle materie concianti*
SOLARIS - Sustainable Options for Leather Advances and Recycling Innovative Solutions

III.B.3 Maria Cristina LAVAGNOLO, *University of Padova*
Closing the loop of new circular materials: the Waste End project

III.B.4 Antonio LANZOTTI, *University of Naples "Federico II"*
Bioinspired Design of green soft robots

III.B.5 Roberta BONGIOVANNI, *Polytechnic University of Turin*
Photopolymers and photoinduced processes: their innovation through ESPERANTO European Doctoral network

III.C Hybrid energy storage systems - Part I: DEFINITIONS and KPIs

Co-organized with ENEA, EERA-ES, UNIPd and CNR-ITAE
Chair: Margherita MORENO, ENEA

III.C.1 Roberto SCIPIONI, *SINTEF*
Presenting StoRIES Hybrid Energy Storage Roadmap

III.C.2 Speaker to be confirmed
Techno-economic evaluation of hybrid systems: goals and challenges

III.C.3 Matthias VETTER, *FRAUNHOFER*
Stationary energy storage: grid needs and different applications

III.C.4 to be defined

III.D NanoInnovation in UNMET clinical needs - Part III

Co-organized with Don Gnocchi Foundation, Univ. of Modena and Reggio Emilia
Chairs: Marzia BEDONI, *Don Gnocchi Foundation* & Giovanni TOSI, *University of Modena and Reggio Emilia*

III.D.1 Gianfranco PASUT, *University of Padua*
Anti-HER2 Super Stealth Immunoliposomes for Targeted-Chemotherapy

III.D.2 Luca MUZIO, *IRCCS San Raffaele Hospital, Milan*
REcTOs proteins: new tools for the treatment of chronic inflammation

III.D.3 In definition

III.E Nanomaterials and nanotechnologies for medical applications Part I

Co-organized with The Mediterranean University of Reggio Calabria and University Magna Graecia of Catanzaro
Chairs: Giuliana FAGGIO & Giacomo MESSINA, *The Mediterranean University of Reggio Calabria* - Donatella PAOLINO, *University Magna Graecia of Catanzaro*

III.E.1 Luciano DE SIO, *Sapienza University of Rome*
Radiolabeled and biomimetic gold nanoparticles for photo-thermal therapy applications

III.E.2 Maria Penelope DE SANTO, *The Mediterranean University of Reggio Calabria*
Chirality amplification in spherically confined chromonics

III.E.3 Caterina Maria TONE, *The Mediterranean University of Reggio Calabria*
Correlative microscopy techniques for biomedical applications

III.E.4 Emanuela Fabiola CRAPARO, *University of Palermo*
Smart hybrid drug delivery systems for the treatment of lung diseases

III.F Regenerative medicine: current applications, challenges and future directions

Co-organized with University Magna Graecia of Catanzaro and Sapienza University
Chair: Francesca MEGIORNI, *Sapienza University of Rome*
The symposium is part of the Special Event SE.I

III.F.1 **Introductive Keynote**
Simona CECCARELLI
Advances in regenerative medicine: from tissue engineering and cell-based therapies to microfluidics technology

III.F.2 Daniela ROSSIN, *University of Turin*
Revolutionizing Cardiac Therapy: 3FEEP - A Nanofunctionalized Scaffold for Post-Myocardial Infarction Tissue Protection and Regeneration

III.F.3 Francesco PASQUALINI, *University of Pavia*
Instrumented human stem cells for drug discovery, disease modeling, and regenerative medicine

III.F.4 Paola PONTECORVI, *Sapienza University of Rome*
Tissue engineering in Mayer-Rokitansky-Küster-Hauser syndrome: state of the art and future perspectives

III.F.5 Domenica CONVERTINO, *Center for Nanotechnology Innovation, IIT, Pisa*
Interaction of graphene and WS2 with neutrophils and mesenchymal stem cells: implications for peripheral nerve regeneration

III.G Discrete to continuum modelling of heterogenous materials and continuous media

Co-organized with Sapienza University of Rome
Chair: Mahmood JABAREEN, Technion - Israel of Technology, Haifa, Israel
The symposium is part of the Workshop WS.I

III.G.1 Reuven SEGEV, *Ben-Gurion University of the Negev, Israel*
Material Defects: From Discrete Modelling to Continuous Distributions to Singular Distributions

III.G.2 Marco COLATOSTI, *Sapienza University of Rome*
On the mechanical behaviour of microstructured materials with different symmetry class modelled as discrete and continuous systems

III.G.3 Razie IZADI, *Sapienza University of Rome*
A Hierarchical Molecular Dynamics and Peridynamics Approach to study Fracture of Green Nano Fibrous Network

III.G.4 Greta ONGARO, *Sapienza University of Rome*
Multiscale procedure for modelling mechanical properties of epoxy-based nanocomposites. Comparison between different computational approaches and experimental results

III.H Session Flagship Project FP2: Energy transition and digital transition in urban regeneration and construction

Chairs: *To be defined by COIMA Rem s.r.l., To be defined from Universities and EPR*
The symposium is part of the Special event SE.II

III.H.0 Introduction by the Chairs

III.H.1 Alessandra BELLIONI, *Coima REM S.r.l.*
The digital and energy transition in the field of urban regeneration

III.H.2 Fabrizio TUCCI, *Università di Roma La Sapienza*
Energy Transition in the multiscale project

III.H.3 Federico CINQUEPALMI, *Università di Roma La Sapienza*
Digital transition and digital twin

III.H.4 Francesco MISSO, *BV Tech*
Sustainable mobility

SEPTEMBER 20 **16:00 - 17:30**

IV.A *Session Flagship Project FP3:* Digital transition in the decarbonization process and in waste recycling processes

Chairs: Ezio PASQUALON, Maire Tecnimont S.p.a., Antonio CARCATERRA, University of Rome La Sapienza

The symposium is part of the Special event SE.II

IV.A.0 Introduction by the Chairs

IV.A.1 Ezio PASQUALON & Antonio CARCATERRA, *Maire Tecnimont S.p.a. & University of Rome La Sapienza*
Digital transition in waste recycling processes:how to achieve Waste Menagement 4.0

IV.A.2 Giorgio VILARDI, *University of Rome La Sapienza*
Simulation of zero emission waste pyrolysis in recycling plant

IV.A.3 Antonio CULLA, *University of Rome La Sapienza*
Automated monitoring and inspections of waste recycling plant

IV.A.4 to be defined

IV.B The role of Research and Technological Innovation Infrastructures in boosting Italian competitiveness

Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM
Chair: Marzia QUAGLIO, *Italian Institute of Technology*

The symposium is part of the Workshop WS.II

IV.B.1 Angelica CHIODONI, *Italian Institute of Tecnology*
CoSyET: a PNRR-funded innovation infrastructure on materials and technologies for energy transition

IV.B.2 Vittorio MORANDI, *CNR-IMM*
iENTRANCE@ENL: a reserach infrastrucure on nanoscience and nanotechnology for energy transition and circular economy within the NextGenEU Program

IV.B.3 Michele MUCCINI, *CNR-ISMN*
i-Matt - an infrastructure to boost innovation leveraging on advanced materials and digitalization

IV.B.4 Carmela CORNACCHIA, *CNR-IMAA*
Enhance interdisciplinary Research and Innovation capacities on enviromental challenges: the ITINERIS HUB

IV.C Hybrid energy storage systems - Part II: USE CASES

Co-organized with ENEA
Chair: Salvatore VASTA, *CNR-ITAE*

IV.C.1 Vincenzo MULONE, *University of Tor Vergata*
Storing electrochemical and thermal energy: a case study for efficient use of renewables in domestic use

IV.C.2 Giovanna CAVAZZINI, *University of Padova*
Analysis of the battery and flywheel hybridization of reversible Pumped-storage Hydro Power Plant

IV.C.3 Andrea FRAZZICA, *CNR-ITAE*
Hybrid Energy Storage Solutions for Buildings: the HyBuild project

IV.C.4 Luca CIOCCOLANTI, *Uniecampus*
The outcomes of the Innova Microsolar project *(to be confirmed)*

IV.C.5 Alberto BENATO, *University of Padova*
Title to be defined

IV.D Advances in additive manufacturing of metals and alloys

Co-organized with Università Politecnica delle Marche, ENEA
Chairs: Giuseppe BARBIERI, *ENEA* & Maria Chiara SPADARO, *Università Politecnica delle Marche*

IV.D.1 Daniele MIRABILE GATTIA, *ENEA*
Alloy design for Additive Manufacturing for applications in the energy sector: a case study

IV.D.2 Monica MATTIOLI BELMONTE CIMA, *Università Politecnica delle Marche*
Metal additive manufacturing in the biomedical field: the cells point of view

IV.D.3 Eleonora SANTECCHIA, *Università Politecnica delle Marche*
Characterization of 17-4PH stainless steel processed by a solid-state additive manufacturing technology

IV.D.4 Sergio GALVAGNO, *ENEA*
Production of additive manufacturing powders by thermal plasma

IV.E Nanomaterials and nanotechnologies for medical applications Part II

Co-organized with The Mediterranean University of Reggio Calabria and University Magna Graecia of Catanzaro
Chairs: Giuliana FAGGIO & Giacomo MESSINA, *The Mediterranean University of Reggio Calabria* - Donatella PAOLINO, *University Magna Graecia of Catanzaro*

IV.E.1 Francesca PETRONELLA, *CNR-IC (Institute of Crystallography), Rome*
Plasmonic nanoparticles-based architectures for immunosensing and gene sensing

IV.E.2 Giuseppe PALADINI, *University of Catania*
Nanoinnovation and drug-delivery: chemico-physical issues

IV.E.3 Federica DE GAETANO, *University of Messina*
Nanoinnovation and Drug-delivery: technological and biological issues

IV.E.4 Agnese BONDI, *University of Ferrara*
Ethosomes and transethosomes: green nanotechnologies for phytocompounds transdermal delivery

IV.F Cell Models In Personalized Medicine

Co-organized with University Magna Graecia of Catanzaro and Sapienza University of Rome
Chair: Christian CELIA, *University 'Gabriele d'Annunzio' of Chieti*
The symposium is part of the Special Event SE.I

IV.F.1 **Introductive Keynote**
Bruno SARMENTO, *Universidade do Porto, Portugal*
Multicellular 3D vascularized cell models in translation of nanomedicines

IV.F.2 Edmondo BATTISTA, *University of Chieti*
Advanced Material Platform Based on PEG-Microgels

IV.F.3 Greta POMANTI, *Sapienza University of Rome*
REPorter system for RNA-based therapy detecting apoptosis and cellular stress inORGanoid models - REP-ORG systems

IV.F.4 Antonella ESPOSITO, *Sapienza University of Rome*
A phenotypic switch in sensitivity to ferroptosis is observed in cancer stem cells enriched 3D cultures vs 2D cultures of primary lung adenocarcinoma cells

IV.F.5 Simona CAMERO, Sapienza University of Rome
Personalized medicine in cancer treatment: preclinical evaluation of targeted therapies in innovative 3D tumor models

IV.G Multiphisics modelling for complex materials and structures

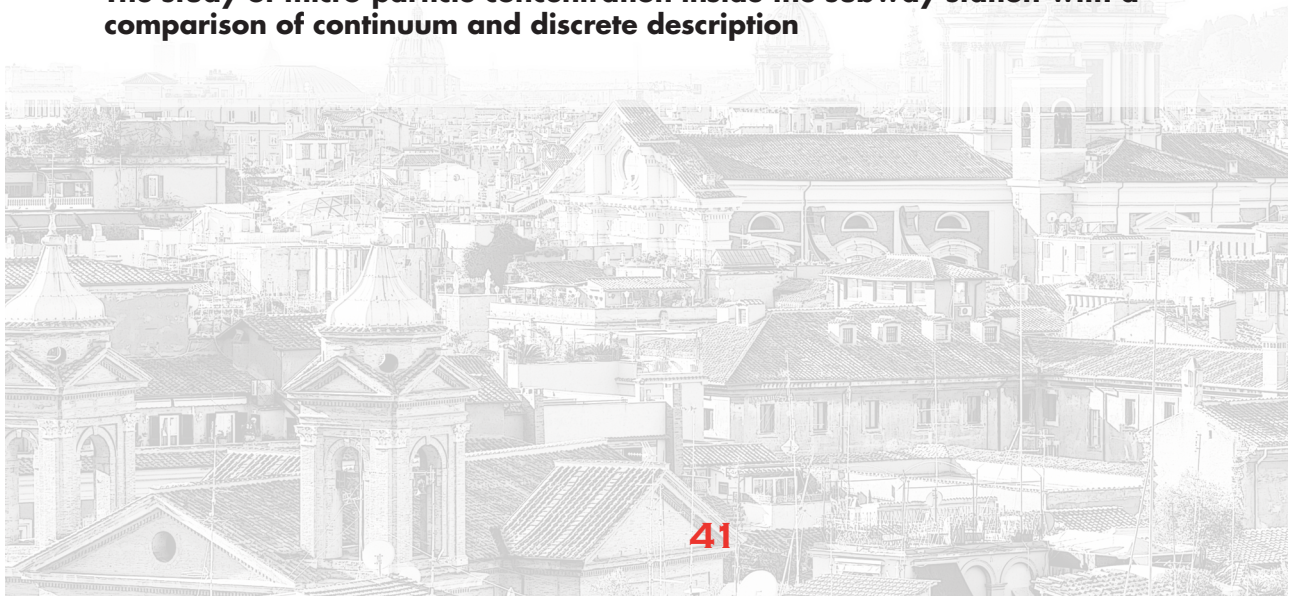
Co-organized with Sapienza University of Rome
Chair: Raffaele BARRETTA, *University of Naples Federico II*
The symposium is part of the Workshop WS.I

IV.G.1 Martin OSTOJA-STARZEWSKI, *University of Illinois at Urbana-Champaign, USA*
Violations of the dissipation inequality in molecular fluids and granular media

IV.G.2 Alessio RAPISARDA, *University Federico II of Naple*
Robotic swarm dynamics to describe the first and second gradient deformations in a continuum material using a kinematic formulation

IV.G.3 Iman MORADI, *Sapienza University of Rome*
The influence of tube layout on heat transfer and tortuosity, a Lattice Boltzmann Method simulation

IV.G.4 Tahereh IZADI, *Kermanshah University of Technology, IRAN*
The study of micro-particle concentration inside the subway station with a comparison of continuum and discrete description



V.A The Italian Energy Materials Acceleration Platform (IEMAP): Automation and high throughput research - Part I

Co-organized with ENEA
Chair: Massimo CELINO, *ENEA*

V.A.1 Massimo CELINO, *ENEA (TERIN)*
The Italian energy materials acceleration platform (IEMAP)

V.A.2 Francesco BUONOCORE, *ENEA (TERIN)*
High-Throughput Automatic Workflow for Atomistic Design of Layered Cathode Materials for Na-Ion Batteries

V.A.3 to be defined

V.A.4 Juliette ZITO, *Istituto Italiano di Tecnologia*
An Automated Tool for the Construction of Semiconductor Nanocrystals

V.A.5 Gabriele SALEH, *Istituto Italiano di Tecnologia*
Atomistic modelling of quantum dots: core-shell and bismuth chalcohalide nanocrystals

V.B Towards Sustainable Mobility: Unlocking Future Solutions - Part II

Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM
Chair: Stefano BIANCO, *Polytechnic University of Turin*

The symposium is part of the Workshop WS.II

V.B.1 Piercarlo MUSTARELLI, *University of Milano Bicocca*
Towards sustainable mobility: next generation lithium batteries, reuse, and recycle

V.B.2 Antunes STAFFOLANI, *University of Bologna*
New Generation batteries: a sustainability approach

V.B.3 Massimiliana CARELLO, *Polytechnic University of Turin - DIMEAS*
The fuel cell vehicle may be the future? The Team H2politO case study

V.B.4 to be defined

V.C Scanning probe microscopy: a versatile tool to analyze different sample properties at nanoscale

Co-organized with SAPÌENZA e ISM-CNR, Roma
Chairs: Marco FORTUNATO, Sapienza University of Rome & Simone DINARELLI, CNR- ISM

V.C.1 Francesca Anna SCARAMUZZO, *Sapienza University of Rome*
Electrochemical AFM: probing chemical reactions at the nanoscale

V.C.2 Daniele PASSERI, *Sapienza University of Rome*
Magnetic AFM: sampling magnetic domains with incredibly high resolution

V.C.3 Marco FORTUNATO, *Sapienza University of Rome*
Piezoresponse Force Microscopy (PFM): a technique to quantitatively evaluate the piezoelectric coefficient at the nanoscale

V.C.4 Angela CAPOCEFALO, *University of L'Aquila*
Combinig AFM and Raman: TERS on biological macromolecules

V.C.5 Simone DINARELLI, *ISM-CNR, Rome*
Un-conventional AFM: alternative ways to use the cantilever

V.D State of art, results and scientific progression on materials in "GaN4AP", the European project for advanced power applications in smart mobility and energy consumption

Co-organized with Distretto Sicilia Micro-nano Sistemi
Chair: Leoluca LIGGIO, *Distretto Sicilia Micro-nano Sistemi*

V.D.1 Leoluca LIGGIO, *Distretto Sicilia Micro-nano Sistemi*
General overview of the results so far of the project GaN4AP of the European consortium for leadership in components and systems based on gallium nitride (GaN)

V.D.2 Alessandro CHINI, *University of Modena and Reggio Emilia*
Characterization and modeling of GaN-devices within GaN4AP project

V.D.3 Véronique SOUSA, *CEA-Leti, Power Semiconductor Devices Laboratory, France*
Materials development for lateral GaN power transistors with improved performances

V.D.4 Danilo FALCHI, *Valeo Powertrain Systems, France*
GaN for Mobility

V.E Single and comprehensive vesicle analysis: the new innovation in the extracellular vesicle research

Co-organized with Sapienza University of Rome and EVita
Chairs: Luciana DINI & Annalisa RADEGHIERI, *Sapienza University of Rome*
The symposium is part of the Joint Event JE.I

V.E.1 Paolo BERGESE, *Università degli Studi di Brescia, IRIB - CNR, CSGI*
6 + 1 out-of-the-box problems in measuring EVs

V.E.2 Dario BRAMBILLA, *SCITEC, CNR, Milano*
Reversible aptamer-directed immobilization of antibodies and its application in extracellular vesicles separation

V.E.3 Carlo MORASSO, *Istituti Clinici Scientifici Maugeri, Pavia*
Biochemical profiling of endogenous nanoparticles by Raman Spectroscopy in breast cancer

V.E.4 Giacomo PARISI, *Sapienza University of Rome*
Unveiling Extracellular Vescicles diverse morphology with Cryo-Electron Microscopy

V.F Catalyzing Tissue Engineering: Exploring the Microfluidic Frontier

Co-organized with Univ. Magna Graecia of Catanzaro and Sapienza University
Chairs: Carlo Massimo CASCIOLA, *Sapienza University of Rome* & Chiara SCOGNAMIGLIO, *IIT, Rome*
The symposium is part of the Special Event SE.I

V.F.1 **Introductive Keynote**
Kristina HAASE, *EMBL, Barcellona, Spain*
Engineering human microtissues to study development and disease

V.F.2 Ersilia FORNETTI, *Center for Life Nano and Neuro Science, IIT Rome*
Development of a human neuromuscular junction on-a-chip

V.F.3 Martina MARCOTULLI, *Center for Life Nano and Neuro Science, IIT Rome*
Development of a low-intensity pulsed ultrasound print-head to drive the differentiation of 3D bioprinted skeletal stem cells

V.F.4 Raffaele CRISPINO, *Center for Advanced Biomaterials for Health Care, IIT Naples*
Gut on-a-chip to study and fight obesity

V.F.5 Michele D'ORAZIO, *University of Rome "Tor Vergata"*
An Innovative platform for reliable Deep Learning Management of Time-lapse Videos in Lab-on-Chip Experiments

VI.A The Italian Energy Materials Acceleration Platform (IEMAP): Automation and high throughput research - Part II

Co-organized with ENEA **- Chair: Francesco BUONOCORE, *ENEA***

VI.A.1 to be defined

VI.A.2 Dongxu ZHU, *Istituto Italiano di Tecnologia*
Synthesis of Near Infrared Emitting InAs-based Nanocrystals using Aminoarsine

VI.A.3 Lucia MERCALDO, *ENEA (TERIN)*
Development of perovskite films for photovoltaics via thermal evaporation and hybrid methods

VI.A.4 Marco TAMMARO, *ENEA (SSPT)*
Realization of a prototype of an experimental apparatus for photovoltaic waste recycling finalized to recovery of materials

VI.A.5 Maria Lucia PROTOPAPA, *ENEA (SSPT)*
Silicon powder recovered from end-of-life photovoltaic panels as anode material for lithium ion batteries

VI.B The role of HPC in the discovery of new materials and processes for a sustainable society - Part I

Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM
Chair: Francesca RISPLENDI, Polytechnic University of Turin

The symposium is part of the Workshop WS.II

VI.B.1 Stefano FABRIS, *CNR-IOM*
Developments and applications of Materials and Molecular Sciences in within the National Center for HPC, Big Data and Quantum Computing

VI.B.2 Andrea FERRETTI, *CNR - nano Modena*
Designing materials with HPC, a story of hardware, software and theory

VI.B.3 Giacomo PRAMPOLINI, *Institute of Chemistry of Organo Metallic Compounds – Pisa Unit (ICCOM-PI)*
From Ab Initio Potential Energy Surfaces to in silico Material Design: Integrating QM Accuracy with HPC Effectiveness

VI.B.4 Cristiana DI VALENTIN, *University of Milano-Bicocca - NanoQlab*
Modeling complex nanosystems for drug delivery, targeted therapy and imaging

VI.C The principle of the 3Rs in nanomedicine and drug delivery studies

Co-organized with ISS, FARVA
Chairs: Giuseppina BOZZUTO & Agnese MOLINARI, *ISS*

VI.C.1 Gianluca PANZINI, *ISS*
Application of the 3R principle in technical-scientific assessments (art. 31 of Legislative Decree no. 26/14)

VI.C.2 Isabella DE ANGELIS, *ISS*
The principle of the 3Rs between past and future

VI.C.3 Cristina ANDREOLI & Francesca MARCON, *ISS*
In vitro models for genotoxicity assessment of nanomaterials

VI.C.4 Emily SCHIFANO, *ISS*
Caenorhabditis elegans: a small worm for a small world

VI.C.5 Federica FOGLIETTA, *ISS*
Three-dimensional models for a deep investigation of ultrasound-based anticancer treatment efficacy

VI.C.6 Mario CARERE, *ISS*
Zebrafish embryos for ecosystem health and benefits for human health in compliance with the principle of the 3Rs

VI.D IPCEI: the key role of Italy in the microelectronics, digital, health and energy large- scale EU industrial research projects

Co-organized with AIRI
Chair: Andrea PORCARI, *AIRI*

The symposium is part of the Workshop WS.IV

VI.D.1 Sara LOI, *STMicroelectronics*
Ambition, results and future perspectives of the IPCEI microelectronics

VI.D.2 Speaker to be defined, *Menarini Silicon Biosystems*
IPCEI Healthcare

VI.D.3 Alberto GIACONIA, *ENEA*
From R&D to the industrialization of hydrogen technologies: the IPCEI Hydrogen

VI.D.4 Edoardo MACCHI, *FBK, Bruno Kessler Foundation*
Toward sustainable made in EU batteries: state of play of two IPCEI projects and Italy's position in the battery value chain

VI.E Nano-Enabled Agriculture: Agro-ecosystems Sustainable Management

Co-organized with University of Tuscia and University of Parma
Chair: Marta MARMIROLI, University of Parma

The symposium is part of the Workshop WS.III

VI.E.1 Michela JANNI, *CNR IMEM*
In vivo plant monitoring: a novel biosensor for precision agriculture and plant phenotyping

VI.E.2 Laura PILOTTO, *University of Udine*
Nano-hydroxyapatite from organic waste for sustainable P- fertilization

VI.E.3 Rocco CANCELLIERE, *University of Rome Tor Vergata*
Expanding circularity of plastic and biochar materials by developing alternative low environmental footprint sensors

VI.E.4 Lucio LITTI, *University of Padova*
Nanotechnology applied to Micro- and Nanoplastics Analysis

VI.E.5 Guido FELLET, *University of Udine*
2nd Summer School "Nanotechnology in Agriculture"

VI.F Precision Medicine: Unraveling New Frontiers with Advanced Models

Co-organized with Univ. Magna Graecia of Catanzaro and Sapienza University
Chair: Lia RIMONDINI, Piemonte University Orientale "A. Avogadro" Novara

The symposium is part of the Special Event SE.I

VI.F.1 **Introductive Keynote**
Andrea COCHIS, *Piemonte University Orientale "Amedeo Avogadro"*
Innovative models and strategies for personalized bone and cartilage repair

VI.F.2 Maria Camilla CIARDULLI, *University of Salerno*
Growth factor controlled delivery systems & 3D biomimetic culture: a study of tenogenic and condrogenic events on human mesenchymal stem cells

VI.F.3 YAnna CITARELLA, *Sapienza University of Rome*
Unravelling the Adipose Tissue-BPA interaction in triple negative breast cancer progression: the role of the tumour microenvironment

VI.F.4 Mauro NASIMBEN, *ENGINSOFT SpA, Padova*
Low-power or resource-constrained environments for virtual screening and quantitative structure-activity relationship analysis for in silico precision medicine

VI.F.5 Farah DAOU, *Piemonte University Orientale "Amedeo Avogadro", Novara*
Unraveling the Transcriptome Profile of Pulsed Electromagnetic Field Stimulation

VI.G Application of innovative technologies to the study of extracellular vesicles

Co-organized with Sapienza University of Rome and EVita
Chairs: Luciana DINI & Annalisa REDEGHIERI, *Sapienza University of Rome*
The symposium is part of the Joint Event JE.I

VI.G.1 Roberto FRIGERIO, *CNR*
Integrated diagnostic workflow for blood and urinary Extracellular Vesicles by Membrane Sensing Peptides and digital detection

VI.G.2 Aurora MANGOLINI, *LABION/FDG*
SPRi based biosensor for the detection of extracellular vesicles as rehabilitation biomarkers

VI.G.3 Carolina PABA, *University of Trieste*
Lipid bilayer fluidity and degree of order regulates small EVs adsorption on model cell membrane

VI.G.4 Giada ROSSO, *Gruppo Cauda*
Fully artificial extracellular vescicles: a biomimicking strategy towards effectvie theranostic tools in nanomedicine

VI.G.5 Diana VARDANYAN, *CNR*
AFM of single vesicles: a multiparametric morpho quantitative analysis

VI.G.6 Deborah POLIGNANO, *ISS*
Effects of intracellular pathway inhibitors on the secretion, protein, and lipid composition of fluorescent Bodipy sEV

VI.H *Session Flagship Project FP5:* Digital transition through AESA (Active Electronically Scanned Array) radar technology, quantum cryptography and quantum communications

Chair: Filippo DE STEFANI, *Leonardo S.p.a.*
The symposium is part of the Special event SE.II

