ORGANIZERS

Airi ASSOCIAZIONE ITALIANA PER LA RICERCA INDUSTRIALE

Nano Italy Associazione

SAPIENZA UNIVERSITÀ DI ROMA

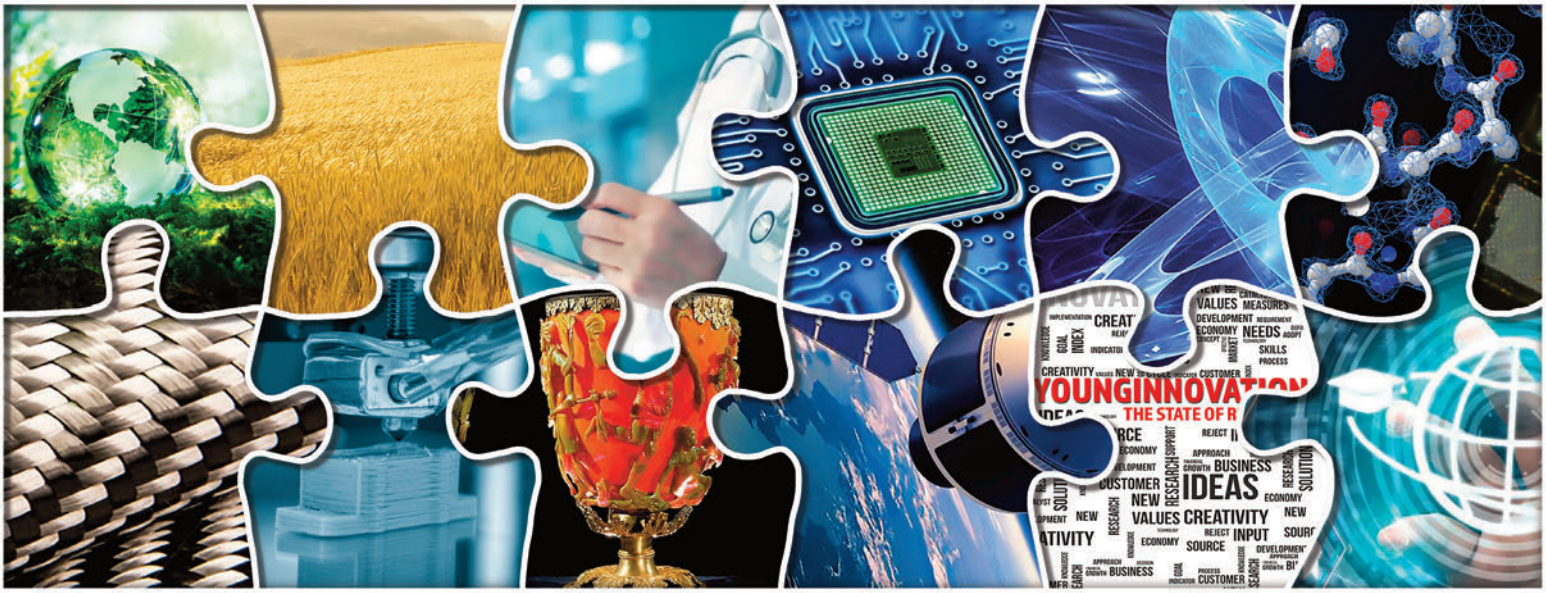
Renaissance Cloister by Sangallo
Faculty of Civil and Industrial Engineering

SEPTEMBER 21-24 2021

Nano Innovation 2021

Rome, 21-24 September

Conference & Exhibition



CO-ORGANIZERS

SAPIENZA UNIVERSITÀ DI ROMA
Politecnico di Torino
DIIES
UMG
Università degli Studi di Messina
UNIMORE UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA
UNIVERSITÀ DEGLI STUDI DI UDINE
SCUOLA NORMALE SUPERIORE
Assing The research partner.
JEOL
ZEISS Seeing beyond
IMM
CSGI
DISTRETTO TECNOLOGICO SICILIA MICRO E NANO SISTEMI S.C.A.R.L.
ASI Agenzia Spaziale Italiana
FONDAZIONE BRUNO KESSLER
Fondazione Don Carlo Gnocchi Onlus
ENEA Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile
iit ISTITUTO ITALIANO DI TECNOLOGIA
INAIL ISTITUTO NAZIONALE PER L'ASSICURAZIONE CONTRO GLI INFORTUNI SUL LAVORO
INRiM ISTITUTO NAZIONALE DI RICERCA METROLOGICA
ISTITUTO SUPERIORE DI SANITÀ
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 953121.
NANOKEY

INSTITUTIONAL PARTNERS

APRE Agenzia per la Promozione della Ricerca Europea
Fondazione Ordine degli Ingegneri Provincia di Roma
Ordine degli Ingegneri della Provincia di Roma

IN COOPERATION WITH

PLATINUM research&innovation

www.nanoinnovation2021.eu

index

01 - 07
welcome & committees

08 - 09
about us

10 - 13
Sapienza University of Rome

14
prizes

15
networking

16
lectio magistralis

17
masterplan

18 - 33
daily plans

34 - 73
technical multi-tracks

74
scientific & technical lectures

75 - 85
special events

86 - 89
poster session

90 - 107
wokshops

108 - 116
schools and courses

117 - 123
joint events

124 - 129
satellite events

130
meeting area

131 - 151
exhibitors

152
supporters

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

PROGETTO GRAFICO E SITO WEB: AZIMUTH DI PATRIZIA DE CASTRO

Institutional Patronages

Presidenza del Consiglio dei Ministri

Ministero dell'Università e della Ricerca

Ministero dello Sviluppo Economico

MINISTERO DELLA DIFESA

Ministero degli Affari Esteri e della Cooperazione Internazionale

REGIONE LAZIO

Scientific Patronages

AIPnD

AICIng
Associazione Italiana di Chimica per Ingegneria

Società Chimica Italiana

SIPaV
Società Italiana di Patologia Vegetale
Italian Phytopathological Society

SISM
Italian Society for Microscopical Sciences

WELCOME

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

The previous five editions of NanoInnovation successfully finished with an average of more than 1200 participants from 10 different countries and 60 thematic symposia and workshops with more than 400 speakers. Most of the leading national public and private research players in nanotechnologies have contributed.

Due to the Covid-19 outbreak, also the VI edition of NanoInnovation, scheduled **from 21 to 24 September 2021**, will be held in a hybrid way. In order to guarantee a wide participation and ensure health protection, some initiatives will take place only online, i.e. the networking event, while others, including thematic symposia, training courses and much more, will take place both online and in attendance. NanoInnovation will be hosted again in the renaissance cloister by Sangallo at the Faculty of Civil and Industrial Engineering of Sapienza University of Rome and extra health measures (i.e. the mandatory use of mask-wearing in enclosed spaces) will be adopted during the event.

NanoInnovation represents the reference national event for the wide and multidisciplinary community involved in the study and development of micro and nanotechnologies and in their integration with other enabling technologies (KETs) in all application fields. For this reason, despite the continuing difficulties imposed by this social/health situation, the organization of the event has continued to proceed at full speed in these months. NanoInnovation has always been a unique and unmissable opportunity to connect academia, research and the entrepreneurial system with the aim of presenting and sharing innovative ideas, transferring know-how, allowing the integration of knowledge and experience between different application fields of nano -biotechnologies.

The main goals of **NanoInnovation 2021** are:

- Providing a **meeting forum** for academia, research, companies and business operators;
- Displaying **state of the art** developments in applied research on nanotechnologies;
- Acting as **showcase** of the innovations in nanotechnologies and KETs;
- Promoting **knowledge transfer** among different R&D players and sectors;
- Offering **capacity building** and **training** opportunities for both scholars and professionals.

The promotion of a Responsible Research and Innovation towards a sustainable development is one of the driving themes of the event. The programme of NanoInnovation 2021, strongly oriented toward application and market aspects of nanotechnology, KETs and innovation in all its aspects, foresees the presence of highly qualified speakers and organizations.

NanoInnovation also offers to students, PhDs and young researchers an excellent and unique opportunity to follow the latest developments on nanotechnologies and to meet leading players in the field.

Organizing Committee

Marco ROSSI *(chair)*

- Sapienza University of Rome

Massimo BERSANI

- FBK

Marco CRESCENZI

- ISS

Vittorio MORANDI

- CNR IMM

Fabrizio PIRRI

- Polytechnic University of Turin

Andrea PORCARI

- AIRI

A special thank to our institutional partners:

- **Ordine degli Ingegneri della Provincia di Roma** and **Fondazione Ordine degli Ingegneri della Provincia di Roma**, that organized the update training course for engineers;
- **APRE - Agency for the Promotion of European Research** that organized the networking event, open and free for all participants.

We would like also to thank the Faculty of Civil and Industrial Engineering of Sapienza University of Rome for kindly hosting the conference, the Department of Basic and Applied Sciences for Engineering for logistic and scientific support, the Steering and Programme Committees for setting up the program structure, the Session Chairpersons and the Speakers who accepted our invitation to share their expertise. A particular appreciation goes to the companies and organizations supporting the event and making possible to participate for free.
We extend our thanks to all the people that worked hardly to make NanoInnovation a valuable and informative experience.

The NanoInnovation 2021 Organizing Committee

Steering Committee

Sesto VITICOLI *(chair)*

- AIRI

Piero BAGLIONI

- University of Florence & CSGI

Giorgio Mariano BALESTRA

- University of Tuscia

Flavia BARONE

- ISS

Marzia BEDONI

- Don Gnocchi Foundation

Claudia L. BIANCHI

- University of Milan

Luca BOARINO

- INRIM

Fabio BOCCUNI

- INAIL

Chiara CAPPELLI

- Scuola Normale Superiore

Ennio CAPRIA

- European Synchrotron (ESRF)

Giuliano CASATI

- Assing

Gianluigi CASSE

- FBK

Sabrina CONOCI

- University of Messina
- CNR-IMM
- Distretto Tecnologico Sicilia Micro e Nano Sistemi

Filippo D'ARPA

- Distretto Tecnologico Sicilia Micro e Nano Sistemi

Marco DI CLEMENTE

- ASI

Giuliana FAGGIO

- The "Mediterranean" University of Reggio Calabria

Steering Committee

Lorenza FERRARIO

- FBK

Guglielmo FORTUNATO

- CNR-IMM

Narciso GAMBACORTI

- CEA - Leti

Roberto GIANNANTONIO

- CNR IRSA

Paolo GRIANTI

- JEOL ITALIA

Andrea LAMBERTI

- Polytechnic University of Turin

Giulio LAMEDICA

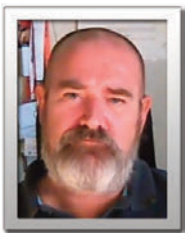
- ZEISS

Claudio LANZIERI

- Leonardo

Nicola LISI

- ENEA



Luca MARCHIOL

- University of Udine

Francesco MATTEUCCI

- European Innovation Council (EIC)

Donatella PAOLINO

- University "Magna Graecia" of Catanzaro

Giuseppe ROSACE

- University of Bergamo

Maria Sabrina SARTO

- Sapienza University of Rome

Giovanni TOSI

- University of Modena and Reggio Emilia

Programme Committee

Marco VITTORI ANTISARI
(chair)

- NanoItaly Association

Fabrizio BARBERIS

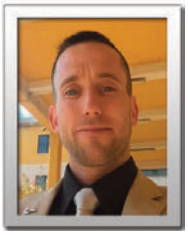
- University of Genoa

Francesco BIANCARDI

- ZEISS

Stefano BIANCO

- Polytechnic University of Turin



Gabriele BULLA

- JEOL ITALIA

Annarica CALCABRINI

- ISS

Sebastiano CAMPAGNA

- University of Messina

Andrea CANESCHI

- INSTM

Ennio CAPRIA

- ESRF

Maria CARAFA

- Sapienza University of Rome

Filippo CASCONE

- Register of Engineers
- Foundation Register of Engineers

Gabriele CENTI

- University of Messina

Massimo CERRI

- Register of Engineers

Annalisa CHIAPPONE

- Polytechnic University of Turin

Luigi Carlo CHIARENZA

- Foundation Register of Engineers

Giancarlo CICERO

- Polytechnic University of Turin

Isabella DE ANGELIS

- ISS

Luciana DINI

- Sapienza University of Rome

Marta FEROCI

- Sapienza University of Rome

Andrea GAIARDO

- FBK

Ettore GAROFALO

- Assing

Rodorico GIORGI

- University of Florence
- CSGI

Sergio IAVICOLI

- INAIL

Leonardo MATTIELLO

- Sapienza University of Rome

Stefania MESCHINI

- ISS

Giacomo MESSINA

- The "Mediterranean" University of Reggio Calabria

Agnese MOLINARI

- ISS

Giovanni NICOLAI

- Register of Engineers

Siglinda PERATHONER

- University of Messina

Donatella PIETRAFORTE

- ISS

Pasqualantonio PINGUE

- Scuola Normale Superiore

Maria Elena PISANU

- ISS

Programme Committee

Georg PUCKER

- FBK

Giuliano RANUZZI

- ASI

Ignazio ROPPOLO

- Polytechnic University of Turin

Stefania SABELLA

- IIT

Daniele SCHIAVI

- University of Tuscia

Annarita STRINGARO

- ISS

NANOINNOVATION IS...

NANOTECHNOLOGY
ATOM
QUANTUM
NANOPARTICLES
MACHINE
DNA
ROTAXANE
ENGINEERING
TEM
NANOELECTRONICS
CHEMICAL
NANOSCALE
APPLICATIONS
NANOBIOTECHNOLOGY
MOLECULAR
TECHNOLOGY
DEVICES
WIKIVERSITY
TRANSPORTS
INITIATIVE
MICROSCOPY
NANOMATERIALS
SILICON
NANOMEDICINE
DRUG DELIVERY
NANOHUB
... MORE & BEYOND

Luigi AMBROSIO

Scuola Normale Superiore
Director

Don Vincenzo BARBANTE

Don Gnocchi Foundation
President

Franco BETTONI

INAIL
President

Silvio BRUSAFERRO

ISS
President

Maria Chiara CARROZZA

CNR
President

Salvatore CUZZOCREA

University of Messina
Rector

Giovambattista DE SARRO

University "Magna Graecia"
of Catanzaro
Rector

Gabriele GALATERI DI GENOLA

Italian Institute of Technology
President

Luigi NICOLAIS

Ministero dell'Università e della Ricerca,
Consigliere per le Politiche sulla Ricerca;
Campania Digital Innovation Hub,
President

Francesco PRIOLO

University of Catania
Rector

Francesco PROFUMO

Bruno Kessler Foundation
President

Francesco SETTE

European Synchrotron (ESRF)
General Director

Santo Marcello ZIMBONE

The "Mediterranean"
University of Reggio Calabria
Rector

Diederik Sybolt WIERSMA

INRIM
President

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.

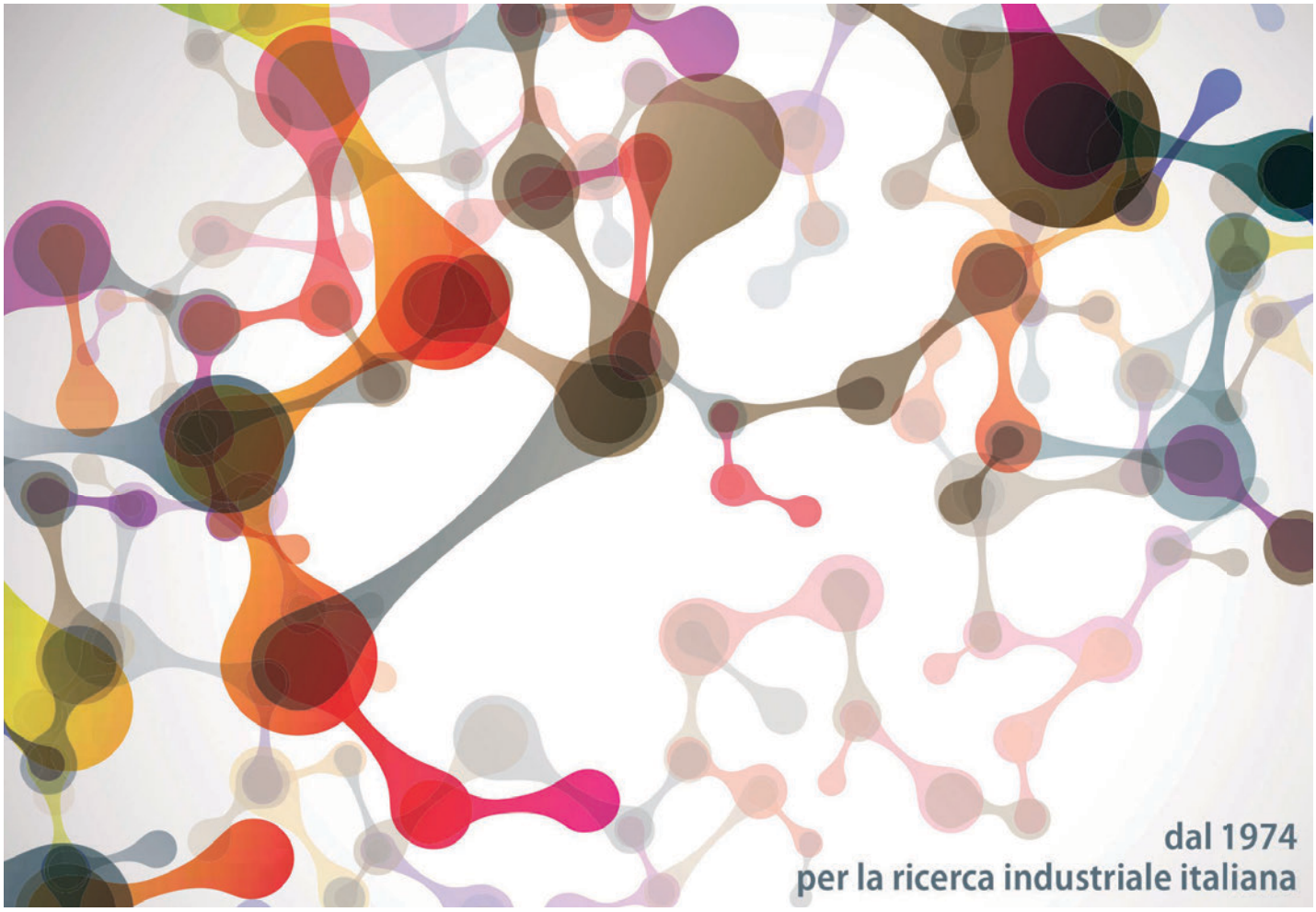
Airi members are large industrial enterprises and SMEs, universities, public research institutions, technology clusters and financial organizations. Due to its broad representative base, Airi is acknowledged as a key opinion leader in Technology forecasting and Research-policy design.

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



Nanoltaly Association

The Nanoltaly 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.

Nanoltaly 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 help transfer of know-how, allowing the integration of ideas and knowledge between different areas of application.

We are strongly convinced that meeting 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 infrastructures 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.

The Association is managed by a Scientific Board which is presently composed by:

Luigi Ambrosio
Luciana Dini
Roberto Morabito
Fabrizio Pirri *(Scientific Secretary)*
Giancarlo Ruocco
Giancarlo Salviati
Pietro Siciliano *(Treasurer)*
Corrado Spinella
Maria Letizia Terranova
Marco Vittori Antisari *(President)*

Associazione Nanoitaly
c/o Dip.to di Scienze di Base ed Applicate
Sapienza Università di Roma
Via Antonio Scarpa, 16 – 00161 Roma
Contact person: Marco Vittori Antisari (marco.vittori@nanoitaly.it)

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 125,000 students, 4,000 professors and nearly as many administrative and technical staff, Sapienza represents a vast knowledge community.

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 74 PhD courses, 200 professional courses and 121 Specialization Schools in Medicine and Health, run by 63 Departments and 11 Faculties. There are 59 libraries and 21 museums, as well as comprehensive student services. The student body includes over 8,000 foreign 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. There are also more than 150 PhD programmes which include almost all major fields of knowledge.
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.

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 University has an annual budget of 1 billion euros, one of the most important in the region.
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

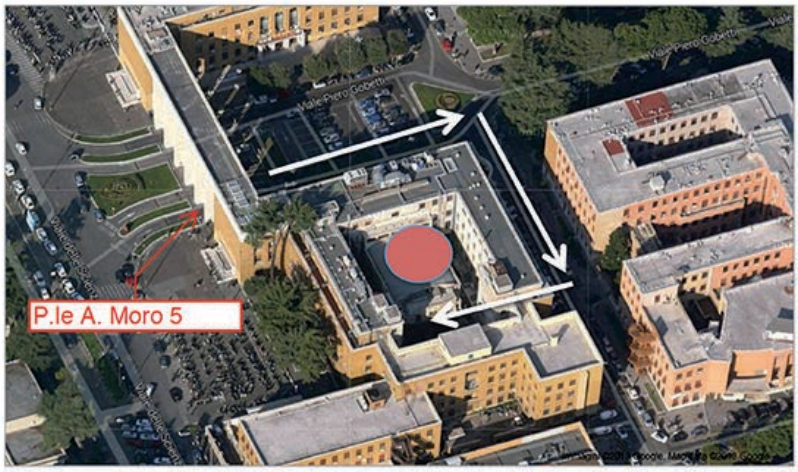
(Centro per le Nanotecnologie applicate all'Ingegneria di Sapienza Università di Roma)

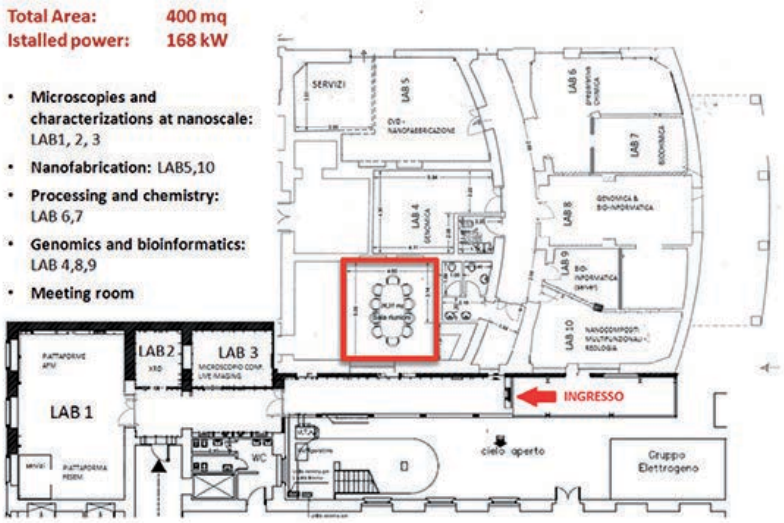
CNIS has been constituted in 2006, and now involves over 90 professors and researchers, coming from different Departments of the Faculties of Engineering, Sciences and Medicine. The vision and goal of CNIS is to embrace and support a multidisciplinary user base of researchers of Sapienza and co-workers 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 devoted to nanoscience and nanotech multidisciplinary applications in materials science, life sciences, engineering and solid state physics. It gathers state-of-art instrumentation for nanotechnology together 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 set of microscopy and nanoscopy techniques is 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 competences available at Sapienza University in the fields of nanotechnology and nanosciences, with the aim of creating synergies among research groups operating in different areas of science, engineering, medicine.
- Constitute a research infrastructure at Sapienza as support to the design, realization and characterization of nanostructures and innovative micro/nano-devices for different fields of applications.
- Provide instrumentation and services to 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 for territory and enterprise, responding to the research and technological development needs of the research programs at regional, national and international levels.





The SNN-Lab has been realized also thanks to funds from Lazio Region aimed at promoting innovation and technological transfer. The Lab is located on an area of 400 mq, at Sapienza University main campus.

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)

ATOMCENTER

Open Infrastructure for Advanced TOmography and Microscopies (ATOM)

www.atomcenter.org

The aim of the project is the foundation of an open research infrastructure for materials and devices characterization, using advanced tomography and microscopy techniques.

The presence in the region of a cluster of scientific instrumentation operating at the nanoscale is one of the fundamental requirements for fast technological transfer in the field of nanotechnology. The **ATOM** project is jointly presented by the Department of Basic and Applied Sciences for Engineering of Sapienza University of Rome, together with other institutions of the same University (CNIS - Research Center for Nanotechnologies applied to Engineering and the Department of Chemistry), and by the Rome Unit of the CNR Institute of Nanotechnology, carrying out cutting-edge research in the nanotechnology sector in the Lazio region, as well as in Italy and internationally.

The network that these research institutions intends to set up in order to develop the **ATOM** infrastructure will be joined, as strategic partners, by some of the most significant companies in the sector operating in the region, such as Leonardo Finmeccanica, ASSING, Rina-CSM, CRISEL and ZEISS.

ATOM has been founded with the aim of investigating in detail the 3D structure of materials, devices, components and biological tissues, from the mesoscopic to the nanoscopic scale, through functional and dynamic nano-characterization.

The planned acquisition will provide users with innovative instrumental platforms with applications in the bio-medical, micro- and nano-electronics, cultural heritage and additive manufacturing sectors.

ATOM is conceived as a link connecting research and business, in virtuous synergy between public and private, to stimulate research and, at the same time, to develop the market linked to its technological applications.

The public sector, which will host the scientific instrumentation and will provide the staff for management and research development, aims to acquire state-of-the-art equipment to enhance nanotechnology skills and international competitiveness.

The private sector, which will guarantee the use of the equipment and, hence, the financial sustainability of **ATOM**, needs to position itself in the making of products in activity sectors of higher added value. Therefore, it requires access to advanced characterization equipment, both to speed up production and to verify the quality of the products.

Regional, national and international companies and research institutions will have access to the services provided by **ATOM** through an online reservation platform, according to a specific Access Regulation for the Infrastructure.

https://www.uniroma1.it/it/notizia/il-progetto-atom-advanced-tomography-and-microscopies-vince-il-bando-della-regione-lazio

FUNDING INSTITUTION REGIONE LAZIO SAPIENZA UNIVERSITÀ DI ROMA

PROJECT PARTNERS SBAI CNRNANOTEC INSTITUTE OF NANOTECHNOLOGY CNIS CENTER OF NANOTECHNOLOGY FOR ENGINEERING OF SAPIENZA DIPARTIMENTO DI CHIMICA

NEST PRIZE

In collaboration with

Sponsored by

Laboratorio NEST of Scuola Normale Superiore is proud to present at **NanoInnovation 2021** the NEST Prize for research in nanoscience, edition 2020. Sponsorized by Rivoira, a company of Nippon Gas Group, the purpose of the NEST Prize is to promote and recognize the activity of young scientists (less than 35 years old) working in Italy on nanoscience field, represented by a submitted scientific publication in the last two years on a peer review international journal.

The prize is awarded by an evaluating committee composed by Directors and/or Coordinators of Laboratorio NEST of Scuola Normale Superiore (SNS), Istituto Nanoscienze of Consiglio Nazionale delle Ricerche (CNR) and Center for Nanotechnology Innovation of Istituto Italiano di Tecnologia (IIT) at the NEST Centre in Pisa.

The NEST Prize consists of € 5,000 Euros cash prize for the winner, a trophy and the opportunity to present his/her research activity at the conference.

During the award ceremony, the edition 2021 of the NEST Prize will be finally presented.

PREMIO NEST 2020

NEST
SCUOLA NORMALE SUPERIORE

NIPPON GASES
The Gas Professionals

PREMIO NAZIONALE NEST PER LA NANOSCIENZA ANNO 2020

Riservato a giovani ricercatori di età non superiore a 35 anni, alla data di scadenza fissata al 21 dicembre 2020, che abbiano pubblicato su una rivista scientifica internazionale tra il 1 gennaio 2019 e il 30 novembre 2020, come unici o primi autori, uno studio nell'ambito della nanoscienza sperimentale.

Possono concorrere ricercatori che non afferiscono al Laboratorio NEST, di qualunque nazionalità, a condizione di essere affiliati ad un laboratorio di ricerca in Italia e che lo studio proposto sia stato realizzato almeno in parte in Italia.
Non saranno presi in considerazione lavori presentati in precedenti edizioni del Premio.

Il Premio, che ammonta a 5.000 euro lordi, sarà erogato al vincitore direttamente dalla Ditta NIPPON GASES.

La domanda di ammissione al concorso deve essere compilata e trasmessa entro il 21 dicembre 2020, a pena esclusione, secondo le modalità previste sul sito del Laboratorio NEST all'indirizzo: www.laboratorionest.it

Info e bando su
www.laboratorionest.it
www.rivoiragas.it

Would you like to discuss your business idea, your research and innovation projects, your technologies with other interested and very skilled people?

THE NETWORKING EVENT IS YOUR GREAT CHANCE!

The meaningful collaboration between NanoInnovation and APRE- Italian Agency for the Promotion of European Research - is renewed for the sixth consecutive year. On the 23rd of September NanoInnovation 2021 conference will offer different chances for presenting your ideas and meet potential research and business partners.
The networking event is the best way to meet potential cooperation partners during face-to-face meetings. People have the possibility to meet each other with a pre-set schedule (around 20 minutes for each meeting) for sharing ideas and experience, building connection, exchanging information, and evaluating new opportunities of collaboration at all levels. A wide spectrum of businessmen, entrepreneurs, researchers and innovators from Europe and beyond the network event will participate at the event, looking for new business and cooperation opportunities: do not miss this great chance!

The networking event is **free of charge** for the conference participants and it will take place online on the **23rd of September** from **09:30 to 13:00** and from **14:30 to 17:30**.

The whole event is managed by APRE – Agency for the Promotion of European Research
Contacts: Matteo Sabini (*sabini@apre.it*) Serena Cheren (*cheren@apre.it*).

TOPICS

The network event will be focused on nanotechnologies in the following sectors:

- INDUSTRY 4.0, ADDITIVE & 3D MANUFACTURING
- AGRI-FOOD
- CONSTRUCTION, BUILDING & RESTORATION
- ELECTRONICS, MICRO AND NANOSYSTEMS
- ENERGY & ENVIRONMENT
- HEALTH & NANOMEDICINE
- INNOVATIVE AND SMART TEXTILES
- NANO-BIO RELATED PRODUCTS
- NANO-MATERIALS BASED INNOVATION (including graphene and 2D materials beyond graphene)
- NANOSCALE CHARACTERIZATION AND MEASUREMENTS
- SAFETY AND SOCIAL IMPACTS
- TRANSPORT, SPACE & AERONAUTICS

HOW IT WORKS

Just few minutes and you will be able to participate to the network event

FIRST STEP

- Go to the brokerage event website on *https://nanoinnovation2021.b2match.io/* and click on "register"
- Insert your data, write a brief description of your organization and your expertise
- Select the networking sessions where you are available for bilateral meeting
- Do not forget to choose the main areas of activity you are interested in

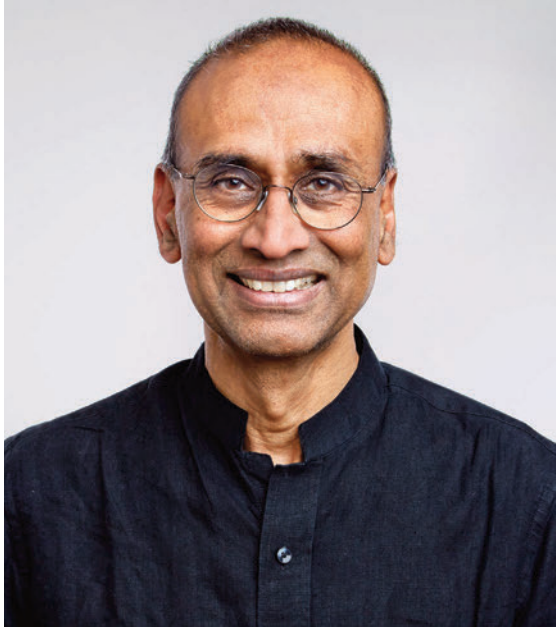
SECOND STEP

- You will be validated by APRE within 2-3 days after registration
- You will receive an invitation to select your potential partners available on the networking tool
- Go to the brokerage event website on *https://nanoinnovation2021.b2match.io/* log-in and book meetings with other registered participants you would like to meet during the networking event in order to discuss collaborative partnerships

THIRD STEP

- Few days before the event, APRE will send your networking agenda with scheduled face to face meetings
- According to your schedule, log in on the brokerage event websiteon *https://nanoinnovation2021.b2match.io/* and join the virtual meeting room!

LECTIO MAGISTRALIS



Dr. Venkatraman RAMAKRISHNAN

2009 Nobel Prize in Chemistry

MRC Laboratory of Molecular Biology (LMB),
Cambridge Biomedical Campus, UK

MY ADVENTURES IN THE RIBOSOME: Nature's amazing nanomachine

Venkatraman 'Venki' Ramakrishnan is a Nobel Prize-winning biologist whose many scientific contributions include his work on the atomic structure of the ribosome. He is senior scientist at the Laboratory of Molecular Biology of the Medical Research Council in Cambridge, UK and was knighted in 2012. He is a Member of the US National Academy of Sciences, Leopoldina and EMBO, and a Foreign Member of the Indian National Science Academy. He was President of the Royal Society from November 2015 until November 2020.

Dr. Ramakrishnan received the **Nobel Prize in Chemistry** for his studies and work on ribosomal structure and function in 2009.

As the site within living cells where RNA is traduced to synthesise proteins from amino acids, ribosomes may be considered nano-3D-printers where genetic information is turned into molecular machines, the proteins. Thanks to ribosomes our cells produce the SARS-Cov2 spike protein, allowing our organism to gain immunity against Covid19.

In his *Lectio Magistralis* at the NanoInnovation Conference on September 24 at 17:30 Dr. Ramakrishnan will talk about "My adventures in the ribosome: Nature's amazing nanomachine" illustrating the molecular architecture and the mechanism of the ribosome. A function central to all living organisms will be described together with the methods used to achieve this fundamental scientific advancement.

Dr. Ramakrishnan has published the book "Gene Machine", recently translated in Italian by Adelphi as "La macchina del gene", in which the scientific challenges of a history changing discovery are intertwined with his personal account of the human side of the scientific community.

At the end of his lecture a book signing event will take place, in the beautiful setting of the Renaissance Cloister by Sangallo, at the Faculty of Civil and Industrial Engineering of Sapienza University of Rome.

A unique and unmissable opportunity to listen to the lesson of Dr. Ramakrishnan and participate in a unique event of its kind.

Tue 21 Sep	**09:00 11:00**	**11:15 13:00**		**14:00 16:30**	**16:45 18:45**	
	Welcome Session & Opening Session on "University, Research and Innovation Policies & Funding" Update trainings and Schools	Round table on "Key Enabling Technologies and open access Research Infrastructures for the Technology Transfer" Update trainings and Schools COVID19: aspetti tecnici oltre l'efficacia dei vaccini		Scientific Plenary Session on Advances and Innovation on Life Science NEST PRIZE Winner	Scientific Plenary Session on Advances and Innovation on material Science	
Wed 22 Sep	**09:00 10:30**	**10:50 11:30**	**11:30 13:00**	**14:00 15:30**	**16:00 17:30**	**17:30 19:00**
	Multi-track sessions	Scientific & Technical Lectures	Multi-track sessions	Multi-track sessions	Multi-track sessions	Joint Events
	Update trainings and Schools		Update trainings and Schools	Update trainings and Schools	Update trainings and Schools	
Thu 23 Sep	**09:00 10:30**	**10:50 11:30**	**11:30 13:00**	**14:00 15:30**	**16:00 17:30**	**17:30 19:00**
	Multi-track sessions	Scientific & Technical Lectures	Multi-track sessions	Multi-track sessions	Multi-track sessions	Joint Events
	Update trainings and Schools		Update trainings and Schools	Update trainings and Schools	Update trainings and Schools	
Fri 24 Sep	**09:00 10:30**	**11:00 12:30**		**14:00 15:30**	**16:00 17:30**	**17:30 18:15**
	Technology transfer: challenges and opportunities	Technology transfer: challenges and opportunities		Technology transfer: challenges and opportunities	Technology transfer: challenges and opportunities	Special closing session
	Multi-track sessions	Multi-track sessions		Multi-track sessions	Multi-track sessions	
	Update trainings and Schools	Update trainings and Schools		Update trainings and Schools	Update trainings and Schools	

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*
PS.I.2	**Paolo ORNELI,** *Regione Lazio, Assessore allo Sviluppo Economico, Commercio e Artigianato, Università, Ricerca, Start-Up e Innovazione*
PS.I.3	**Silvio BRUSAFERRO**, *ISS - Istituto Superiore di Sanità, President*
PS.I.4	**Francesco SETTE**, *ESRF - European Synchrotron Radiation Facility, General Director*
PS.I.5	**Marco FALZETTI**, *APRE - Agenzia Promozione Ricerca Europea, Director*
PS.I.6	**Antonio D'ANDREA**, *Sapienza University of Rome, Faculty of Civil and Industrial Engineering, Dean*

OPENING SESSION
on "University, Research and Innovation Policies & Funding"

Chair: **Roberto FORMARO**, *ASI, Programmes Director*

PS.I.7	Luigi NICOLAIS, *Ministero dell'Università e della Ricerca, Consigliere per le Politiche sulla Ricerca; Campania Digital Innovation Hub, President* **From research to business... the Italian strategy**
PS.I.8	Pierpaolo GAMBINI, *Leonardo Company, Chief Technology Innovation Office, Head of Innovation and Intellectual Property* **The Policy and Governance of Innovative Technologies, the role of collaboration with universities**
PS.I.9	Nello LI PIRA, *Material Engineering Methods & Tools, CRF-Stellantis, Global Materials R&I and Roadmap Manager* **Materials for vehicle electrification: A new paradigm for Automotive Components**
PS.I.10	Francesco MATTEUCCI, *European Innovation Council (EIC), Programme Manager* **Funding for technological innovation: Is it useful to merge bottom-up with challenge-based calls?**
PS.I.11	Martina DE SOLE, *ENoLL (European Network of Living Labs), Director* **The living labs as a way of co-creating the future together maximizing the impact of innovation**

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

11:15 - 13:00

ROUND TABLE

"Key Enabling Technologies and open access Research Infrastructures for the Technology Transfer"

Moderators: Chiara LICO, *Journalist* & Alberto MAZZOTTI, *Journalist*

The Round Table will be coordinated by Marco ROSSI, Sapienza University of Rome

In recent years, the role of research infrastructures as providers of high-level instrumentation and highly specialized skill has strongly increased owing to the need of optimum management of extremely expensive instrumentation of high complexity. The corresponding modification in the management of the research activity where the laboratory results have to be integrated with experiments carried out in large research infrastructures of public access poses, besides new opportunities, also new and often unexplored problems. The interaction among different structures has to be optimized as well as the interaction among different research teams, the intellectual property has to be managed as well as the time and access modes. Even more complex is the building up of delocalized research infrastructures organized as a network of independent laboratories. The Round Table is focused on this last option with the aim of opening a dialogue among all the players potentially interested in the use of infrastructures, providing them with information on both technological and organizational-managerial characteristics for the realization of a network of research infrastructures, while collecting opinions and suggestions on the optimum management approach. The themes on the table span from the needs in terms of operative structure, operator skills, to the instrument characteristics and their evolution strategy. We expect to stimulate in this way, further interests of operators thanks to a greater awareness of the potential offered by individual infrastructures and their integration.