VI.H.0 Introduction by the Chairs

VI.H.1 Alberto MACRI PELLIZZERI, *MBDA Italia SpA*
Digital transition through AESA

VI.H.2 Gian Carlo CARDARILLI, *Università di Roma Tor Vergata*
Calibration techniques for MIMO radar

VI.H.3 Andrea QUIRINI, Fabiola COLONE, Pierfrancesco LOMBARDO, Sapienza Univ.
A Flexible Design Strategy for Three-Element Non-Uniform Linear Arrays

VI.H.4 Romeo BECCHERELLI, *CNR*
Beamscanning antenna for THz applications

VI.H.5 Stephan WABNITZ, Fabio SCIARRINO, *Sapienza Università di Roma*
Optical Transmission with multimode fibers

VI.H.6 Luigi SIGILLO, Danilo COMMINIELLO, *Sapienza Università di Roma*
Generative AI for Remote Sensing Imagery

SEPTEMBER 21 **14:00 - 15:30**

VII.A Innovative Nanotechnological Approaches for Regenerative Medicine

Co-organized with Distretto Sicilia Micro-nano Sistemi, University of Messina, CNR-IPCB & CNR-ISMN
Chairs: Sabrina CONOCI, *University of Messina* - Luigi AMBROSIO, *CNR-IPCB* & Alek DEDIU, *CNR-ISMN*

VII.A.1 Gianluca VADALÀ, *Campus Bio-Medico University Hospital Foundation*
Cell therapy for spine

VII.A.2 Valentina BENFENATI, *CNR-ISOF*
Brain

VII.A.3 Maria Grazia RAUCCI, *CNR-IPCB*
Theragenerative 2D materials for cancer

VII.A.4 Domenico FRANCO, *University of Messina*
Ag-graphene Ti functionalised Bioscaffolds: Antibacterial and bone regeneration properties

VII.B The importance of recycling, recovery, and reuse of materials in the energy transition

Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM, University of Genova
Chair: Marzia QUAGLIO, *Polytechnic University of Turin*

The symposium is part of the Workshop WS.II

VII.B.1 Flavio TONELLI, *University of Genova*
The importance of Remanufacturing vs. Repairing in the Italian Industrial Strategy

VII.B.2 Alessandra ZANOLETTI, *University of Brescia*
New environmental-friendly technologies for the recovery of raw materials

VII.B.3 Gaia BRUSSA, *Polytechnic University of Milan*
Waste generation from energy transition: a focus on wind turbine blades and photovoltaic panels recycling and recovery

VII.B.4 Filippo STRINGA, *Polytechnic University of Milan*
EU projects on innovative re-use and recycling solutions for lithium-ion batteries

VII.C Micro- and nanofluidic systems in cancer research

Co-organized with ISS - OMM, National Research Council, University of Salento, University Polyclinic Foundation "A. Gemelli" IRCCS, React4Life
Chair: Fabrizio MATTEI, *ISS*

VII.C.1 Adele DE NINNO, *Institute for Photonics and Nanotechnologies - CNR*
Organs-on chips as smart in vitro tools for dissecting heterogeneous cancer models

VII.C.2 Giuseppe MARUCCIO, *University of Salento*
Exploiting biosensors to investigate tumors through lab-on-chip and organ-on-chip systems

VII.C.3 Gabriele CIASCA, *University Polyclinic Foundation "A. Gemelli" - IRCCS*
Mid-Infrared Resonant Nanostructures for Ultrasensitive Detection and Molecular Characterization of Tumor-derived Extracellular Vesicles

VII.C.4 Silvia SCAGLIONE, *React4Life, Chief Researcher Officer*
Multiorgan-on-chip systems to study the complexity of the cell microenvironments

VII.D Managing digital assets in research and innovation: applications and impacts of Web 3.0 and blockchain techs

Co-organized with AIRI, Fondazione Piemonte Innova & EU TechEthos project
Chairs: Laura MORGAGNI, *Fondazione Piemonte Innova* & Andrea PORCARI, *AIRI and TechEthos project*

The symposium is part of the Workshop WS.IV

VII.D.1 Andrea PORCARI, *Airi and TechEthos project*
Introduction: insights on the TechEthos project

VII.D.2 Antonio PUNZI, *Departement of Law, LUISS University*
The Personal Identity (and its Property) in the Digital Era

VII.D.3 Jacopo FRACASSI, *Extended Reality & Metaverse Observatory and Blockchain & Web3 Observatory, Polytechnic of Milan - Osservatori digital Innovation*
The Metaverse and the role of Blockchain: towards the future of the Web

VII.D.4 Serena DE LAURENTIIS, *Ales S.p.A., Legal Department, Gallerie degli Uffizi, Florence*
Problems and opportunities of cultural heritage enhancement with technologies based on NFT

VII.D.5 Francesco CRISCIOTTI, *DGS - Food Drug Free Project*
BIAS Project- Blockchain enabled Intelligent Agricultural Services

VII.D.6 Lorenzo ZULLO, *ChemChain*
Use of blockchain to exchange information along the value chain, supporting sustainable and circular economic models

VII.E Nano-Enabled Agriculture: Perspectives in Crop Protection

Co-organized with University of Tuscia & University of Parma
Chair: Sara FRANCESCONI, University of Tuscia

The symposium is part of the Workshop WS.III

VII.E.1 Chiaraluce MORETTI, *University of Perugia*
Silver nanoclusters with $Ag^{2+/3+}$ oxidative states are a new highly effective tool against phytopathogenic bacteria

VII.E.2 Sara FALSINI, *University of Florence*
Enhancing the efficacy of bioactive molecules in the Mediterranean fruit fly control by nanocarriers with exopolysaccharides from cyanobacteria

VII.E.3 Davide SAVY, *University of Naples*
Novel nanocarriers and antibacterials from compost-extracted humic substance

VII.E.4 Francesca BALDASSARRE, *University of Salento*
Thyme-based nano-biocides exploring Calcium Carbonate and Cellulose Nanocrystals: the case studies of Xylella fastidiosa and Pseudomonas savastanoi

VII.E.5 Stefania BOI, *NanOmnia srl*
Nanostructured pesticide formulations fate after different plant application forms

VII.F Revolutionizing Cancer Treatment: The Power of CAR-T Therapy

Co-organized with Univ. Magna Graecia of Catanzaro and Sapienza University
Chair: Maria Chiara CRISTIANO, *University Magna Graecia of Catanzaro*
The symposium is part of the Special Event SE.I

VII.F.1 **Introductive Keynote**
Biagio DE ANGELIS, *IRCCS Ospedale Pediatrico Bambin Gesù, Roma*
Gene Therapy with CAR-T cells: from the researcher's bench to the patient bedside

VII.F.2 Michele PEZZELA, *IRCCS Ospedale Pediatrico Bambin Gesù, Roma*
Engineering CXCR2-modified GD2.CAE T Cells to improve chemotaxis and antitumor efficacy in a pediatric sarcoma model

VII.F.3 Marco CORTESE, *University of Turin*
Design, characterization and preclinical validation of a combinatorial CAR-based immunotherapy against colorectal cancer with HER2 amplification

VII.F.4 Caterina D'ACCARDO, *University of Palermo*
CD44v6-specific CAR-T cells: a promising therapeutic strategy for colorectal and thyroid cancer patients

VII.F.5 Valeria LEUCI, *University of Turin*
CAR Cell therapy in the era of solid tumor treatment: a versatile and customizable living drug

VII.G Enable Technologies for Leading-edge Space Applications

Co-organized with Thales Alenia Space
Chair: Mirko ROCCI, *Thales Alenia Space*

VII.G.1 Mirko ROCCI, *Thales AleniaSpace*
Enhancing Performance of Space-Qualified Materials through Bulk Doping and Coating based on Two-Dimensional Crystals

VII.G.2 Giovanni CUCINELLA, *IMT srl*
Advancements in System-in-Package Technology for Future Space Equipment

VII.G.3 Speaker to be defined
Smart materials: application to transparent material in Space window

VII.G.4 Speaker to be defined
3D FDM-printing: application of tecnopolymers to space structures

VII.G.5 Speaker to be defined
Challenges of AM in space application: NDI and standardization

VII.H The Italian Energy Materials Acceleration Platform (IEMAP): Automation and high throughput research - Part III

Co-organized with ENEA
Chair: Maria Lucia PROTOPAPA, *ENEA*

VII.H.1 Federica FORTE, *ENEA (SSPT)*
Materials recovery from end-of-life lithium-ion batteries: results and perspectives

VII.H.2 Maria Sole DI CARLI, *ENEA (TERIN)*
Synthesis and Characterization of a Composite Anion Exchange Membrane for Water Electrolyzers (AEMWE)

VII.H.3 Alessandro MORDINI, *CNR-ICCOM*
New materials for photovoltaic and integrated photovoltaic-storage devices

VII.H.4 Stefano RAMPINO, *CNR-IMEM*
PV-Storage integrated devices: perspectives, advantages and challenges in interfacing solar cells, batteries and supercapacitors

14:00 - 15:30 **SEPTEMBER 21**

VII.I *Session Flagship Project FP6:* Artificial intelligence, virtual reality and digital twin for advanced engineering and aerospace

Chairs: Giovanni MORABITO & Stefano PENNA, *Thales Alena Sapce Italia*, and Enrico TRONCI, *Sapienza University of Rome*

The symposium is part of the Special Event SE.II

VII.I.0 Introduction by the Chairs

VII.I.1 Laura DI GREGORIO, *Sapienza University of Rome*
Advanced Materials and Manufacturing

VII.I.2 Annalisa SANTOLAMAZZA, *University of Rome Tor Vergata*
Innovation in Engineering Education: Exploring AI, VR, AR, AM, and Digital Twin applications to foster advanced learning

VII.I.3 Mauro OLIVIERI, *University of Rome La Sapienza* and Vittorio GRETO, *MBDA Italia SpA*
Designing Configurable Microprocessors for Accelerated Image Processing and Recognition based on Neural Network Engines

VII.I.4 Enrico TRONCI, *Sapienza University of Rome* and Giovanni MORABITO, *Thales Alenia Space Italia*
Automated design of industrial plants through AI and digital twins

VII.I.5 Pier Paolo VALENTINI & Marco CIRELLI, *University of Rome Tor Vergata*
Virtual and Augmented Reality Laboratory for supporting the interactive and collaborative development and interrogation of virtual prototypes and digital twins

VII.I.6 Fabio GASPARETTI, *University of studies of Roma Tre*
Recommender Systems in Machne Aided Design

VIII.A Innovative LabonChip Technologies for Medical Assessment

Co-organized with Distretto Sicilia Micro-nano Sistemi, University of Messina, ASI, FBK & URT LabSENSE CNR
Chairs: Sabrina CONOCI, *University of Messina* - Costantino DEL GAUDIO, *ASI* - Leandro LORENZELLI, *FBK* & Alessia IRRERA, *URT LabSENSE CNR*

VIII.A.1 Costantino DEL GAUDIO, *Italian Space Agency ASI*
Lab-on-Chip for Space Life Sciences

VIII.A.2 Emanuele SCIUTO, *University of Messina*
Point of care Device based on PCR-free approach

VIII.A.3 Leandro LORENZELLI, *FBK-SD Sensors and Devices Center, Microsystems Technology Unit*
Trends in Multi-depth Probing 3D Microelectrode Array for in-vitro recording the Electrophysiological Activity within 3D Neuronal Cultures

VIII.A.4 Alessio Antonio LEONARDI, *University of Catania*
Advancing sensing technologies: label-free fluorescent sensors based on silicon nanowires

VIII.B The role of HPC in the discovery of new materials and processes for a sustainable society - Part II

Co-organized with Polytechnic University of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, INRIM
Chair: Francesca RISPLENDI, *Polytechnic University of Turin*
The symposium is part of the Workshop WS.II

VIII.B.1 Layla MARTIN-SAMOS COLOMER, *CNR-IOM Trieste*
Materials Foundry: Development of High Performance Computing applications to leverage scientific discovery and technological advancement

VIII.B.2 Michele RE FIORENTIN, *Polytechnic University of Turin*
Potential and challenges of ab initio simulations in CO_2 electroreduction

VIII.B.3 Luca TUBIANA, *University of Trento*
From the kinetoplast DNA to bio-inspired topological supramolecular materials and back

VIII.B.4 Simone SALA, *ENI*
Materials design and optimization for next-generation photovoltaics

VIII.C Organ on chip and digital twin technologies for advanced healthcare

Co-organized with Polytechnic University of Turin & CNR
Chairs: Simone MARASSO, *CNR* - Francesca FRASCELLA & Lucia NAPIONE, *Polytechnic University of Turin*

VIII.C.1 Ben MAOZ, *Tel Aviv University, Israel*
Organs-on-a-Chip: A new told for studying human physiology

VIII.C.2 Paolo MASSOBRIO, *University of Genoa*
Brain-on-a-chip: dream or reality? Recent advancements using MEA technology to engineer complex 2D and 3D neuronal assemblies

VIII.C.3 Giorgia IMPARATO, *IIT*
3D histological competent human tissue in vitro for reliable OoC devices

VIII.C.4 Simona VILLATA, *Polytechnic University of Turin*
3D bioprintied infected skin model as a platform for drug and therapies screening

VIII.C.5 Gabriele Angelo DUBINI, *Polytechnic University of Milan*
Microfuidic platform for high-throughput drug screening on patient-derived organoids 3d cultures

VIII.D Advanced materials and technologies for sustainable construction

Co-organized with AIRI, EU SocKETs project
Chair: Andrea PORCARI, *AIRI and SocKETs project*

The symposium is part of the Workshop WS.IV

VIII.D.1 Andrea PORCARI, *Airi and SocKETs project*
Introduction: SocKETs co-creation innovation scenarios toward sustainability in the construction sector

VIII.D.2 Gian Marco REVEL, *Università Politecnica delle Marche and ECTP (European Construction, built environment , energy efficient building Tech Platform)*
Supporting and funding innovation in the construction and built environment sector: the European framework

VIII.D.3 Giovanni PINTO, *Italcementi*
New opportunities for processes and products in the cement and concrete sector

VIII.D.4 Riccardo ANGIULI, *CETMA - EU Research Center for Technologies Design and Materials*
Circular Economy and Sustainable Materials for construction sector

VIII.D.5 Marco IUORIO, *Stress Scarl – High tech Research Center for Sustainable Construction*
The supply chain and the challenge of innovation in design and production processe

VIII.E Nanotechnology opportunities in the food sector: from ingredient functionalization and product stabilization to packaging design

Co-organized with University of Udine and University of Tuscia
Chairs: Sofia MELCHIOR & Stella PLAZZOTTA, *University of Udine*

The symposium is part of the Workshop WS.III

VIII.E.1 Sofia MELCHIOR & Stella PLAZZOTTA, *University of Udine*
Nano-architecture of food ingredients: towards novel food functionalities

VIII.E.2 Alessandro ZAMBON, *University of Bologna*
Possible synergism between natural antimicrobial substances and innovative food processing to increase microbial inactivation: a case study on supercritical carbon dioxide technology

VIII.E.3 Marisa MANZANO, *University of Udine*
Biosensors for food safety applications

VIII.E.4 Daniele CARULLO, *University of Milan*
Boosting the shelf-life of food items via "nano-inspired" packaging design approaches

VIII.E.5 Otmar GEISS, *EC Joint Research Centre*
Activities of the European Commission's Joint Research Centre on nanomaterials in food

VIII.F Unveiling the Potential of Advanced Nanostructured Materials in Biomedicine

Co-organized with Univ. Magna Graecia of Catanzaro and Sapienza University
Chairs: Luciano GALANTINI & Iolanda FRANCOLINI, Sapienza University of Rome
The symposium is part of the Special Event SE.I

VIII.F.1 Introductive Keynote
Maria Chiara DI GREGORIO, *Sapienza University of Rome*
Metal Organic Crystals: shaping, uniformity and simmetry breaking

VIII.F.2 Valeria D'ANNIBALE, *Sapienza University of Rome*
Porphyrins/Bile Salts interplay towards new nano-composite materials

VIII.F.3 Erica QUAGLIARINI, *Sapienza University of Rome*
Magnetic Levitation of Personalized Nanoparticle–Protein Corona as an Effective Tool for Cancer Detection

VIII.F.4 Marco COSTANTINI, *Warsaw Institute of Physical Chemistry of Science Academy*
Digital manufacturing in biomedical research: a step towards engineering functional tissue and organ replicas in vitro

VIII.F.5 Lucrezia DESIDERIO, *Sapienza University of Rome*
Determination of the optimal pH for Doxorubicin encapsulation in polymeric micelles

VIII.G Smart Multi-Energy Systems and Microgrids for Enabling the energy transition

Co-organized with ENEA
Chairs: Martina CALIANO (on line) & Maria VALENTI, ENEA

VIII.G.1 Maria VALENTI, *ENEA*
Smart, multivector and integrated microgrids and systems, to accelerate the energy transition

VIII.G.2 Giovanni BRUNACCINI, *CNR*
Flexibility analysis of multicarrier smart micro-grids: electrical and thermal vectors teaming for energy services provision

VIII.G.3 Chiara GANDOLFI, *Ricerca sul Sistema Energetico – RSE S.p.A*
The RSE MV/LV hybrid AC/DC Test Facility

VIII.G.4 Carlo SANDRONI, *Ricerca sul Sistema Energetico – RSE S.p.A*
Multi-energy system integration for a flexible power system: the RSE's demonstrator

VIII.H *Session Flagship Project FP8:* Human-centric AI to deliver empowered customer experiences

Chairs: Mattia GIGLIOTTI *(UniCredit S.p.a.) and to be defined (Unidata)*
The symposium is part of the Special Event SE.II

VIII.H.0 Introduction by the Chairs

VIII.H.1 Patrizio PISANI, *Unidata*
The water network becomes a data driven smart grid

VIII.H.2 Mattia GIGLIOTTI, *UniCredit S.p.a.*
Trustworthy and Explainable AI

VIII.H.3 definition ongoing

IX.A Challenges in Health and biomedicine

Co-organized with CNR -IIA
Chairs: Antonella MACAGNANO & Fabrizio DE CESARE, *CNR - IIA*
The symposium is part of the Workshop WS.V

IX.A.1 Antonella MACAGNANO, *CNR-IIA*
The contribution of CNR (Italy) in developing advanced technological solutions for a variety of applications

IX.A.2 Eyal ZUSSMANN, *TECHNION- Haifa, Israel*
Electrospinning: a bridge between nanotechnologies and bioinspired applications

IX.A.3 Alessio VARESANO, *STIIMA-CNR*
Keratin-based nanofibres for biomedical applications and electrospun filter media

IX.A.4 Irene BONADIES, *IPCG-CNR*
The use of natural and bio- based polymers in electrospinning

IX.A.5 Maria Letizia FOCARETE, *SpinBOW S.r.l. & University of Bologna*
University-Industry cooperation. Functional elctrospun polymeric nanofibers: from nanohybrid to bioactive materials

IX.B Advancements in Nanotechnology and materials for bio-applications

Co-organized with Sapienza University of Rome
Chairs: Giuseppina SANDRI, *Univ. Pavia* and Carlotta Marianecci, *Sapienza Univ.*

IX.B.1 Jacopo FORTE, *Sapienza University of Rome*
How to manage hair loss: innovative nano-formulations

IX.B.2 Marta POLLINI, *University of Pavia*
Design and development of scaffolds for tissue engineering via centrifugal spinning

IX.B.3 Valentina ALEMANNO, *Sapienza University of Rome*
Spectroscopic and structural investigations on albumin reversibility and conformational changes under stress conditions

IX.B.4 to be defined

IX.C Learnings on SSbD in industrial processes: comparing case studies from five EU projects on Safe and Sustainable by Design

Co-organized with AIRI, ASINA Project, REPOXYBLE, SbD4Nano, Sabydoma & SAbyNA
Chair: Lisa BREGOLI, *Warrant Hub*
The symposium is part of the Workshop WS.VI

IX.C.1 Lisa BREGOLI, *Warrant Hub*
Welcome and overview on the EU projects

IX.C.2 Ivonne TONANI TOMMASONI, *RED OF VIEW*
ASINA – Creams formulation for COSMETIC sector

IX.C.3 Marti BUSQUETS FITE, *Applied Nanoparticles Ltd (APPNPS)*
SABYDOMA – Real-life transfer of SSbD platform to industry: coupling ONLINE screening and characterization to a continuous-flow AgNPs production line

IX.C.4 Stefano MANFREDINI, *Ambrosialab Srl, University of Ferrara, Spain*
SSbD approaches for Cosmetic Application

IX.C.5 Davide LOTTI, *LATI Industria Termoplastici SpA*
SbD evaluation of filament manufacturing for Fused Deposition Modelling using the SAbyNA guidance platform

IX.C.6 Elvira VILLARO ÁBALOS, *CTO, Avanzare Innovacion Tecnologica S.L.*
REPOXYBLE – Biobased multifunctional recyclable epoxy based composites

IX.C.7 Elena MOCCHIO & Adriano FERRARA, *UNI - Italian Organization for Standardization*
ASINA – How standardization can boost research and innovation

IX.D Stories of successful integration of spectrometry technologies and research in advanced and engineered materials

Co-organized with ISS - FAST
Chair: Marco CRESCENZI e Giorgia STENDARDO, *ISS*

IX.D.1 Sergio BRUTTI, *Sapienza University of Rome*
Secondary aprotic Li-O2 batteries: challenges and perspectives

IX.D.2 Giulia FIORAVANTI, *University of L'Aquila*
Graphene Oxide: a new emerging contrast agent for Magnetic Resonance Imaging

IX.D.3 Giovanna DE SIMONE, *Roma Tre University*
Nitrobindin protein family as nitric oxide sensors

IX.D.4 Francesca FERRARIS, *ISS*
Single particle ICP-MS as an essential tool for characterizing the agglomeration behaviour and fate of food-grade titanium dioxide in human gastrointestinal digestion

IX.E Aspetti della proprietà intellettuale: dalla tutela alla condivisione della conoscenza

Co-organized with PRAXI, Sapienza University of Rome
Chair: Leonardo MATTIELLO, *Sapienza University of Rome*

IX.E.1 Daniele RICCIONI, *Sapienza University of Rome - Ufficio Valorizzazione e Trasferimento Tecnologico*
Tech transfer

IX.E.2 Maria Vittoria PRIMICERI, *PRAXI Intellectual Property*
Management of international procedures of protection and breaking news

IX.E.3 Paola CIACCIA, *Sapienza University of Rome - Settore Brevetti e Licensing*
Policy, valore della conoscenza e importanza strategica della tutela

IX.F Artificial intelligence and Machine learning in digital health

Co-organized with University Magna Graecia of Catanzaro and Sapienza University of Rome
Chair: Laura BONZANO, *University of Genova*

The symposium is part of the Special Event SE.I

IX.F.1 **Introductive Keynote**
Alessia BRAMANTI, *University of Salerno*
Application of artificial intelligence and machine learing in cardiovascular diseases

IX.F.2 Monica BIGGIO, *University of Genova*
Disentangling Blink Reflexes in Multiple Sclerosis with machine learning techniques

IX.F.3 Giuseppe Felice RUSSO, *University of Salerno*
Innovation in cardiology: telemedicine and artificial intelligence to manage heart failure

IX.F.4 Luigi CHIRICOSTA, *IRCCS Messina*
Big data and omics: bioinformatics to support personalized medicine

IX.F.5 Paulina Anna WOJTYLO, *University of Perugia*
Development of the novel indolic modulators of the aryl hydrocarbon receptor using machine learning

IX.G The electrochemical approach for innovation in energetics and industrial processing through the control of active materials at the nm level

Co-organized with ENEA, and Sapienza University of Rome
Chair: Danilo DINI, *Sapienza University of Rome*

The symposium is part of the Workshop WS.VII

IX.G.1 Stefano PASSERINI, *Sapienza University of Rome*
Metal-organic framework derived nanoparticles embedded in carbonaceous matrices for lithium and sodium batteries

IX.G.2 Leone FRUSTERI, *CNR*
Electro-spun Nano-fibers: An Innovative Conductive Matrix to produce Self-Standing Electrodes for Sodium-ion Batteries

IX.G.3 Gianni APPETECCHI, *ENEA*
Innovative electrode chemistry in ionic liquid electrolytes for sodium-less battery systems

IX.G.4 Alfonso POZIO, *ENEA*
Synthesis and Characterization of a Composite Anion Exchange Membrane for Water Electrolyzers (AEMWE)

IX.H Hydrogen Valley and other Projects on Hydrogen Utilization in Italy - Part I

Co-organized with ENEA
Chair: Paola GISLON, ENEA

The symposium is part of the Workshop WS.VIII

IX.H.1 Filippo CIRILLI, *RINA-CSM*
Decarbonization in energy intensive industry

IX.H.2 Giorgio SEGRE, *ITALGAS*
Title to be defined

IX.H.3 Edoardo D'AMANZO, *RINA-CSM*
Electrification in steel industry

IX.H.4 David ARMAROLI, *ENEL*
Title to be defined

X.A Challenges in Environment & Energy

Co-organized with CNR -IIA
Chairs: Antonella MACAGNANO & Fabrizio DE CESARE, *CNR - IIA*
The symposium is part of the Workshop WS.V

X.A.1 Antonella MACAGNANO, *CNR-IIA*
Flexible strategy to design selective sensors for gaseous markers (MOSSA Project)

X.A.2 Andrea CAMPOSEO, *NANO CNR*
Networks of electrospun nanofibers for tunable light sources

X.A.3 Paolo STUFANO, *NANOTEC-CNR*
Bio-based nano-composites for Energy conversion and storage

X.A.4 Stefano LINARI, *Linari Engineering S.r.l.*
Design and fabrication of nanocomposites for biomedical and industrial applications

X.A.5 Stefano LORENZONI, *SKE Research Equipment*
Nanofibers technology: from lab to market

X.B Hydrogen Valley and other Projects on Hydrogen Utilization in Italy - Part II

Co-organized with ENEA and RINA-CSM
Chairs: Paola GISLON, ENEA and (to be defined), *RINA-CSM*
The symposium is part of the Workshop WS.VIII

X.B.1 Speaker to be defined, *RINA-CSM*
Hydra project

X.B.2 Paolo ALESSIO, *SGI*
SGI Projects on green hydrogen

X.B.3 Andrea BOMBARDI, *RINA*
Title to be defined

X.B.4 Domenico BORELLO, *Sapienza University of Rome*
Towards the decarbonization in the mobility sector in the Italian Scenario: the role of hydrogen and sustainable fuels

X.C ASINA project exploitation workshop: SSbD industrial application in cosmetics, textile and other sectors

Co-organized with AIRI, ASINA Project, REPOXYBLE, SbD4Nano, Sabydoma & SAbyNA
Chair: Anna Luisa COSTA, *National Research Council and ASINA project Coordinator*
The symposium is part of the Workshop WS.VI

X.C.1 Massimo PERUCCA, *Project s.a.s*
ASINA expert system

X.C.2 Juliana OLIVEIRA, *CeNTI-Centre for Nanotechnology and Smart Materials, Portugal*
Antimicrobial textile manufacturing

X.C.3 Jesús LOPEZ DE IPIÑA PEÑA, *TECNALIA, Spain*
Digital Twin for sustainable manufacturing

X.C.4 Joonas KOIVISTO (online), *Air Pollution Management, Finland*
Industrial-oriented exposure assessment

X.C.5 Rossella BENGALLI, *University of Milano – Bicocca*
Experimental workflow for the estimation of relevant exposure dose and effects

X.D Metrology and Nanomaterials for Energy

Co-organized with INRIM, Fraunhofer-Gesellschaft
Chairs: Luca BOARINO & Natascia DE LEO, *INRIM*

X.D.1 Christian HAGENDORF, (on line) *Fraunhofer Center for Silicon-Photovoltaics CSP*
Next Generation photoelectrochemical Reactors and Solar-to-hydrogen Metrology

X.D.2 Sebastian RISSE, *Helmholtz-Zentrum Berlin, Electrochemical Energy Storage*
Multidimensional Operando Analysis of Li/S Batteries with Neutrons and Photons

X.D.3 Alberto Giuliano ALBO, *INRIM*
European Metrology Network Clean Energy and energy transition

X.D.4 Fernando ARAUJO CASTRO, (on line) *Head of Materials Science and Engineering|Principal Scientist National Physical Laboratory, UK*
The VAMAS activities in Energy Materials

X.D.5 Lorenzo PATTELLI, *INRiM*
Patterning of SiO_2 surfaces for sub-ambient passive cooling under direct sunlight

X.E Electrochemical energy storage:Innovative systems and advanced materials - Part I

Co-organized with ENEA, RSE and CNR-ITAE
Chair: Omar PEREGO, *ENEA*

The symposium is part of the Workshop WS.VII

X.E.1 Alessandra DI BLASI, Margherita MORENO & Omar PEREGO, *CNR-ITAE | ENEA | RSE*
Italian system research along the battery value chain: challenges towards increase the overall sustainability

X.E.2 Marcella BALORDI, *RSE*
Geothermal brines: a promising unconventional lithium reserve for Europe

X.E.3 Sergio BRUTTI, *Sapienza University of Rome*
Towards anodeless lithium metal negative electrodes for secondary aprotic batteries

X.E.4 Antonio RINALDI, *ENEA*
Exploring new chemistries, materials and manufacturing strategies for next generation batteries in the ORANGEES project

X.F Nanotechnologies for precision medicine

Co-organized with Univ. Magna Graecia of Catanzaro and Sapienza University
Chair: Emanuela Fabiola CRAPARO, *University of Palermo*

The symposium is part of the Special Event SE.I

X.F.1 **Introductive Keynote**
Nunzio DENORA, *University 'Aldo Moro' of Bari*
Are targeted nano-drug delivery strategies critical for success of precision model?