The participation to the Round Table is open and free. For those interested to be included in the published list of participants, please, send the request to Prof. Marco Rossi, chair of NanoInnovation, to his email address: *marco.rossi@uniroma1.it*

Invited participants	
Flavia BARONE	**ISS** *Head of the Multidisciplinary Unit on Nanomaterials and Nanotechnologies*
Andrea BECCARI	**Regione Lazio** *Assessorato allo Sviluppo Economico, Commercio e Artigianato, Università, Ricerca, Start-Up e Innovazione*
Massimo BERSANI	**FBK** *Program Manager, Sensors & Devices Center*
Luca BOARINO	**INRIM** *Quantum Research Labs & Nanofacility, Adv. Mat. Life Science Division*
Matteo BONFANTI	**IIT**, *Technology Transfer Director*
Marco BRANCATI	**Telespazio**, *Chief Technology & Innovation Officer*
Ennio CAPRIA	**ESRF** *Deputy Head of Business Development*
Gianluigi CASSE	**FBK** *Director, Sensors & Devices Center*
Regina CIANCIO	**CNR-IOM, Trieste** *Italian representative of the e-DREAM Initiative*
Sabrina CONOCI	**University of Messina,** *Third Mission Delegate* **CNR-IMM; Distretto Tecnologico Sicilia Micro e Nano Sistemi**
Marco CRESCENZI	**ISS,** *FAST, Director*
Salvatore CUZZOCREA	**University of Messina**, *Rector*
Giovambattista DE SARRO	**University "Magna Graecia" of Catanzaro,** *Rector*
Dario DELLA SALA	**ENEA**, *Head of Division "Sustainable materials"*
Martina DE SOLE	**ENoLL (European Network of Living Labs)**, *Director*
Marco FALZETTI	**APRE**, *Director*

Roberto FORMARO	**Italian Space Agency,** *Director, Aerospace Programmes*
Guglielmo FORTUNATO	**CNR-IMM,** *Responsabile del progetto: NanoMicroFab - Infrastruttura aperta di ricerca per il supporto di aziende operanti nell'ambito della micro-nanoelettronica*
Luigi GALLO	**INVITALIA,** *Incentivi e Innovazione, Responsabile Area Innovazione*
Narciso GAMBACORTI	**CEA-Leti,** *Program Manager Nanocharacterization & Metrology*
Pierpaolo GAMBINI	**LEONARDO SpA** *Chief Technology Innovation Office, Head of Innovation and IP*
Roberto GIANNANTONIO	*Freelance professional on Technological Innovation*
Pietro GIMONDO	**RINA Consulting – CENTRO SVILUPPO MATERIALI SpA** *Head of relations with industry, tender, funded research*
Nello LI PIRA	**FCA - Stellantis,** *Global Materials R&I & Roadmap Manager*
Francesco MATTEUCCI	**European Innovation Council (EIC),** *Programme Manager*
Vittorio MORANDI	**CNR-IMM,** *Coordinator of It-fab*
Fabiola MASSA	**University of Rome Tor Vergata**
Ugo MENCHERINI	**ART-ER Attrattività Ricerca Territorio della Regione Emilia Romagna,** *Support Manager, Area Ricerca e Innovazione*
Edoardo MOLA	**PRAXI Spa,** *CEO*
Luigi NICOLAIS	**Ministero dell'Università e della Ricerca** *Consigliere per le Politiche sulla Ricerca* **Campania Digital Innovation Hub** *President*
Luca ONNIS	**Warrant Hub S.p.A.,** *Chief Operating Officer*
Vincenzo PALERMO	**CNR-ISOF,** *Director*
Antonio Marco PANTALEO	**European Innovation Council (EIC)** *Programme Manager for Energy & Green Technologies*
Pasqualantonio PINGUE	**Scuola Normale Superiore** *Chief Operating Officer. Laboratorio NEST*
Francesco SETTE	**ESRF** *General Director*
Laura SPINARDI	**NETVAL,** *Consiglio Direttivo* **IRCCS Policlinico di Milano**, *Head of Technology Transfer Office*
Rosario Corrado SPINELLA	**CNR-DSFTM,** *Director*
Achille SPINELLI	**Provincia Autonoma di Trento** *Assessore allo sviluppo economico, ricerca e lavoro*
Giovanni TOSI	**University of Modena and Reggio Emilia** *Scientific Responsible of Nanomedicine Platform,* *Secretary of European Technology Platform for Nanomedicine*
Sesto VITICOLI	**AIRI**, *Vice-president*
Marco VITTORI ANTISARI	**NanoItaly Association**, *President*

14:00 - 16:00

SCIENTIFIC PLENARY SESSION ON ADVANCES AND INNOVATION ON LIFE SCIENCE	
Chair: Beatrice VALLONE, *Sapienza University of Rome*	
PS.II.1	Don Vincenzo BARBANTE, *Don Gnocchi Foundation, President* **Introductory welcome**
PS.II.2	Elena CATTANEO, *University of Milan* **Huntington's disease: from an ancient gene to brain-permeable therapeutic nanoparticles**
PS.II.3	Daniela BARGELLINI RHODES, *Fellowship of the Royal Society, MRC Laboratory of Molecular Biology, Cambridge, UK, NTU Institute of Structural Biology, Singapore* **The Resolution Revolution in Cryo-EM: How did it happen and its applications in biomedicine**
PS.II.4	Salvatore CUZZOCREA, *University of Messina, Rector* **Inside neuroinflammation: role of nanomedicine as emerging therapeutic tool in the *symphony* of glial cells**

16:00 - 16:30

Announcement of the NEST PRIZE Winner	
Chair: Pasqualantonio PINGUE, *Scuola Normale Superiore*	
PS.III	Pasqualantonio PINGUE, *Scuola Normale Superiore* Mario ALLOATTI, *Nippon Gases* Fabio BELTRAM, *Scuola Normale Superiore* **Introduction**
	Proclamation
	Scientific contribution of the winner
	Conclusion and 'arrivederci' to the next NanoInnovation 2022

16:45 - 18:45

SCIENTIFIC PLENARY SESSION ON ADVANCES AND INNOVATION ON MATERIAL SCIENCE	
Chair: Vittorio MORANDI, *CNR-IMM, Bologna*	
PS.IV.1	Vincenzo PALERMO, *CNR-ISOF, Bologna, Chalmers University of Technology, Göteborg, Sweden* **Graphene history – from lab weirdo to breakthrough in industrial innovation**
PS.IV.2	Gianluigi CASSE, *FBK-Fondazione Bruno Kessler, Director of Sensors and Devices Center* **Development of novel devices ready for series production**
PS.IV.3	Françoise BEZERRA, *CNES, France, Sace Radiation Environment Engineer & Radiation Safety Officer* **Irradiation facilities used for electronic component testing: Selection, limitations and possible evolutions**

WELCOME COCKTAIL

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

TT.I

09:00 - 10:30

TT.I.A	**New drug delivery systems in biomedical applications - Part 1** *Co-organized with ISS* Chairs: Annarica CALCABRINI & Stefania MESCHINI, *ISS*
TT.I.B **WS.I.1**	**Future Technology for large scale hydrogen production, storage** *Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA* Chair: Elena TRESSO, *Polytechnic of Turin* *The symposium is part of the workshop WS.I*
TT.I.C	**Tools to measure and stimulate activity in brain tissue and their applications** *Co-organized with CNR-IMM* Chair: Guglielmo FORTUNATO, *CNR-IMM*
TT.I.D **WS.II.1**	**Innovative approaches in UNMET clinical needs for maximum health care impact - Medical Needs** *Co-organized with Don Gnocchi Foundation, University of Modena and Reggio Emilia, University of Catanzaro and Sapienza University of Rome* Chairs: Maria CARAFA, *Sapienza University of Rome* & Marzia BEDONI, *Don Gnocchi Foundation* *The symposium is part of the workshop WS.II*
TT.I.E	**Organ-on-Chip for innovative clinical trials** *Co-organized with the European project FLAMIN-GO* Chair: Roberto GIANNANTONIO, *CNR - IRSA*
TT.I.F	**Tissue Regeneration** *Co-organized with University of Catanzaro & Sapienza University of Rome* Chairs: Konrad URBANEK & Fabiola MARINO, *University Magna Graecia of Catanzaro*
TT.I.G	**The Genetic Point of Care: the New Frontier of Bio-Technologies for Future Outbreaks Management - Part 1** *Co-organized with University of Messina, Polytechnic of Turin and FBK* Chair: Sabrina CONOCI, *University of Messina, CNR-IMM & Distretto Tecnologico Sicilia Micro e Nano Sistemi*
TT.I.H **WS.VI.1**	**Introduction to the electronic solutions for aerospace applications** *Co-organized with ASI & ESRF* Chair: Ennio CAPRIA, *ESRF, Grenoble* *The symposium is part of the workshop WS.VI*

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

11:30 - 13:00

TT.II

TT.II.A **WS.III.1**	**AgriNanoTechniques: Nanomaterials for products and application in agriculture – Nano-Enabled Agriculture and EU Green Deal** *Organized by University of Udine* Chair: Luca MARCHIOL, *University of Udine* *The symposium is part of the workshop WS.III*
TT.II.B **WS.I.2**	**Future Technology for large scale hydrogen use and distribution** *Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA* Chair: Giulia MONTELEONE, *ENEA* *The symposium is part of the workshop WS.I*
TT.II.C	**New drug delivery systems in biomedical applications - Part 2** *Co-organized with ISS* Chairs: Annarica CALCABRINI & Stefania MESCHINI, *ISS*
TT.II.D **WS.II.2**	**Innovative approaches in UNMET clinical needs for maximum health care impact - Innovation in Academia** *Co-organized with Don Gnocchi Foundation, University of Modena and Reggio Emilia, University of Catanzaro and Sapienza University of Rome* Chairs: Furio GRAMATICA, *Don Gnocchi Foundation* & Giovanni TOSI, *University of Modena and Reggio Emilia* *The symposium is part of the workshop WS.II*
TT.II.E	**Smart Textiles and the role in nanotechnologies** *Co-organized with the project PON R&I ARS01_00951 - Design, creatività e Made in Italy - ECOTEC* Chair: Roberto GIANNANTONIO, *Klopman International Srl*
TT.II.F	**Advanced technologies in cardiovascular diseases** *Co-organized with University of Catanzaro & Sapienza University of Rome* Chairs: Daniele TORELLA, *University Magna Graecia of Catanzaro* & Mattia TIBONI, *University of Urbino*
TT.II.G	**Microscopy for Materials Sciences** *Co-organized with ZEISS* Chair: Veronica SPARACINO, *ZEISS*
TT.II.H	**The Genetic Point of Care: the New Frontier of Bio-Technologies for Future Outbreaks Management - Part 2** *Co-organized with University of Messina, Polytechnic of Turin and FBK* Chair: Sabrina CONOCI, *University of Messina, CNR-IMM & Distretto Tecnologico Sicilia Micro e Nano Sistemi*
TT.II.I **WS.VI.2**	**Testing of radiation hardness of electronic components** *Co-organized with ASI & ESRF* Chair: Ennio CAPRIA, *ESRF, Grenoble* *The symposium is part of the workshop WS.VI*

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

TT.III

14:00 - 15:30

TT.III.A **WS.III.2**	**AgriNanoTechniques: Nanomaterials for products and application in agriculture - Nanosafety in Food: Regulatory Needs** *Co-organized with ISS* Chairs: Flavia BARONE & Isabella DE ANGELIS, *Environment and Health Department - ISS* *The symposium is part of the workshop WS.III*
TT.III.B **WS.I.3**	**The virtuous CO_2 circle: integration with hydrogen** *Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA* Chair: Stefano STENDARDO, *ENEA* *The symposium is part of the workshop WS.I*
TT.III.C **WS.VI.3**	**The strategic role of additive manufacturing for aerospace applications** *Co-organized with ASI & ESRF* Chair: Marco PIZZARELLI, *ASI* *The symposium is part of the workshop WS.VI*
TT.III.D **WS.II.3**	**Innovative approaches in UNMET clinical needs for maximum health care impact - Translational aspects** *Co-organized with Don Gnocchi Foundation, University of Modena and Reggio Emilia, University of Catanzaro and Sapienza University of Rome* Chairs: Marzia BEDONI, *Don Gnocchi Foundation* & Giovanni TOSI, *University of Modena and Reggio Emilia* *The symposium is part of the workshop WS.II*
TT.III.E	**Hot topics in Life Sciences - Focus on natural compound** *Co-organized with University of Catanzaro & Sapienza University of Rome* Chairs: Stefano ALCARO, *University Magna Graecia of Catanzaro* & Ettore NOVELLINO, *University of Naples Federico II*
TT.III.F	**Microscopy for Life Sciences - Cryo-Microscopy and Impact of Applied Physics on Optical Techniques** *Co-organized with ZEISS* Chair: Luciana DINI, *Sapienza University of Rome*
TT.III.G	**Scale-up of Nanomaterials for Energy - Part 1** *Co-organized with the European Innovation Council (EIC)* Chairs: Francesco MATTEUCCI, *EIC* & Roberto GIANNANTONIO, *CNR IRSA*
TT.III.H	**The energy hubs and districts in Italy: a showcase for nanotech - Part 1** *Co-organized with University of Messina* Chair: Gabriele CENTI, *University of Messina* Co-Chairs: Sebastiano CAMPAGNA, *University of Messina* & Siglinda PERATHONER, *University of Messina & INSTM*

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

16:00 - 17:30

TT.IV

TT.IV.A **WS.III.3**	**AgriNanoTechniques: Nanomaterials for products and application in agriculture - ENMs and Plant Protection** *Organized by University of Tuscia* Chair: Giorgio Mariano BALESTRA, *University of Tuscia* *The symposium is part of the workshop WS.III*
TT.IV.B **WS.I.4**	**Nanomaterials and Nanotechnology for CO_2: Capture and Conversion** *Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA* Chair: Stefano BIANCO, *Polytechnic of Turin* *The symposium is part of the workshop WS.I*
TT.IV.C **WS.VI.4**	**Advanced imaging characterisation of metallic parts manufactured via additive manufacturing** *Co-organized with ASI & ESRF* Chair: Marco PIZZARELLI, *ASI* *The symposium is part of the workshop WS.VI*
TT.IV.D	**Pluripotent Stem Cell as a Multidisciplinary Platform in Clinical Research** *Co-organized with University of Catanzaro & Sapienza University of Rome* Chairs: Giovanni CUDA & Heather BOND, *University Magna Graecia of Catanzaro*
TT.IV.E	**The energy hubs and districts in Italy: a showcase for nanotech - Part 2** *Co-organized with University of Messina* Chair: Gabriele CENTI, *University of Messina* Co-Chairs: Sebastiano CAMPAGNA, *University of Messina* & Siglinda PERATHONER, *University of Messina & INSTM*
TT.IV.F	**Recent advances in Image Analysis and Data Management** *Co-organized with ZEISS* Chair: Matteo TROMBETTONI, *ZEISS*
TT.IV.G	**Scale-up of Nanomaterials for Energy - Part 2** *Co-organized with the European Innovation Council (EIC)* Chairs: Francesco MATTEUCCI, *EIC* & Roberto GIANNANTONIO, *CNR IRSA*
TT.IV.H	**New Frontiers in Electron Microscopy** *Co-organized with JEOL & Sapienza University of Rome* Chair: Marco VITTORI ANTISARI, *NanoItaly Association*

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

TT.V

09:00 - 10:30

TT.V.A **WS.IV.1**	**The Digital Transition** *Co-organized with AIRI* Chair: Sesto VITICOLI, *AIRI* *The symposium is part of the workshop WS.IV*
TT.V.B **WS.I.5**	**Design and Characterization of nanomaterials for the energy transition** *Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA* Chair: Giancarlo CICERO, *Polytechnic of Turin* *The symposium is part of the workshop WS.I*
TT.V.C	**Development of Micro and Nanotechnologies for Predictivity, Diagnosis, Therapy and Regenerative Treatments of Pathological of Bone and Osteo-Articular Alterations** *Co-organized with Distretto Tecnologico Sicilia Micro e Nano Sistemi* Chair: Sabrina CONOCI, *University of Messina, CNR-IMM & Distretto Tecnologico Sicilia Micro e Nano Sistemi* Co-Chairs: Giovanna CALABRESE, *University of Messina* & Francesco TRAINA, *Istituto Ortopedico Rizzoli - Bologna*
TT.V.D	**From life sciences to innovative materials: stories of successful integration of technology and nanoresearch - Part 1** *Co-organized with ISS* Chair: Marco CRESCENZI, *ISS* Co-Chair: Rossella CANESE, *ISS*
TT.V.E	**A new generation of power converters and intelligent power switches, based on GaN, for higher performance applications in the sector of smart mobility and renewable energy** *Co-organized with Distretto Tecnologico Sicilia Micro e Nano Sistemi* Chair: Leoluca LIGGIO, *Coordinator of the European Project "GaN4AP" & Distretto Tecnologico Sicilia Micro e Nano Sistemi*
TT.V.F	**Innovative technologies in drug delivery: Extracellular Vesicles** *Co-organized with University of Catanzaro & Sapienza University of Rome* Chairs: Maria CARAFA, *Sapienza University of Rome* & Maria Chiara CRISTIANO, *University Magna Graecia of Catanzaro*
TT.V.G	**Recent Advancements in surface modification for Micro and optoelectronics** *Co-organized with FBK* Chair: Massimo BERSANI, *FBK*
TT.V.H **WS.V.1**	**Zero-dimensional materials and nanocomposites** *Co-organized with University of Reggio Calabria & CNR-IMM* Chairs: Giuliana FAGGIO & Giacomo MESSINA, *University of Reggio Calabria* and Vittorio MORANDI, *CNR-IMM* *The symposium is part of the workshop WS.V*

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

11:30 - 13:00

TT.VI

TT.VI.A **WS.IV.2**	**The Green Transition - Part 1: Energy** *Co-organized with AIRI* Chair: Andrea PORCARI, *AIRI* *The symposium is part of the workshop WS.IV*
TT.VI.B **WS.I.6**	**Electrochemical energy storage from fundamental studies to pilot engineering: Li ion batteries** *Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA* Chair: Pier Paolo PROSINI, *ENEA* *The symposium is part of the workshop WS.I*
TT.VI.C	**From life sciences to innovative materials: stories of successful integration of technology and nanoresearch - Part 2** *Co-organized with ISS* Chair: Marco CRESCENZI, *ISS* Co-Chair: Rossella CANESE, *ISS*
TT.VI.D **WS.V.2**	**Carbon-based 2D materials** *Co-organized with University of Reggio Calabria & CNR-IMM* Chairs: Giuliana FAGGIO & Giacomo MESSINA, *University of Reggio Calabria* and Vittorio MORANDI, *CNR-IMM* *The symposium is part of the workshop WS.V*
TT.VI.E	**Manufacturing and industrial applications of 3D and 4D printing of polymer nanocomposites and devices - Part 1** *Co-organized with Polytechnic of Turin & CNR-IMM* Chairs: Ignazio ROPPOLO & Annalisa CHIAPPONE, *Polytechnic of Turin*
TT.VI.F	**Brain Delivery** *Co-organized with University of Catanzaro & Sapienza University of Rome* Chairs: Teresa MUSUMECI, *University of Catania* & Federica DE GAETANO, *University of Messina*
TT.VI.G	**Innovative packaging materials and tools for preventive conservation of Cultural Heritage** *Co-organized with CSGI* Chair: Rodorico GIORGI, *CSGI*
TT.VI.H	**Materials and devices in photonic quantum technologies - Part 1** *Co-organized with FBK* Chair: Georg PUCKER, *FBK*