X.F.2 Domenico LIGUORO, *Sapienza University of Rome*
Systemic delivery of miRNA-loaded nanoparticles blunts resistance to targeted therapy in BRAF-mutant melanoma

X.F.3 Ilaria ARDUINO, *University of Bari*
Microfluidic-assisted preparation of solid lipid nanoparticles for the brain-delivery of biologicals

X.F.4 Alessio INCOCCIATI, *Sapienza University of Rome*
Engineered ferritin nanoparticles for biomedical applications: tailoring the external and internal surfaces for enhanced functionality

X.F.5 Lorenzo MANCINI, *University of Perugia*
Microfluidic manufactured nanohybrid self-assembling platforms for protein delivery

XI.A Tumor microenvironment on the move: progress and challenges

Co-organized with University Magna Graecia of Catanzaro and Sapienza University of Rome

Chair: Marilena LANZINO, *University of Calabria*

The symposium is part of the Special Event SE.I

XI.A.1 **Introductive Keynote**
Ines BARONE, *University of Calabria*
The weight of obesity in breast cancer: unravelling the molecular links

XI.A.2 Martina VINCENZI, *Sapienza University of Rome*
Identification of a novel biomarker of HIF-1alpha-mediated doxorubicin resistance in 3D cancer spheroid models

XI.A.3 Elena SPLENDIANI, *Sapienza University of Rome*
Circulating EV-microRNAs in Metastatic Melanoma: from diagnostic to response to treatment biomarkers

XI.A.4 Maria Gioia FABIANO, *Sapienza University of Rome*
Inhibiting Pin1 by ATRA-loaded niosomes to treat High-Grade Serous Ovarian Cancer

XI.A.5 Giusy AUGIMERI, *University of Calabria*
A hybrid cell population generated through engulfment of mesenchymal stem cell by breast cancer cells enhances chemoresistance and metastasis

XI.B Challenges for sustainable life

Co-organized with CNR -IIA

Chairs: Antonella MACAGNANO & Fabrizio DE CESARE, *CNR - IIA*

The symposium is part of the Workshop WS.V

XI.B.1 Alberto FIGOLI, *ITM-CNR*
Toward a sustainable membrane fabrication by electrospinning

XI.B.2 Fabrizio DE CESARE, *University of Tuscia and IIA-CNR*
Tackling future food demand developing electrospun nanofibrous products for sustainable agriculture

XI.B.3 Massimo MARI, *IIA-CNR*
The electrospinning technology: a precious tool to innovate productive cycles, promote the eco-design of products and support the ecological transition

XI.B.4 Simona PELLEGRI, *Invenio Solutions*
I find, I discover-INVENIO SRL: production from electrospinning of innovative, highly performing and eco-friendly electrospun materials

XI.C Electrochemical energy storage: innovative materials and systems - Part II (advanced materials)

Co-organized with ENEA
Chair: Margherita MORENO, *ENEA*

The symposium is part of the Workshop WS.VII

XI.C.1 Stefano MARCHIONNA, *RSE*
Highly reversible anode for LIB and NIB based on oxidized Ti3Al(1-x)SnxC2 MAX phases

XI.C.2 Arcangelo CELESTE, *Sapienza University of Rome*
Li-rich layered oxides: towards more sustainable and high energy cathode materials for Li-ion batteries

XI.C.3 Massimo INNOCENTI, *University of Florence*
New frontiers of sustainability and circularity in the galvanic industry

XI.C.4 Pietro COLUCCI, *ENEA*
Lignin-Derived Vacuum Pyrolysis Hard Carbon for Sodium Batteries

XI.D Basic research in the hydrogen value chain

Co-organized with ENEA
Chair: Paola GISLON, *ENEA*

The symposium is part of the Workshop WS.VIII

XI.D.1 Carlo VISCONTI, *Polytechnic University of Milan*
Title to be defined

XI.D.2 Francesco BASILE, *University of Bologna*
Title to be defined

XI.D.3 Alessandra CARBONE, *ITAE-CNR*
Polymer Electrolyte Fuel Cells: challenges and perspectives

XI.D.4 Vincenzo PALMA, *University of Salento*
Title to be defined

XI.E *Session Flagship Project FP4:* Development, innovation and certification of medical and non-medical devices for health

Chairs: Mauro CISLAGHI, *BV Tech* & Livia OTTOLENGHI, *Sapienza University*

The symposium is part of the Special Event SE.II

XI.E.0 Introduction by the Chairs

XI.E.1 Hossein Cheraghi BIDSORKHI, *Sapienza University of Rome*
Multifunctional Graphene-based Smart sensor for Gait Monitoringd

XI.E.2 Gaetano MAROCCO, *University of Rome Tor Vergata*
Simulation, design, and industrialization of secure Bio-integrated wireless devices

XI.E.3 Vincenzo CARDINALE, University of Rome La Sapienza
Title in definition

XI.E.4 Duilio Luca BACOCCO, *ISS*
Italian Implantable Prostheses Registry infrastructure to monitor patients' health and medical devices safety

SEPTEMBER 22 **16:00 - 17:30**

XII.A Modellization of processes in the hydrogen value chain

Co-organized with ENEA
Chair: Paola GISLON, ENEA

The symposium is part of the Workshop WS.VIII

XII.A.1 Maria Anna MURMURA, *Sapienza University of Rome*
Numerical investigation of the effect of gas flow configuration on the performance of a solid oxide electrolyzer

XII.A.2 Gino CORTELLESSA, *University of Cassino*
Analytical and numerical models for green hydrogen - natural gas mixtures

XII.A.3 Mariagiovanna MINUTILLO, *University of Salento*
Fuel cell systems for maritime applications: research and technology development

XII.A.4 Lorenzo BARTOLUCCI, *University of Rome Tor Vergata*
Fuel Cell Modeling for an Efficient Stack Design

XII.B Electrochemical energy storage: innovative materials and systems - Part III (Systems)

Co-organized with ENEA
Chair: Alessandra DI BLASI, ENEA

The symposium is part of the Workshop WS.VII

XII.B.1 Enrica MICOLANO, *RSE*
Innovative cell monitoring devices and diagnostic algorithms to predict aging mechanisms and residual useful life

XII.B.2 Salvatore Gianluca LEONARDI, *CNR*
Creation of lithium-ion battery ageing datasets for the development and training of data-driven algorithms for estimating SoH and RUL of batteries used in grid services

XII.B.3 Giulio MELA, *RSE*
An R package for the computation of the Commodity Life Cycle Costing Indicator. An Economic Measure of Natural Resource Use in the Life Cycle

XII.B.4 Alessandra DI BLASI, Margherita MORENO, *Omar PEREGO, CNR-ITAE | ENEA | RSE*
National, European and international initiatives on batteries

XII.C Advancements in nanomaterials synthesis and nano characterization for Electronic Applications

Co-organized with Sapienza University of Rome
Chair: Paolo POSTORINO, *University of Rome*

XII.C.1 Gabriele CALABRESE, *IMM-CNR, Bologna*
Effect of the molecular self-assembly under confinement on the thermoelectric properties of thin films

XII.C.2 Flavio COGNIGNI, *Sapienza University of Rome*
Leveraging Correlative Microscopy for Failure Analysis in Electronics and Semiconductors

XII.C.3 Tommaso A. SALOMONE, *Sapienza University of Rome*
Nanostructured polymer/AuNPs blends for optoelectronics

XII.C.4 In definition

XII.D *Session Flagship Project FP7:* Advanced and automated innovation labs for diagnostic and therapeutic biopharma solutions

Chairs: To be defined by Lead Industries, To be defined by Universities and EPR

The symposium is part of the Special Event SE.II

XII.D.0 Introduction by the Chairs

XII.D.1 Raffaele SALADINO, *University of Tuscia*
A unique and integrated lignin based nano-platform for health and nanomedicine applications

XII.D.2 Lucia GABRIELE, *ISS*
Establishing ISoChipLab to develop immune_system-on-chip models for improving preclinical research and drug testing

XII.D.3 Alberto SINIBALDI, *Sapienza University of Rome*
Development of a point-of-care nano-photonic platform for the quantitative detection of biomarkers in plasma of patients affected by cancer and infectious diseases

XII.D.4 Eliana CAPECCHI, *University of studies of Tuscia*
Sustainable Nanostructured Polyphenols: advanced Bio-Inks and biosensors for dermocosmetic and precision medicine

XII.D.5 Federica MONDIO e Augusto GIARDINI, *Catalent Anagni Srl*
Lipidic Nano Particles and their use in the m-RNA vaccines

PARALLEL LECTURES (PL) SESSIONS

20 SEPTEMBER

10:50 - 11:30

Chair: Luciana DINI, *Sapienza University of Rome*

PL.I.A	Simone DINARELLI, *Istituto di Struttura della Materia, CNR* **The Nanomotion Sensor: how AFM Cantilevers can be used as nanosensors for real-time investigations in biomedicine**

Chair: Giorgio DIVITINI, *IIT*

PL.I.B	Jordi ARBIOL, *Catalan Institute of Nanoscience and Nanotechnology ICN2, Barcelona, Catalonia, ES* **Nanostructures at Atomic Scale: From Energy and Environmental Applications to QD**

Chair: Reuven SEGEV, *Ben-Gurion University of the Negev, Israel*

PL.I.C	Raffaele BARRETTA, *University of Naples "Federico II"* **Challenges and achievements in nonlocal mechanics of nanostructures**

21 SEPTEMBER

10:50 - 11:30

Chair: Luca MARCHIOL, *University of Udine*

PL.II.A	Ana Maria RINCON, *EFSA - European Food Safety Authority* **Regulatory safety assessment in the European Union of food additives containing nanoparticles**

Chair: Danilo DINI, *Sapienza University of Rome*

PL.II.B	José SOLLA-GULLÓN, *University of Alicante* **Shape-controlled nanoparticles in Electrocatalysis: from fundamentals to recent advances and future challenges**

Chair: Massimo BERSANI, *FBK, Trento*

PL.II.C	Amir PAKDEL, *Trinity College - Dublin, Ireland* **Advancing Thermal Energy Harvesting Efficiency through Nanoengineered Thermoelectric Materials**

Chair: Ernesto PLACIDI, *Sapienza University of Rome (to be confirmed)*

PL.II.D	Livia ANGELONI, *Eindhoven University of Technology, The Netherlands* **AFM and AFM for Cellular Mechanics and Biomaterial Interaction**

22 SEPTEMBER

10:50 - 11:30

Chair: Marco VITTORI ANTISARI, *NanoItaly Association*

PL.III.A	Eugenia PECHKOVA, *University of Genova* **Protein Langmuir-Blodgett (LB) nanofilms with amyloid motifs: characterization and application**

Chair: Danilo DINI, *Sapienza University of Rome*

PL.III.B	Robert HILLMANN, *University of Leicester* **Electron Transfer Reactions for Latent Fingerprint Visualization: From Nanoscale Control of the Fundamentals to Macroscopic Imaging**

Chair: Giuliano CASATI, *Oxford Instruments NanoAnalysis*

PL.III.C	Keith DICKS, *Oxford Instruments NanoAnalysis* **Correlative Indexing with Dynamic Template Matching – Hybrid EBSD - Pattern Matching**

Chair: Domenico BORELLO, *Sapienza University of Rome*

PL.III.D	Dina LANZI, *SNAM* Title in definition

BREAKOUT SESSIONS

September 20-21-22

NanoInnovation BreakOut sessions are designed to provide a focused, interactive and informal sessions, where participants split into smaller groups to discuss specific topics, themes, or issues related to research topics, practical applications, processes & products, challenges and emerging trands, cooperation opportunities, projects and other aspects of their professional activities. They aim to encourage in-depth conversations, brainstorming, and the exchange of ideas among attendees who share a common interest related to the selected themes. Experts or moderators guide the discussions and ensure that the conversation stays on track. The topics for these sessions have been chosen to cover various aspects of nanotechnology, ranging from cutting-edge research to practical applications, challenges, formation and emerging trends. The typical objective of a BreakOut session is to foster a more intimate and collaborative environment compared to the main event, allowing participants to delve deeper into specific subjects. It's an opportunity for attendees to share their insights, research findings, and opinions, as well as to network and establish connections with fellow professionals who have similar interests. In summary, a BreakOut session at a scientific event like Nanoinnovation serves as a platform for focused discussions, knowledge exchange, and networking among participants who are passionate about nanotechnology and its advancements.

The BreakOut Sessions will take place between 17.45 and 19.15, shortly after the conference programme, in parallel with the cocktail hour (17.30 and 20.00).

20 SEPTEMBER

BO.1 - BreakOut Session 17:45 - 19:15	
Survivor's skills: How to survive in the jungle of research (I)	
Chairs: Allegra VIA (*Sapienza University of Rome),* Diego MANTOVANI (*University of Laval, Canada) and* Francesca BOCCAFOSCHI (*University of Piemonte Orientale)*	
BO.1.A.1	**Developing a career in research: things you should carefully consider (Session 1 of 3)**
Innovation of Tools for Imaging and Fabrication (I)	
Chair: Massimo BERSANI, *FBK (to be confirmed)*	
BO.1.B.1	Byron JA. CHETHAM, *CytoViva, Inc* & Fabio PERISSINOTTO, *Schaefer* **Label Free, Hyperspectral Microscopy for Materials and Biological Research**
BO.1.B.2	Massimo STROPPARI, *Areaderma* **High-Control Production Technologies for Innovative Natural Cosmetics**
BO.1.B.3	Keith DICKS, *Oxford Instruments NanoAnalysis* **Simultaneous high speed Backscattered Electron and X-Ray (BEX) imaging - a new technique for SEM**
Rome Technopole: ROUND TABLE (I)	
Chair: Franco FOSSATI, *Foundation Rome Technopole, Scientific Director*	
BO.1.C.1	**Round Table on Energy Transition (flagship projects FP1, FP2 and PF3)**

21 SEPTEMBER

BO.2 - BreakOut Session 17:45 - 19:15	
Survivor's skills: How to survive in the jungle of research (II)	
Chair: Allegra VIA, *Sapienza University of Rome*	
BO.2.A.1	**Do I have the transferable skills to successfully develop my research career? (Session 2of 3)**
Innovation of Tools for Imaging and Fabrication (II)	
Chair: Massimo BERSANI, *FBK*	
BO.2.B.1	Richard HALL-WILTON, *Director of Center for Sensors and Devices, FBK, Trento* **Tools for Innovation @ FBK**
BO.2.B.2	Fabio PERISSINOTTO, *Schaefer* & Aubrey LAMBERT, *TomoCube,Inc* **Label free, live cell imaging with quantitative measurement allows accurate 3D measurement of cell morphology, cellular interactions, and cellular kinetics**
BO.2.B.3	Vasilis THEOFYLAKTOPOULOS, *Gambetti Kenologia, Heidelberg Instruments Nano, Switzerland* **NanoFrazor Lithography for advanced 2D & 3D nanodevices**
Rome Technopole: ROUND TABLE (II)	
Chair: Franco FOSSATI, *Foundation Rome Technopole, Scientific Director*	
BO.2.C.1	**Round Table on Digital Transition (flagship projects FP5, FP6 and PF8)**

22 SEPTEMBER

BO.3 - BreakOut Session 16:00 - 17:30	
Survivor's skills: How to survive in the jungle of research (III)	
Chair: Allegra VIA, *Sapienza University of Rome*	
BO.3.A.1	**Focus on communication, interpersonal and career development skills (session 3 of 3)**
17:45 - 19:15	
Nanotechnology and Innovation: Labs & Industries points of view	
Chair: to be defined	
BO.3.B.1	Settimio CASTELLI, *Karthesia* **Title to be defined**
Rome Technopole: ROUND TABLE (III)	
Chair: Franco FOSSATI, *Foundation Rome Technopole, Scientific Director*	
BO.3.C.1	**Round Table on Health and Bio-Pharma (flagship projects FP4 and PF7)**

YOUNGINNOVATION

The State of Research communicated by Young Researchers

September 20 - 21 - 22

Chairs:
Donatella PAOLINO, University Magna Graecia of Catanzaro & Marco ROSSI, Sapienza University of Rome

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NanoInnovation has always been committed to promoting science and research at all levels. With a mission to encourage exchanges between universities, research institutions, and companies, the organization aims to facilitate the participation of early-stage researchers in the scientific world and support their careers through mentorship activities. In line with these goals, NanoInnovation is excited to announce the third edition of the special event "YoungInnovation - The State of Research communicated by Young Researchers," which will take place on September 20-22 in collaboration with the University Magna Graecia of Catanzaro and Sapienza University of Rome. In today's world, science, technology, and innovation serve as the driving force behind global development. As our society faces complex and rapidly changing challenges, researchers play a crucial role in finding solutions. It is the new generations of researchers and scientists who hold the key to future development worldwide. The three-day event will feature a series of symposia where the state of research will be presented by young researchers, preferentially under the age of 35, who dedicate their days to working in laboratories to produce innovation. YoungInnovation aims to communicate the current status of research, with a particular focus on highly innovative aspects. The symposia will cover a wide range of topics, including life sciences, material sciences, personalized medicine, advanced microscopy techniques, etc (da specificare nel caso). To further enrich the event, plenary scientific lectures will be delivered by renowned "Senior Scientists." These distinguished individuals will provide valuable insights and a roadmap on the topics discussed during the daily symposia, offering a comprehensive overview of the field's advancements. Beyond its scientific contributions, the event aims to foster the exchange of ideas and provide support to young researchers in their endeavors. YoungInnovation will serve as a platform where these aspiring scientists can engage in meaningful discussions, share their research, and network with their peers who will be attending the event. With the third edition of YoungInnovation, NanoInnovation continues its commitment to nurturing the talent and potential of young researchers. By dedicating a significant portion of the event to their contributions, the organization ensures that their work receives the recognition and visibility it deserves. As a result, the event not only serves as a showcase of cutting-edge research but also as a catalyst for collaboration, inspiration, and the advancement of scientific knowledge.

A very special and sweet thank you goes to
'Antica Dolceria Bonajuto'
for the energy boost to the YoungInnovation crew
(www.bonajuto.it).

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20 SEPTEMBER

09:00 - 10:30	SE.I.1

Exploring the Future: Advances in 3D Bioprinting for Tissue Engineering and Regenerative Medicine

Chair: Michele CONTI, *University of Pavia*

SE.I.1.1	***Introductive Keynote*** Carmine GENTILE, *University of Technology, Sydney, Australia* **Bioengineering the human cardiac microenvironment uing patient- derived cardiac spheroid and 3D bioprinting technologies**
SE.I.1.2	Giuseppe Francesco RACANIELLO, *University 'Aldo Moro' of Bari* **Production of solide dosage forms via Direct Powder Extrusion 3D Printing**
SE.I.1.3	Pier Francesco GAZIANO, *University of Tor Vergata, Rome* **Cells in bioprinted hydrogel structures: insights from models and simulations**
SE.I.1.4	Elena DELGROSSO, *Univeristy of Pavia* **3D Bioprinting to Develop Neoplastic Biological Constructs for Experimental Boron Neutron Capture Therapy (BNCT) Applications**
SE.I.1.5	Michele MARINO, *University of Tor Vergata, Rome* **Cellular stress response in tissues: the good, the bad and the ugly**

Round table

11:30 - 13:00	SE.I.2

Bioengineering for biomedical applications of microfluidics

Chair: Francesco PASQUALINI, *University of Pavia*

SE.I.2.1	***Introductive Keynote*** Federica CASELLI, *University 'Tor Vergata', Rome* **Advanced microfluidic strategies for cytometry**
SE.I.2.2	Gianluca CIDONIO, *Center for Life Nano and Neuro Science, IIT Rome* **Novel aqueous two phase solutions for 3D microfluidic bioprinting applications**
SE.I.2.3	Marco BELLOTTI, *University of Pavia* **Use of numerical simulations to better understand the formation process of Nanoparticles**
SE.I.2.4	Chiara SCOGNAMIGLIO, *Center for Life Nano and Neuro Science, IIT Rome* **Ovarian cancer immunotherapy on a chip: a 3d preclinical model to test novel mi-RNA based therapies**
SE.I.2.5	Francesco SERPE, *Sapienza University of Rome* **Foaming fibres with 3D microfluidic bioprinting for the engineering of bone-relevant implants**

Round table

20 SEPTEMBER

14:00 - 15:30	SE.I.3
Regenerative medicine: current applications, challenges and future directions	
Chair: Francesca MEGIORNI, *Sapienza University of Rome*	
SE.I.3.1	***Introductive Keynote*** Simona CECCARELLI, *Sapienza University of Rome* **Advances in regenerative medicine: from tissue engineering and cell-based therapies to microfluidics technology**
SE.I.3.2	Daniela ROSSIN, *University of Turin* **Revolutionizing Cardiac Therapy: 3FEEP - A Nanofunctionalized Scaffold for Post-Myocardial Infarction Tissue Protection and Regeneration**
SE.I.3.3	Francesco PASQUALINI, *University of Pavia* **Instrumented human stem cells for drug discovery, disease modeling, and regenerative medicine**
SE.I.3.4	Paola PONTECORVI, *Sapienza University of Rome* **Tissue engineering in Mayer-Rokitansky-Küster-Hauser syndrome: state of the art and future perspectives**
SE.I.3.5	Domenica CONVERTINO, *Center for Nanotechnology Innovation, IIT, Pisa* **Interaction of graphene and WS2 with neutrophils and mesenchymal stem cells: implications for peripheral nerve regeneration**
Round table	

16:00 - 17:30	SE.I.4
Cell Models In Personalized Medicine	
Chair: Christian CELIA, *University 'Gabriele d'Annunzio' of Chieti*	
SE.I.4.1	***Introductive Keynote*** Bruno SARMENTO, *Universidade do Porto, Portugal* **Multicellular 3D vascularized cell models in translation of nanomedicines**
SE.I.4.2	Edmondo BATTISTA, *University of Chieti* **Advanced Material Platform Based on PEG-Microgels**
SE.I.4.3	Greta POMANTI, *Sapienza University of Rome* **REPorter system for RNA-based therapy detecting apoptosis and cellular stress inORGanoid models - REP-ORG systems**
SE.I.4.4	Antonella ESPOSITO, *Sapienza University of Rome* **A phenotypic switch in sensitivity to ferroptosis is observed in cancer stem cells enriched 3D cultures vs 2D cultures of primary lung adenocarcinoma cells**
SE.I.4.5	Simona CAMERO, *Sapienza University of Rome* **Personalized medicine in cancer treatment: preclinical evaluation of targeted therapies in innovative 3D tumor models**
Round table	

17:45 - 19:15
Survivor's skills: How to survive in the jungle of research: Developing a career in research: things you should carefully consider (Session 1 of 3)

21 SEPTEMBER

09:00 - 10:30	SE.I.5

Catalyzing Tissue Engineering: Exploring the Microfluidic Frontier

Chairs: Carlo Massimo CASCIOLA, *Sapienza University of Rome* & Chiara SCOGNAMIGLIO, *IIT, Rome*

SE.I.5.1	***Introductive Keynote*** Kristina HAASE, EMBL, *Barcellona, Spain* **Engineering human microtissues to study development and disease**
SE.I.5.2	Ersilia FORNETTI, *Center for Life Nano and Neuro Science, IIT Rome* **Development of a human neuromuscular junction on-a-chip**
SE.I.5.3	Martina MARCOTULLI, *Center for Life Nano and Neuro Science, IIT Rome* **Development of a low-intensity pulsed ultrasound print-head to drive the differentiation of 3D bioprinted skeletal stem cells**
SE.I.5.4	Raffaele CRISPINO, *Center for Advanced Biomaterials for Health Care, IIT Naples* **Gut on-a-chip to study and fight obesity**
SE.I.5.5	Michele D'ORAZIO, *University of Rome "Tor Vergata"* **An Innovative platform for reliable Deep Learning Management of Time-lapse Videos in Lab-on-Chip Experiments**

Round table

11:30 - 13:00	SE.I.6

Precision Medicine: Unraveling New Frontiers with Advanced Models

Chair: Lia RIMONDINI, *Piemonte University Orientale "Amedeo Avogadro", Novara*

SE.I.6.1	***Introductive Keynote*** Andrea COCHIS, *Piemonte University Orientale "Amedeo Avogadro"* **Innovative models and strategies for personalized bone and cartilage repair**
SE.I.6.2	Maria Camilla CIARDULLI, *University of Salerno* **Growth factor controlled delivery systems & 3D biomimetic culture: a study of tenogenic and condrogenic events on human mesenchymal stem cells**
SE.I.6.3	Anna CITARELLA, *Sapienza University of Rome* **Unravelling the Adipose Tissue-BPA interaction in triple negative breast cancer progression: the role of the tumour microenvironment**
SE.I.6.4	Mauro NASIMBEN, *ENGINSOFT SpA, Padova* **Low-power or resource-constrained environments for virtual screening and quantitative structure-activity relationship analysis for in silico precision medicine**
SE.I.6.5	Farah DAOU, *Piemonte University Orientale "Amedeo Avogadro", Novara* **Unraveling the Transcriptome Profile of Pulsed Electromagnetic Field Stimulation**

Round table

21 SEPTEMBER

14:00 - 15:30	SE.I.7

Revolutionizing Cancer Treatment: The Power of CAR-T Therapy

Chair: Maria Chiara CRISTIANO, *University Magna Graecia of Catanzaro*

SE.I.7.1	***Introductive Keynote*** Biagio DE ANGELIS, *IRCCS Ospedale Pediatrico Bambin Gesù, Roma* **Gene Therapy with CAR-T cells: from the researcher's bench to the patient bedside**
SE.I.7.2	Michele PEZZELA, *IRCCS Ospedale Pediatrico Bambin Gesù, Roma* **Engineering CXCR2-modified GD2.CAE T Cells to improve chemotaxis and antitumor efficacy in a pediatric sarcoma model**
SE.I.7.3	Marco CORTESE, *University of Turin* **Design, characterization and preclinical validation of a combinatorial CAR-based immunotherapy against colorectal cancer with HER2 amplification**
SE.I.7.4	Caterina D'ACCARDO, *University of Palermo* **CD44v6-specific CAR-T cells: a promising therapeutic strategy for colorectal and thyroid cancer patients**
SE.I.7.5	Valeria LEUCI, *University of Turin* **CAR Cell therapy in the era of solid tumor treatment: a versatile and customizable living drug**

Round table

16:00 - 17:30	SE.I.8

Unveiling the Potential of Advanced Nanostructured Materials in Biomedicine

Chairs: Luciano GALANTINI & Iolanda FRANCOLINI, *Sapienza University of Rome*

SE.I.8.1	***Introductive Keynote*** Maria Chiara DI GREGORIO, *Sapienza University of Rome* **Metal Organic Crystals: shaping, uniformity and simmetry breaking**
SE.I.8.2	Valeria D'ANNIBALE, *Sapienza University of Rome* **Porphyrins/Bile Salts interplay towards new nano-composite materials**
SE.I.8.3	Erica QUAGLIARINI, *Sapienza University of Rome* **Magnetic Levitation of Personalized Nanoparticle–Protein Corona as an Effective Tool for Cancer Detection**
SE.I.8.4	Marco COSTANTINI, *Warsaw Institute of Physical Chemistry of Science Academy* **Digital manufacturing in biomedical research: a step towards engineering functional tissue and organ replicas in vitro**
SE.I.8.5	Lucrezia DESIDERIO, *Sapienza University of Rome* **Determination of the optimal pH for Doxorubicin encapsulation in polymeric micelles**

Round table

17:45 - 19:15
Survivor's skills: How to survive in the jungle of research: Do I have the transferable skills to successfully develop my research career? (Session 2of 3)

22 SEPTEMBER

09:00 - 10:30	SE.I.9

Artificial intelligence and Machine learning in digital health

Chair: Laura BONZANO, *University of Genova*

SE.I.9.1	***Introductive Keynote*** Alessia BRAMANTI, *University of Salerno* **Application of artificial intelligence and machine learing in cardiovascular diseases**
SE.I.9.2	Monica BIGGIO, *University of Genova* **Disentangling Blink Reflexes in Multiple Sclerosis with machine learning techniques**
SE.I.9.3	Giuseppe Felice RUSSO, *University of studies of Salerno* **Innovation in cardiology: telemedicine and artificial intelligence to manage heart failure**
SE.I.9.4	Luigi CHIRICOSTA, *IRCCS Messina* **Big data and omics: bioinformatics to support personalized medicine**
SE.I.9.5	Paulina Anna WOJTYLO, *University of Perugia* **Development of the novel indolic modulators of the aryl hydrocarbon receptor using machine learning**

Round table

11:30 - 13:00	SE.I.10

Nanotechnologies for precision medicine

Chair: Emanuela Fabiola CRAPARO, *University of Palermo*

SE.I.10.1	***Introductive Keynote*** Nunzio DENORA, *University 'Aldo Moro' of Bari* **Are targeted nano-drug delivery strategies critical for success of precision model?**
SE.I.10.2	Domenico LIGUORO, *Sapienza University of Rome* **Systemic delivery of miRNA-loaded nanoparticles blunts resistance to targeted therapy in BRAF-mutant melanoma**
SE.I.10.3	Ilaria ARDUINO, *University of Bari* **Microfluidic-assisted preparation of solid lipid nanoparticles for the brain-delivery of biologicals**
SE.I.10.4	Alessio INCOCCIATI, *Sapienza University of Rome* **Engineered ferritin nanoparticles for biomedical applications: tailoring the external and internal surfaces for enhanced functionality**
SE.I.10.5	Lorenzo MANCINI, *University of Perugia* **Microfluidic manufactured nanohybrid self-assembling platforms for protein delivery**

Round table

22 SEPTEMBER

14:00 - 15:30	SE.I.11

Tumor microenvironment on the move: progress and challenges

Chair: Marilena LANZINO, *University of Calabria*

SE.I.11.1	***Introductive Keynote*** Ines BARONE, *University of Calabria* **The weight of obesity in breast cancer: unravelling the molecular links**
SE.I.11.2	Martina VINCENZI, *Sapienza University of Rome* **Identification of a novel biomarker of HIF-1alpha-mediated doxorubicin resistance in 3D cancer spheroid models**
SE.I.11.3	Elena SPLENDIANI, *Sapienza University of Rome* **Circulating EV-microRNAs in Metastatic Melanoma: from diagnostic to response to treatment biomarkers**
SE.I.11.4	Maria Gioia FABIANO, *Sapienza University of Rome* **Inhibiting Pin1 by ATRA-loaded niosomes to treat High-Grade Serous Ovarian Cancer**
SE.I.11.5	Giusy AUGIMERI, *University of Calabria* **A hybrid cell population generated through engulfment of mesenchymal stem cell by breast cancer cells enhances chemoresistance and metastasis**

Round table

16:00 - 17:30
Survivor's skills: How to survive in the jungle of research: Focus on communication, interpersonal and career development skills (session 3 of 3)

Finanziato dall'Unione europea NextGenerationEU | Ministero dell'Università e della Ricerca | Italiadomani PIANO NAZIONALE DI RIPRESA E RESILIENZA | ROME TECHNOPOLE INNOVATION ECOSYSTEM

ROME TECHNOPOLE

The state of research communicated by the players

September 20 - 21 - 22

Organized by: **Foundation Rome Technopole**

Rome Technopole is the Lazio regional innovation ecosystem - made up of 7 universities, 4 Research bodies, the Lazio Region and the Municipality of Rome, and other public bodies, 20 industrial groups and companies - which actively contributes to increasing investments in research and development, in the driving sectors of:
1. energy transition,
2. digital transition,
3. health and bio-pharma.

Rome Technopole is one of the most ambitious, innovative and challenging projects in the NRP area, financed by the MUR with 110 million Euros, which engages the Partners in the implementation of innovative projects over 3 years.

The 8 Flagship Projects of the Rome Technopole are:
1. Decarbonization and digitization in research on new green energy sources
2. Energy transition and digital transition in urban regeneration and construction
3. Digital transition in the decarbonization process and waste recycling processes
4. Development, innovation and certification of medical and non-medical devices for health
5. Digital transition through radar technologies, quantum cryptography and quantum communications
6. Artificial intelligence, virtual reality and digital twins for advanced engineering and aerospace
7. Advanced and automated innovation laboratories for diagnostic and therapeutic biopharmaceutical solutions
8. Human-centred artificial intelligence for customer service and business development.

Also, Rome Technopole provides the city of Rome and the Lazio region with a "one-door" model for university education, for higher education, for research and technology transfer, for the promotion and development of innovation in sectors with a higher technological content and of strategic interest for our country. Sapienza University of Rome is the project leader, and the President of Rome Technopole Foundation is Antonella Polimeni, Rector of Sapienza University of Rome. The Rome Technopole Foundation idea comes from the availability of several academic and industrial excellences established in a narrow geographycal comprensory and all related to research and technologies development applied to energy and digital transition as well as into the field of Health and Biopharma. This is seen as a viable answer to the challenges coming from the market demand evolution, from the increased commercial and technological capacities of emerging countries as well as from the need of keeping or reaching the state of the art in the domains mentioned above. The objective is intended to be reached by simplifying the enterprise-academia relationship through a unique entity where all the capacities are embedded, shortening the reaction time upon the request of qualified personnel/competencies and adapting the high educational path upon specific requests coming from the industrial world. The success of this initiative depends from the way it is applied in practice, from the acceptance of each partner of collaborating wherever there is not direct competition among each other and from the recognition of intensification of the level of the defies every company has to face to survive a market more and more aggressive, such that putting in place a research partership merging with its neighbors can be an effective way not to disperse resources.

For more information visit our web site here: Organized by the Foundation Rome Technopole, the Workshop is structured around a comprehensive workplan featuring the eight flagship projects, which together the 6 spokes collectively represent the pillars upon which the Rome Technopole's mission is built, embodying the intersection of research, academia, industry, and regional governance. By exploring the strategic details of each flagship project, this workshop serves as a critical platform for knowledge dissemination, idea exchange, and fostering collaborative synergies.

The sessions will provide an in-depth analysis of the technological breakthroughs, research milestones, and industry collaborations that define each flagship project. Participants will gain insights into the innovative methodologies, cross-disciplinary approaches, and transformative impacts that these projects are set to achieve within their respective thematic domains. As the Rome Technopole ecosystem propels forward, the workshop stands as a testament to the collective dedication towards shaping a future marked by sustainable energy, digital transformation, and advancements in healthcare and biopharmaceuticals.

20 SEPTEMBER

11:30 - 13:00	SE.II.1

Session Flagship Project FP1:
Decarbonization and digitalization in research on new green energy sources

Lead industry: Eni S.p.A
Universities and EPR: Università La Sapienza, Università di Roma Tor Vergata, Università degli Studi Roma Tre, Università degli studi di Cassino e del Lazio Meridionale, Università degli Studi della Tuscia, Università Campus Bio-Medico di Roma- UCBM, CNR – Consiglio Nazionale delle Ricerche, ENEA - Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile
Industries and other entities: Aeroporti di Roma, ACEA, Catalent

Chairs: Juan Andres BUONADONNA, ENI S.p.A. (to be confirmed), to be defined from Universities and EPR

FP1 involves activities starting from fundamental and applied research, up to development of: training programs focused on the theme of sustainable entrepreneurship through the collaboration with ENI Joule; training programs capable of vertically specializing the best talents and developing resources through an innovative training offer, focused on the new skills needed for green jobs; virtual reality tools, which have the ultimate goal of supporting the energy transition; specific programs with activities that involve employees of partner companies and / or selected companies that correspond to the Technopole mission on intrapreneurship issues, favoring a "contamination"; of experiences between the same participants from different companies.

SE.II.1.0	Introduction by the Chairs
SE.II.1.1	Franco RISPOLI, *Sapienza University of Rome* **Development of advanced models and experimental testing of innovative, renewable and sustainable energy technologies applied to different scenarios, from the mobility sector to the renewable energy communities**
SE.II.1.2	Ginevra SALERNO & Laura MICHELI, *Roma Tre University* **SWEET (Sustainable Water Energy Environmental Technologies)**
SE.II.1.3	Marco FORTUNATO, *Sapienza University of Rome* **Flexible Nanogenerators based on Piezoelectric PVDF-TrFE Nanocomposites Poled via DC Magnetic Field**
SE.II.1.4	In definition

20 SEPTEMBER

14:00 - 15:30	SE.II.2

Session Flagship Project FP2:
Energy transition and digital transition in urban regeneration and construction

Lead industry: COIMA Rem s.r.l.
Universities and EPR: Sapienza Università di Roma, Università di Roma Tor Vergata, Università degli Studi Roma Tre, Università degli Studi Cassino e del Lazio Meridionale, Università degli Studi della Tuscia, Università LUISS, Campus Biomedico, CNR, ENEA, INFN
Industries and other entities: Almaviva, BVtech

Chairs: To be defined by COIMA Rem s.r.l., To be defined from Universities and EPR

FP2 focuses on development and application of digital and green technologies to urban regeneration and building construction, according to the green city approach which assumes ecological quality as a strategic priority in order to ensure sustainability and resilience of programs and intervention projects in the era of the climate crisis, soil scarcity and other natural resources. The project cover all aspects of the open-innovation chain including: i) Technology development and innovation aimed at implementing digital transition and zero- emission in construction and urban regeneration; ii) Scale-up of technology in order to enhance TRL of these technologies and apply it to the design of the new campus and headquarter of Rome Technopole, as a case-study for technology exploitation; iii) Development of a model of sustainable mobility integrated in the project of green urban regeneration; iv) Educational and training activities on these technologies to be integrated as "minor" courses in the existing ones; v) Outreach and public engagement aimed at disseminating the culture of digital transition and green technology for urban regeneration in society.

SE.II.2.0	Introduction by the Chairs
SE.II.2.1	Alessandra BELLIONI, *Coima REM S.r.l.* **The digital and energy transition in the field of urban regeneration**
SE.II.2.2	Fabrizio TUCCI, *Sapienza University of Rome* **Energy Transition in the multiscale project**
SE.II.2.3	Federico CINQUEPALMI, *Sapienza University of Rome* **Digital transition and digital twin**
SE.II.2.4	Francesco MISSO, *BV Tech* **Sustainable mobility**

20 SEPTEMBER

16:00 - 17:30	SE.II.3

Session Flagship Project FP3:
Digital transition in the decarbonization process and in waste recycling processes

Lead industry: Maire Tecnimont SpA
Universities and EPR: Università La Sapienza, Università di Roma Tor Vergata, Università degli Studi Roma Tre, Università degli studi di Cassino e del Lazio Meridionale, Università della Tuscia, Libera Università Internazionale degli Studi Sociali Guido Carli (LUISS), Consiglio Nazionale delle Ricerche (CNR), Università Campus Bio-Medico (UCBM)
Industries and other entities: Almaviva

Chairs: Ezio PASQUALON, *Maire Tecnimont S.p.a.*, Antonio CARCATERRA, *University of Rome La Sapienza*

The main aim of the project is to study how digital technologies can help to better industrialize waste recycling processes and plants by making them sustainable and innovative, while promoting the creation and activation of circular districts.
The project, being transversal to the areas of digital and ecological transition, is structured in the following technological tasks:

1. the development of a predictive model based on artificial intelligence to predict the characteristics of incoming waste as feedstock in order to pilot its delivery chain;
2. the selection and advanced characterization of waste to map its origin and characteristics;
3. the tracking and advanced characterization of recycled products to enable circular economy clusters;
4. the development of innovative and sustainable low TRL technologies, processes and materials for the recycling and reuse of waste materials (e.g. recovery of critical elements and rare earths from waste, etc.)
5. the development of a voluntary certification system, based on blockchain technology, aimed at placing "plastic credits" on the market with a scheme similar in principle to that of "carbon permits or credits";
6. The advanced and predictive monitoring of the environmental impact of waste recycling plants.

SE.II.3.0	Introduction by the Chairs
SE.II.3.1	Ezio PASQUALON & Antonio CARCATERRA, *Maire Tecnimont S.p.a. & Sapienza University of Rome* **Digital transition in waste recycling processes:how to achieve Waste Menagement 4.0**
SE.II.3.2	Nicola VERDONE, *Sapienza University of Rome* **Simulation of zero emission waste pyrolysis in recycling plant**
SE.II.3.3	Antonio CULLA, *Sapienza University of Rome* **Automated monitoring and inspections of waste recycling plant**

17:30 - 20:00
Cocktail & Social

17:45 - 19:15
ROUND TABLE ON ENERGY TRANSITION

21 SEPTEMBER

11:30 - 13:00	SE.II.4

Session Flagship Project FP5:
Digital transition through AESA (Active Electronically Scanned Array) radar technology, quantum cryptography and quantum

Lead industry: Leonardo SpA
Universities and EPR: Università degli Studi di Roma "Tor Vergata", CNR – Consiglio Nazionale delle Ricerche, Università degli Studi della Tuscia, Sapienza Università di Roma, Università degli Studi Roma Tre
Industries and other entities: Airbus Italia, MBDA Italia SpA

Chair: Chair: Filippo DE STEFANI, *Leonaro S.p.a.*

The project will focus on the development of innovative processing architectures and AESA radars and on new technologies for quantum cryptography & communications, from satellite to ground. Digital transition of the leading theme across this project and it is declined through the following main topics: 1) Neural processing, compressive sensing, waveform optimization, micro doppler detection, sustainability, virtualization, digital twin, with the scope also to set up a domestic line of production and overcome risks connected to a technological dependency and supply shortage, improve costs/performance ratio and increase the competitiveness of the national industry; 2) Multisensor and distributed processing (considering also cyber resilience); 3) Artificial intelligence evolution and big data analytics. Moreover, in the perspective of innovation ecosystem, a Joint Lab will be set up with the scope of analyzing and validating the performance of network components and key exchange protocols in relation to the physical characteristics of the quantum signal, with a view to realize integrated terrestrial / satellite networks. Specific innovative curricula will be activated in existing university courses in order to strengthen and widening knowledge of students in ICT and big-data engineering.

SE.II.4.0	Introduction by the Chairs
SE.II.4.1	Alberto MACRI PELLIZZERI, *MBDA Italia SpA* & Filippo de STEFANI, *Leonardo S.p.A.* **New functionalities for AESA Radar**
SE.II.4.2	Gian Carlo CARDARILLI, *Università di Roma Tor Vergata* **Calibration techniques for MIMO radar**
SE.II.4.3	Andrea QUIRINI, Fabiola COLONE, Pierfrancesco LOMBARDO, *Sapienza University of Rome* **A Flexible Design Strategy for Three-Element Non-Uniform Linear Arrays**
SE.II.4.4	Romeo BECCHERELLI, *CNR* **Beamscanning antenna for THz applications**
SE.II.4.5	Stephan WABNITZ, Fabio SCIARRINO, *Sapienza University of Rome* **Optical Transmission with multimode fibers**
SE.II.4.6	Luigi SIGILLO, Danilo COMMINIELLO, *Sapienza University of Rome* **Generative AI for Remote Sensing Imagery**

21 SEPTEMBER

14:00 - 15:30	SE.II.5

Session Flagship Project FP6:
Artificial intelligence, virtual reality and digital twin for advanced engineering and aerospace

Lead industry: Thales Alenia Space
Universities and EPR: Sapienza Università di Roma, Università di Roma Tor Vergata, Università degli studi Roma Tre, Università degli studi di Cassino e del Lazio Meridionale, Università della Tuscia, CNR, LUISS, INFN, ENEA, Università Campus Bio-Medico di Roma
Industries and other entities: Airbus Italia, Almaviva, Bvtech, MBDA

Chairs: Giovanni MORABITO & Stefano PENNA, *Thales Alenia Space Italia* and Enrico TRONCI, *Sapienza Università di Roma*

This project is centered within the digital transition stream and involved different activities in the innovation ecosystem perspective: applied research, technology development and innovation; Open Research Infrastructures; higher education with industrial collaboration. The scope is to create a Join Lab to promote a stable cooperation between universities, research centers and industries to develop proof-of-concept level activities in the field of advanced engineering, including space applications, aerospace, satellite technologies, exploiting digital technologies: 1) Artificial intelligence (Machin & Deep learning) and big-data analytics; 2) Virtual and augmented reality; 3) Robotic collaboration; 4) Virtual testing and simulation; 5) Co-design and co-engineering thinking to discover new innovative and creative solutions to be tested, validated and integrated.

SE.II.5.0	Introduction by the Chairs
SE.II.5.1	Laura DI GREGORIO, *Sapienza University of Rome* **Advanced Materials and Manufacturing**
SE.II.5.2	Annalisa SANTOLAMAZZA, *Università di Roma Tor Vergata* **Innovation in Engineering Education: Exploring AI, VR, AR, AM, and Digital Twin applications to foster advanced learning**
SE.II.5.3	Mauro OLIVIERI, *Sapienza University of Rome* and Vittorio GRETO, *MBDA Italia SpA* **Designing Configurable Microprocessors for Accelerated Image Processing and Recognition based on Neural Network Engines**
SE.II.5.4	Enrico TRONCI, *Sapienza University of Rome* and Giovanni MORABITO, *Thales Alenia Space Italia* **Automated design of industrial plants through AI and digital twins**
SE.II.5.5	Pier Paolo VALENTINI & Marco CIRELLI, *Università di Roma Tor Vergata* **Virtual and Augmented Reality Laboratory for supporting the interactive and collaborative development and interrogation of virtual prototypes and digital twins**
SE.II.5.6	Fabio GASPARETTI, *University of Roma Tre* **Recommender Systems in Machine Aided Design**

21 SEPTEMBER

16:00 - 17:30	SE.II.6
Session Flagship Project FP8: **Human-centric AI to deliver empowered customer experiences**	
Lead industry: Universities and EPR: Industries and other entities:	
Chairs: Mattia GIGLIOTTI (UniCredit S.p.a.) and to be defined (Unidata)	
FP8 objective is to foster a more AI-oriented re-design of value chain creation for any digital ecosystem. To this purpose the goals are: devise models, processes and tools that are strongly grounded on the pillars of privacy, robustness, fairness, explainability, sustainability and transparency to stakeholders; and investigate and possibly advance the latest solutions (i.e., those based on the data-as-a-product paradigm), fostering the adoption of privacy, security and sustainability principles by entities and players which are investing in a digital growth.	
SE.II.6.0	Introduction by the Chairs
SE.II.6.1	Patrizio PISANI, *Unidata* **The water network becomes a data driven smart grid**
SE.II.6.2	Mattia GIGLIOTTI, *UniCredit S.p.a.* **Trustworthy and Explainable AI**
SE.II.6.3	definition ongoing
17:30 - 20:00 Cocktail & Social	
17:45 - 19:15 **ROUND TABLE ON DIGITAL TRANSITION**	

22 SEPTEMBER

14:00 - 15:30	SE.II.7

Session Flagship Project FP4:
Development, innovation and certification of medical and non-medical devices for health

Lead industry: BVTech, Confindustria Dispositivi Medici
Universities and EPR: Sapienza Università di Roma, Università di Roma Tor Vergata, Università degli studi di Cassino e del Lazio Meridionale, CNR, UCBM, INFN, ENEA, ISS
Industries and other entities: Catalent Anagni, Takis

Chairs: Mauro CISLAGHI, *BV Tech* & Livia OTTOLENGHI, *University of Rome La Sapienza*

FP4 implements the ecosystem chain related to the process of designing, certifying and applying medical devices, starting with professionals and arriving at patients, in the consideration that every activity in the health sector provides for the use of a medical device. The objective is to implement inside Rome Technopole, thanks to the multidisciplinary and wide range of expertise and partnership, the whole value chain involves: 1) Development of new medical and non- medical devices for heath application and healthcare: this include all steps starting from applied research to technology transfer and scale-up of technologies; 2) Experimental testing and validation of the devices, including the various stages of certification and clinical investigation (e.g. approval by the committee ethics, conducting clinical investigations, etc.); 3) Creation of a new Joint Lab for assist companies in all process of development, testing and certification of medical and non-medical devices, including training for technician and longlife learning.

SE.II.7.0	Introduction by the Chairs
SE.II.7.1	Hossein Cheraghi BIDSORKHI, *Sapienza University of Rome* **Multifunctional Graphene-based Smart sensor for Gait Monitoring**
SE.II.7.2	Gaetano MAROCCO, *University of Rome Tor Vergata* **Simulation, design, and industrialization of secure Bio-integrated wireless devices**
SE.II.7.3	Vincenzo CARDINALE, *Sapienza University of Rome* **Title in definition**
SE.II.7.4	Duilio Luca BACOCCO, *ISS* **Italian Implantable Prostheses Registry infrastructure to monitor patients' health and medical devices safety**

22 SEPTEMBER

16:00 - 17:30	SE.II.8

Session Flagship Project FP7:
Advanced and automated innovation labs for diagnostic and therapeutic biopharma solutions

Lead industry: Takis, Catalent Anagni
Universities and EPR: Università La Sapienza, Università di Roma Tor Vergata, Università degli studi Roma Tre, Università della Tuscia, Università Campus Bio-Medico di Roma, CNR, INFN, ISS

Chairs: To be defined by Lead Industries, To be defined by Universities and EPR

FP7 is aimed to contribute to the development of an advanced open innovation Joint Laboratory focused on the accelerated development of biopharma solutions for enabling innovative characterization and large-scale production of high-affinity monoclonal antibodies for diagnostic and therapeutic applications, and other emerging solutions for relevant pathologies. This laboratory will be directly shared as Joint Open Lab with the research partners of Rome Technopole specialized on the specific area of bio-pharma and with all the other interested Rome Technopole partners and stakeholders for technology transfer, innovation and training activities.