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

TT.VII

14:00 - 15:30

TT.VII.A **WS.IV.3**	**The Green Transition - Part 2: Mobility and Circular Economy** *Co-organized with AIRI* Chair: Andrea PORCARI, *AIRI* *The symposium is part of the workshop WS.IV*
TT.VII.B **WS.I.7**	**Electrochemical energy storage from fundamental studies to pilot engineering: new generation batteries - Part 1** *Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA* Chair: Margherita MORENO, *ENEA* *The symposium is part of the workshop WS.I*
TT.VII.C	**Green chemistry and LCA applications as tools for sustainability in the textile value chain - Part 1** *Co-organized with University of Bergamo* Chairs: Giuseppe ROSACE, *University of Bergamo* & Roberto VANNUCCI, *Centro Tessile Cotoniero & Abbigliamento S.p.A.*
TT.VII.D	**Ophtalmic/Topical Delivery** *Co-organized with University of Catanzaro & Sapienza University of Rome* Chairs: Rosario PIGNATELLO, *University of Catania* & Maria Camilla BERGONZI, *University of Florence*
TT.VII.E	**ARTES 4.0 and ISAAC PROJECT at SNS: fluorescence microscopy and deep-learning algorithms for nanomedicine** *Co-organized with Scuola Normale Superiore* Chairs: Pasqualantonio PINGUE & Francesco CARDARELLI, *Scuola Normale Superiore*
TT.VII.F	**Advanced technologies for occupational health and safety in nanomaterials production processes** *Co-organized with INAIL and IIT* Chairs: Stefania SABELLA, *IIT* & Fabio BOCCUNI, *INAIL*
TT.VII.G	**Materials and devices in photonic quantum technologies - Part 2** *Co-organized with FBK* Chair: Georg PUCKER, *FBK*

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

16:00 - 17:30

TT.VIII

TT.VIII.A **WS.IV.4**	**The Green Transition - Part 3: Circular Economy** *Co-organized with AIRI* Chair: Andrea PORCARI, *AIRI* *The symposium is part of the workshop WS.IV*
TT.VIII.B **WS.I.8**	**Electrochemical energy storage from fundamental studies to pilot engineering: new generation batteries - Part 2** *Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA* Chair: Nadhira BENSAADA LAIDANI, *FBK* *The symposium is part of the workshop WS.I*
TT.VIII.C	**Green chemistry and LCA applications as tools for sustainability in the textile value chain - Part 2** *Co-organized with University of Bergamo* Chairs: Giuseppe ROSACE, *University of Bergamo* & Roberto VANNUCCI, *Centro Tessile Cotoniero & Abbigliamento S.p.A.*
TT.VIII.D	**Regenerative Medicine** *Co-organized with University of Catanzaro & Sapienza University of Rome* Chairs: Giovanni TOSI, *University of Modena and Reggio Emilia* & Angela BONACCORSO, *University of Catania*
TT.VIII.E	**Nanotechnologies for Cultural Heritage** *Co-organized with Scuola Normale Superiore* Chair: Pasqualantonio PINGUE, *Laboratorio NEST, Scuola Normale Superiore*
TT.VIII.F	**Manufacturing and industrial applications of 3D and 4D printing of polymer nanocomposites and devices - Part 2** *Co-organized with Polytechnic of Turin & CNR-IMM* Chairs: Ignazio ROPPOLO & Annalisa CHIAPPONE, *Polytechnic of Turin*
TT.VIII.G **WS.V.3**	**Beyond graphene** *Co-organized with University of Reggio Calabria & CNR-IMM* Chairs: Giuliana FAGGIO & Giacomo MESSINA, *University of Reggio Calabria and* Vittorio MORANDI, *CNR-IMM* *The symposium is part of the workshop WS.V*

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

TT.IX

09:00 - 10:30

TT.IX.A	**Nanomaterials: manufacturing, characterizations and applications - Part 1** *Co-organized with University of Catanzaro & Sapienza University of Rome* Chairs: Marta FEROCI & Leonardo MATTIELLO, *Sapienza University of Rome*
TT.IX.B	**Electrochemical energy storage: the atomistic design perspective** *Co-organized with ENEA* Chair: Francesco BUONOCORE, *ENEA* Co-Chair: Margherita MORENO, *ENEA*
TT.IX.C	**Medicine through nanomaterials** *Co-organized with Sapienza University of Rome* Chair: Luciana DINI, *Sapienza University of Rome*
TT.IX.D	**European Metrology Programme for Innovation and Research toward the Green Deal: Quantum, Energy and Environment** *Co-organized with INRIM* Chair: Luca BOARINO, *INRIM* Co-Chairs: Gianluca MILANO, *INRIM* & Natascia DE LEO, *INRIM*
TT.IX.E	**Advances and perspectives in gas detection technology - Part 1** *Co-organized with FBK* Chair: Andrea GAIARDO, *FBK*

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

24 SEPT MORNING

11:00 - 12:30

TT.X

TT.X.A	**Nanomaterials: manufacturing, characterizations and applications - Part 2** *Co-organized with University of Catanzaro & Sapienza University of Rome* Chairs: Marta FEROCI & Leonardo MATTIELLO, *Sapienza University of Rome*
TT.X.B	**How to enable the access of SME to nanotechnologies** *Co-organized with the European Project NANOREGION* Chair: Marco LAZZARINO, *CNR-IOM Area Science Park*
TT.X.C	**Electron microscopy in Material Science in Italy: opportunities, organization and networking** *Co-organized with CNR-IMM, CNR-IOM & Sapienza University of Rome* Chairs: Vittorio MORANDI, *CNR-IMM*, Marco ROSSI, *Sapienza University of Rome* & Regina CIANCIO, *CNR-IOM*
TT.X.D	**Advances and perspectives in gas detection technology - Part 2** *Co-organized with FBK* Chair: Andrea GAIARDO, *FBK*
TT.X.E	**Safe by Design of nanomaterials in industrial production processes** *Co-organized with EU Project SbD4Nano & AIRI* Chair: Elisabetta TOSCHI, *ART-ER & SbD4Nano project*
TT.X.F	**Advanced solutions for characterizations in nanoscience** *Co-organized with Sapienza University of Rome* Chair: Daniele PASSERI, *Sapienza University of Rome*

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

24 SEPT AFTERNOON

14:00 - 15:30

TT.XI

TT.XI.A	**Nanomaterials: manufacturing, characterizations and applications - Part 3** *Co-organized with University of Catanzaro & Sapienza University of Rome* Chairs: Marta FEROCI & Leonardo MATTIELLO, *Sapienza University of Rome*
TT.XI.B	**Electrochemical storage: new materials for the batteries of the future - Part 1** *Co-organized with ENEA* Chair: Margherita MORENO, *ENEA*

16:00 - 17:30

TT.XII

TT.XII.A	**Innovation through nanomaterials** *Co-organized with University of Catanzaro & Sapienza University of Rome* Chairs: Marta FEROCI & Leonardo MATTIELLO, *Sapienza University of Rome*
TT.XII.B	**Electrochemical storage: new materials for the batteries of the future - Part 2** *Co-organized with ENEA* Chair: Margherita MORENO, *ENEA*

09:00 - 10:30 **SEPTEMBER 22**

I.A New drug delivery systems in biomedical applications - Part 1

Co-organized with ISS
Chairs: Annarica CALCABRINI & Stefania MESCHINI, *ISS*

I.A.1 Simona SENNATO, *CNR-ISC & Sapienza University of Rome*
A novel approach for determination of size and absolute concentration of liposomes based on Laser Transmission Spectroscopy (LTS) technique

I.A.2 Paolo VERSACI, *Sapienza University of Rome*
Graphene oxide nanocomposites for drug delivery in cancer cells

I.A.3 Martina MARSOTTO, *Roma Tre University*
Gold nanorods: how the structure-property relationship controls biotechnological applications

I.B Future Technology for large scale hydrogen production, storage

Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA
Chair: Elena TRESSO, *Polytechnic of Turin*

The symposium is part of the workshop WS.I

I.B.1 Massimo SANTARELLI, *Polytechnic of Turin*
Scenarios for hydrogen production, transport and final use

I.B.2 Alfonso POZIO, *ENEA*
The role of LT electrolysis for the italian hydrogen production in energy transition

I.B.3 Matteo TESTI, *Bruno Kessler Foundation*
Water electrolysis for hydrogen production: technologies and applications

I.B.4 Marcello BARICCO, *University of Turin*
Challenges for hydrogen storage and handling

I.C Tools to measure and stimulate activity in brain tissue and their applications

Co-organized with CNR-IMM
Chair: Guglielmo FORTUNATO, *CNR-IMM*

I.C.1 Maria Victoria SANCHEZ VIVES, *August Pi i Sunyer Biomedical Research Institute (IDIBAPS), Spain*
Electrical modulation of cerebral cortical activity

I.C.2 Luca MAIOLO, *CNR- IMM*
Ultra-thin flexible electronics and hybrid solutions for smart neural interfaces

I.C.3 Maurizio MATTIA, *ISS*
Decoding motor plans and other from coarse grained intracortical recordings

I.C.4 Valentina BENFENATI, *CNR-ISOF*
Glial engineering and glial interfaces: new path towards neuromodulation

I.D Innovative approaches in UNMET clinical needs for maximum health care impact - Medical Needs

Co-organized with Don Gnocchi Foundation, University of Modena and Reggio Emilia, University of Catanzaro and Sapienza University of Rome
Chairs: Maria CARAFA, *Sapienza University of Rome* & Marzia BEDONI, *Don Gnocchi Foundation*

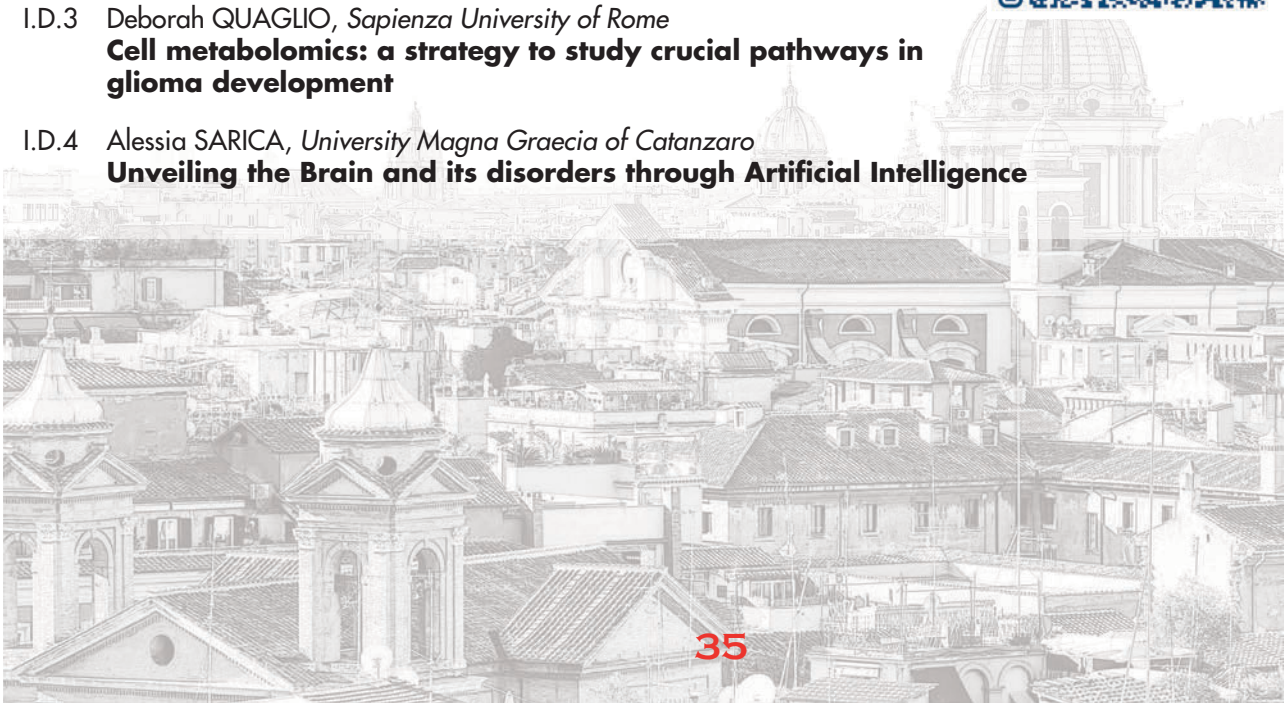
The symposium is part of the workshop WS.II

I.D.1 Lorena PASSONI, *Humanitas Research Hospital*
Delivering Drug-Loaded Liposomes to Glioblastoma Stem Cells

I.D.2 Emmanuel GARCION, *University of Angers, France*
Design & Application of Innovative Locoregional Treatments in Glioblastoma: Vectorization versus interventionnal tumor traps

I.D.3 Deborah QUAGLIO, *Sapienza University of Rome*
Cell metabolomics: a strategy to study crucial pathways in glioma development

I.D.4 Alessia SARICA, *University Magna Graecia of Catanzaro*
Unveiling the Brain and its disorders through Artificial Intelligence



I.E Organ-on-Chip for innovative clinical trials

Co-organized with the European project FLAMIN-GO
Chair: Roberto GIANNANTONIO, *CNR - IRSA*

I.E.1 Annalisa CHIOCCHETTI, *University of Piemonte Orientale*
The FLAMIN-GO project

I.E.2 Alessandra NERVIANI, *Queen Mary University of London, UK*
Applying precision medicine to unmet clinical needs in Rheumatoid Arthritis

I.E.3 Alessandro POLINI, *CNR NANOTEC - Institute of Nanotechnology, National Research Council*
Organ-on-chip technology: are we ready for clinical-trials-on-chip?

I.E.4 Mauro PETRETTA, *REGENHU*
3D Bioprinting: inspiring new strategies for personalized healthcare

I.E.5 Salvatore GIRARDO, *Max Planck Institute for the Science of Light, Germany*
Cell-like Hydrogel Microparticles for Mechanobiology

I.F Tissue Regeneration

Co-organized with University of Catanzaro & Sapienza University of Rome
Chairs: Konrad URBANEK & Fabiola MARINO, *University Magna Graecia of Catanzaro*

The symposium is part of the Special Event SE.I

I.F.1 Maurilio SAMPAOLESI, *KU Leuven, Belgium*
2D and 3D human iPSC-based models to reveal new therapeutic targets for Duchenne muscular dystrophy

I.F.2 Eleonora CIANFLONE, *University Magna Graecia of Catanzaro*
Targeting stem cell senescence to rejuvenate the aged heart

I.F.3 Dalila MIELE, *University of Pavia*
Production of polydioxanone (PDO) microfibers obtained by centrifugal spinning technology as skin/tendon tissue substitutes

I.F.4 Barbara VIGANI, *University of Pavia*
Spermidine as multifunctional agent in the design of innovative tools for nervous tissue repair

I.F.5 Mariangela SCALISE, *University Magna Graecia of Catanzaro*
Endogenous resident multipotent progenitors as cardiac tumor initiating cells

I.G The Genetic Point of Care: the New Frontier of Bio-Technologies for Future Outbreaks Management - Part 1

Co-organized with University of Messina, Polytechnic of Turin and FBK
Chair: Sabrina CONOCI, *University of Messina, CNR-IMM & Distretto Tecnologico Sicilia Micro e Nano Sistemi*

The symposium is part of the Special Event SE.II

I.G.1 Introduction

I.G.2 Wolfgang KNOLL, *Austrian Institute of Technology, Austria*
Recent trends in electronic biosensing

I.G.3 Giovanni VALENTI, *University of Bologna*
Electrochemiluminescence-based biosensor: from academic curiosity to an industrial success

I.G.4 Cristina POTRICH, *FBK*
SARS-CoV-2 detection using isothermal amplification in genetic point-of-care

I.H Introduction to the electronic solutions for aerospace applications

Co-organized with ASI & ESRF
Chair: Ennio CAPRIA, *ESRF, Grenoble*

The symposium is part of the Workshop WS.VI

I.H.1 Silvia NATALUCCI, *ASI*
Usage of COTS EEE Components in ASI Space Programs

I.H.2 Gianluigi CASSE, *FBK*
Radiation hardened sensors and electronics: studies and guidelines

I.H.3 Francesco PINTACUDA, *STMicroelectronics*
Design strategy for RadHard components

11:30 - 13:00 **SEPTEMBER 22**

II.A AgriNanoTechniques: Nanomaterials for products and application in agriculture - Nano-Enabled Agriculture and EU Green Deal

Organized by University of Udine
Under the patronage of SOCIETA' ITALIANA DI AGRONOMIA
Chair: Luca MARCHIOL, *University of Udine*

The symposium is part of the workshop WS.III

II.A.1 Claudia CRESTINI, *University of Venezia Cà Foscari*
Lignin and tannins from plants to laboratory and back: nanostructures for active delivery

II.A.2 Matteo GIGLI, *University of Venezia Cà Foscari, Spin off T3*
Lignin nanostructures: from Lab to market

II.A.3 Sara FALSINI, *University of Firenze*
Lignin nanocapsules for bioactive compound delivery to plants

II.A.4 Michele IAFISCO, *CNR ISTEC - Spin Off Recover Ingredients*
Agriculture applications of nano-structured calcium phosphates derived from fish industry by-products

II.B Future Technology for large scale hydrogen use and distribution

Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA
Chair: Giulia MONTELEONE, *ENEA*

The symposium is part of the workshop WS.I

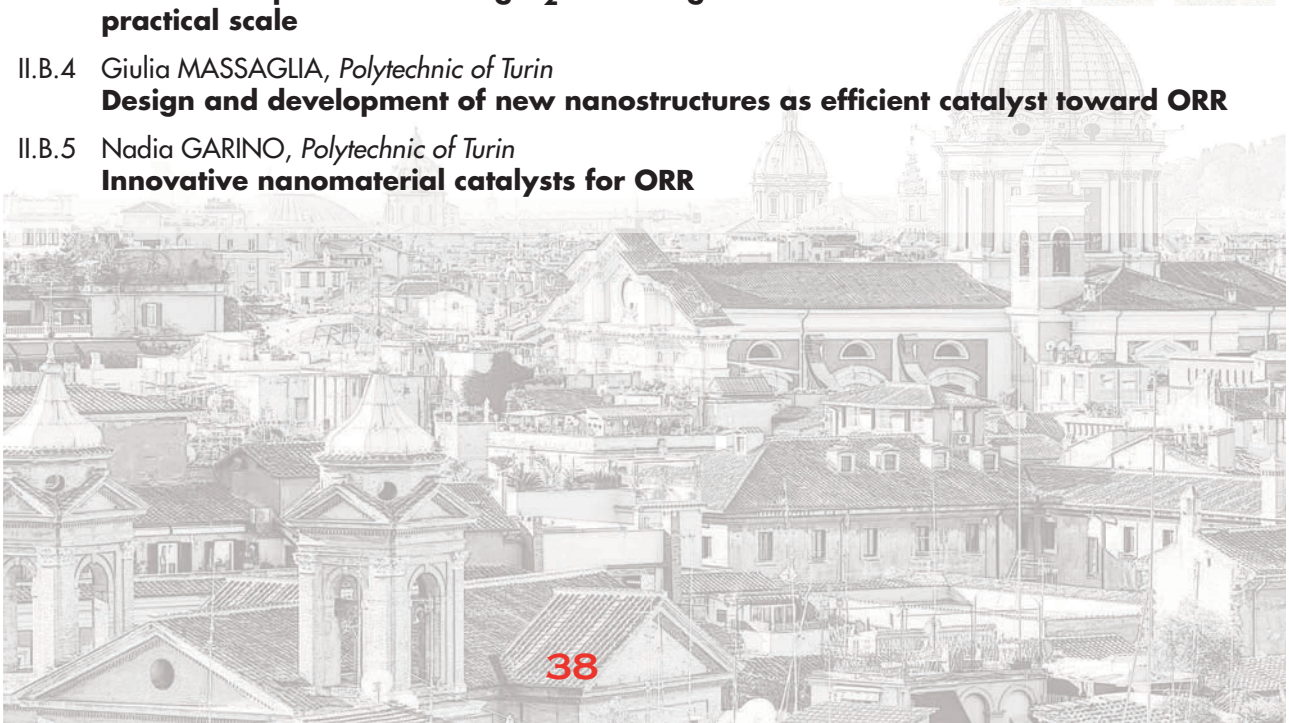
II.B.1 Nora GOURDOUPI, *Advent Technologies, Greece*
Overview of Advent Technologies activities to the hydrogen economy and energy transition

II.B.2 Barbara MENIN, *CSFT - IIT*
Research activity on H_2 @CSFT: Biological production, storage and use

II.B.3 Jan VAN ERLE, *EPFL, Switzerland*
Materials aspects considering H_2 use and generation on a practical scale

II.B.4 Giulia MASSAGLIA, *Polytechnic of Turin*
Design and development of new nanostructures as efficient catalyst toward ORR

II.B.5 Nadia GARINO, *Polytechnic of Turin*
Innovative nanomaterial catalysts for ORR



II.C New drug delivery systems in biomedical applications - Part 2

Co-organized with ISS
Chairs: Annarica CALCABRINI & Stefania MESCHINI, *ISS*

II.C.1 Marzia GARIBOLDI, *University of Insubria*
Free and poly-methyl-methacrylate-bounded BODIPYs for photodynamic therapy

II.C.2 Beatrice SIMONIS, *Sapienza University of Rome*
Transport of cationic liposomes in a human Blood Brain Barrier model: role of the stereochemistry of lipid components on liposome physico-chemical and biological features

II.C.3 Maria Beatrice ARASI, *Department of Oncology and Molecular Medicine - ISS*
Direct targeting of metastatic melanoma cells through anti-CSPG4-conjugated nanoparticles and natural loaded vesicles

II.D Innovative approaches in UNMET clinical needs for maximum health care impact - Innovation in Academia

Co-organized with Don Gnocchi Foundation, University of Modena and Reggio Emilia, University of Catanzaro and Sapienza University of Rome
Chairs: Furio GRAMATICA, *Don Gnocchi Foundation* & Giovanni TOSI, *University of Modena and Reggio Emilia*

The symposium is part of the workshop WS.II

II.D.1 Raymond SCHIFFELERS, *UTRECHT University, The Netherlands & European Technology Platform for Nanomedicine, EU*
Synthetic or natural lipid nanoparticles for RNA delivery

II.D.2 Jason DUSKEY, *University of Modena & Reggio Emilia*
Improved GBM Targeting: Nanomedicines approaches from conception to testing

II.D.3 Carlo Augusto BORTOLOTTI, *University of Modena & Reggio Emilia*
Nanoinnovation in biosensoring: Label-free Organic Biosensors for Diagnostics

II.D.4 Michele DI LAURO, *IIT*
Organic Neuroelectronics: a cross-fertilisation story

II.D.5 Amel DJOUDI, *University of Angers, France*
Development of innovative nanocomposite hydrogels for the treatment of Glioblastoma Multiforme

II.E Smart Textiles and the role in nanotechnologies

Co-organized with the project PON R&I ARS01_00951 - Design, creatività e Made in Italy - ECOTEC
Chair: Roberto GIANNANTONIO, *Klopman International Srl*

II.E.1 Karen DE CLERCK, *Ghent University, Belgium*
Going from polymer to application: design of color-changing nanofibrous sensors

II.E.2 Roberto GIANNANTONIO, *Klopman International Srl*
Smart Textiles: the PON ECOTEC Project

II.E.3 Marco PUGLIESE, *Klopman International Srl*
Textile-integrated OLED light sources

II.E.4 Roberto GIANNUZZI, *CNR NANOTEC*
Chromogenic Textiles

II.E.5 Pierangelo METRANGOLO, *Polytechnic of Milan*
Innovative Solutions for a Greener Fluorine Chemistry

II.F Advanced technologies in cardiovascular diseases

Co-organized with University of Catanzaro & Sapienza University of Rome
Chairs: Daniele TORELLA, *University Magna Graecia of Catanzaro* & Mattia TIBONI, *University of Urbino*

The symposium is part of the special event SE.I

II.F.1 Konrad URBANEK, *University Magna Graecia of Catanzaro*
Cellular and molecular basis of cardio-oncology

II.F.2 Fabiola MARINO, *University Magna Graecia of Catanzaro*
From spheroids to organoids: the evolution of model system for human cardiac regeneration in a dish

II.F.3 Cristina CASADIDIO, *University of Camerino*
Cardiac Delivery of therapeutics via injectable thermosensitive hydrogels

II.F.4 Nadia SALERNO, *University Magna Graecia of Catanzaro*
In vivo advanced cardiac imaging in small animals

II.G Microscopy for Materials Sciences

Co-organized with ZEISS
Chair: Veronica SPARACINO, *ZEISS*

II.G.1 Flavio COGNIGNI, *Sapienza University of Rome*
Application of Sub-micron X-ray Microscopy in The Artificial Bone Grafting

II.G.2 Francesco CAZZANIGA, *STMicroelectronics*
Non specular behavior of low KV STEM on thick samples

II.G.3 Ludovica ROVATTI, *Polytechnic of Milan*
Opportunities offered by scanning electron microscopy for the analysis of materials obtained by innovative processes

II.G.4 Francesco BIANCARDI, *ZEISS*
Multi-Beam systems and integrated in-situ techniques

II.H The Genetic Point of Care: the New Frontier of Bio-Technologies for Future Outbreaks Management - Part 2

Co-organized with University of Messina, Polytechnic of Turin and FBK
Chair: Sabrina CONOCI, *University of Messina, CNR-IMM & Distretto Tecnologico Sicilia Micro e Nano Sistemi*

The symposium is part of the special event SE.II

II.H.1 Alek DEDIU, *CNR-INSM, Bologna*
Magnetic Biosensing for Early Diagnostics - towards the detection of ultra-low concentration of biomarkers

II.H.2 Lucia NAPIONE, *Polytechnic of Turin*
Integrated Nanotechnologies in Lateral Flow Devices for the Diagnosis and Monitoring of Covid-19 and other Complex Diseases

II.H.3 Alessia IRRERA, *CNR-IPCF, Messina*
New Generation Label-Free Optical Biosensors Based On Silicon Nanowires

II.H.4 Alberto DANIELLI, *University of Bologna* - Maria Giovanna RIZZO, *University of Messina*
Innovative Biotechnological Systems for The Detection of Eukaryote Cells, Microorganisms And Proteins With Phage Display Biotechnology

II.I Testing of radiation hardness of electronic components

Co-organized with ASI & ESRF
Chair: Ennio CAPRIA, *ESRF, Grenoble*

The symposium is part of the Workshop WS.VI

II.I.1 Jan BUDROWEIT, *German Aerospace Center, Germany*
The use of irradiation facility for the testing of electronic components for space

II.I.2 Giovanni CUCINELLA, *IMT*
Electron Beam Radiation Tests - The eRAD Project experience

II.I.3 Salvatore FIORE, *ENEA*
RADNEXT: the widest network of facilities for the testing of radiation hardness of electronic components

II.I.4 Ennio CAPRIA, *ESRF, France*
A competence center on irradiation for electronic components in Grenoble

II.I.5 Rita CARPENTIERO, *ASI*
ASIF initiatives in support of Italian irradiation facilities

14:00 - 15:30 **SEPTEMBER 22**

III.A AgriNanoTechniques: Nanomaterials for products and application in agriculture - Nanosafety in Food: Regulatory Needs

Organized by ISS
Chairs: Flavia BARONE & Isabella DE ANGELIS, *Environment and Health Department - ISS*

The symposium is part of the workshop WS.III

III.A.1 Flavia BARONE, *Environment and Health Department - ISS*
Introduction

III.A.2 Josefa BARRERO, *European Commission, Joint Research Centre (JRC), Ispra*
Nano in Food project: A collaborative effort to increase the analytical capacity in EU Member States

III.A.3 Stefania SABELLA, *IIT - Genova*
In vitro simulated digestion models: state of the art

III.A.4 Isabella DE ANGELIS, *Environment and Health Department - ISS*
Advanced in vitro model of intestinal barrier

III.A.5 Federico BENETTI, *ECSIN-European Center for the Sustainable Impact of Nanotechnology, ECAMRICERT SRL*
Analytical methodologies for the detection of nanomaterials: state of the art

III.B The virtuous CO_2 circle: integration with hydrogen

Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA
Chair: Stefano STENDARDO, *ENEA*

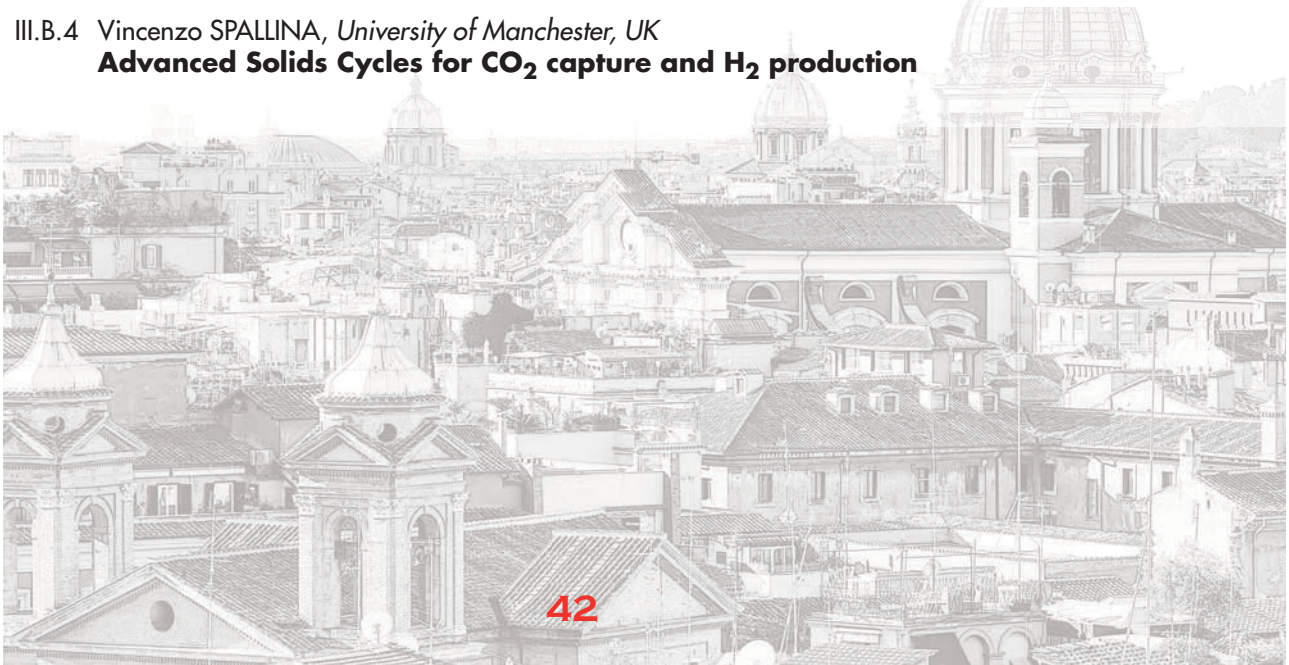
The symposium is part of the workshop WS.I

III.B.1 Angelica CHIODONI, *CSFT - IIT*
Roadmap to CO_2 capture, storage and valorization @CSFT

III.B.2 Luca TURCHETTI, *ENEA*
Is there still room for steam reforming in the green hydrogen era?

III.B.3 Fausto GALLUCCI, *Technical University Eindhoven, The Netherlands*
Membrane and plasma reactors for H_2 production

III.B.4 Vincenzo SPALLINA, *University of Manchester, UK*
Advanced Solids Cycles for CO_2 capture and H_2 production



III.C The strategic role of additive manufacturing for aerospace applications

Co-organized with ASI & ESRF
Chair: Marco PIZZARELLI, *ASI*

The symposium is part of the Workshop WS.VI

III.C.1 Mariangela LOMBARDI, *Polytechnic of Turin*
Additive Manufacturing of metallic parts: essential paradigms and trends

III.C.2 Francesco LUMACA, *Thales Alenia Space*
Additive Manufacturing for the Space Components: Present And Trends in TAS-I

III.C.3 Pietro TADINI, *AVIO*
Attività ALM in Avio: Programmi di Ricerca, sviluppo del combustore M10, evoluzioni e sviluppi futuri

III.D Innovative approaches in UNMET clinical needs for maximum health care impact - Translational aspects

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

The symposium is part of the workshop WS.II

III.D.1 Furio GRAMATICA, *Don Gnocchi Foundation*
Crosstech innovation in Horizon Europe

III.D.2 Dora MEHN, *European Commission, Directorate General Joint Research Centre, Directorate F – Health, Consumers and Reference Materials, Consumer Products Safety (EU)*
Advanced methods for sizing nanomedicine materials

III.D.3 Fanny CAPUTO, *Sintef, Norway*
Measuring physical properties of liposomes and of lipid-based nanoparticles for RNA delivery: from method development to standardization

III.D.4 Michele DE LUCA, *University of Modena and Reggio Emilia & Holostem*
Combined cell and gene therapy for epidermolysis bullosa

III.D.5 Sabrina PRICI, *University of Trieste & COST Action Nano2Clinic*
Cancer nanomedicine from the bench to the bedside

III.D.6 Maria DE LA FUENTE, *Oncomet, Spain*
DIVERSA, Delivery Innovation for VERsatile Solutions in Advanced Therapeutics

14:00 - 15:30 **SEPTEMBER 22**

III.E Hot topics in Life Sciences - Focus on natural compounds

Co-organized with University of Catanzaro & Sapienza University of Rome
Chairs: Stefano ALCARO, *University Magna Graecia of Catanzaro* & Ettore NOVELLINO, *University of Naples Federico II*

The symposium is part of the special event SE.I

III.E.1 Bruno BOTTA, *Sapienza University of Rome*
The Role of Natural Products in Promoting Well-being: From Foods to Drugs

III.E.2 Federica MORACA, *University of Naples Federico II*
Nucleic acids as target of natural small molecules

III.E.3 Isabella ROMEO, *University Magna Graecia of Catanzaro*
Natural agents against SARS-CoV-2

III.E.4 Francesca Alessandra AMBROSIO, *University Magna Graecia of Catanzaro*
Targeting HuD with natural compounds

III.F Microscopy for Life Sciences - Cryo-Microscopy and Impact of Applied Physics on Optical Techniques

Co-organized with ZEISS
Chair: Luciana DINI, *Sapienza University of Rome*

III.F.1 Alessandro COMETTA, *ZEISS*
The impact of Applied Physics on Light Microscopy: Lattice Lightsheet and Lattice SIM

III.F.2 Francesco BIANCARDI, *ZEISS*
Cryo Correlative Workflow: Imaging the near to native state across multiple Microscopy platforms

III.F.3 Paolo GRIANTI, *JEOL*
JEOL CRYOARM: results with no compromise

III.G Scale-up of Nanomaterials for Energy - Part 1

Co-organized with the European Innovation Council (EIC)
Chairs: Francesco MATTEUCCI, *EIC* & Roberto GIANNANTONIO, *CNR IRSA*

III.G.1 Paolo BONDAVALLI, *Thales Research & Technology*
Nanomaterials: applications, uses-cases and scalability in production and implementation

III.G.2 Sawaco NAKAMAE, *EERA-AMPEA*
Joint Programme AMPEA (Advanced Material and Processes for Energy Applications)

III.G.3 Mariya IVANOVA, *Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research – IEK-1: Materials Synthesis and Processing*
R&D activities at Forschungszentrum Jülich GmbH and examples of innovation uptake towards energy and environmental key technological solutions

III.G.4 Schwan HOSSEINY, *CENmat*
Smart Nanomaterials Design for Economic and Truly Green Hydrogen - from Milligram to Kilogram

III.H The energy hubs and districts in Italy: a showcase for nanotech - Part 1

Co-organized with University of Messina
Chair: Gabriele CENTI, *University of Messina*
Co-Chairs: Sebastiano CAMPAGNA, *University of Messina* & Siglinda PERATHONER, *University of Messina & INSTM*

III.H.1 Frederic CHANDEZON, *CEA- Fundamental Research Division/IRIG, Grenoble, France*
SUNERGY a European large scale initiative on fossil free free fuels and chemicals

III.H.2 Antonio LUCCI, *RINA*
Hydrogen storage & transport challenges

III.H.3 Gaetano IAQUANIELLO, *NextChem (Maire/Tecnimont group)*
Long-duration Storage (LDS): a fundamental step for massive exploitation of Variable Renewable Energies

III.H.4 Francesco Luca BASILE, *University of Bologna & Italian delegate for cluster 5 Climate Energy and Mobility (EU HE)*
Green energy hubs for local integrated energy communities

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

IV.A AgriNanoTechniques: Nanomaterials for products and application in agriculture - ENMs and Plant Protection

Organized by University of Tuscia
Under the patronage of SIPaV
Chair: Giorgio Mariano BALESTRA, *University of Tuscia*

The symposium is part of the workshop WS.III

IV.A.1 Stefano TACCONI, *Sapienza University of Rome*
Phytochemical delivery in olive plants: microscopic and proteomic evaluation

IV.A.2 Francesca BALDASSARRE, *University of Salento*
Biosourced active ingredients and chemical nanotechnologies for sustainable plants protection

IV.A.3 Daniele SCHIAVI, *University of Tuscia*
Nanotechnology for wastes valorization in hazelnut and industrial crops sustainable protection strategies

IV.A.4 Mathews L. PARET, *University of Florida, USA*
Recent trends in application of nanomaterials for management of bacterial and viral pathogens affecting vegetable crops and research and development opportunities

IV.B Nanomaterials and Nanotechnology for CO_2: Capture and Conversion

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

The symposium is part of the workshop WS.I

IV.B.1 Deepack PANT, *VITO - Belgium*
Technological advances in carbon dioxide capture & utilization (CCU)

IV.B.2 Daniele SASSONE, *Polytechnic of Turin & CSFT@POLITO*
Synergic effect of Carbon Nanotubes on Zeolitic Organic Framework catalyst for CO_2 electroreduction