SE.II.8.0	Introduction by the Chairs
SE.II.8.1	Raffaele SALADINO, *Università degli Studi della Tuscia* **A unique and integrated lignin based nano-platform for health and nanomedicine applications**
SE.II.8.2	Lucia GABRIELE, *ISS* **Establishing ISoChipLab to develop immune_system-on-chip models for improving preclinical research and drug testing**
SE.II.8.3	Alberto SINIBALDI, *Sapienza University of Rome* **Development of a point-of-care nano-photonic platform for the quantitative detection of biomarkers in plasma of patients affected by cancer and infectious diseases**
SE.II.8.4	Eliana CAPECCHI, *University of studies of Tuscia* **Sustainable Nanostructured Polyphenols: advanced Bio-Inks and biosensors for dermocosmetic and precision medicine**
SE.II.8.5	Federica MONDIO e Augusto GIARDINI, *Catalent Anagni Srl* **Lipidic Nano Particles and their use in the m-RNA vaccines**

17:30 - 20:00
Cocktail & Social

17:45 - 19:15
ROUND TABLE ON HEALTH AND BIO-PHARMA

Poster Session

For the latest updates, please check the QRcode on the side

01 Luisa AFFATIGATO, *University of Palermo*
Ferritin-coated SPIONs as a smart magnetic nanocarrier for site targeted theranostic applications

02 Valentina ALEMANNO, *Sapienza University of Rome*
Preservation and Reproduction of an Ancient Human Humerus through X-ray Microscopy and 3D Printing

03 Daniele ALMONTI, *Università "Tor Vergata"*
Functionalized Nickel-Graphene Coatings for Tribological Applications

04 Emre ASLAN, *Selcuk University, Turkey*
WC-based materials for electrocatalytic hydrogen evolution

05 Randa ASSADI, *Ben Gurion University of The Negev, IR*
Surface Charge Transfer on Hydrogenate Si for Electrochemical Cells

06 Pierfrancesco ATANASIO, *Sapienza Università di Roma*
Rice Husk Waste-Derived Carbon Aerogels: A Sustainable Approach for Advanced Supercapacitor Electrodes

07 Valeria BARRECA, *Istituto Superiore di Sanità*
Study of exosomes internalization by antigen-presenting cells

08 Silvia BATTISTONI, *IMEM-CNR*
A fully organic memristive system for pattern recognition

09 Mariangela BELLUSCI, *ENEA*
Magnetic Nanoparticles Enclosed In Metal-Organic Frameworks For Magnetic Induction Swing Adsorption Separation Technology

10 Andrea BETTUCCI, *Sapienza University of Rome*
Do Nanoplastics Change Red Blood Cell Viscoelasticity? A Pilot Study Harnessing Quartz Crystal Microbalance With Dissipation Monitoring

11 Monica BIGGIO, *Università degli studi di Genova*
Disentangling Blink Reflexes in Multiple Sclerosis with machine learning techniques

12 Roya BINAYMOTLAGH, *Sapienza University of Rome*
Biosynthesis of antibacterial peptide hydrogels/titania nanoparticles composites

13 Ludovica BINELLI, *Dip. di Scienze Università Roma Tre*
Gold nanorods functionalized to reach cell nucleus: new tools for theranostic applications

14 Francesca BONFIGLI, *ENEA - Frascati*
UV sensors based on nanocomposite hydrogels as a sun exposure alarm

15 Carmela BORRIELLO, *ENEA*
Metal Material Extrusion 3D-printed stainless-steel electrodes for water electrolysis

16 Sabina BOTTI, *ENEA*
Graphene/polymer nano-composites for antibacterial surfaces

17 Giuseppina BOZZUTO, *ISS*
"Core-shell" liposomes for cellular and subcellular targeting

18 Clodomiro CAFOLLA, *Durham Univ., UK*
Quantitative detection of extracellular nanovesicles in drops of saliva using microcantilevers

19 Gabriele CALABRESE, *IMM-CNR*
Effect of the molecular self-assembly under confinement on the thermoelectric properties of thin films

20 Giancarlo CAPPELLINI, *Università di Cagliari*
Optical and electronic properties within DFT and TD-DFT of antiviral and anticancer drugs using carbon and boron nitride nanostructures carriers

21 Marilena CARBONE, *University of Rome Tor Vergata*
Inulin coated ZnO nanoparticles as biostmulants for promoting growth of V. faba seedlings

22 Gianluca CIARLEGLIO, *Sapienza University of Rome*
pH-Responsive Hydrogel Vectors with Nanostructures: Innovative Approaches for the Efficient Delivery of Lipophilic Drugs

23 Andrea CICCONARDI, *Istituto Italiano di Tecnologia*
Automatic Recognition of $CsPbI_3$ Nanocrystals images

24 Denia Marlenis CID PEREZ, *Pontificia Universidad Católica Madre y Maestra, Dominican Republic*
A review of graphene applications in green hydrogen production

25 Chiara CIVITELLI, *Istituto Superiore di Sanità*
In vitro approach for evaluating digested nanomaterials effects on intestinal barrier permeability

26 Claudia COLANTONIO, *CNR-ISC*
Smart microgels for biocompatible fluorescent nuclear track detectors for radiobiology

27 Marisa COLONE, *Istituto Superiore di Sanità*
Innovative systems for drug delivery in oncology

28 Maria CONDELLO, *Istituto Superiore di Sanità*
Antibacterial and non-toxic Ag-Al2O3 layer for public space applications

29 Domenica CONVERTINO, *Istituto Italiano di Tecnologia*
Interaction of graphene and WS_2 with neutrophils and mesenchymal stem cells: implications for peripheral nerve regeneration

30 Marco COSTANTINI, *Polish Academy of Sciences, PL*
Fabrication of synthetic polymer foams and gradient structures via microfluidics for energy absorption applications

31 Rosaria D'AMATO, *ENEA*
Development and characterization of 3D-printed nanocomposites for application in cultural heritage

32 Anna DE GIROLAMO DEL MAURO, *ENEA*
Photomobile properties of liquid crystal polymers with or without azobenzene units and carbon based particles

33 M. Federica DE RICCARDIS, *ENEA*
Carbon-based electrocatalysts for oxygen reduction reaction

34 Claudio DI GIULIO, *INFN-LNF*
How the LNF IARI infrastructures are being transformed by ML and 3D printing

35 Andra DINACHE, *INFLPR, Romania*
Laser-assisted Generated Nanoemulsions as Drug Delivery Systems

36 Vincenzo FABBRIZIO, *Università degli studi di Milano*
Combining electrochemical and photocatalytic degradation of organic pollutants for the simultaneous wastewater remediation and hydrogen production

37 Bouaïcha FAIZA, *University of Oum El Bouaghi, Algeria*
Structural and Magnetic Properties in CoxFe2-xO4 Spinel Ferrites

38 Emma FENUDE, *CNR-DSCTM*
Organogel Formation by Hierarchical Self-Assembly of β-Helix Forming Peptides

39 Angela FIORE, *ENEA*
Recycling of silicon recovered from end-of-life PV panels by 9-Tech treatment plant, for application in lithium-ion batteries

40 Celestino FONTANETO, *I.T.I. OMAR, Novara*
LURING: periodic precipitation for controlled release of drugs

41 Luana FORLEO, *Fond. Don Carlo Gnocchi - ONLUS*
Raman spectroscopy for the biochemical characterization of human salivary extracellular vesicles as a valuable source of brain biomarkers

42 Melissa Greta GALLONI, *Univ. degli Studi di Milano*
Advanced sustainable floating photocatalysts for wastewater remediation

43 David GELENIDZE, *Tbilisi State University, GE*
Hybrid Nanofluid Preparation Via Plasma Arc

44 Maria Francesca GIUFFRIDA, *ENEA*
Development Of MOF/Polymer Adsorbent Membranes For Industrial Drying Processes

45 Lorenzo GONTRANI, *Rome Tor Vergata University*
Looking for applicative properties with structure in mind: green innovative media can foster the synthesis of task-specific metal oxide nanoparticles

46 Daniele GORI, *AcZon S.r.l.*
A new alternative to PE-Cy5 tandem dye for flow cytometry

47 Farid HAJAREH HAGHIGHI, *Sapienza Univ. of Rome*
Self-assembling peptide-based magnetogels for the removal of heavy metals from water

48 Elisa INNOCENZI, *Istituto Zooprofilattico Sperimentale del Lazio e della Toscana "M. Aleandri"*
Regeneration of an osteogenic lesion in a dog using the integrative action of platelet-rich plasma and hydroxyapatite nanoparticles

49 Pierpaolo IOVANE, *ENEA*
Plasma treatment of Silicon Carbide: preliminary experimental results

50 Talha KURU, *Selçuk University, Turkey*
Photo-enhanced piezocatalytic hydrogen evolution activity of clay based catalyst

51 Giancarlo LA PENNA, *Sapienza University of Rome*
Strain characterization in SiGe epitaxial samples by Tip Enhanced Raman Spectroscopy

52 Maria Rita MANCINI, *ENEA*
Nanoreinforced Concrete Composites For Possible Nuclear Waste Confinement

53 Lucija MANDIĆ, Ruđer Bošković *Institute, Croatia*
Functionalized superparamagnetic magnetite nanocarriers for poorly soluble myricetin in drug delivery

54 Valentina MANGOLINI, *Fond. Don Carlo Gnocchi*
Raman spectroscopy characterization of multifunctional nanoliposomes for neurological disorders

55 Daniele MIRABILE GATTIA, *ENEA*
Polymeric composites with improved thermal conductivity for AM applications

56 Daniele MIRABILE GATTIA, *ENEA*
Development of a ferritic alloy for AM of heat exchangers for corrosive environments

57 Riccardo MISCIOSCIA, *ENEA*
Evaluation of the effects of recovery processes on the phase transitions of shape memory filaments investigated through the comparative analysis of resistance-temperature measurements

58 Maria MONTANINO, *ENEA*
Gravure printed cathodes for lithium-ion batteries

59 Jessica OCCHIUZZI, *University of L'Aquila*
Efficient Solar Membrane Distillation and Crystallization using WS2-PVDF Nanocomposite Membranes

60 Elena OLIVIERI, *Università Roma Tre*
Pegylated gold nanoparticles as promising carrier for multiple sclerosis drugs

Poster Session

61 Marzia PENTIMALLI, *ENEA*
Recovery/Recycling/Reuse of fiber-reinforced thermoplastic composites deriving from end-of-life battery cases. An experimental study

62 Giulia PICCININI, *Università degli studi di Parma*
Cardioprotective effects of cerium oxide nanoparticles in a rat model of diabetic cardiomyopathy

63 Alfonso POZIO, *ENEA CR Casaccia*
Synthesis and Characterization of a Composite Anion Exchange Membrane for Water Electrolyzers (AEMWE)

64 Alessandra RICELLI, *CNR*
Molecular insights into mycotoxin production and implementation of technological approaches for mycotoxin detection in the workplace

65 Chiara RITAROSSI, *Istituto Superiore di Sanità*
In vivo and in vitro approaches for evaluating potential toxic effects of micro- and nano-plastics

66 Daniela ROSSIN, *Università di Torino*
Revolutionizing Cardiac Therapy: 3FEEP - A Nanofunctionalized Scaffold for Post-Myocardial Infarction Tissue Protection and Regeneration

67 Anja SADŽAK, Ruđer Bošković *Institute, Croatia*
Kinetics of flavonoid degradation and controlled release from functionalized magnetic nanoparticles

68 Tommaso A. SALAMONE, *Sapienza University of Rome*
Nanostructured polymer/AuNPs blends for optoelectronics

69 Elisa SCIURTI, *IMM-CNR*
Detection of copper ions in Organ-on-Chip platforms via Anodic Stripping Voltammetry

70 Suzana ŠEGOTA, Ruđer Bošković *Institute, Croatia*
Potential of new nanodelivered systems in food and pharmaceutical industry

71 Mihai SERBANESCU, *INFLPR, Romania*
Oxide nanowires for gas sensing applications

72 Zeynab SKAFI, *University of Rome "Tor Vergata"*
Optimizing Flexible Solar Cells on PET for Indoor Application: Halide and Interfacial Passivation Design

73 Adriana SMARANDACHE, *INFLPR, Romania*
Detection of microplastics in water using laser-based technology

74 Simone SOTGIU, *Sapienza, University of Rome*
Probing enhanced electron-phonon coupling in graphene by infrared resonance Raman spectroscopy

75 Angela STAICU, *INFLPR, Romania*
Enhancing Photodynamic Therapy for Melanoma: Nanoparticle-Porphyrin Complexes

76 Miruna STAN, *University of Bucharest, Romania*
Fluorescent PLGA nanoparticles: in vitro toxicity study using a co-culture of human keratinocytes and dermal fibroblasts

77 Annarita STRINGARO, *Istituto Superiore di Sanità*
Metal complex-based liposomes as promising delivery platforms for cancer treatment

78 Bhatia SUDHIR, *Genekam Biotechnology AG, Germany*
One step isolation and staining of CD20 B-cells with quantum dots magnetic beads antibody conjugate from human mononuclear cell cultures for fluorescent microscopy

79 Giuliana TAGLIERI, *SNAPTECH S.R.L.*
Traditional technologies enhanced by nano-innovation for the sustainable conservative restoration of historical buildings and monuments

80 Loredana TAMMARO, *ENEA*
PLA-recovered carbon fiber composites filaments for FDM 3D printing

81 Maria Celeste TIRELLI, *Polish Academy of Sciences, PL*
Microfluidic-assisted digital manufacturing of functionally graded porous materials with transient physical and biological properties

82 Ana-Maria UDREA, *INFLPR, Romania*
Spectroscopic Investigations and in silico determinations of Nanocomplexes in cancer treatment

83 Francesca VARSANO, *ENEA*
Supported NiCo nanoparticles as magnetic catalyst for induction heated reforming reactions

84 Vincenzo VINCIGUERRA, *STMicroelectronics*
Comparing Finite Element Analysis and Analytical Approaches for Determining the Equivalent Thickness of a Taiko Wafer using ANSYS Software

85 Agnieszka WITECKA, *Polish Academy of Sciences, PL*
Hybrid mesoporous silica nanoparticles templated with surfactant polyion complex (SPIC) micelles for pH-triggered drug release

86 Jie XU, *CHOSE (Centre for Hybrid and Organic Solar Energy), University of Rome Tor Vergata*
Highly Efficient Perovskite Solar Cells Indoors via Compositional and Additive Engineering

87 Sabrina ZUCCALÀ, *4ward360*
Nanotechnology in the 5 domains of Defense: effectiveness in aerospace and underwater applications

BRIDGING THE GAP BETWEEN ATOMISTIC MODELING AND CONTINUUM MECHANICS

September 20

Co-organized with:

SAPIENZA
UNIVERSITÀ DI ROMA

WORKSHOP COMMITTEE

Patrizia TROVALUSCI, *Sapienza University of Rome*
Nicholas FANTUZZI, *University of Bologna*
Razieh IZADI, *Sapienza University of Rome*
Marco PINGARO, *Sapienza University of Rome*

The workshop "Bridging the Gap between Atomistic Modeling and Continuum Mechanics" aims at exploring the challenges and opportunities in connecting two fundamental approaches in materials science and engineering. Atomistic and continuum modeling are both widely used to study the behavior of materials at different length and time scales. Atomistic modeling offers a detailed understanding of the material behavior at the atomic level, while continuum mechanics provides an efficient macroscopic view of the material properties and behavior.

Despite their differences, these two approaches can be complementary in providing a comprehensive and efficient understanding of materials behavior. By combination of atomistic and continuum descriptions, one can benefit from the efficiency of continuum description while preserving the accuracy of detailed atomistic modeling. However, bridging the gap between atomistic simulation and continuum modeling requires overcoming several challenges, such as the lack of direct communication between the two approaches, and the difficulty of reconciling the different scales and assumptions used in each method. This dichotomy can be by-passed by resorting to multiscale procedures allowing to preserve memory at the continuum macroscopic scale of the material internal structure (at the micro/nano scale). Particular attention will be devoted to non-standard/non-local continuous ormulations, in order to account for the material internal lengths and to deal with scale effects.

The minisymposium will bring together researchers and practitioners from different fields to present their recent work, discuss the latest developments, and share their experiences in bridging the gap between atomistic simulation and continuum modeling. The general aim is to foster a better understanding of the strengths and limitations of both atomistic simulation and continuum modeling and to explore new ways to integrate the two approaches to advance our knowledge of materials behavior.

The symposium will also provide a platform for networking and collaboration among researchers, practitioners, and industry professionalsinterested in this exciting and rapidly evolving field.

20 SEPTEMBER

09:00 - 10:30	WS.I.1 - TT.I.G

Computational methods in the presence of nanoscopic structures and phenomena

Chair: Patrizia TROVALUSCI, *University of Rome*

WS.I.1.1 TT.I.G.1	George STEFANOU, *University of Thessaloniki, Greece* **A stochastic multiscale framework for modeling graphene nanoplatelets**
WS.I.1.2 TT.I.G.2	Mahmood JABAREEN, *Technion - Israel of Technology, Israel* **Computational homogenization of nearly incompressible composites**
WS.I.1.3 TT.I.G.3	Aram CORNAGGIA, *University of Bergamo* **Computational elastoplastic structural analysis of carbon nanotubes**
WS.I.1.4 TT.I.G.4	Milkan GAFF, *Mendel University in Brno, Czech Republic* **Enhancing Fire Resistance Properties of Thermally Modified Robinia Pseudoacacia Wood Using Natural and Synthetic Fire-Retardants, modified by nanoparticels: Chemical Characterization and Burning Behavior**

11:30 - 13:00	WS.I.2 - TT.II.G

The use of nonclassical/non-local continuua for describing heterogeneous media from nano to macro scales

Reuven SEGEV, *Ben-Gurion University of the Negev, Israel*

WS.I.2.1 TT.II.G.1	Meral TUNA, *Sapienza University of Rome* **Size-Dependent Mechanical Behaviour of Carbon Nanotubes: Non-Classical Micropolar Continuum and Molecular Dynamics Simulations**
WS.I.2.2 TT.II.G.2	Emanuele RECCIA, *University of Cagliari* **Cosserat-point approach for material with internal structure**
WS.I.2.3 TT.II.G.3	Avraam KONSTANTINIDIS (on line), *Aristotle University of Thessaloniki, Greece* **On combined gradient – stochastic models**
WS.I.2.4 TT.II.G.4	Abdol Majid REZAEL, *Sapienza University of Rome* **Molecular dynamics simulation and multiscale micropolar modelling for 3D printed biodegradable polymers**
WS.I.2.5 TT.II.G.5	Ugo GALVANETTO (online), *University of Padova* **New trends in applied computational peridynamics**

20 SEPTEMBER

14:00 - 15:30	WS.I.3 - TT.III.G

Discrete to continuum modelling of heterogenous materials and continuous media

Chair: Mahmood Jabareen, *Technion - Israel of Technology, Haifa, Israel*

WS.I.3.1 TT.III.G.1	Reuven SEGEV, *Ben-Gurion University of the Negev, Israel* **Material Defects: From Discrete Modelling to Continuous Distributions to Singular Distributions**
WS.I.3.2 TT.III.G.2	Marco COLATOSTI, *Sapienza University of Rome* **On the mechanical behaviour of microstructured materials with different symmetry class modelled as discrete and continuous systems**
WS.I.3.3 TT.III.G.3	Razie IZADI, *Sapienza University of Rome* **A Hierarchical Molecular Dynamics and Peridynamics Approach to study Fracture of Green Nano Fibrous Network**
WS.I.3.4 TT.III.G.4	Greta ONGARO, *Sapienza University of Rome* **Multiscale procedure for modelling mechanical properties of epoxy-based nanocomposites. Comparison between different computational approaches and experimental results**

16:00 - 17:30	WS.I.4 - TT.IV.G

Multiphisics modelling for complex materials and structures

Chair: Raffaele BARRETTA, *University of Naples Federico II*

WS.I.4.1 TT.IV.G.1	Martin OSTOJA-STARZEWSKI, *University of Illinois at Urbana-Champaign, USA* **Violations of the dissipation inequality in molecular fluids and granular media**
WS.I.4.2 TT.IV.G.2	Alessio RAPISARDA, *University Federico II of Naple* **Robotic swarm dynamics to describe the first and second gradient deformations in a continuum material using a kinematic formulation**
WS.I.4.3 TT.IV.G.3	Iman MORADI, *Sapienza University of Rome* **The influence of tube layout on heat transfer and tortuosity, a Lattice Boltzmann Method simulation**
WS.I.4.4 TT.IV.G.4	Tahereh IZADI, *Kermanshah University of Technology, IRAN* **The study of micro-particle concentration inside the subway station with a comparison of continuum and discrete description**

EMERGING MATERIALS AND TECHNOLOGIES FOR A SUSTAINABLE SOCIETY

September 20-21

Co-organized with:

Politecnico di Torino

ISTITUTO ITALIANO DI TECNOLOGIA

INRiM ISTITUTO NAZIONALE DI RICERCA METROLOGICA

WORKSHOP COMMITTEE

Giancarlo CICERO, Stefano BIANCO, Marzia QUAGLIO, Francesca RISPLENDI & Marco FONTANA, *Polytechnic University of Turin*

Candido Fabrizio PIRRI - *IIT Center for Sustainable Future Technologies CSFT@POLITO*

Pietro ASINARI - *INRIM*

The workshop "Emerging materials and technologies for a sustainable society" aims at bringing together researchers, academics, and representative from the industrial world and civil society from various fields to explore the latest developments and prospects of emerging materials and technologies in promoting sustainability. The workshop will cover a wide range of topics, including but not limited to nanomaterials, hydrogen for future mobility, advanced manufacturing, renewable energy technologies, and smart materials. The workshop seeks to promote interdisciplinary collaboration and exchange of ideas to address the pressing challenges of sustainability and help create a more sustainable society. Through invited presentations and interactive discussions, the workshop will provide a platform for participants to share their knowledge and experiences, learn about the latest advancements in the field, and identify new research opportunities and future directions.

Sustainability is one of the most pressing challenges of our time, and emerging materials and technologies have the potential to play a critical role in addressing this challenge. By developing and utilizing materials and technologies that are more environmentally friendly, energy-efficient, and cost-effective, we can achieve a more sustainable society. The workshop on "Emerging materials and technologies for a sustainable society" aims to highlight the latest advancements and potential of emerging materials and technologies in this area. Among the others, the workshop will focus on exploring the potential of hydrogen fuel cell technology to revolutionize the way we power transportation. As the world looks to transition away from fossil fuels and reduce carbon emissions, hydrogen offers a promising alternative as a clean, abundant, and renewable energy source. Nanomaterials are another important area of focus, as they have unique physical and chemical properties that make them suitable for a variety of applications, such as energy storage, water filtration, and catalysis.

Advanced manufacturing technologies, such as 3D printing, are also of great interest in the workshop, as they offer new opportunities to produce complex and customized structures with minimal waste and energy consumption. Renewable energy technologies, such as solar and wind power, are critical to achieving a more sustainable society, and researchers are exploring new materials and technologies to improve their efficiency and reduce their costs. Smart materials, which can respond to changes in their environment, are also a promising area of research for sustainability, as they have potential applications in areas such as energy storage and sensing.

The symposium is organized within the framework of several PNRR initiatives aimed at promoting sustainable development in Italy. Each symposium will address some specific PNRR initiatives related to sustainable development and infrastructure investment. Led by experts in the relevant fields, each session will provide a detailed overview of each initiative and its potential impact.

20 SEPTEMBER

09:00 - 10:30	WS.II.1 - TT.I.B

Towards Sustainable Mobility: Unlocking Future Solutions - Part I

Chair: Stefano BIANCO, *Polytechnic University of Turin*

WS.II.1.1 TT.I.B.1	Giuseppe SCELLATO, *Polytechnic University of Turin* **Public policies to support the development of innovation ecosystems: evidence from the PNRR NODES project**
WS.II.1.2 TT.I.B.2	Paola RIZZI, *University of Turin* **Materials for hydrogen handling**
WS.II.1.3 TT.I.B.3	Gabriele RICCHIARDI, *University of Turin* **Materials for sustainable vehicles, beyond the powertrain**
WS.II.1.4 TT.I.B.4	Enrica FONTANANOVA, *CNR-ITM* **Development of proton exchange membranes using green solvents**

11:30 - 13:00	WS.II.2 - TT.II.B

Emerging technologies for clean energy production and distribution

Chair: Marco FONTANA, *Polytechnic University of Turin*

WS.II.2.1 TT.II.B.1	Renzo VALENTINI, *University of Pisa* **Title to be defined**
WS.II.2.2 TT.II.B.2	Andrea LAMBERTI, *Polytechnic University of Turin* **Sustainable electrochemical energy harvesting and storage devices: development and integration**
WS.II.2.3 TT.II.B.3	Walter GAGGIOLI, *ENEA* **CST/CSP hybridization with other renewable energies**
WS.II.2.4 TT.II.B.4	Antonio POLITANO, *University of L'Aquila* **Quantum Materials and Thermoplasmonics: Revolutionizing Solar Desalination, Mineral Extraction, and Blue Energy Harvesting**

20 SEPTEMBER

14:00 - 15:30	WS.II.3 - TT.III.B

Smart and sustainable materials for circular and augmented industrial products and processes

Chair: Giulia MASSAGLIA, *Polytechnic University of Turin*

WS.II.3.1 TT.III.B.1	Domenico CAPUTO, *University of Naples "Federico II"* **Innovative materials and disruptive technologies for the future challenges of the Made in Italy**
WS.II.3.2 TT.III.B.2	Claudia FLORIO, *Stazione Sperimentale dell'Industria delle Pelli e delle materie concianti* **SOLARIS - Sustainable Options for Leather Advances and Recycling Innovative Solutions**
WS.II.3.3 TT.III.B.3	Maria Cristina LAVAGNOLO, *University of Padova* **Closing the loop of new circular materials: the Waste End project**
WS.II.3.4 TT.III.B.4	Antonio LANZOTTI, *University of Naples "Federico II"* **Bioinspired Design of green soft robots**
WS.II.3.5 TT.III.B.5	Roberta BONGIOVANNI, *Polytechnic University of Turin* **Photopolymers and photoinduced processes: their innovation through ESPERANTO European Doctoral network**

16:00 - 17:30	WS.II.4 - TT.IV.B

The role of Research and Technological Innovation Infrastructures in boosting Italian competitiveness

Chair: Marzia QUAGLIO, *Italian Institute of Technology*

WS.II.4.1 TT.IV.B.1	Angelica CHIODONI, *Italian Institute of Tecnology* **CoSyET: a PNRR-funded innovation infrastructure on materials and technologies for energy transition**
WS.II.4.2 TT.IV.B.2	Vittorio MORANDI, *CNR-IMM* **iENTRANCE@ENL: a reserach infrastrucure on nanoscience and nanotechnology for energy transition and circular economy within the NextGenEU Program**
WS.II.4.3 TT.IV.B.3	Michele MUCCINI, *CNR-ISMN* **i-Matt - an infrastructure to boost innovation leveraging on advanced materials and digitalization**
WS.II.4.4 TT.IV.B.4	Carmela CORNACCHIA, *CNR-IMAA* **Enhance interdisciplinary Research and Innovation capacities on enviromental challenges: the ITINERIS HUB**

21 SEPTEMBER

09:00 - 10:30	WS.II.5 - TT.V.B

Towards Sustainable Mobility: Unlocking Future Solutions - Part II

Chair: Stefano BIANCO, *Polytechnic University of Turin*

WS.II.5.1 TT.V.B.1	Piercarlo MUSTARELLI, *University of Milano Bicocca* **Towards sustainable mobility: next generation lithium batteries, reuse, and recycle**
WS.II.5.2 TT.V.B.2	Antunes STAFFOLANI, *University of Bologna* **New Generation batteries: a sustainability approach**
WS.II.5.3 TT.V.B.3	Massimiliana CARELLO, *Polytechnic University of Turin - DIMEAS* **The fuel cell vehicle may be the future? The Team H2politO case study**
WS.II.5.4 TT.V.B.4	to be defined

11:30 - 13:00	WS.II.6 - TT.VI.B

The role of HPC in the discovery of new materials and processes for a sustainable society - Part I

Chair: Francesca RISPLENDI, *Polytechnic University of Turin*

WS.II.6.1 TT.VI.B.1	Stefano FABRIS, *CNR-IOM* **Developments and applications of Materials and Molecular Sciences in within the National Center for HPC, Big Data and Quantum Computing**
WS.II.6.2 TT.VI.B.2	Andrea FERRETTI, *CNR - nano Modena* **Designing materials with HPC, a story of hardware, software, and theory**
WS.II.6.3 TT.VI.B.3	Giacomo PRAMPOLINI, *Institute of Chemistry of Organo Metallic Compounds – Pisa Unit (ICCOM-PI)* **From Ab Initio Potential Energy Surfaces to in silico Material Design: Integrating QM Accuracy with HPC Effectiveness**
WS.II.6.4 TT.VI.B.4	Cristiana DI VALENTIN, *University of Milano-Bicocca - NanoQlab* **Modeling complex nanosystems for drug delivery, targeted therapy and imaging**

21 SEPTEMBER

14:00 - 15:30	WS.II.7 - TT.VII.B

The importance of recycling, recovery, and reuse of materials in the energy transition

Chair: Marzia QUAGLIO, *Polytechnic University of Turin*

WS.II.7.1 TT.VII.B.1	Flavio TONELLI, *University of Genova* **The importance of Remanufacturing vs. Repairing in the Italian Industrial Strategy**
WS.II.7.2 TT.VII.B.2	Alessandra ZANOLETTI, *University of Brescia* **New environmental-friendly technologies for the recovery of raw materials**
WS.II.7.3 TT.VII.B.3	Gaia BRUSSA, *Polytechnic University of Milan* **Waste generation from energy transition: a focus on wind turbine blades and photovoltaic panels recycling and recovery**
WS.II.7.4 TT.VII.B.4	Filippo STRINGA, *Polytechnic University of Milan* **EU projects on innovative re-use and recycling solutions for lithium-ion batteries**

16:00 - 17:30	WS.II.8 - TT.VIII.B

The role of HPC in the discovery of new materials and processes for a sustainable society - Part II

Chair: Francesca RISPLENDI, *Polytechnic University of Turin*

WS.II.8.1 TT.VIII.B.1	Layla MARTIN-SAMOS COLOMER, *CNR-IOM Trieste* **Materials Foundry: Development of High Performance Computing applications to leverage scientific discovery and technological advancement**
WS.II.8.2 TT.VIII.B.2	Michele RE FIORENTIN, *Polytechnic University of Turin* **Potential and challenges of ab initio simulations in CO_2 electroreduction**
WS.II.8.3 TT.VIII.B.3	Luca TUBIANA, *University of Trento* **From the kinetoplast DNA to bio-inspired topological supramolecular materials and back**
WS.II.8.4 TT.VIII.B.4	Alfonso AMENDOLA, *ENI* **title to be defined**

NANOTECHNOLOGY-BASED INNOVATIVE APPROACHES IN AGRICULTURE
(VII edition of the workshop AgriNanoTechniques)

September 21

Co-organized with:

UNIVERSITÀ DEGLI STUDI DELLA TUSCIA

UNIVERSITÀ DEGLI STUDI DI UDINE

WORKSHOP COMMITTEE

Giorgio Mariano BALESTRA, *University of Tuscia*
Luca MARCHIOL, *University of Udine*
Daniele SCHIAVI, *University of Tuscia*

Under the patronage of

SIPaV
Società Italiana di Patologia Vegetale
Italian Phytopathological Society

With the world's population expected to exceed nine billion by 2050, scientists are working to develop new ways to meet rising global demand for food, energy and water without increasing the strain on natural resources and the environmental pressure.