IV.B.3 Paolo PESCARMONA, *University of Groningen, The Netherlands*
Supported bismuth nanoparticles as upscalable and highly selective electrocatalyst for the conversion of CO_2 into formate

IV.B.4 Stefano STENDARDO, *ENEA*
Deep decarbonisation of hard-to-abate industry via inherently circular CCUS processes

IV.B.5 Enrico BOCCI, *Università Guglielmo Marconi*
Steam indirectly heated gasification for biofuels productions from residual biomass

IV.C Advanced imaging characterisation of metallic parts manufactured via additive manufacturing

Co-organized with ASI & ESRF
Chair: Marco PIZZARELLI, *ASI*

The symposium is part of the Workshop WS.VI

IV.C.1 Bianca Maria COLOSIMO, *Polytechnic of Milan*
Additive Manufacturing and big data mining: opportunities and challenges of in-situ monitoring and qualification

IV.C.2 Rosario BORRELLI, *CIRA*
Metallic Additive Manufacturing at the Italian Aerospace Research Centre

IV.C.3 Romaine ISAACS, *ZEISS*
Nanotomography characterization and phase identification of high temperature 3D printed Al-Ce alloys

IV.C.4 Julio Cesar DA SILVA, *CNRS & ESRF, France*
Characterization of an ultrafine eutectic Ti-Fe-based alloy processed by additive manufacturing via Near-Field Ptychographic Tomography

IV.D Pluripotent Stem Cell as a Multidisciplinary Platform in Clinical Research

Co-organized with University of Catanzaro & Sapienza University of Rome
Chairs: Giovanni CUDA & Heather BOND, *University Magna Graecia of Catanzaro*

The symposium is part of the special event SE.I

IV.D.1 Graziano MARTELLO, *University of Padova*
Generation of human induced Pluripotent Stem cells in microfluidics

IV.D.2 Elvira I. PARROTTA, *University Magna Graecia of Catanzaro*
Identification of retinoic acid-responsive transcriptional regulators in human ESCs

IV.D.3 Stefania SCALISE, *University Magna Graecia of Catanzaro*
In vitro model of febrile seizures and epilepsy using patient-specific induced pluripotent stem cells-derived neurons

IV.D.4 Valeria LUCCHINO, *University Magna Graecia of Catanzaro*
Generation of human induced pluripotent stem cell lines from two Italian siblings affected by Unverricht-Lundborg disease

IV.D.5 Luana SCARAMUZZINO, *University Magna Graecia of Catanzaro*
Uncovering the function of Ferritin heavy chain (FHC) in human embryonic stem cells

IV.E The energy hubs and districts in Italy: a showcase for nanotech - Part 2

Co-organized with University of Messina
Chair: Gabriele CENTI, *University of Messina*
Co-Chairs: Sebastiano CAMPAGNA, *University of Messina* & Siglinda PERATHONER, *University of Messina & INSTM*

IV.E.1 Cosimo GERARDI, *ENEL Green Power*
The role of high efficiency innovative silicon based PV technology for distributed energy production

IV.E.2 Francesca FERRAZZA, *ENI, Decarbonization & Environmental Technologies R&D programme*
Innovative technologies at ENI for renewable energy and decarbonization

IV.E.3 Alessandro VIVIANI, *The European House – Ambrosetti*
H_2 Italy 2050: A national hydrogen value chain for the growth and decarbonization of Italy

IV.E.4 Luigi CREMA, *FBK, Centre Sustainable Energy*
Hydrogen valleys: concepts, application in the Alpine Region and the role of novel technologies

IV.F Recent advances in Image Analysis and Data Management

Co-organized with ZEISS
Chair: Matteo TROMBETTONI, *ZEISS*

IV.F.1 Francesco BIANCARDI & Alessandro COMETTA, *ZEISS*
Image Analysis and Data Management in Microscopy – how to work in a modern and connected Research Laboratory

IV.F.2 Silvia CONTESSI & Alessandro COMETTA, *ZEISS*
Hands-on Session: a case study of remote data acquisition and on-site data processing

IV.G Scale-up of Nanomaterials for Energy - Part 2

Co-organized with the European Innovation Council (EIC)
Chairs: Francesco MATTEUCCI, *EIC* & Roberto GIANNANTONIO, *CNR IRSA*

IV.G.1 Francesco MATTEUCCI, *EIC*
Giulia MARZETTI, *European Commission, DG for Research and Innovation*
Scale-up of nanomaterials: the EC DG RTD initiatives

IV.G.2 Valeria NICOLOSI, *Trinity College Dublin, Ireland*
Scale-up of nanomaterials: the Research perspective

IV.G.3 Fabio BOCCUNI, *INAIL*
Prevention-through-design for nanomaterials innovation processes

IV.G.4 **Round Table with all participants**

IV.H New Frontiers in Electron Microscopy

Co-organized with JEOL & Sapienza University of Rome
Chair: Marco VITTORI ANTISARI, *Nanoltaly Association*

The symposium is part of the Special Event SE.IV

IV.H.1 Keynote Lecture
Fabrizio CARBONE, *EPFL, Losanna, Switzerland*
Transmission electron microscopy with engineered electrons

IV.H.2 Giovanni Maria VANACORE, *University of Milano-Bicocca*
Ultrafast Electron Microscopy: Femtosecond imaging, diffraction and spectroscopy for material science and quantum applications

IV.H.3 Nehal Aboulfotoh ALI, *Zewail City of Science and Technology, Egypt*
Explore the horizons of 4D imaging using ultrafast Electron Microscope

IV.H.4 Vincenzo GRILLO, *CNR-NANO, Modena*
Adaptive optics and where to find them. A guide to new ideas and application to material science

09:00 - 10:30 **SEPTEMBER 23**

V.A The Digital Transition

Co-organized with AIRI
Chair: Sesto VITICOLI, *AIRI*

The symposium is part of the workshop WS.IV

V.A.1 Margot BEZZI, *APRE*
The importance of Responsible Research and Innovation (RRI) in EU R&I Programming

V.A.2 Marco ARDOLINO, *Laboratorio RISE & University of Brescia*
The digital transformation in the manufacturing industry

V.A.3 Laura MORGAGNI, *Fondazione TORINO WIRELESS*
The Italian Way for the Digital Transition and the key role of Innovation Ecosystems to drive SMEs towards an effective digital transformation

V.A.4 Roberto SABELLA, *ERICSSON*
Digitization of production systems and ports: recount of innovation projects

V.A.5 Claudio PERISSINOTTI BISONI, *UNI*
Standardisation and digital transformation: the challenges for sustainable innovation

V.B Design and Characterization of nanomaterials for the energy transition

Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA
Chair: Giancarlo CICERO, *Polytechnic of Turin*

The symposium is part of the workshop WS.I

V.B.1 Nadhira Bensaada LAIDANI, *Bruno Kessler Foundation*
Overview of facilities and materials for renewable energy in FBK

V.B.2 Pieter GLATZEL, *ESRF, France*
Combining advanced spectroscopic techniques with operando measurements

V.B.3 Massimo CELINO, *ENEA*
The ENEA computational infrastructure for materials design

V.B.4 Michele RE FIORENTIN, *CSFT@POLITO*
Ab initio 2D material design for sustainable applications

V.C Development of Micro and Nanotechnologies for Predictivity, Diagnosis, Therapy and Regenerative Treatments of Pathological of Bone and Osteo-Articular Alterations

Co-organized with Distretto Tecnologico Sicilia Micro e Nano Sistemi
Chair: Sabrina CONOCI, *University of Messina, CNR-IMM & Distretto Tecnologico Sicilia Micro e Nano Sistemi*
Co-Chairs: Giovanna CALABRESE, *University of Messina* & Francesco TRAINA, *Istituto Ortopedico Rizzoli - Bologna*

V.C.1 Luigi AMBROSIO, *CNR-IPCB, Napoli*
Engineering Biomaterials and bio-interfaces

V.C.2 Damiano GENOVESE, *University of Bologna*
Synergic use of fluorescent hyaluronan and core-shell nanoparticles for enhanced in-vitro osteoinductivity and osteoconductivity

V.C.3 Massimiliano MARAGLINO MISCIAGNA, *Finceramica*
Biomimetic and nanostructured 3D scaffold for joint surface preservation

V.C.4 Maria Grazia RAUCCI, *CNR-IPCB, Napoli*
Therapeutic and regenerative biomaterial for bone cancer treatment

V.D From life sciences to innovative materials: stories of successful integration of technology and nanoresearch - Part 1

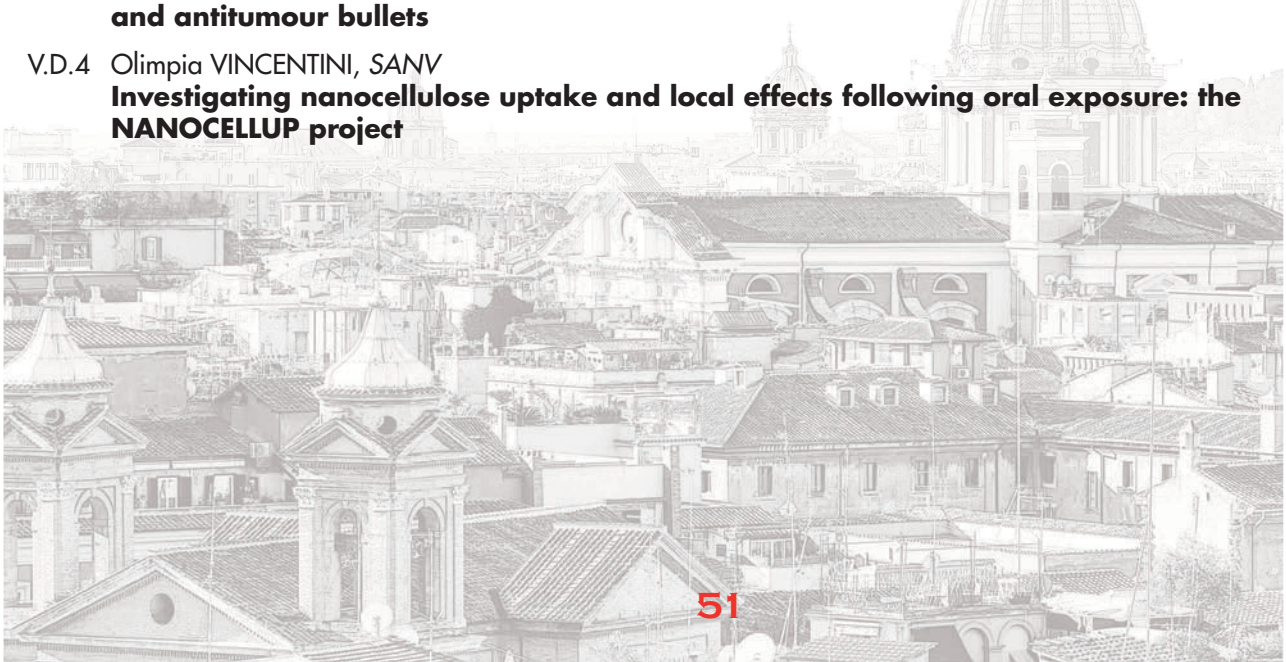
Co-organized with ISS
Chair: Marco CRESCENZI, *ISS*
Co-Chair: Rossella CANESE, *ISS*

V.D.1 Lucia Lisa PETRILLI, *Ospedale Pediatrico Bambino Gesù*
Imaging and single single-cell mass cytometry in pediatric high grade glioma

V.D.2 Lucia GABRIELE, *ISS - OMM*
Tumor on a chip: using microfluidic devices to understand interaction between tumor and immune cells

V.D.3 Luana LUGINI, *ISS - OMM*
Natural Killer-derived extracellular vesicles: immune sensors and antitumour bullets

V.D.4 Olimpia VINCENTINI, *SANV*
Investigating nanocellulose uptake and local effects following oral exposure: the NANOCELLUP project



V.E A new generation of power converters and intelligent power switches, based on GaN, for higher performance applications in the sector of smart mobility and renewable energy

Co-organized with Distretto Tecnologico Sicilia Micro e Nano Sistemi
Chair: Leoluca LIGGIO, *Coordinator of the European Project "GaN4AP" & Distretto Tecnologico Sicilia Micro e Nano Sistemi*

V.E.1 Leoluca LIGGIO, *Coordinator of the European Project "GaN4AP" & Distretto Tecnologico Sicilia Micro e Nano Sistemi*
The GaN4AP project overview and objectives

V.E.2 Gaudenzio MENEGHESSO, *Scientific Responsible of the European Project "GaN4AP" & University of Padova*
GaN for Advanced Power Applications: the future of power electronics

V.E.3 Danilo FALCHI, *Valeo, France*
Gan for Automotive - LV power application

V.E.4 Martin HAUG, *Wurth, Germany*
Impact of GaN on passive component requirements

V.F Innovative technologies in drug delivery: Extracellular Vesicles

Co-organized with University of Catanzaro & Sapienza University of Rome
Chairs: Maria CARAFA, *Sapienza University of Rome* & Maria Chiara CRISTIANO, *University Magna Graecia of Catanzaro*

The symposium is part of the special event SE.I

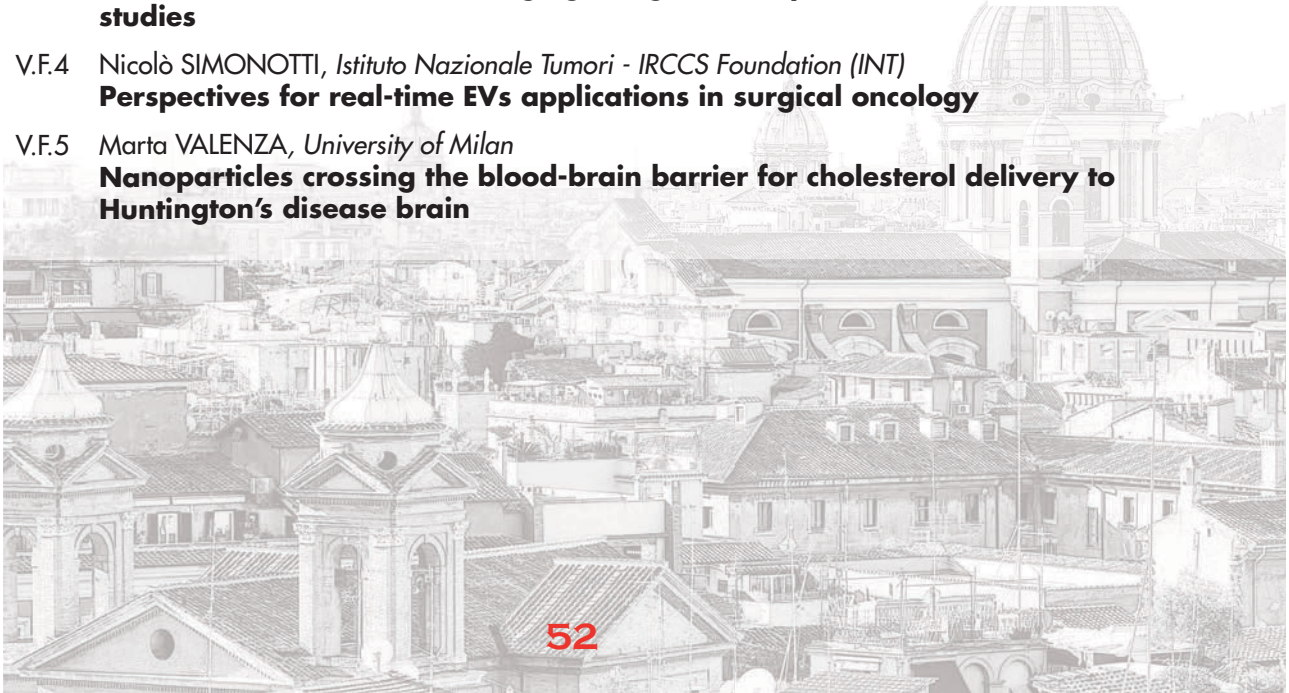
V.F.1 Paolo CIANA, *University of Milan*
Transplantation of autologous extracellular vesicles for cancer-specific targeting

V.F.2 Mariangela GAROFALO, *University of Padova*
Extracellular Vesicles: new frontiers for modern delivery of therapeutics

V.F.3 Alessandro VILLA, *University of Milan*
EVs as tools for enhanced imaging: insights from preclinical studies

V.F.4 Nicolò SIMONOTTI, *Istituto Nazionale Tumori - IRCCS Foundation (INT)*
Perspectives for real-time EVs applications in surgical oncology

V.F.5 Marta VALENZA, *University of Milan*
Nanoparticles crossing the blood-brain barrier for cholesterol delivery to Huntington's disease brain



V.G Recent Advancements in surface modification for Micro and optoelectronics

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

V.G.1 Elia SCATTOLO, *FBK & Free University of Bozen-Bolzano*
Near infra-red light detection enhancement of plasmonic photodetectors

V.G.2 Michael A. MORRIS, *Trinity College Dublin, Ireland*
Vapour phase infiltration of polymer functionalised substrates for thin film and pattern formation

V.G.3 Gizem YANALAK, *Selcuk University, Turkey*
Enhanced Photocatalytic Hydrogen Evolution by Mesoporous Graphitic Carbon Nitride/Black Phosphorus/Gold Nanohybrid

V.G.4 Azlouk MANEL, *Necmettin Erbakan University, Turkey*
Selective Chromate Filtration Based Cellulose Fiber Composite by Lab-in Syringe Systems

V.G.5 Mustafa ERSOZ, *Selcuk University, Turkey*
Preparation of NiO-ERGO nanocomposite film modified SPE for sensing application

V.G.6 Gizem TURKKAN, *Selcuk University,Turkey*
Preparation of Co_3O_4-ERGO nanocomposite film modified SPE for sensing application

V.H Zero-dimensional materials and nanocomposites

Co-organized with University of Reggio Calabria & CNR-IMM
Chairs: Giuliana FAGGIO & Giacomo MESSINA, *University of Reggio Calabria* and Vittorio MORANDI, *CNR-IMM*

The symposium is part of the workshop WS.V

V.H.1 Fabrizio MESSINA, *University of Palermo*
Using carbon dots as light harvesters and light emitters in functional nanocomposites: current developments and future perspectives

V.H.2 Marco PAPAGNO, *University of Calabria*
Scanning tunneling microscopy and photoemission investigation of 2D Supramolecular Assembly of 4-DecyloxyBenzoic Acid on Au(111)

V.H.3 Manuela MELUCCI, *CNR-ISOF*
Challenges and opportunities for graphene composites in water treatment

V.H.4 Meganne CHRISTIAN, *CNR-IMM*
Opportunities for nanomaterials to facilitate research in extreme environments

11:30 - 13:00 **SEPTEMBER 23**

VI.A The Green Transition - Part 1: Energy

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

The symposium is part of the workshop WS.IV

VI.A.1 Pasquale SALZA, *ENEL*
The role of Energy Storage in the future decarbonized electricity system

VI.A.2 Massimo MAZZER, *Consorzio MISTER*
Photovoltaics is more than a KET

VI.A.3 Francesca DE GIORGIO, *CNR*
Stefano SAGUATTI, *Manz Italy*
The strategic role of batteries for the energy transition

VI.A.4 Giulia MONTELEONE, *ENEA*
Hydrogen: sectors of application and development perspectives of technologies for production, transport and final use

VI.A.5 Rossella ILLIANO, *AYMING*
Grants funding and Tax Credit incentives as driving force towards the energy transition

VI.B Electrochemical energy storage from fundamental studies to pilot engineering: Li ion batteries

Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA
Chair: Pier Paolo PROSINI, *ENEA*

The symposium is part of the workshop WS.I

VI.B.1 Silvia BODOARDO, *Polytechnic of Turin*
Advanced materials for European Li-ion batteries: from raw materials to manufacturing and recycling

VI.B.2 Pier Paolo PROSINI, *ENEA*
The ENEA objectives within IPCEI Battery

VI.B.3 Laura SILVESTRI, *ENEA*
Development of a Co-free Li-rich layered oxide material to use as positive electrode in Li-ion batteries

VI.B.4 Alessandro AGOSTINI, *ENEA*
The role of sustainability assessment in the technological innovation

VI.C From life sciences to innovative materials: stories of successful integration of technology and nanoresearch - Part 2

Co-organized with ISS
Chair: Marco CRESCENZI, *ISS*
Co-Chair: Rossella CANESE, *ISS*

VI.C.1 Stefano AMALFITANO, *CNR - IRSA*
Uncovering the release of micro and nanoplastics from disposable face masks at times of COVID-19

VI.C.2 Andrea LAGHI, *Sapienza University of Rome & Ospedale S. Andrea*
Nanoparticles and theranostics: state-of-the-art of clinical experience

VI.C.3 Federica PALOMBARINI, *Sapienza University of Rome*
Self-assembling ferritin-dendrimer nanovehicles for targeted delivery of small RNAs to tumor cells

VI.C.4 Maria FITTIPALDI, *University of Firenze*
Magnetic Nanoparticles in Bioreactors for Theranostic Applications: Host-Guest Characterization by EPR and Mössbauer Spectroscopies

VI.D Carbon-based 2D materials

Co-organized with University of Reggio Calabria & CNR-IMM
Chairs: Giuliana FAGGIO & Giacomo MESSINA, *University of Reggio Calabria* and Vittorio MORANDI, *CNR-IMM*

The symposium is part of the workshop WS.V

VI.D.1 Maurizio CASALINO, *CNR-IMM, Napoli*
How graphene can enable the development of near-infrared silicon-based resonant cavity enhanced photodetectors

VI.D.2 Maria Luisa GRILLI, *ENEA Casaccia*
Enhancing the absorption of Single Layer Graphene: simulation and experimental study in symmetric and asymmetric NIR Fabry-Perot filters

VI.D.3 Alfonso POLICICCHIO, *University of Calabria*
Copper impregnated activated carbon for gas storage applications

VI.D.4 Camilla COLETTI, *IIT*
Wafer-scale integration of graphene for waveguide-integrated optoelectronics

11:30 - 13:00 **SEPTEMBER 23**

VI.E Manufacturing and industrial applications of 3D and 4D printing of polymer nanocomposites and devices - Part 1

Co-organized with Polytechnic of Turin & CNR-IMM
Chairs: Ignazio ROPPOLO & Annalisa CHIAPPONE, *Polytechnic of Turin*

VI.E.1 Shlomo MAGDASSI, *The Hebrew University of Jerusalem, Israel*
Additive manufacturing: The next industrial revolution

VI.E.2 Valentina BERTANA, *Polytechnic of Turin*
From macro- to nano- additive manufacturing: 3D priting of active devices

VI.E.3 Paolo BARIANI, *Schaefer South-East Europe srl*
How 3D Non-contact surface metrology improves additive manufacturing processes

VI.E.4 Gustavo GONZALEZ, *AIRI*
Industrial 3D printing with polymers: current and future trends

VI.F Brain Delivery

Co-organized with University of Catanzaro & Sapienza University of Rome
Chairs: Teresa MUSUMECI, *University of Catania* & Federica DE GAETANO, *University of Messina*

The symposium is part of the special event SE.I

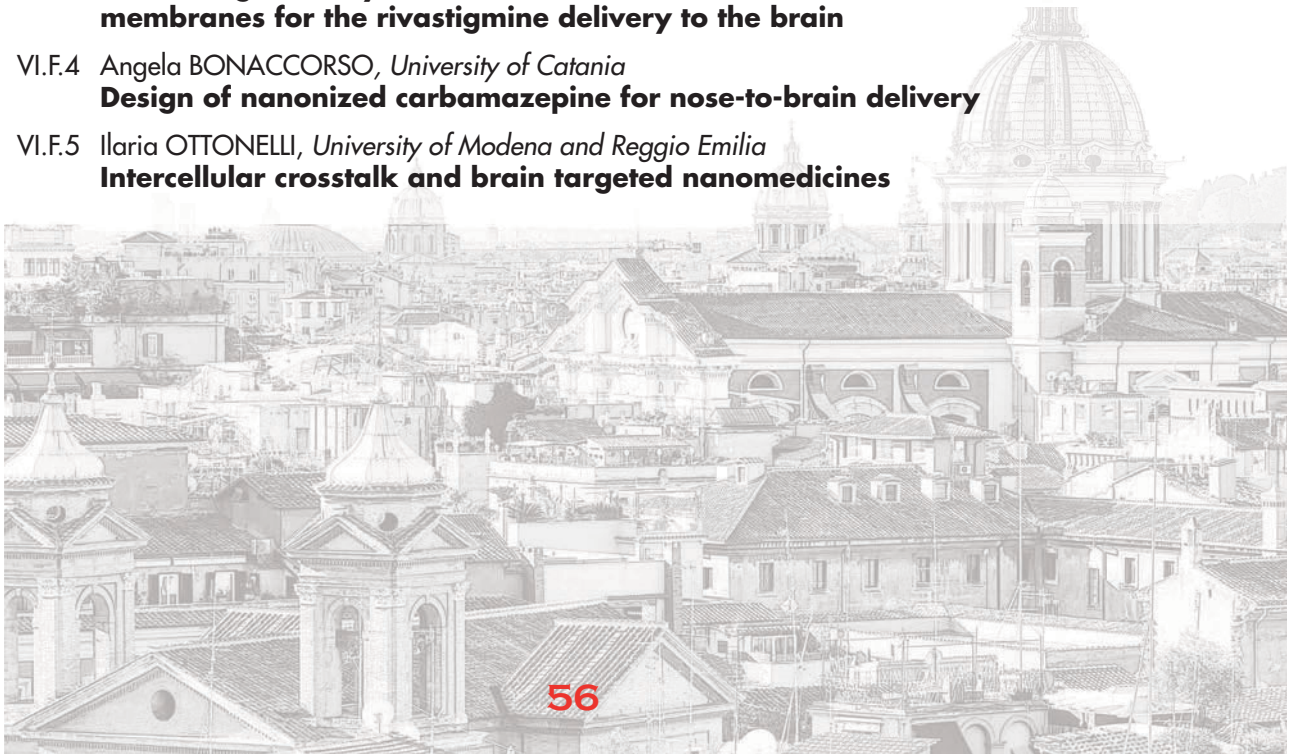
VI.F.1 Giovanni TOSI, *University of Modena and Reggio Emilia*
Brain & Nanomedicine: where we are and where to go

VI.F.2 Maria Camilla BERGONZI, *University of Florence*
Thymoquinone-Loaded Soluplus® -Solutol® HS15 Mixed Micelles: Preparation, In Vitro Characterization, and Effect on the SH-SY5Y Cell Migration

VI.F.3 Luca CERRI, *University of Pisa*
Camouflage nanosystems based on chitosan and cellular membranes for the rivastigmine delivery to the brain

VI.F.4 Angela BONACCORSO, *University of Catania*
Design of nanonized carbamazepine for nose-to-brain delivery

VI.F.5 Ilaria OTTONELLI, *University of Modena and Reggio Emilia*
Intercellular crosstalk and brain targeted nanomedicines



VI.G Innovative packaging materials and tools for preventive conservation of Cultural Heritage

Co-organized with CSGI
Chair: Rodorico GIORGI, *CSGI*

VI.G.1 Antonio MIRABILE, *MIRABILE*
Nanomaterials supporting preventive conservation of Cultural Heritage: the contribution of the EU funded APACHE project

VI.G.2 Rodorico GIORGI, *CSGI – University of Florence*
Environmentally friendly ZnO/Castor oil polyurethane composites for the adsorption of acid VOCs

VI.G.3 Siavash MARAGHECHI, *Eindhovhen University of Technology, The Netherlands*
In depths of paper degradation: A microscale experimental methodology

VI.G.4 Daniela IACOPINO, *Tyndall National Institute-University College Cork, Ireland*
Flexible and bendable sensor platforms for monitoring of heritage artworks

VI.H Materials and devices in photonic quantum technologies - Part 1

Co-organized with FBK
Chair: Georg PUCKER, *FBK*

VI.H.1 Valeria SAGGIO, *University of Vienna, Austria*
Demonstrating quantum speed-ups in reinforcement learning using an integrated photonic processor

VI.H.2 Alexander SZAMEIT, *Uni-Rostock, Germany*
Topological Photonics

VI.H.3 Mario AGIO, *Stu Siegen, Germany*
Diamond nanophotonics and electronics for bright single-photon emission

VI.H.4 Samuele GRANDI, *ICFO, Spain*
Integrated, Multiplexed Quantum Memories for Quantum Communication

14:00 - 15:30 **SEPTEMBER 23**

VII.A The Green Transition - Part 2: Mobility and Circular Economy

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

The symposium is part of the workshop WS.IV

VII.A.1 **Presentation of the books: L'impresa saggia and Innovazione Responsabile (ed. Guerini & Associati)**

- L'Impresa saggia: Ikujiro Nonaka e Hirotaka Takeuchi, *Italian edition by Fabio Corno, Milano-Bicocca University*
- Innovazione Responsabile: Sesto Viticoli, *Airi*

Moderator: Maria Cristina Origlia *(socio-economic journalist)*

VII.A.2 Filippo DI GIOVANNI, *STMicroelectronics*
The role of semiconductor industry for carbon-free mobility

VII.A.3 Alessandro MORBI, *ITALCEMENTI*
High Performance Fiber Reinforced Concrete for infrastructural retrofitting

VII.A.4 Enrico BRENA, *FEDERCHIMICA*
Chemistry as a driving force to develop the circular economy

VII.A.5 Giancarlo PEPPONI, *FBK*
Use of XRF technique for multi approach metal sorting

VII.B Electrochemical energy storage from fundamental studies to pilot engineering: new generation batteries - Part 1

Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA
Chair: Margherita MORENO, *ENEA*

The symposium is part of the workshop WS.I

VII.B.1 Yongil KIM, *Ulsan National Institute of Science and Technology, South Korea*
Seasonal Energy Storage: The new challenge for electrochemistry

VII.B.2 Maria Rosa PALACIN PEIRÒ, *Institut de Ciència de Materials de Barcelona (ICMAB CSIC), Spain*
Multivalent ion batteries

VII.B.3 Caroline CELLE, *CEA, France*
Solid State Electrolytes for next generation of batteries: materials and processes

VII.C Green chemistry and LCA applications as tools for sustainability in the textile value chain - Part 1

Co-organized with University of Bergamo
Chairs: Giuseppe ROSACE, *University of Bergamo* & Roberto VANNUCCI, *Centro Tessile Cotoniero & Abbigliamento S.p.A.*

VII.C.1 Stefania DAL CORSO, *CentroCot*
Green chemistry and textile innovation: the environmental product assessment

VII.C.2 Brecht TOMME, *Ghent University, Belgium*
Removing finishing chemicals from outdoor acrylic textiles

VII.C.3 Olga CHYBOVÁ, *Inotex, Czech Republic*
Reduction of the waste generation through prolongation of the service life of textile products

VII.D Ophtalmic/Topical Delivery

Co-organized with University of Catanzaro & Sapienza University of Rome
Chairs: Rosario PIGNATELLO, *University of Catania* & Maria Camilla BERGONZI, *University of Florence*

The symposium is part of the special event SE.I

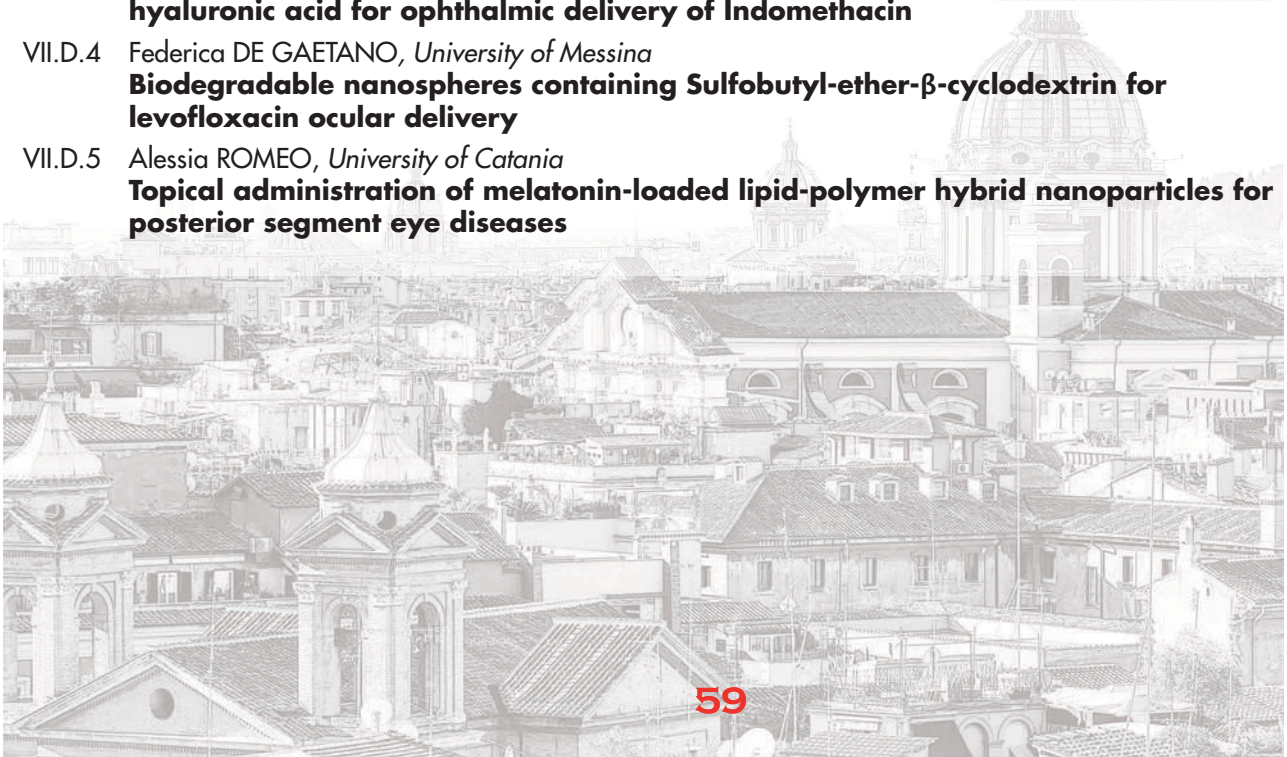
VII.D.1 Claudio BUCOLO, *University of Catania*
Ocular Drug Delivery: the Pharmacologist Perspective

VII.D.2 Brunella GRASSIRI, *University of Pisa*
Thiolated hydroxypropyl-β-cyclodextrin as a promising mucoadhesive tool to prolong poorly soluble drugs ocular residence time

VII.D.3 Francesco RACANIELLO, *University of Bari*
Chitosan/SBE-β-CD NPs with external coating of thiolated hyaluronic acid for ophthalmic delivery of Indomethacin

VII.D.4 Federica DE GAETANO, *University of Messina*
Biodegradable nanospheres containing Sulfobutyl-ether-β-cyclodextrin for levofloxacin ocular delivery

VII.D.5 Alessia ROMEO, *University of Catania*
Topical administration of melatonin-loaded lipid-polymer hybrid nanoparticles for posterior segment eye diseases



POSITIS SIGNIS ET
JVSSV CLEMENTIS XIII

VII.E ARTES 4.0 and ISAAC PROJECT at SNS: fluorescence microscopy and deep-learning algorithms for nanomedicine

Co-organized with Scuola Normale Superiore
Chairs: Pasqualantonio PINGUE & Francesco CARDARELLI, *Scuola Normale Superiore*

VII.E.1 Chiara CAPPELLI, *Scuola Normale Superiore & Delegata al Trasferimento tecnologico e coordinatrice macronodo ARTES4.0@SNS*
ARTES 4.0 and Technology Transfer at Scuola Normale Superiore

VII.E.2 Francesco CARDARELLI, *NEST-Scuola Normale Superiore*
Basic research and Healthcare 4.0: which relationship? A case study ... at the nanoscale

VII.E.3 Giuseppe BARILLARO, *University of Pisa*
Microlenses for monitoring pathogens on surfaces by exploiting fluorescence microscopy with a smartphone

VII.E.4 Marco CASADEI, *FLIMLABS*
Perspectives on new generation of FLIM instrumentation

VII.F Advanced technologies for occupational health and safety in nanomaterials production processes

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

VII.F.1 Stefania SABELLA, *IIT*
The "NanoKey" prevention-through-design approach: development, validation and technology transfer

VII.F.2 Francesca TOMBOLINI, *INAIL*
Measurement and characterization of workers' exposure in nano-objects production processes

VII.F.3 Delia CAVALLO, *INAIL*
Biomonitoring of workers involved in the graphene production process

VII.F.4 Luisana DI CRISTO, *IIT*
An Integrated cellular approach to predict the risk of nanomaterials following occupational exposure

VII.F.5 Evie L. PAPADOPOULOU, *IIT*
Fluorescence-based paper sensors for the optical detection of nanomaterials

VII.G Materials and devices in photonic quantum technologies - Part 2

Co-organized with FBK
Chair: Georg PUCKER, *FBK*

VII.G.1 Simone Luigi MARASSO, *Polytechnic of Turin*
Advanced facilities for the realization of quantum devices in Piedmont

VII.G.2 Ottavia JEDRKIEWICZ, *IFN-CNR, Como*
Laser writing of color centers and optofluidics in synthetic diamond for quantum technologies

VII.G.3 Luigi SANTAMARIA, *ASI*
Overview of Quantum Technologies in the frame of Italian Space Agency activities

16:00 - 17:30 **SEPTEMBER 23**

VIII.A The Green Transition - Part 3: Circular Economy

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

The symposium is part of the workshop WS.IV

VIII.A.1 Giovanni PINTO, *ITALCEMENTI*
Recycled aggregates for green concretes

VIII.A.2 Francesca NANNI, *Consorzio INSTM*
The role of Additive Manufacturing Technologies

VIII.A.3 Antonio ROMEO, *DINTEC*
SMEs environmental sustainability assessment

VIII.B Electrochemical energy storage from fundamental studies to pilot engineering: new generation batteries - Part 2

Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies - CSFT@POLITO, FBK and ENEA
Chair: Nadhira BENSAADA LAIDANI, *FBK*