Organizations including the World Bank, and the U.N. Food and Agriculture Organization, as well as the EU F2F and Green Deal strategies are calling for more innovation to address the challenges of the agri-food sector.

The development of nano-based techniques in agriculture has been started very recently; they will be implemented within the evolving science of precision agriculture, in which farmers use technology to target their use of water, fertilizer, plant protection products and other inputs. A second, broad potential application concerns the issues of reduction and valorization of agri-food wastes.

The introduction of nanotechnologies in agriculture still need deepen basic and applied knowledge, however several promising results were achieved, so far. A huge development is taking place in this sector, therefore nanotech applications currently under development will soon be overtaken by other ideas that are expected to contribute to solve several issues in the field of sustainable agriculture.

NanoInnovation 2023 hosts the VII edition of the workshop "AgriNanoTechniques" co- organized by the Universities of Tuscia and Udine.

The workshop will be the forum for discussing the perspective of nanotechnologies in the primary sector among the stakeholders and scientific research.

21 SEPTEMBER

11:30 - 13:00	WS.III.1 - TT.VI.E

Nano-Enabled Agriculture: Agro-ecosystems Sustainable Management

Chair: Marta MARMIROLI, *University of Parma*

WS.III.1.1 TT.VI.E.1	Michela JANNI, *CNR IMEM* **In vivo plant monitoring: a novel biosensor for precision agriculture and plant phenotyping**
WS.III.1.2 TT.VI.E.2	Laura PILOTTO, *University of Udine* **Nano-hydroxyapatite from organic waste for sustainable P- fertilization**
WS.III.1.3 TT.VI.E.3	Rocco CANCELLIERE, *University of Rome Tor Vergata* **Expanding circularity of plastic and biochar materials by developing alternative low environmental footprint sensors**
WS.III.1.4 TT.VI.E.4	Lucio LITTI, *University of Padova* **Nanotechnology applied to Micro- and Nanoplastics Analysis**
WS.III.1.5 TT.VI.E.5	Guido FELLET, *University of Udine* **2nd Summer School "Nanotechnology in Agriculture"**

14:00 - 15:30	WS.III.2 - TT.VII.E

Nano-Enabled Agriculture: Perspectives in Crop Protection

Chair: Sara FRANCESCONI, *University of Tuscia*

WS.III.2.1 TT.VII.E.1	Chiaraluce MORETTI, *University of Perugia* **Silver nanoclusters with $Ag^{2+}/^{3+}$ oxidative states are a new highly effective tool against phytopathogenic bacteria**
WS.III.2.2 TT.VII.E.2	Sara FALSINI, *University of Florence* **Enhancing the efficacy of bioactive molecules in the Mediterranean fruit fly control by nanocarriers with exopolysaccharides from cyanobacteria**
WS.III.2.3 TT.VII.E.3	Davide SAVY, *University of Naples* **Novel nanocarriers and antibacterials from compost-extracted humic substance**
WS.III.2.4 TT.VII.E.4	Francesca BALDASSARRE, *University of Salento* **Thyme-based nano-biocides exploring Calcium Carbonate and Cellulose Nanocrystals: the case studies of Xylella fastidiosa and Pseudomonas savastanoi**
WS.III.2.5 TT.VII.E.5	Stefania BOI, *NanOmnia srl* **Nanostructured pesticide formulations fate after different plant application forms**

21 SEPTEMBER

16:00 - 17:30	WS.III.3 - TT.VIII.E

Nanotechnology opportunities in the food sector: from ingredient functionalization and product stabilization to packaging design

Chairs: Sofia MELCHIOR & Stella PLAZZOTTA, *University of Udine*

WS.III.3.1 TT.VIII.E.1	Sofia MELCHIOR & Stella PLAZZOTTA, *University of Udine* **Nano-architecture of food ingredients: towards novel food functionalities**
WS.III.3.2 TT.VIII.E.2	Alessandro ZAMBON, *University of Bologna* **Possible synergism between natural antimicrobial substances and innovative food processing to increase microbial inactivation: a case study on supercritical carbon dioxide technology**
WS.III.3.3 TT.VIII.E.3	Marisa MANZANO, *University of Udine* **Biosensors for food safety applications**
WS.III.3.4 TT.VIII.E.4	Daniele CARULLO, *University of Milan* **Boosting the shelf-life of food items via "nano-inspired" packaging design approaches**
WS.III.3.5 TT.VIII.E.5	Otmar GEISS, *EC Joint Research Centre* **Activities of the European Commission's Joint Research Centre on nanomaterials in food**

HIGH SOCIOECONOMIC IMPACT TECHNOLOGIES FOR THE GREEN AND DIGITAL TRANSITION

September 21

Co-organized with:

Airi ASSOCIAZIONE ITALIANA PER LA RICERCA INDUSTRIALE

TECHETHOS FUTURE ○ TECHNOLOGY ○ ETHICS

SOCKETS SOCIETAL ENGAGEMENT WITH KEY ENABLING TECHNOLOGIES

FPI FONDAZIONE PIEMONTE INNOVA

WORKSHOP COMMITTEE

Andrea PORCARI, Elena DESTRO, Olmo GUAGNETTI, Sara MORISANI, *Airi*
Pasquale SANFILIPPO, *STMicroelectronics*
Laura MORGAGNI, *Piemonte Innova*

Airi promotes a set of events with a thematic approach: new technologies for digital and green transition that impact on people and firms' everyday life, underlying how a responsible approach can help to combine economic, environmental, and social aspects to reach sustainability. The events will offer an opportunity to showcase results of Airi EU projects, including SocKETs, TechEthos and REPOXYBLE. The first symposium focuses on the role of Italy in IPCEI (Important Projects of Common European Interest), discussing those ongoing and approved on microelectronics, ICT, hydrogen, batteries and healthcare. The second aims at exploring the use of Web 3.0 and blockchain technologies in different industrial research value chain, and stimulating a discussion on the legal and socio- economic implications of an epochal phenomenon: the digitization of information, and creation of digital assets of physical data and products. The third showcases applications of advanced materials and manufacturing processes, and their combination with digital technologies, in the construction and built environment sector. There are growing co-creation, cooperation and funding opportunities to drive more innovative and sustainable approaches in these sectors.

11:30 - 13:00	WS.IV.1 - TT.VI.D

IPCEI: the key role of Italy in the microelectronics, digital, health and energy large- scale EU industrial research projects

Chair: Andrea PORCARI, *AIRI*

WS.IV.1.1 TT.VI.D.1	Sara LOI, *STMicroelectronics* **Ambition, results and future perspectives of the IPCEI microelectronics**
WS.IV.1.2 TT.VI.D.2	Speaker to be defined, *Menarini Silicon Biosystems* **IPCEI Healthcare**
WS.IV.1.3 TT.VI.D.3	Alberto GIACONIA, *ENEA, Italian National Agency for New Technologies, Energy and Sustainable Economic Development* **From R&D to the industrialization of hydrogen technologies: the IPCEI Hydrogen**
WS.IV.1.4 TT.VI.D.4	Edoardo MACCHI, *FBK, Bruno Kessler Foundation* **Toward sustainable made in EU batteries: state of play of two IPCEI projects and Italy's position in the battery value chain**

21 SEPTEMBER

14:00 - 15:30	WS.IV.2 - TT.VII.D

Managing digital assets in research and innovation: applications and impacts of Web 3.0 and blockchain techs

Chairs: Laura MORGAGNI, *Fondazione Piemonte Innova* & Andrea PORCARI, *AIRI and TechEthos project*

WS.IV.2.1 TT.VII.D.1	Andrea PORCARI, *Airi and TechEthos project* **Introduction: insights on the TechEthos project**
WS.IV.2.2 TT.VII.D.2	Antonio PUNZI, *Departement of Law, LUISS University* **The Personal Identity (and its Property) in the Digital Era**
WS.IV.2.3 TT.VII.D.3	Jacopo FRACASSI, *Extended Reality & Metaverse Observatory and Blockchain & Web3 Observatory, Polytechnic of Milan - Osservatori digital Innovation* **The Metaverse and the role of Blockchain: towards the future of the Web**
WS.IV.2.4 TT.VII.D.4	Serena DE LAURENTIIS, *Ales S.p.A., Legal Department, Gallerie degli Uffizi, Florence* **Problems and opportunities of cultural heritage enhancement with technologies based on NFT**
WS.IV.2.5 TT.VII.D.5	Francesco CRISCIOTTI, *DGS - Food Drug Free Project* **BIAS Project- Blockchain enabled Intelligent Agricultural Services**
WS.IV.2.6 TT.VII.D.6	Lorenzo ZULLO, *ChemChain* **Use of blockchain to exchange information along the value chain, supporting sustainable and circular economic models**

16:00 - 17:30	WS.IV.3 - TT.VIII.D

Advanced materials and technologies for sustainable construction

Chair: Andrea PORCARI, *AIRI and SocKETs project*

WS.IV.3.1 TT.VIII.D.1	Andrea PORCARI, *Airi and SocKETs project* **Introduction: SocKETs co-creation innovation scenarios toward sustainability in the construction sector**
WS.IV.3.2 TT.VIII.D.2	Gian Marco REVEL, *Università Politecnica delle Marche and ECTP (European Construction, built environment , energy efficient building Tech Platform)* **Supporting and funding innovation in the construction and built environment sector: the European framework**
WS.IV.3.3 TT.VIII.D.3	Giovanni PINTO, *Italcementi* **New opportunities for processes and products in the cement and concrete sector**
WS.IV.3.4 TT.VIII.D.4	Riccardo ANGIULI, *CETMA - EU Research Center for Technologies Design and Materials* **Circular Economy and Sustainable Materials for construction sector**
WS.IV.3.5 TT.VIII.D.5	Marco IUORIO, *Stress Scarl – High tech Research Center for Sustainable Construction* **The supply chain and the challenge of innovation in design and production processe**

TACKLING GLOBAL CHALLENGES WITH ELECTROSPINNING

September 22

Co-organized with:

Consiglio Nazionale delle Ricerche

WORKSHOP COMMITTEE

Antonella MACAGNANO, CNR

Electrospinning is internationally recognized as one of the key nanotechnologies of the future. It is currently the most economical, versatile and efficient technology for manufacturing both highly porous membranes, nano and/or microfibers and nano/microparticles. It allows to design nanofibrous matrices, starting from polymeric solutions, with multiple shapes (hollow, core-shell, nanocomposite, hybrid, porous, smooth, filiform, slice-like) and 2D- and 3D architectures.
These structures have been successfully used in numerous applications (energy, sensors, medicine, textiles, filtration, packaging, agriculture) due to their large surface area, high and adjustable porosity (e.g. controlled release systems), modular robustness (combination of components) and ease of functionalization (encapsulation, blending, surface functionalization). The use of solvents and green methods as well as materials from waste from agro-industrial chains represents one of the last frontiers towards a sustainable approach. One hundred years after the foundation of the CNR, the workshop aims to promote the versatility of this technology and the advances achieved in this regard by research in the CNR, encouraged
by the birth in Italy of enterprises dedicated both to the development of customized equipment and functional materials for applications in both R&D and various fields (such as smart textiles, advanced filtration systems, sustainable packaging, cosmetics, slow-release biomedical gauze, etc.).

09:00 - 10:30	**WS.V.1 - TT.IX.A**
Challenges in Health and biomedicine	
Chairs: Antonella MACAGNANO & Fabrizio DE CESARE, *CNR - IIA*	
WS.V.1.1 TT.IX.A.1	Antonella MACAGNANO, *CNR-IIA* **The contribution of CNR (Italy) in developing advanced technological solutions for a variety of applications**
WS.V.1.2 TT.IX.A.2	Eyal ZUSSMANN, *TECHNION- Haifa, ISRAEL* **Electrospinning: a bridge between nanotechnologies and bioinspired applications**
WS.V.1.3 TT.IX.A.3	Alessio VARESANO, *STIIMA-CNR* **Keratin-based nanofibres for biomedical applications and electrospun filter media**
WS.V.1.4 TT.IX.A.4	Irene BONADIES, *IPCG-CNR* **The use of natural and bio- based polymers in electrospinning**
WS.V.1.5 TT.IX.A.5	Maria Letizia FOCARETE, *SpinBOW S.r.l. & University of Bologna* **University-Industry cooperation. Functional elctrospun polymeric nanofibers: from nanohybrid to bioactive materials**

22 SEPTEMBER

11:30 - 13:00	WS.V.2 - TT.X.A

Challenges in Environment & Energy

Chairs: Antonella MACAGNANO & Fabrizio DE CESARE, *CNR - IIA*

WS.V.2.1 TT.X.A.1	Antonella MACAGNANO, *CNR-IIA* **Flexible strategy to design selective sensors for gaseous markers (MOSSA Project)**
WS.V.2.2 TT.X.A.2	Andrea CAMPOSEO, *NANO CNR* **Networks of electrospun nanofibers for tunable light sources**
WS.V.2.3 TT.X.A.3	Paolo STUFANO, *NANOTEC-CNR* **Bio-based nano-composites for Energy conversion and storage**
WS.V.2.4 TT.X.A.4	Stefano LINARI, *Linari Engineering S.r.l.* **Design and fabrication of nanocomposites for biomedical and industrial applications**
WS.V.2.5 TT.X.A.5	Stefano LORENZONI, *SKE Research Equipment* **Nanofibers technology: from lab to market**

14:00 - 15:30	WS.V.3 - TT.XI.B

Challenges for sustainable life

Chairs: Antonella MACAGNANO & Fabrizio DE CESARE, *CNR - IIA*

WS.V.3.1 TT.XI.B.1	Alberto FIGOLI, *ITM-CNR* **Toward a sustainable membrane fabrication by electrospinning**
WS.V.3.2 TT.XI.B.2	Fabrizio DE CESARE, *University of Tuscia - CNR - IIA* **Tackling future food demand developing electrospun nanofibrous products for sustainable agriculture**
WS.V.3.3 TT.XI.B.3	Massimo MARI, *CNR-IIA* **The electrospinning technology: a precious tool to innovate productive cycles, promote the eco-design of products and support the ecological transition**
WS.V.3.4 TT.XI.B.4	Simona PELLEGRI, *Invenio Solutions* **I find, I discover-INVENIO SRL: production from electrospinning of innovative, highly performing and eco-friendly electrospun materials**

WS.VI

TOWARD INDUSTRIAL APPLICATION OF THE SAFE AND SUSTAINABLE BY DESIGN (SSBD) APPROACH

September 22

Co-organized with:

ASINA Anticipating Safety Issues at the Design Stage of NAno Product Development

Airi ASSOCIAZIONE ITALIANA PER LA RICERCA INDUSTRIALE

repoxyble BIO-BASED MULTIFUNCTIONAL RECYCLABLE COMPOSITES

SABYDOMA

SbD Nano 4 SAFE BY DESIGN FOR NANO

SAbyNA

WORKSHOP COMMITTEE

Alina BISAG, *ART-ER*
Anna Luisa COSTA, *National Research Council and ASINA project Coordinator*
Andrea PORCARI, *Airi- Italian Association for Industrial Research*

The safety and sustainability of chemicals and materials and their applications are a cornerstone of current EU policy and industrial strategies. Frameworks and criteria for the practical implementation of SSbD approaches have been published by the OECD, European Commission, and industrial actors, such as CEFIC.

These will increasingly become premium aspects to access funding and contracts and are a prerequisite to developing products aiming to fulfil sustainable development goals. The workshop, organized within the NanoInnovation Conference, will showcase experiences and activities at the European level on the development of advanced materials following the Safe and Sustainable by Design approach in key industrial sectors: chemical, plastics, cosmetics, textile, aeronautical, and automotive.

Case studies and exploitable results from the European Projects: ASINA, SABYDOMA, SAbyNA, and SbD4Nano will be presented, together with foreseen activities from the REPOXYBLE project. Strategies for deployment and exploitation of SSbD methods, processes, and products developed by these projects will be discussed with players and industrial stakeholders. The workshop is open to both innovators and risk managers in research organizations, companies, institutions, and other organizations active and interested in the safety and sustainability of advanced materials, nanomaterials, and related products.

ASINA (GA 862444), SABYDOMA (GA 862296), SAbyNA (GA 862419), SbD4Nano (GA 862195), REPOXYBLE (GA 101091891), have received funding from European HORIZON Research and Innovation Programme.

22 SEPTEMBER

09:00 - 10:30	WS.VI.1 - TT.IX.C

Learnings on SSbD in industrial processes: comparing case studies from five EU projects on Safe and Sustainable by Design

Chair: Lisa BREGOLI, *Warrant Hub*

WS.VI.1.1 TT.IX.C.1	Lisa BREGOLI, *Warrant Hub* **Welcome and overview on the EU projects**
WS.VI.1.2 TT.IX.C.2	Ivonne TONANI TOMMASONI, *RED OF VIEW* **ASINA – Creams formulation for COSMETIC sector**
WS.VI.1.3 TT.IX.C.3	Marti BUSQUETS FITE, *Applied Nanoparticles Ltd (APPNPS), Spain* **SABYDOMA – Real-life transfer of SSbD platform to industry: coupling ONLINE screening and characterization to a continuous-flow AgNPs production line**
WS.VI.1.4 TT.IX.C.4	Stefano MANFREDINI, *Ambrosialab Srl, University of Ferrara* **SSbD approaches for Cosmetic Application**
WS.VI.1.5 TT.IX.C.5	Davide LOTTI, *LATI Industria Termoplastici SpA* **SbD evaluation of filament manufacturing for Fused Deposition Modelling using the SAbyNA guidance platform**
WS.VI.1.6 TT.IX.C.6	Elvira VILLARO ÁBALOS, *CTO - Chief Technology Officer, Avanzare Innovacion Tecnologica S.L. and coordinator of Repoxyble project* **REPOXYBLE – Biobased multifunctional recyclable epoxy based composites**
WS.VI.1.7 TT.IX.C.7	Elena MOCCHIO & Adriano FERRARA, *UNI - Italian Organization for Standardization* **ASINA – How standardization can boost research and innovation**

11:30 - 13:00	WS.VI.2 - TT.X.C

ASINA project exploitation workshop: SSbD industrial application in cosmetics, textile and other sectors

Chair: Anna Luisa COSTA, *National Research Council and ASINA project Coordinator*

WS.VI.2.1 TT.X.C.1	Massimo PERUCCA, *Project s.a.s* **ASINA expert system**
WS.VI.2.2 TT.X.C.2	Juliana OLIVEIRA, *CeNTI - Centre for Nanotechnology and Smart Materials, Portugal* **Antimicrobial textile manufacturing**
WS.VI.2.3 TT.X.C.3	Jesús LOPEZ DE IPIÑA PEÑA, *TECNALIA, Spain* **Digital Twin for sustainable manufacturing**
WS.VI.2.4 TT.X.C.4	Joonas KOIVISTO (remotely), *Air Pollution Management, Finland* **Industrial-oriented exposure assessment**
WS.VI.2.5 TT.X.C.5	Rossella BENGALLI, *University of Milano – Bicocca* **Experimental workflow for the estimation of relevant exposure dose and effects**

ELECTROCHEMISTRY AND NANOSCIENCES: A POWERFUL SYNERGY FOR THE SUSTAINABLE PROGRESS IN ENERGY STORAGE AND INDUSTRIAL PROCESSING

September 22

Co-organized with:

Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile

SAPIENZA UNIVERSITÀ DI ROMA

WORKSHOP COMMITTEE

Margherita MORENO, ENEA (Coordinator)
Danilo DINI, Sapienza University of Rome
Alessandra DI BLASI, *CNR-ITAE*
Omar PEREGO, *RSE*

Recently the Electrochemical Science revealed to be central in the ambits of energy transition, sustainability, circularity and decarbonisation through various research activities: electric energy production (electrochemical and fuel cells), storage (batteries), surface processing (electroplating) and sensing/imaging of the electrochemical activity of surfaces.

The most important developments in such areas are consequential to the progresses in the science of the nanomaterials. For this reason it appears appropriated to dedicate a topical session on electrochemistry at NANOINNOVATION, which focuses on the aspects of energetics and industrial processing considering the most recent developments in nanosciences. In this context the electrochemical storage represents one of the key technologies to enable the energy transition process for the progressive detachment from an economy based on fossil fuels in favor of an energy mix of renewable energies.

R&D activities in the development of innovative storage systems, both for stationary applications and for electro-mobility, play a key role towards the increase of the use and penetration of renewable sources in the country's energy system.

The study, the optimization and the characterization (both experimental and theoretical) of innovative and frontier materials for battery components play a fundamental role for the development of batteries of the future (new chemistries) and for increasingly sustainable and secure. The European Commission has launched a series of initiatives to strengthen the European value chain of batteries, with a view to greater competitiveness and independence from dominant foreign markets.

These initiatives aim to cover all levels of technology maturity with the final aim of building new European battery giga-factories.

22 SEPTEMBER

09:00 - 10:30	WS.VII.1 - TT.IX.G

The electrochemical approach for innovation in energetics and industrial processing through the control of active materials at the nm level

Chair: Danilo DINI, *University of Rome*

WS.VII.1.1 TT.IX.G.1	Stefano PASSERINI, *Sapienza University of Rome* **Metal-organic framework derived nanoparticles embedded in carbonaceous matrices for lithium and sodium batteries**
WS.VII.1.2 TT.IX.G.2	Leone FRUSTERI, *CNR* **Electro-spun Nano-fibers: An Innovative Conductive Matrix to produce Self-Standing Electrodes for Sodium-ion Batteries**
WS.VII.1.3 TT.IX.G.3	Gianni APPETECCHI, *ENEA* **Innovative electrode chemistry in ionic liquid electrolytes for sodium-less battery systems**
WS.VII.1.4 TT.IX.G.4	Alfonso POZIO, *ENEA* **Synthesis and Characterization of a Composite Anion Exchange Membrane for Water Electrolyzers (AEMWE)**

11:30 - 13:00	WS.VII.2 - TT.X.H

Electrochemical energy storage:Innovative systems and advanced materials - Part I

Chair: Omar PEREGO, *ENEA*

WS.VII.2.1 TT.X.H.1	Alessandra DI BLASI, Margherita MORENO & Omar PEREGO, *CNR-ITAE | ENEA | RSE* **Italian system research along the battery value chain: challenges towards increase the overall sustainability**
WS.VII.2.2 TT.X.H.2	Marcella BALORDI, *RSE* **Geothermal brines: a promising unconventional lithium reserve for Europe**
WS.VII.2.3 TT.X.H.3	Sergio BRUTTI, *Sapienza University of Rome* **Towards anodeless lithium metal negative electrodes for secondary aprotic batteries**
WS.VII.2.4 TT.X.H.4	Mariasole DI CARLI & Noemi FIASCHINI, *ENEA | Nanofaber* **Introducing the ORANGEES project: new organic and hybrid materials for electrochemical storage. Electrospinning: a powerful technic to produce new organic/hybrid membranes and to tailor their properties for electrochemical uses**

22 SEPTEMBER

14:00 - 15:30	WS.VII.3 - TT.XI.C

Electrochemical energy storage: innovative materials and systems - Part II (advanced materials)

Chair: Margherita MORENO, *ENEA*

WS.VII.3.1 TT.XI.C.1	Stefano MARCHIONNA, *RSE* **Highly reversible anode for LIB and NIB based on oxidized Ti3Al(1-x)SnxC2 MAX phases**
WS.VII.3.2 TT.XI.C.2	Arcangelo CELESTE, *Sapienza University of Rome* **Li-rich layered oxides: towards more sustainable and high energy cathode materials for Li-ion batteries**
WS.VII.3.3 TT.XI.C.3	Massimo INNOCENTI, *University of Florence* **New frontiers of sustainability and circularity in the galvanic industry**
WS.VII.3.4 TT.XI.C.4	Pietro COLUCCI, *ENEA* **Lignin-Derived Vacuum Pyrolysis Hard Carbon for Sodium Batteries**

16:00 - 17:30	WS.VII.4 - TT.XII.B

Electrochemical energy storage: innovative materials and systems - Part III (Systems)

Chair: Alessandra DI BLASI, *ENEA*

WS.VII.4.1 TT.XII.B.1	Enrica MICOLANO, *RSE* **Innovative cell monitoring devices and diagnostic algorithms to predict aging mechanisms and residual useful life**
WS.VII.4.2 TT.XII.B.2	Salvatore Gianluca LEONARDI, *CNR* **Creation of lithium-ion battery ageing datasets for the development and training of data-driven algorithms for estimating SoH and RUL of batteries used in grid services**
WS.VII.4.3 TT.XII.B.3	Giulio MELA, *RSE* **An R package for the computation of the Commodity Life Cycle Costing Indicator. An Economic Measure of Natural Resource Use in the Life Cycle**
WS.VII.4.4 TT.XII.B.4	Alessandra DI BLASI, Margherita MORENO, Omar PEREGO, *CNR-ITAE | ENEA | RSE* **National, European and international initiatives on batteries**

THE ROLE OF HYDROGEN IN THE ENERGY TRANSITION ROAD MAP

September 22

Co-organized with:

Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile

WORKSHOP COMMITTEE

Paola GISLON, ENEA (coordinator)
to be defined by RINA-CSM
Giulia MONTELEONE, *ENEA (to be confirmed)*

In a time marked by the urgent requirement to move towards more environmentally friendly energy solutions, hydrogen emerges as a key player in reshaping the global energy landscape. This workshop aims to examine various aspects of hydrogen utilization, highlighting initiatives such as Hydrogen Valley and other innovative projects that demonstrate a commitment to innovation and environmental responsibility.

Given the growing concerns about the environment and the diminishing availability of fossil fuels, this workshop offers a comprehensive journey through the hydrogen value chain. Our exploration begins with a thorough examination of the pioneering Hydrogen Valley project. This initiative showcases Italy's dedication to fostering a greener energy future, and we will delve into its strategic vision, challenges faced, and achievements attained thus far. Digging deeper, the workshop emphasizes the critical importance of fundamental research within the hydrogen value chain.

Basic research serves as the foundation for hydrogen-based technologies, guiding us towards efficient and sustainable energy solutions. Participants will gain insights into the essential role of basic research, understanding how it informs the development of advanced technologies, improves efficiency, and enhances the overall viability of hydrogen as an energy source. The workshop also delves into the analytical realm of process modeling within the hydrogen value chain.

Through advanced modeling techniques, we will uncover the complex interplay of variables, illustrating how these processes can be optimized for greater efficiency, reduced environmental impact, and improved economic viability. This workshop offers a comprehensive exploration of hydrogen's multifaceted role in the energetic transition, covering historical perspectives, ongoing projects, foundational research, and advanced modeling. Participants will gain a holistic understanding of how hydrogen is driving the decarbonization agenda and shaping the future energy landscape.

22 SEPTEMBER

09:00 - 10:30	WS.VIII.1 - TT.IX.H

Hydrogen Valley and other Projects on Hydrogen Utilization in Italy - Part I

Chair: Paola GISLON, *ENEA*

WS.VIII.1.1 TT.IX.H.1	Filippo CIRILLI, *RINA-CSM* **Decarbonization in energy intensive industry**
WS.VIII.1.2 TT.IX.H.2	Giorgio SEGRE, *ITALGAS* **Title to be defined**
WS.VIII.1.3 TT.IX.H.3	Edoardo D'AMANZO, *RINA-CSM* **Electrification in steel industry**
WS.VIII.1.4 TT.IX.H.4	David ARMAROLI, *ENEL* **Title to be defined**

11:30 - 13:00	WS.VIII.2 - TT.X.B

Hydrogen Valley and other Projects on Hydrogen Utilization in Italy - Part II

Chairs: Paola GISLON, *ENEA and (to be defined), RINA-CSM*

WS.VIII.2.1 TT.X.B.1	Speaker to be defined, *RINA-CSM* **Hydra project**
WS.VIII.2.2 TT.X.B.2	Paolo ALESSIO, *SGI* **SGI Projects on green hydrogen**
WS.VIII.2.3 TT.X.B.3	Andrea BOMBARDI, *RINA* **Title to be defined**
WS.VIII.2.4 TT.X.B.4	Domenico BORELLO, *Sapienza University of Rome* **Towards the decarbonization in the mobility sector in the Italian Scenario: the role of hydrogen and sustainable fuels.**

22 SEPTEMBER

14:00 - 15:30	WS.VIII.3 - TT.XI.D

Basic research in the hydrogen value chain

Chair: Paola GISLON, *ENEA*

WS.VIII.3.1 TT.XI.D.1	Carlo VISCONTI, *Polytechnic University of Milan* **Title to be defined**
WS.VIII.3.2 TT.XI.D.2	Francesco BASILE, *University of Bologna* **Title to be defined**
WS.VIII.3.3 TT.XI.D.3	Alessandra CARBONE, *ITAE-CNR* **Polymer Electrolyte Fuel Cells: challenges and perspectives**
WS.VIII.3.4 TT.XI.D.4	Vincenzo PALMA, *University of Salento* **Title to be defined**

16:00 - 17:30	WS.VIII.4 - TT.XII.C

Modellization of processes in the hydrogen value chain

Chair: Paola GISLON, *ENEA*

WS.VIII.4.1 TT.XII.C.1	Maria Anna MURMURA, *Sapienza University of Rome* **Numerical investigation of the effect of gas flow configuration on the performance of a solid oxide electrolyzer**
WS.VIII.4.2 TT.XII.C.2	Gino CORTELLESSA, *University of Cassino* **Analytical and numerical models for green hydrogen - natural gas mixtures**
WS.VIII.4.3 TT.XII.C.3	Mariagiovanna MINUTILLO, *University of Salento* **Fuel cell systems for maritime applications: research and technology development**
WS.VIII.4.4 TT.XII.C.4	Lorenzo BARTOLUCCI, *University of Rome Tor Vergata* **Fuel Cell Modeling for an Efficient Stack Design**

NANOETHICS: NAVIGATING ETHICAL CHALLENGES IN THE NEW RESEARCH AND INNOVATION AGE

September 20

Co-organized with:

FONDAZIONE BRUNO KESSLER
FUTURE BUILT ON KNOWLEDGE

WORKSHOP COMMITTEE

Massimo Bersani & Rossana Dell'Anna, *FBK - Centro Sensori e Dispositivi*
Massimo Leone & Sara Hejazi, *FBK - Centro Scienze Religiose*

As research and innovation continue to thrive in the dynamic landscape of the current age, the need for ethical considerations has become increasingly important. This workshop aims to explore the diverse and complex ethical dimensions inherent in contemporary research and innovation practices. By addressing the ethical implications across various domains, the workshop will provide participants with a comprehensive understanding of the challenges and opportunities that arise in the pursuit of responsible and impactful research and innovation. The workshop will bring together a diverse group of researchers, practitioners, and stakeholders engaged in interdisciplinary fields, including nanotechnology, quantum science, artificial intelligence, biotechnology, emerging technologies and experts in ethical issues. Through thought-provoking talks, interactive discussions, and case studies, participants will examine ethical frameworks, best practices, and guidelines that can guide responsible conduct in research and innovation.

Key topics to be covered during the workshop include:

Exploring the ethical implications of emerging technologies
Discussing the importance of human-centric design principles, user privacy, and consent in the development and deployment of innovative technologies
Ethical implications of scientific advancements
Collaborative approaches to ethical decision-making: Encouraging collaborative and interdisciplinary approaches to ethical decision-making, emphasizing the involvement of diverse stakeholders.
The workshop aims to foster a collaborative and interactive environment, enabling participants to share insights, experiences, and innovative strategies for addressing ethical challenges in research and innovation. By actively engaging in discussions, participants will gain a deeper understanding of the ethical implications in their respective fields and contribute to the development of ethical frameworks.

As closing step of the a round table between interdisciplinary key players of Ethic Research advancement and Innovation will be held. Keywords: ethics, research, innovation, emerging technologies, responsible conduct, renovability, human-centric design, interdisciplinary collaboration.

20 SEPTEMBER

09:00 - 10:30	WS.IX.1 - TT.I.A

Nanoethics: Navigating Ethical Challenges in the New Research and Innovation Age - Part I

Chair: Massimo BERSANI, *FBK*

WS.IX.1.1 TT.I.A.1	Massimo LEONE, *FBK, Trento* **The God of Small Devices**
WS.IX.1.2 TT.I.A.2	Livia DI BERNARDINI, *APRE* **The responsible development of emerging technologies in Europe: the FORGING experience**
WS.IX.1.3 TT.I.A.3	Sara HEJAZI, *Center for Religious Studies (ISR), Bruno Kessler Foundation* **In the beggining was the word. Narratives, words and silences implied in the relationship between humans and nanotechnologies**

11:30 - 13:00	WS.IX.2 - TT.II.A

Nanoethics: Navigating Ethical Challenges in the New Research and Innovation Age - Part II

Chair: Richard HALL WILTON, *FBK*

WS.IX.2.1 TT.II.A.1	Massimo BERSANI, *FBK* **Ethics and Innovation**
WS.IX.2.2 TT.II.A.2	Diego COGLITORE, *APRE* **Horizon Europe for Responsible Artificial Intelligence: Ethical Guidelines**
WS.IX.2.3 TT.II.A.3	Martin GASTAL, *CERN Geneve CH (to be confirmed)* **Science: towards inclusion and equality: involving and engaging developing countries**

SCHOOL ON NANOTECHNOLOGIES: processes and applications to sensors and actuators

September 20-21-22

Chairs: Vittorio MORANDI, *CNR-IMM* & Lorenza FERRARIO, *FBK*

Co-organized with

It-fab Italian Network for Micro and Nano Fabrication

The course is dedicated to Master Degree and Ph.D students, as well as to scientists working in the wide field of micro- and nano-technology, offering the opportunity to learn about fundamentals on processes, devices fabrication and characterization processes, with attention to both planar and 3D technologies. Besides the lectures dedicated to single technology steps, building blocks of the silicon-based micro- and nano-fabrication technologies, there will be sessions dedicated to devices application areas. The School will be completed with live sessions from cleanrooms to practically show some of the fundamental silicon processing steps.

Wednesday 20 September

09:30 - 09:50	**Welcome and introduction** Lorenza FERRARIO, *FBK*
09:50 - 10:30	**PNRR infrastructures** Vittorio MORANDI, *CNR-IMM*
break	
10:50 - 11:35	**Ion implantation - basic technologies: doping (1)** Antonino PICCIOTTO, *FBK*
11:35 - 12:20	**Tecniche alternative per il drogaggio dei semiconduttori - basic technologies: doping (2)** Michele PEREGO, *CNR-IMM*
12:20 - 13:00	**Plasma/etching (1) - basic technologies: etching (1)** Fulvio MANCARELLA, *CNR-IMM*
light lunch	
14:00 - 14:45	**Plasma/etching (2) - basic technologies: etching (2)** Fulvio MANCARELLA, *CNR-IMM*
14:45 - 15:30	**Deposition (1) - basic technologies: deposition (1)** Riccardo BERTACCO, *PoliMI/PoliFAB*
break	
16:00 - 16:45	**Deposition (2) - basic technologies: deposition (2)** Riccardo BERTACCO, *PoliMI/PoliFAB*

Thursday 21 September

09:00 - 09:45	**Lithography (1) - basic technologies: litho (1)** Massimo CUSCUNA', *CNR NANOTEC*
09:45 - 10:30	**Lithography (2) - basic technologies: litho (2)** Massimo CUSCUNA', *CNR NANOTEC*
break	
10:50 - 11:35	**Litografia basata su copolimeri a blocchi - basic technologies: litho (3)** Michele PEREGO & Irdi MURATAJ, *CNR-IMM, INRiM*
11:35 - 12:20	**Thermal scanning probe lithography - basic technologies: litho (4)** Edoardo ALBISETTI, *Polytechnic University of Milan*
12:20 - 13:00	**Two photon polymerization and Additive Manufacturing - basic technologies: litho (5)** Valentina BERTANA, *Polytechnic University of Turin*
light lunch	
14:00 - 14:45	**Quantum and nanotechnologies applied to time and frequency metrology - METROLOGY - basic technologies: metrology (1)** Giulia APRILE, *INRiM*
14:45 - 15:30	**Traceable Dimensional Nanometrology by Metrological AFM - basic technologies: metrology (2)** Luigi RIBOTTA, *INRiM*

Friday 22 September

09:00 - 09:45	**Advanced materials for the laser particle acceleration and the laser fusion applications: 15 years activity at MNF-FBK - applications (1)** Antonino PICCIOTTO, *FBK*
09:45 - 10:30	**FAIR DATA - OPEN/FAIR Data** Francesca DE CHIARA, *CNRR-IMM*
break	
10:50 - 11:35	**Microfluidics and biosensors - applications (2)** Simone Luigi MARASSO, *Polytechnic University of Turin*
11:35 - 12:20	**Integrazione del materiale GaN per i dispositivi di potenza - applications (3)** Stefano TOIA, *STM Italy*
12:20 - 12:30	CLOSURE OF THE SCHOOL

The intercellular communication by extracellular vesicles: a specialized and diversified network in physiological and pathological conditions

September 21

Chairs: Luciana DINI, Annalisa RADEGHIERI and Alice GUALERZI, *Sapienza University of Rome*

Co-organized with:

SAPIENZA UNIVERSITÀ DI ROMA

EVCIta
SOCIETÀ ITALIANA PER LE VESCICOLE EXTRACELLULARI

Extracellular vesicles (EVs) are nowadays recognized as fundamental elements in intercellular communication. They are a heterogeneous population of membrane-bounded vesicles that play important roles not only in cellular communication but also in preventing or promoting certain diseases, including infectious diseases, neurological disorders, metabolic alterations, and cancer. Techniques and innovative approaches for EVs isolation and characterization have been highlighted in this special event on EXTRACELLULAR VESICLES: THE NEW ERA OF THE INTERCELLULAR COMMUNICATION, organized by the Sapienza Dept of Biology and Biotechnology C.Darwin (Luciana Dini and Stefano Tacconi) in collaboration with EVITA (Annalisa Redeghieri), and divided in two symposia. Considering the extreme heterogeneity of the EVs and the difficulty of establishing standard analytical procedures, in the first symposium we will examine the new innovation research for a single and comprehensive vesicle analysis with four lectures on advanced techniques. The second symposium will be focused on the development and on the applications of innovative technologies for the study of extracellular vesicles. The event will be an opportunity to meet and discuss the state of the art and the prospects of technological research in the Extracellular Vesicles field.

21 SEPTEMBER

09:00 - 10:30	JE.I.1

SINGLE AND COMPREHENSIVE VESICLE ANALYSIS: THE NEW INNOVATION IN THE EXTRACELLULAR VESICLE RESEARCH

Chairs: Luciana DINI & Annalisa RADEGHIERI, *Sapienza University of Rome*

JE.I.1.1	Paolo BERGESE, *Università degli Studi di Brescia, IRIB - CNR, CSGI* **6 + 1 out-of-the-box problems in measuring EVs**
JE.I.1.2	Dario BRAMBILLA, *SCITEC, CNR, Milano* **Reversible aptamer-directed immobilization of antibodies and its application in extracellular vesicles separation**
JE.I.1.3	Carlo MORASSO, *Istituti Clinici Scientifici Maugeri, Pavia* **Biochemical profiling of endogenous nanoparticles by Raman Spectroscopy in breast cancer**
JE.I.1.4	Giacomo PARISI, *Sapienza University of Rome* **Unveiling Extracellular Vescicles diverse morphology with Cryo-Electron Microscopy**

21 SEPTEMBER

11:30 - 13:00	JE.I.2

APPLICATION OF INNOVATIVE TECHNOLOGIES TO THE STUDY OF EXTRACELLULAR VESICLES

Chairs: Luciana DINI & Annalisa RADEGHIERI, *Sapienza University of Rome*

JE.I.2.1	Roberto FRIGERIO, *CNR* **Integrated diagnostic workflow for blood and urinary Extracellular Vesicles by Membrane Sensing Peptides and digital detection**
JE.I.2.2	Aurora MANGOLINI, *LABION/FDG* **SPRi based biosensor for the detection of extracellular vesicles as rehabilitation biomarkers**
JE.I.2.3	Carolina PABA, *University of Trieste* **Lipid bilayer fluidity and degree of order regulates small EVs adsorption on model cell membrane**
JE.I.2.4	Giada ROSSO, *Gruppo Cauda* **Fully artificial extracellular vescicles: a biomimicking strategy towards effectvie theranostic tools in nanomedicine**
JE.I.2.5	Diana VARDANYAN, *CNR* **AFM of single vesicles: a multiparametric morpho quantitative analysis**
JE.I.2.6	Deborah POLIGNANO, *ISS* **Effects of intracellular pathway inhibitors on the secretion, protein, and lipid composition of fluorescent Bodipy sEV**

OPEN INNOVATION & OPEN SCIENCE
VI Edition

September 22

Chairs: Vittorio MORANDI, *CNR* and Marco ROSSI, *Sapienza University of Rome*

In collaboration with:

Airi ASSOCIAZIONE ITALIANA PER LA RICERCA INDUSTRIALE

Nano Italy Associazione

SAPIENZA UNIVERSITÀ DI ROMA

With the growing interest generated by the previous five editions of "Open Innovation and Open Science," the event is once again being organized as part of NanoInnovation 2023, marking its sixth edition.

Since the 2022 edition, it was decided, for continuity, to retain the same title, but the contents and aims of the event have been revised and reconfigured to thoughtfully align with the scenarios presented in the National Recovery and Resilience Plan (PNRR), emphasizing sustainability, localized re-industrialization, reimagining globalization policies, and addressing the evolving needs of university and post-graduate training programs.

In particular, the current 2023 edition will be mainly focused on the actions regarding the project for the implementation of the Research Infrastructures (RIs) and of the Infrastructure for Innovation, that are strategic structural elements of the PNRR, as they have activated an investment plan that has no precedent in the Italian research landscape.

PNRR represents an unique opportunity to modernize and expand existing laboratories as well as to build new laboratories, and, at the same time, it will also result in an huge responsibility for all those laboratories, to develop cutting-edge projects in strategic sectors such as material development, quantum technologies, digital and ecological transition, and to realize a sustainable, effective and impactful ecosystem at the National and European level.

Moreover, the policies for the use of resources deriving from the application of Recovery Funds will make the relationship between public and private research even more crucial and strategic, with a focus on the valorization of knowledge which will represent a key factor for a concrete and stable economic recovery. In such a context, a key element of the PNRR action on RIs is the commitment to make available the result of these large investments – laboratories and associated know-how – to a wide audience, including scientific and business audiences, and also to create training chains useful for filling skills gaps in cutting-edge sectors.

The ability to identify and exploit network skills and knowledge, to manage rapid and complex cooperative processes, to promote inclusive and multi-stakeholder processes to increase the social impact of innovation, to aggregate multidisciplinary skills and knowledge, are increasingly crucial factors for the success of the ongoing projects on RIs.

In the last years, also before the pandemic, the innovation processes have undergone profound changes. The principles of Open Innovation, as a response to the changes in the competitive, technological, scientific environment and the entire approach to research pursued at a national or supranational level according to the principles of Open Science, demonstrate how much the spaces and places of innovation today require careful consideration of the new forms and organizational mechanisms that permeate the action of public and private actors operating in increasingly dynamic contexts, such as those that are determined by the effect of technological convergence, digital transition and the progressive blurring of the boundaries that once allowed to clearly distinguish the various industrial sectors.

The interweaving of relationships between a multiplicity of actors (private and public companies, government bodies and authorities, public and private research bodies, etc.), giving rise to particularly complex networked systems, determines the generation of new organizational forms with a "hybrid nature" (strategic European and National initiatives, strategic alliances, partnerships, joint ventures, consortia, temporary entrepreneurial formations, supply chain systems, etc.) which are based on hybrid mechanisms of regulation and management of relations (market, hierarchy, clan, trust), whose understanding and correct application, of a contextual nature with respect to the needs of the various actors participating in the innovative projects, contributes significantly to determining their effectiveness and efficiency.

The 6th edition of Open Innovation and Open Science is structured 4 sessions. During these sessions some of the main research organizations, universities and large national companies, SMEs, national professional associations and territorial bodies will discuss models and experiences related to:

- Policies for the creation and the sustainability of research and technological infrastructures
- Technology transfer, Industrial Research, and Public-Private Partnerships within PNRR
- Principles and methods for open science and open innovation
- Initiatives and approach towards processes and products integration and sustainability
- Higher education system: innovation policies and requirements

09.00 – 10.30	Implementation and Sustainability of the Research Infrastructures' ecosystem
11.30 – 13.00	Technology transfer, Industrial Research and Technological Infrastructures for Innovation
14.00 – 15:30	Open Science and Open Innovation: guidelines and application
16.00 – 17.30	Research Infrastructures Ecosystem at Sapienza University" programme

Please visit the official event website for the final programme and updates:

www.nanoinnovation2023.eu

The FusionScope
A Unique New Platform for Correlative Microscopy via Combination of AFM and SEM
WORKSHOP & LIVE DEMO

September 20

In collaboration with:

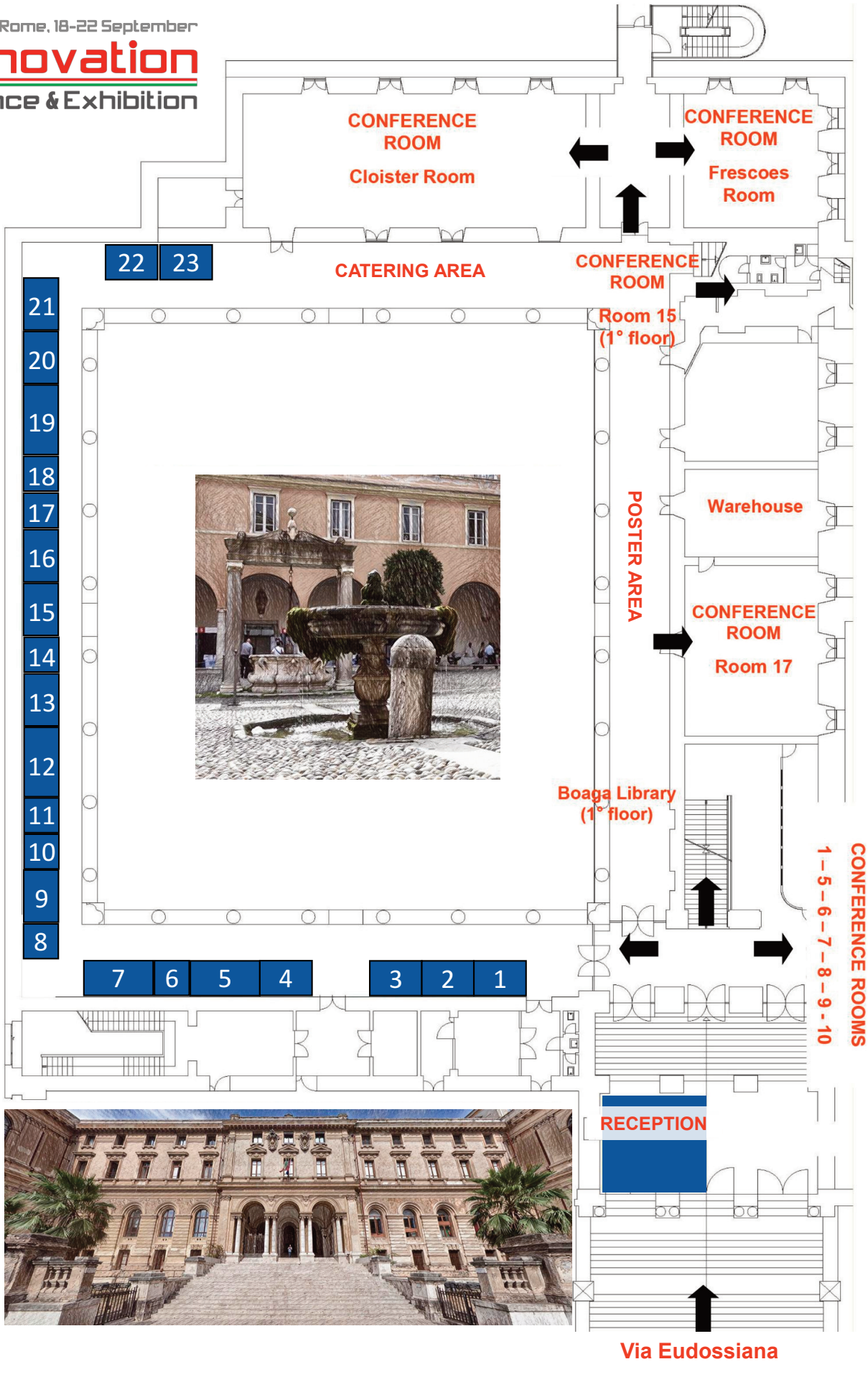
Quantum Design ITALY

Correlative microscopy represents an important technique to analyze materials and their properties with spatial correlative resolution. In this context, scanning electron microscopy (SEM) and atomic force microscopy (AFM) are powerful tools to study even smallest features of a sample with nanometer resolution. However, combining these methods is not simple and remains a challenge in terms of the required instrument setups. In most cases, both methods are used separately, and the results obtained can often not be easily correlated afterwards.The FusionScope - a combination of AFM and SEM - bridges the gap between these two powerful microscopy methods by providing a true correlative instrument design approach coupled with a joint coordinate system. In this workshop, we will demonstrate that a true correlative in-situ analysis of materials - using the FusionScope - is indeed possible. The workshop will cover in detail the idea, requirements, and benefits of correlative microscopy with this instrument, via a theoretical introduction and a LIVE DEMONSTRATION. We will demonstrate the capability to position the AFM tip precisely on the area of interest using profile view – an 80° eucentric tilt. In addition, we will show how the FusionScope can add true height information to the SEM data, and how the advanced capabilities of a probe-based method such as AFM are beneficial to image material properties that would otherwise be "invisible" or simply inaccessible using other methods. The workshop will also cover methods of data acquisition and post-processing, as well as the fabrication of high-performance cantilever tips using the focused electron beam induced deposition (FEBID) technique, followed by an introduction to the self-sensing cantilever technology that allows a pure electrical readout of the cantilever deflection signal. Attendance is free but registration is required.

SEPTEMBER 20	
Chair: to be defined	
09:00 - 09:20	Welcome & Registration
09:20 - 09:30	Introduction to Quantum Design Italy & Quantum Design Microscopy
09:30 - 10:30	Introduction to Correlative Microscopy, Data Processing and Cantilever Technology
break	
10:50 - 11:30	Meet the FusionScope: Presentation and Discussions
11:30 - 13:00	Hands On: Live FusionScope Demonstration
light lunch	
14:00 - 17:30	FusionScope: Bring your own samples **Live Demonstration @ FusionScope with your samples**
Speakers	

Marion WOLFF
Assistant Industrial Engineer at Quantum Design Microscopy
Hajo FRERICHS
Application Specialist at Quantum Design Microscopy
Federico PALMACCI
Sales Engineer at Quantum Design Italy

Nano Innovation 2023
Rome, 18-22 September
Conference & Exhibition



ALPHABETICAL ORDER

9	**ASSING** AGAR SCIENTIFIC BRUKER SURFACE & DIMENSIONAL ANALYSIS CRESTEC CORPORATION IMINA TECHNOLOGIES NENOVISION NU INSTRUMENTS PHYSICAL ELECTRONICS RIBER RIGAKU TESCAN
10	**DPI SMART**
11	**DTC LAZIO**
22	**EMME 3**
23	**ESFR**
13	**FBK**
5	**GAMBETTI KENOLOGIA** HEIDELBERG INSTRUMENTS KLA INSTRUMENTS OXFORD INSTRUMENTS PLASMA TECHNOLOGY PARK SYSTEMS POLYTEKNIK
20	**INRIM**
16	**JEOL S.P.A. ITALIA**
19	**KARTHESIA**
6	**MICRON SEMICONDUCTOR ITALIA**
4	**NG LABTEC**
14	**OXFORD INSTRUMENTS NANOANALYSIS**
15	**PERKIN ELMER**
8	**PLATINUM**
1	**QUANTUM DESIGN ITALY**
17	**RENISHAW**
12	**ROME TECHNOPOLE**
3	**SCHAEFER ITALY**
18	**TECHETHOS - AIRI**
7	**THERMO FISHER SCIENTIFIC**
2	**VERDER SCIENTIFIC**
21	**ZEISS**

BOOTH ORDER

1	**QUANTUM DESIGN ITALY**
2	**VERDER SCIENTIFIC**
3	**SCHAEFER ITALY**
4	**NG LABTEC**
5	**GAMBETTI KENOLOGIA** HEIDELBERG INSTRUMENTS KLA INSTRUMENTS OXFORD INSTRUMENTS PLASMA TECHNOLOGY PARK SYSTEMS POLYTEKNIK
6	**MICRON SEMICONDUCTOR ITALIA**
7	**THERMO FISHER SCIENTIFIC**
8	**PLATINUM**
9	**ASSING** AGAR SCIENTIFIC BRUKER SURFACE & DIMENSIONAL ANALYSIS CRESTEC CORPORATION IMINA TECHNOLOGIES NENOVISION NU INSTRUMENTS PHYSICAL ELECTRONICS RIBER RIGAKU TESCAN
10	**DPI SMART**
11	**DTC LAZIO**
12	**ROME TECHNOPOLE**
13	**FBK**
14	**OXFORD INSTRUMENTS NANOANALYSIS**
15	**PERKIN ELMER**
16	**JEOL S.P.A. ITALIA**
17	**RENISHAW**
18	**TECHETHOS - AIRI**
19	**KARTHESIA**
20	**INRIM**
21	**ZEISS**
22	**EMME 3**
23	**ESFR**

BOOTH 9

ASSING SPA

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ASSING S.p.A is an Italian Company Founded in 1971, with ambitious ideas: to develop Responsible Innovation and Internationalization. Our goal is to produce technological innovation by collaborating with the most important European public and private sector Researchers
Assing is a leader in Italy in delivering high technology solutions and products for Industry and Research. Competences range from design to high technology infrastructure; from the identification of the appropriate analytical techniques to the provision of related systems; from technical-scientific consulting to the organization of training courses. **Assing**, designs, realizes and validates **clean rooms** for research laboratories and production areas and cell-factories. Thanks to its know-how, is able to offer a Global Solution to the various customer requests, as a partner, providing all means and services necessary to carry out its activities. The Company also plays an active role in Research, participating in several projects, both nationally and internationally, aimed at developing new technologies.
Automotive Division: We design and manufacture turnkey solutions and equipment for Automotive Powertrain Test Systems. Our skills include EOL test solutions for components of innovative powertrain for electric and hybrid vehicles (BEV, PHEV, Fuel Cell EV), as well as test benches for traditional applications such as Hot and Cold engine test benches, Automatic and Manual Transmissions, DCT Module

Scientific Instruments Division
Main partners: TESCAN, RIGAKU, NU INSTRUMENTS, RIBER, PHYSICAL ELECTRONICS, BRUKER NANOSURFACES AND METROLOGY, NENOVISION and AGAR SCIENTIFIC.

BOOTH 10

DPI SMART

Sapienza University of Rome - Department of Astronautics, Electrical, Energy Engineering
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The DPI SMART project "Individual Protection Devices, Active Intelligent for Sustainable Multifunctional Reliable Resilient Protection Clusters" is promoted and supported by INAIL and involves the collaboration of highly qualified public and private partners.
Objective: The DPI SMART project involves the creation of a cluster of active and intelligent protective devices aimed at reducing risk exposure and improving worker health and safety.
System features: Sustainability in terms of cost and life cycle of PPE; Multifunctionality with respect to different types of detectable risk; Reliability in reporting critical events in Occupational Health and Safety; Resilience with reference to changes in technology and workers' conditions during the performance of activities and possible implementation of new work processes; The project contributes to the achievement of the objectives of the core area of INAIL's Institutional Mission, specifically the programmatic theme P6 "Innovative systems of health and safety management for risks related to the evolution of production processes, with particular reference to Industry 4.0"
Fields of application
These devices can be used: In the workplace to signal potential hazards due to manual handling of loads, exposure to excessive levels of chemicals with the purpose of a "Protection Cluster" that, when applied to current passive PPE (body, face and eye protection, APVR, helmets, footwear and gloves), adds "active" functionality while not affecting Certification, ensuring resilience, reliability and economic and production sustainability.

BOOTH 11

DTC LAZIO

c/o Area Servizi di Supporto alla Ricerca e al Trasferimento Tecnologico
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The Centre of Excellence of the Lazio Technological District for Cultural Heritage and Activities (CoE DTC Lazio) was founded on July 2018 by five public Universities (Sapienza University of Rome, University of Tor Vergata, University of Roma Tre, University of Viterbo, University of Cassino and Southern Lazio) and three main national research bodies (CNR, ENEA, INFN), with the support of the Lazio Region and MUR, and in collaboration with MiC. The CoE DTC Lazio is a registered association that promotes and integrates research expertise and advanced training in conservation, enhancement and management of historic, artistic and cultural heritage of the Lazio Region. The goal of the Centre of Excellence is the implementation of strategic actions in order to enhancing, at both national and international levels, the attractiveness of the regional system of training-research-innovation-technology transfer-industrial productivity with reference to the Cultural Heritage, and implementing an excellent public-private model for collaboration and stable partnerships between research and enterprise in Lazio Region. Today the DTC Lazio Community includes: more than 700 researchers and teachers engaged in research and education projects; 350 learners of the advanced training courses offered by the Centre; 20,000 users of "massive open online courses" published on the Coursera platform; 154 members of the Stakeholder Board; 275 highly qualified laboratories equipped with advanced scientific instrumentation. The DTC is also strongly committed to the qualification and specialization of human capital through innovative training and higher education projects, such as Masters, Advanced Training Courses (CAF), Permanent in-depth courses (CAP), Massive Online Open Courses (MOOC), aimed at to young graduates, entrepreneurs, employees of companies, organizations and service companies operating in the cultural heritage sector.

BOOTH 22

EMME 3 S.R.L.

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Emme 3 was founded in 1980 to offer only the best scientific equipment to laboratories in the main research and industry sectors. We are specialized in the marketing and assistance of laboratory and scientific equipment, and their accessories and materials. As an official Italian retailer of the best foreign manufacturers, Emme 3 is able to offer products that meet the highest quality standards. Only thanks to our team of qualified operators we can offer all the assistance and help you need. In 2020, Emme 3 absorbed the "2M strumenti" sales program, a company with 30 years of experience in the field of materials science and nanotechnologies.
Emme 3 is now global interlocutor for SEM/TEM users and Italian retailer for the best foreign manufactures within the electron microscopy field, offering scientific instruments aimed to improve research and development such as:

- TEM preparation systems (ultramicrotome, glass knife maker, **RMC Boeckeler**)
- SEM/TEM preparations systems (carbon coater, sputter, glow discharge, **Quorum**)
- material characterization solutions (cooling/heating/controlled atmosphere stages, **Linkam**)
- SEM/TEM preparation/analysis systems (cameras, detectors, holders, **Gatan**, **EDAX**)
- micromanipulators e nanoprobes for SEM (**Kleindiek**)
- vacuum deposition systems (**Moorfield**)
- in-situ systems for material characterization by TEM (**Protochips**)
- consumables for SEM/TEM (**TAAB, EMS, Diatome**).
- works under controlled atmosphere (glovebox for chemists, new materials research, lithium research etc, **Vigor**)

BOOTH 23

THE EUROPEAN SYNCHROTON (ESRF)

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With a brand-new generation of high-energy synchrotron, the ESRF is the world's brightest X-ray source and a centre of excellence for fundamental and innovation-driven research in condensed and living matter science. Located in Grenoble, France, the ESRF owes its success to the international cooperation of 21 partner countries. The ESRF - The European Synchrotron Radiation Facility - is the most intense source of synchrotron-generated light, producing X-rays 100 billion times brighter than the X-rays used in hospitals. These X-rays, endowed with exceptional properties, are produced at the ESRF by the high energy electrons that race around the storage ring, a circular tunnel measuring 844 metres in circumference. Each year, the demand to use these X-ray beams increases and near to 9000 scientists from around the world come to Grenoble, to "beamlines", each equipped with state-of-the-art instrumentation, operating 24 hours a day, seven days a week.
Thanks to the brilliance and quality of its X-rays, the ESRF functions like a "super-microscope" which "films" the position and motion of atoms in condensed and living matter, and reveals the structure of matter in all its beauty and complexity. It provides unrivalled opportunities for scientists in the exploration of materials and living matter in many fields: chemistry, material physics, archaeology and cultural heritage, structural biology and medical applications, environmental sciences, information science and nanotechnologies.
Thirty years ago the ESRF made history as the world's first third-generation synchrotron light source. Today, the ESRF continues to lead the way with the Extremely Brilliant Source (EBS), a brand-new generation of high-energy synchrotron, improving X-ray performances of brilliance and coherence once again by a factor of 100. This new concept, based on innovative technology, paves the way for a new standard of synchrotrons around the world. ESRF-EBS will contribute to tackling global challenges in key areas such as health, environment, energy and new industrial materials, and to unveiling hidden secrets of our natural and cultural heritage through the non-destructive investigation of precious artefacts and palaeontological treasures.

BOOTH 13

FONDAZIONE BRUNO KESSLER

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FBK is the top Research Institute in Italy, ranked at the 1st place for scientific excellence within 3 different subject areas and for the economic and social impact according to the latest quality of research ANVUR evaluation. With its 3000 square meters of laboratories and scientific infrastructures and a community of over 450 researchers, 140 doctoral students, 200 visiting fellows and thesis students, 700 affiliates and accredited students combined, Fondazione Bruno Kessler acts as a scientific and technological hub, its premises and platforms hosting a lively ecosystem of co-located ventures, spin-offs, projects and training opportunities.
The result of more than half a century of history, through 11 centers dedicated to technology and innovation and to the humanities and social sciences, FBK aims to achieve excellent results in the scientific and technological field with particular regard to interdisciplinary approaches and the application dimension.
This is due to the constant focus on collaborations and exchange activities with public administration and institutions, small, medium-sized and multinational companies, European and international institutions, which broaden the capacity for innovation and involve the local community and the local economy in the circulation of knowledge and technologies. From the expertise built in 30 years of research to an innovative vision for the Artificial Intelligence of the future, this is the mission of the FBK Strategic Plan for the decade 2018-2028.
The Mission of Fondazione Bruno Kessler can be summarized in two main points:
1. Scientific research of excellence; 2. Impact on Society
FBK aims at excellence both in fundamental research for the advancement of knowledge, and in the more mature fields of science and technology that allow a greater and more immediate economic and social impact.
The Center for Sensors and Devices (FBK-SD) performs research and innovation in the areas of Materials Science, silicon-based devices and MEMS, radiation detectors and imagers, photonics, bioscience and biotechnologies, and quantum technologies.

BOOTH 5

GAMBETTI KENOLOGIA SRL

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Gambetti Kenologia has been present in the market of surface characterization, micro and nano fabrication, surface treatment systems and vacuum and ultra-vacuum components for almost 4 decades.

Since our creation, we have embarked on a path of selecting the best international partners to introduce cutting-edge techniques and technologies to the Italian market.

Ours is now a strong and wellknown business reality that provides technical advice, a wide range of solutions and products and a high-profile pre- and post-sales service.

Our philosophy of constant research of innovative products has allowed us to create new important collaborations and synergies with companies such as POLYTEKNIK, Heidelberg, Osiris, Molecular Vista and ForgeNano.

We are therefore pleased to showcase and offer these new instruments and systems in addition to our historical partners, including Park Systems, KLA, Oxford Instruments Plasma Technology and others.

BOOTH 20

INRiM
Istituto Nazionale di Ricerca Metrologica

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The National Metrology Research Institute - **INRiM** - is a **public scientific research body** established by Legislative Decree No. 38 of 21 January 2004. **INRiM** was born in 2006, merging the Gustavo Colonnetti Metrological Institute of CNR and the Galileo Ferraris National Electrotechnical Institute. INRiM carries out and promotes **research in metrology** and develops the most advanced measurement standards and methods and related technologies, fulfilling the functions of a primary metrological institute according to Law No. 273 of 11 August 1991. To this end, as a signatory to international agreements on metrology, upon delegation of the competent institutions, and similarly to the metrological institutes of other countries, INRiM **creates and maintains the national standards for units of measurement**. The existence of such standards is necessary for the **traceability and legal value of measures** in the sectors of industry commerce, scientific research, health and environmental protection, as well as for measurement needs in the judicial field and for any other area in which the high scientific-technological content of metrological research is crucial. INRiM also **enhances, disseminates and transfers knowledge and results** in measurement science and materials research to promote national technological development and improve citizens' quality of life and services. INRiM also transfers knowledge and research results in order to promote the development of the country in its various components. INRiM has a unique position with respect to the European metrological institutes: by virtue of its position within the national research system, it is called upon to measure itself against other public research bodies in terms of scientific excellence and, at the same time, is invested by the law to carry out its mission as a primary metrological institute, to accompany and support the technological development of the country.

BOOTH 16

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JEOL is a leading global supplier of scientific instruments used for research and development in the fields of nanotechnology, life sciences, optical communication, forensics, and biotechnology.

Utilizing its unique technologies, products, services, and knowledge, JEOL helps its customers make significant breakthroughs in product development and scientific research.

JEOL products range from scientific instrumentation to industrial equipment including Scanning electron microscopes (**SEM**), Transmission electron microscopes (**TEM**), Auger micro probe analyzers (**AES**), Electron probe micro analyzers (**EPMA**), Photoelectron spectrometers (**XPS**), **Mass spectrometers**, **NMR** spectrometers, Electron spin resonance (**EPR**), and semiconductor tools.

JEOL (ITALIA) S.p.A. ensure both commercial and service assistance of JEOL instruments installed on the Italian territory thanks to highly organized and specialized structure.

BOOTH 19

KARTHESIA

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website: www.karthesia.com
contact person: **Settimio CASTELLI**
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"Modular Structural System" - Karthesia, is a building system which holds an International Industrial Patent based on an Original invention: 3 different geometric types (A, B, C) that generate a set of 9 elements (1A + 4B + 4C) that can be used and assembled together in a modular and collaborative way. A characteristic immediately evident is that of a "geometric figure, not Mono but Multi". This "multi" aspect of Karthesia offers a wide choice of solutions to combine creativity and building requirements that can be made from an array of materials and in any scale of sizes. This results in structures that are therefore not necessarily static, but dynamic, precisely due to the relative peculiarities and behavioural characteristics of the system. This Innovative System, can be easily and quickly adopted and integrated into all technologies currently in use. In the current Global Market, the technologies and resources necessary to develop production using this innovation are already present and available in all the most important industrial sectors and with very low investment compared to the advantages. The advantages of applying the Karthesia System are: **FLEXIBILITY**: It allows infinite combinations (thanks to the slide-in assembly methods and in the total absence of traditional connections and/or joints), for simple and complex applications thanks to the possibility of creating modular systems even with scalar sizing. **DESIGN, ASSEMBLY, TRANSPORT AND INSTALLATION**: The characteristics of the system, allow for a wide choice of design solutions, with a timely identification of components, efficient organization in transport and rapid installation. **REVERSIBILITY**: Its specific mode of assembly allows simple and easy disassembly and removal of the structure, then restoration of the previous state (useful for temporary structures.) **REUSABILITY**: The absence of traditional joints and the flexibility of the system allow the total reuse of all components. **RELIABILITY**: The characteristics of the components, and the modular composition, make it possible to achieve high structural performance, which can already be estimated at the design stage. **SUSTAINABILITY**: The absence of disposal material is a value for sustainability and care for the environment. **KARTHESIA is therefore able to offer innovative solutions in both stable and temporary constructions, small and large, in the global market arena.**

BOOTH 6

MICRON SEMICONDUCTOR ITALIA

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e-mail: micronsemitalia@pec.micron.com

We are an industry leader in innovative memory and storage solutions transforming how the world uses information to enrich life for all. With a relentless focus on our customers, technology leadership, and manufacturing and operational excellence, Micron delivers a rich portfolio of high-performance DRAM, NAND and NOR memory and storage products through our Micron® and Crucial® brands. Every day, the innovations that our people create fuel the data economy, enabling advances in artificial intelligence and 5G applications that unleash opportunities — from the data center to the intelligent edge and across the client and mobile user experience.

To learn more about Micron Technology, Inc. (Nasdaq: MU), visit micron.com

BOOTH 4

NG LABTEC

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NG Labtec: who we are
Since 2005, we have been operating in the Italian market and beyond as a distributor of scientific instruments for the characterization of surfaces and materials. Thanks to the previous 20 years of experience, from the very first moment our motto has been "Excellence is not an option and makes life better." And it is with this philosophy that every day we approach the choice of our Partners, the training of our Staff, the requests of our Clients, and thanks to this style of work we have won the trust of many leading realities in their respective fields.

The Mission
Our goal is to offer added value to all those who choose us. We have demonstration instruments and an application laboratory in where we can test on your own samples the effectiveness of our solutions. Our service department guarantees after-sales support, both corrective and preventive. We are also able to offer training courses for the techniques we deal with, with programs tailored to accordance with the needs of individual realities; as well as services analysis or instrument rental.

Our Solutions and Products:
We are able to offer different techniques to measure and characterize physical properties of surfaces and bulk materials: *Color, appearance and gloss measurements: solutions for any type of surface and material even non-contact or combining visual and digital visions; Dispersion Stability Analysis for the study of separation phenomena (sedimentation, coalescence,…); Foam Analysis: formation, persistency and morphology; Corrosion Evaluation; Particle size with DLS, Laser scattering, DIA (Dynamic Image Analysis); Sample preparation for plastic and coatings; Plasma Treatment for metal cleaning and Surfaces Activation;* Surface Chemistry: contact angle, tensiometers, bubble pressure tensiometers for the study of surfaces, liquids and their interactions

BOOTH 14

OXFORD INSTRUMENTS NANOANALYSIS

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Celebrating over 60 years of scientific excellence and innovation, Oxford Instruments is committed to supporting research and industrial applications to develop a deeper understanding of the world through Science & Technology.

Oxford Instruments Electron Microscopy products enable you to accurately analyse and characterise materials down to the nanoscale level more rapidly, by combining superior detection and analysis instruments with software platforms that interpret the resulting data in the context of your research.

We will be introducing - Unity - the world's first BEX imaging detector that combines Backscattered Electron and X-ray (BEX) imaging in a single technique, simultaneously.

You are welcome to the Oxford Instruments booth!
We'd love to talk to you about what's new in NanoAnalysis!

BOOTH 15

PERKIN ELMER

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PerkinElmer is a trusted global leader in scientific solutions with an 80+ year track record of bringing thought leadership, innovation and technology to our customers, that enable and accelerate scientific outcomes. Manufacturing the latest in analytical tools combined with our expansive OneSource services offerings we provide our customers the insights needed to reshape the world for the better. Utilizing our deep scientific knowledge and history, we strive to provide you with the products, services, and expertise that matter most to your laboratory.

PerkinElmer's instruments and solutions are designed to enable scientists and researchers around the world to monitor the safety and quality of our food, protect and preserve the environment we live in, and drive innovation in emerging technology.

BOOTH 8

PLATINUM "Aziende&Protagonisti"

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PLATINUM "Aziende&Protagonisti" è la rivista a colori allegata a **"Il Sole 24 ORE"** che illustra il panorama economico italiano, con un target imprenditoriale (grandi imprese e PMI), istituzionale ed economico-finanziario nonché dei liberi professionisti. **PLATINUM "Aziende & Protagonisti"** è distribuita in Italia in edicola e direct mailing con **"Il Sole 24 ORE"**, in Europa, in lingua inglese, in sei paesi della CE a maggior capitalizzazione, tramite le C.C.I.E. La tiratura è di circa 140.000 copie senza reso distribuite in Italia ed in EUROPA. Distribuzione mirata in tutte le Università Italiane, nei maggiori Centri di Ricerca Nazionali, Commissione Europea – D.G.Ricerca&Innovazione, Parlamento Europeo – Presidenza, C.E. Centro Comune di Ricerca (JRC), Commissione Europea in Italia Roma e Milano, fiere e convegni nazionali ed internazionali.
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BOOTH 1

QUANTUM DESIGN ITALY

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For more than 50 years, Quantum Design Europe has been one of the **leading distributors of high-tech systems and components for research and industry**. With **120 employees in 20 European countries**, we offer the broadest selection with an exciting mix of suppliers from long-established corporations on the one hand and innovative start-up companies on the other. **We provide well-founded and independent advice** catered to your individual requirements and see ourselves as links between highly specialized manufacturers and science. This can only work when all partners are on an equal level. Our motto is thus: **"From scientists to scientists"**. In line with this aspiration, **all our sales and service employees have a scientific degree**. We can propose solutions for materials science, imaging, spectroscopy, photonics, nanotechnology and life science research. Nanotechnology has always been one of the most important fields for us, we can offer several instruments like AFM, from the educational ones to the High-End platforms (**Nanosurf**), Electron microscopes, from the benchtop SEM to the high-end SEM and TEM (**HITACHI High-Tech**), different solutions for **Correlative Microscopy** like the Raman/confocal/AFM systems (**WITec**), In Situ TEM Solutions (**DENSsolutions**), Cathodoluminescence, Crio-EM and Fast-EM (**Delmic**), and the AFSEM, that combines AFM with SEM (**Quantum Design microscopy**). This year we will present our brand new instrument **FusionScope**, an easy-to-use correlative microscopy platform designed from the ground up to add the benefits of SEM imaging to a wide range of AFM measurement techniques! **You can see the FusionScope LIVE at the Satellite Event "The FusionScope - A Unique New Platform for Correlative Microscopy via Combination of AFM and SEM" on Wednesday the 20th**, it will also be available in the other conference days: stop by at our booth to learn more!

BOOTH 17

RENISHAW

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Renishaw is a global, high precision metrology and healthcare technology group.

We design, develop and deliver solutions and systems that provide unparalleled precision, control and reliability.

We are also a world leader in the field of additive manufacturing (also referred to as metal 3D printing), where we design and produce industrial machines which 'print' parts from metal powder. From transport to agriculture, electronics to healthcare, our breakthrough technology transforms product performance.

We have more than 79 offices in 37 countries, with over 4,400 employees worldwide. Over 2,500 people are employed within the UK where we carry out the majority of our research and development and manufacturing.

BOOTH 12

ROME TECHNOPOLE

c/o Sapienza Università di Roma
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Rome Technopole is an R&D project proposed by the regional system of public and private universities and EPRs, industrial associations, industries and enterprises, the Lazio Region, the Municipality of Rome, and the regional Chambers of Commerce, aimed at generating a qualitative leap forward in the Lazio Region in all innovation processes geared to sustainable development, 'smart specialisation', and the upgrading and revitalisation of the industrial sector, with a specific focus on three thematic areas characterised by the highest qualification and most robust industrial presence in the region: Energy Transition, Digital Transition, and Health & Biopharma.

The Rome Technopole project aims to create a regional innovation ecosystem through which can achieve the three macro-priority objectives for Lazio:

to foster a repositioning process of regional industrial and production realities towards higher value-added segments and markets through processes of adaptation of know-how and technologies of excellence;
to make Lazio a "great European innovation region" with an international dimension
to guide Lazio along internationalisation paths that orient the renewed competitive capacity of the industrial sector towards markets of strategic interest.

BOOTH 3

SCHAEFER ITALY

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website: www.schaefer-tec.it
contact person: **Paolo BARIANI**
e-mail: info@schaefer-tec.it

Schaefer SEE is a microscopy services company active in Italy since 2005. We bring to market highly innovative nano-scale characterization instruments.

We are much more than just a dealer. Our strengths are:

- Competence;
- Premium after-sale customer support delivered by our trained engineers;
- Our ability to run tests and measurement with the instruments we own in our offices.

2022 Instruments portfolio:

- SPM microscopes for operation in: air, environments or vacuum, and related accessories;
- Tabletop SEM microscopes;
- Optical profilers and optical 3D microscopes;
- 3D/4D label free microscopes developed specifically for the life sciences;
- Microscopy-based cell counters, also with recognition capabilities;
- Nanovesicles/Exosomes separation and analysis tools;
- Light scattering nanoparticles characterization tools;
- Control instrumentation (vacuum control, mass flow meters, HV and UHV parts)

Please don't hesitate to contact us for discussing your measurement needs. Whether you are looking for the best tool to invest into for your lab, or whether you need just measurements to be performed on contract, we will be happy to work with you!

BOOTH 18

TECHETHOS & AIRI

website: www.airi.it - www.techethos.eu
contact person: **Andrea PORCARI**
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Airi is a partner of the Horizon Europe TechEthos project, addressing the ethics of technologies with high socio-economic impact. New and emerging technologies are expected to generate opportunities and offer a wealth of socio-economic benefits, though also pose a number of potential ethical and legal challenges and societal consequences. How can we prioritise ethics and societal values in the design, development, and deployment of new and emerging technologies, particularly those with high socio-economic impact? TechEthos made an in-depth horizon scan of current and future disruptive technologies and selected three exemplary tech families to develop guidance to support Ethics-by-design: climate engineering, neurotechnologies, and digital extended reality (XR). The "Ethics-by-design" vision is to bring ethical and societal values into the design and development of technology from the very beginning of the process. The project's goal is to enhance ethical and legal frameworks and operational guidelines to support the research and innovation community in integrating ethics concerns and societal values into research protocols and technology design. Thus, the project provides a unique, in-depth analysis of potential ethical, social and legal implications of a variety of applications related to the three families of technologies identified and beyond, and a guidance to address these implications and increase the impact of your technology developments.
Visit the stand to get in touch with the project, and as well have updated information on activities and opportunities for cooperation with Airi, including the following initiatives:

- TechEthos (H2020): Ethics for technologies with high socio-economic impact.
- SocKETs (H2020): Societal engagement on Key Enabling Technologies
- Repoxyble (Horizon Europe): Biobased multifunctional recyclable composites
- Bioring (Horizon Europe/CBE): High performance biocoatings from renewable reactive building blocks
- Renato Ugo Prize for the best industrial thesis

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