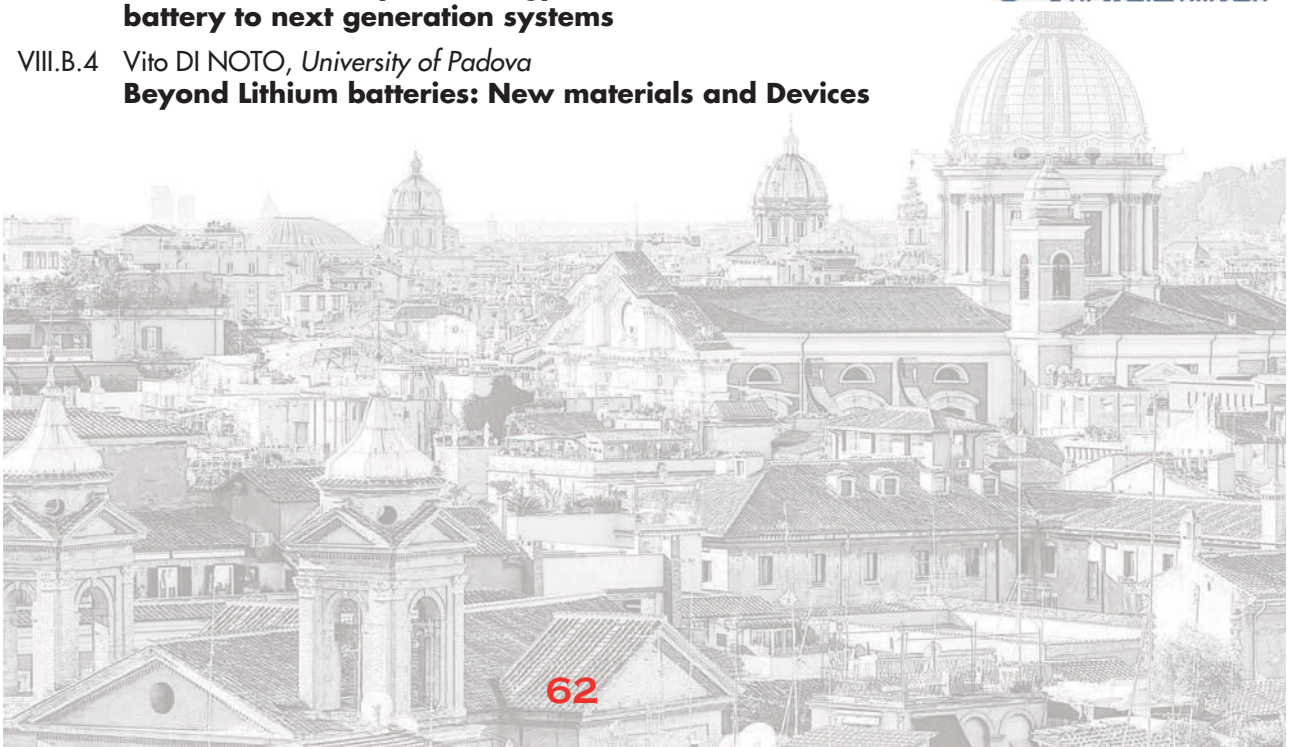
The symposium is part of the workshop WS.I

VIII.B.1 Lucia FAGIOLARI, *Polytechnic of Turin*
Exploring promising materials platforms for potassium batteries

VIII.B.2 Mattia PALERMO, *Green Energy Storage*
On the quest for new RFB redox couples: a computational approach

VIII.B.3 Peter FISCHER, *Fraunhofer ICI, Germany*
Redox flow battery technology – from vanadium flow battery to next generation systems

VIII.B.4 Vito DI NOTO, *University of Padova*
Beyond Lithium batteries: New materials and Devices



VIII.C Green chemistry and LCA applications as tools for sustainability in the textile value chain - Part 2

Co-organized with University of Bergamo
Chairs: Giuseppe ROSACE, *University of Bergamo* & Roberto VANNUCCI, *Centro Tessile Cotoniero & Abbigliamento S.p.A.*

VIII.C.1 Claudio BRUGNONI, *Brugnoni*
Michela SECCHI, *CentroCot*
Economic evaluation and environmental impact of surgical masks

VIII.C.2 Claudio COLLEONI, *ArgoChem Srl*
Fluoro-free water repellent finish: properties and compliance with environmental standards

VIII.C.3 Maria Rosaria PLUTINO, *CNR-ISMN*
Innovative bio-based hybrid materials for the development of sustainable applications

VIII.D Regenerative Medicine

Co-organized with University of Catanzaro & Sapienza University of Rome
Chairs: Giovanni TOSI, *University of Modena and Reggio Emilia* & Angela BONACCORSO, *University of Catania*

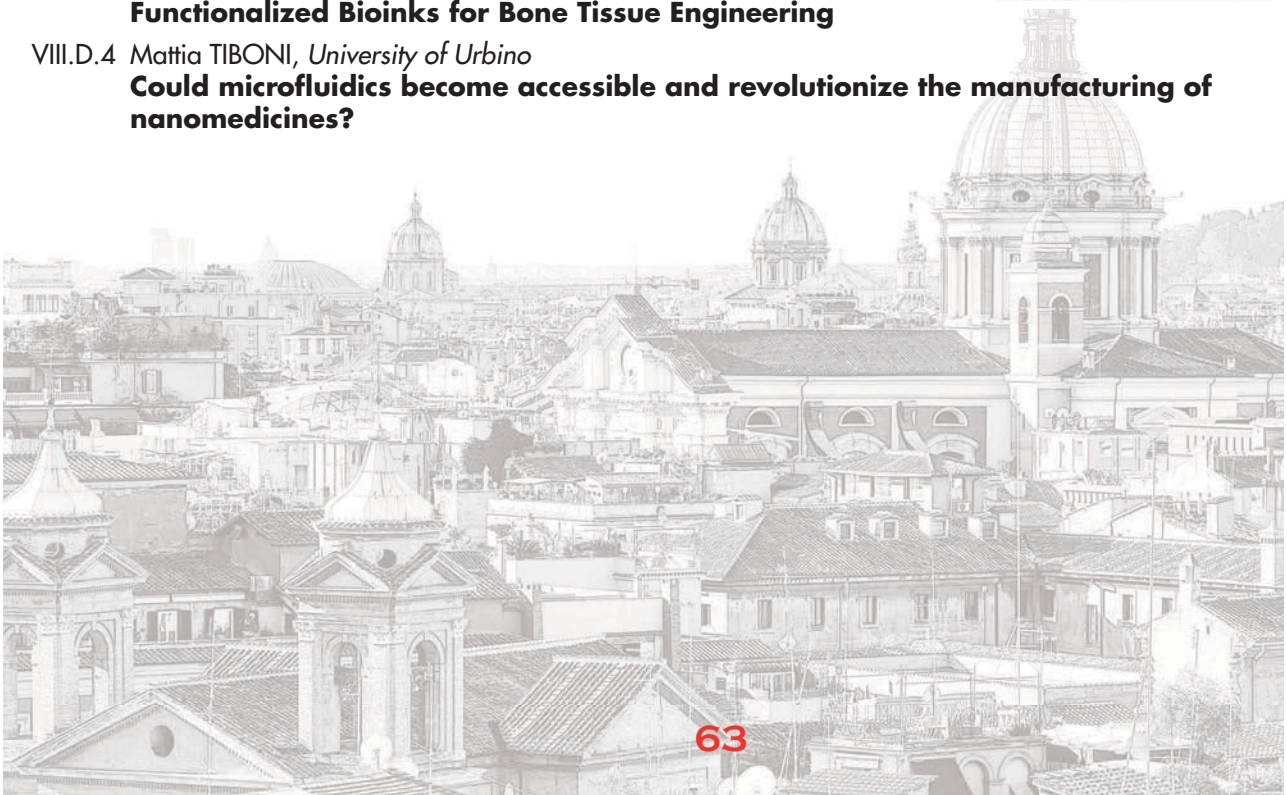
The symposium is part of the special event SE.I

VIII.D.1 Laura CALZÀ, *University of Bologna*
Neurodegeneration: moving from technology to application note

VIII.D.2 Luca LORENZINI, *University of Bologna*
Nanoformulation and multitarget therapy for early spinal cord injury

VIII.D.3 Margherita MONTANARI, *ISTEC - CNR*
Bioprinting of Biomimetic Nano-Hydroxyapatite Functionalized Bioinks for Bone Tissue Engineering

VIII.D.4 Mattia TIBONI, *University of Urbino*
Could microfluidics become accessible and revolutionize the manufacturing of nanomedicines?



VIII.E Nanotechnologies for Cultural Heritage

Co-organized with Scuola Normale Superiore
Chair: Pasqualantonio PINGUE, *Laboratorio NEST, Scuola Normale Superiore*

VIII.E.1 Pasqualantonio PINGUE, *Laboratorio NEST, Scuola Normale Superiore*
COMAST, il progetto regionale Toscano sui beni culturali: il contributo della Scuola Normale Superiore

VIII.E.2 Patrizia CAPIZZI, *University of Palermo*
Ultrasound-based diagnostics for cultural heritage

VIII.F Manufacturing and industrial applications of 3D and 4D printing of polymer nanocomposites and devices - Part 2

Co-organized with Polytechnic of Turin & CNR-IMM
Chairs: Ignazio ROPPOLO & Annalisa CHIAPPONE, *Polytechnic of Turin*

VIII.F.1 Michele DELLA CIANA, *CNR-IMM & University of Ferrara*
High vacuum compatibility of 3D printed parts

VIII.F.2 Giancarlo RIZZA, *École Polytechnique de Paris, France*
4D additive manufacturing: the way to program 3D printed objects

VIII.F.3 Lorenzo CALABRI, *ART-ER , Bologna*
High Performance Production Through 3D-Printing, the Vanguard Initiative 3DP Pilot

VIII.F.4 Stefano BERTOLDO, *INFN-LNL*
Simple 3D printed supports for particle detection at L.N.L.

VIII.G Beyond graphene

Co-organized with University of Reggio Calabria & CNR-IMM
Chairs: Giuliana FAGGIO & Giacomo MESSINA, *University of Reggio Calabria* and Vittorio MORANDI, *CNR-IMM*

The symposium is part of the workshop WS.V

VIII.G.1 Antonio POLITANO, *University of L'Aquila*
Ambient-stable transition-metal dichalcogenides hosting type-II Dirac fermions and their applications in catalysis, nanoelectronics, and plasmonics

VIII.G.2 Francesco BONACCORSO, *IIT*
Large-scale production of 2D crystals for energy applications

VIII.G.3 Andrea IENCO, *CNR-ICOMM*
Recipes for Few-layer Black Phosphorus Functionalization

VIII.G.4 Alessandro MOLLE, *CNR-IMM*
Nanoscale Engineering of emerging Two-Dimensional Materials

09:00 - 10:30 **SEPTEMBER 24**

IX.A Nanomaterials: manufacturing, characterizations and applications - Part 1

Co-organized with University of Catanzaro & Sapienza University of Rome
Chairs: Marta FEROCI & Leonardo MATTIELLO, *Sapienza University of Rome*

The symposium is part of the special event SE.I

IX.A.1 Pierfrancesco ATANASIO, *Sapienza University of Rome*
Preparation of Carbon/Silicon Hybrid Nanostructured Anodes for Lithium ion Batteries by CVD and Liquid Phase Deposition

IX.A.2 Serena DE SANTIS, *University of Roma Tre*
Nanoindentation protocol to characterize surface free energy of micro and nano-structured titanium

IX.A.3 Anastasia FORNARI, *Sapienza University of Rome*
Nanocellulose as bio-inspired consolidant for degraded wood

IX.A.4 Federica MITRI, *University of Roma Tre*
Quantum Dots-based sensors for Explosive Detection

IX.B Electrochemical energy storage: the atomistic design perspective

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

IX.B.1 Francesco BUONOCORE & Margherita MORENO, *ENEA*
An introduction to the atomistic design of materials for electrochemical energy storage

IX.B.2 Michele PAVONE, *University of Napoli, Federico II*
Ab initio modeling of electrode and electrode-electrolyte interfaces in post-Li batteries

IX.B.3 Otello Maria ROSCIONI, *Material X, UK*
A computational journey from the electronic structure to the mesoscale... and back!

IX.B.4 Alan PASTORELLI, *Flash Battery*
Towards a predictive analysis, diagnose and maintenance of batteries: data set optimisation, an industrial perspective

IX.C Medicine through nanomaterials

Co-organized with Sapienza University of Rome
Chair: Luciana DINI, *Sapienza University of Rome*

IX.C.1 Emanuele MAURI, *University Campus Bio-Medico*
Microfluidic droplet-based synthesis of polymeric nanoparticles as controlled drug delivery systems

IX.C.2 Maria Rita CANDITO, *University of Padova*
Chitin nanofibrils nanocomposite biocompatibility on inner ear cells

IX.C.3 Roberta FIORINO, *University of Modena & Reggio Emilia*
Preclinical safety assessment of Superparamagnetic Iron Oxide Nanoparticles: exploring the Pomacea canaliculata as a suitable model for screening toxicity. Preliminary results

IX.C.4 Evgeniya PESHKOVA, *University of Genoa*
Protein's Langmuir-Blodgett nanofilms studied by X-Ray nanodiffraction (nanoXRD), X-ray free electron laser (XFEL) and Cryo-Electron Microscopy (Cryo-EM)

IX.C.5 Stephanie MORRIS, *NanoComposix*
Silica in Nanomedicine: Developing Next-Gen Therapeutic Platforms

IX.D European Metrology Programme for Innovation and Research toward the Green Deal: Quantum, Energy and Environment

Co-organized with INRIM
Chair: Luca BOARINO, *INRIM*
Co-Chairs: Gianluca MILANO, *INRIM* & Natascia DE LEO, *INRIM*

IX.D.1 Burkhard BECKHOFF, *Head of X Ray Spectrometry group, PTB Bessy II, Berlin, Germany*
Aeromet II

IX.D.2 Zhi LI, *Nanometrology Department, PTB, Braunschweig, Germany*
Metrology for high throughput characterisation of nanowire energy harvesting devices

IX.D.3 Gianluca MILANO, *Advanced Materials Metrology & Life Sciences, INRIM*
MEMQuD

IX.D.4 Emanuele ENRICO, *INRIM*
ParaWave (17FUN10) - Josephson travelling wave parametric amplifier and its application for metrology

IX.E Advances and perspectives in gas detection technology - Part 1

Co-organized with FBK
Chair: Andrea GAIARDO, *FBK*

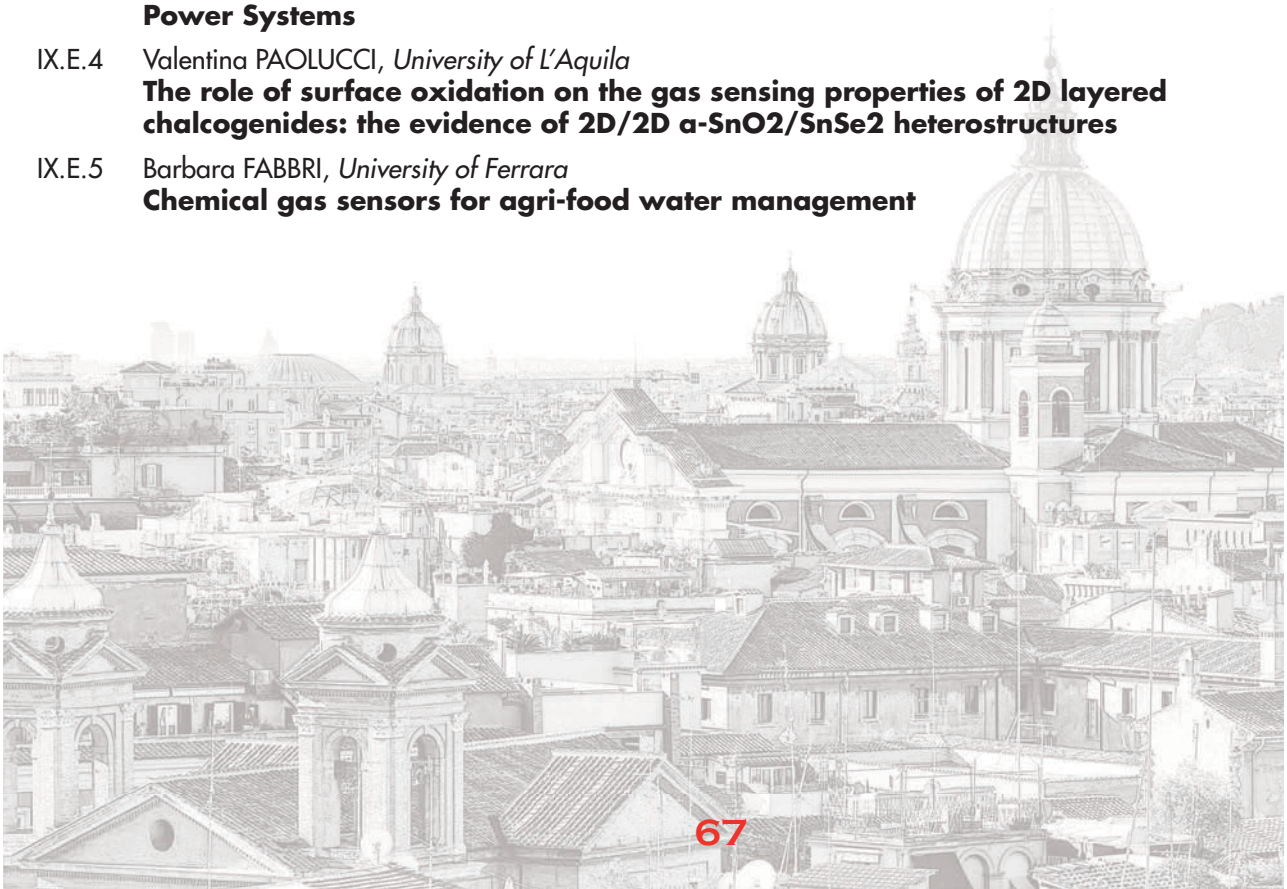
IX.E.1 Elisabetta COMINI, *University of Brescia*
Metal oxides nanostructures: optimisation of their chemical sensing properties

IX.E.2 Stefano ZAMPOLLI, *CNR-IMM, Bologna*
SensiMOX: towards a system-in-package multisensing smart cable

IX.E.3 Ambra FIORAVANTI, *CNR-STEMS, Ferrara*
The New Application of Metal Oxide Gas Sensors in Fluid Power Systems

IX.E.4 Valentina PAOLUCCI, *University of L'Aquila*
The role of surface oxidation on the gas sensing properties of 2D layered chalcogenides: the evidence of 2D/2D a-SnO2/SnSe2 heterostructures

IX.E.5 Barbara FABBRI, *University of Ferrara*
Chemical gas sensors for agri-food water management



11:00 - 12:30 **SEPTEMBER 24**

X.A Nanomaterials: manufacturing, characterizations and applications - Part 2

Co-organized with University of Catanzaro & Sapienza University of Rome
Chairs: Marta FEROCI & Leonardo MATTIELLO, *Sapienza University of Rome*

The symposium is part of the special event SE.I

X.A.1 Fabiana PANDOLFI, *University of Tuscia*
Chitosan-based nanocapsules to prevent marine biofouling

X.A.2 Daniele ROCCO, *Sapienza University of Rome*
Synthesis and Characterization of New Plastic Scintillators for Fast Timing Detectors

X.A.3 Vincenzo SCARANO, *Sapienza University of Rome*
Oligothiophenes: electrochemically obtained smart materials

X.A.4 Simone SOTGIU, *Sapienza University of Rome*
Raman Scattering at Infrared Energies of Extremely Thin Semiconductors

X.A.5 Andrea GALLO, *Polytechnic of Turin*
Laboratory approach for the 3D visualization of the generation of an in-situ reactive zone for aquifer remediation

X.B How to enable the access of SME to nanotechnologies

Co-organized with the European Project NANOREGION
Chair: Marco LAZZARINO, *CNR-IOM Area Science Park*

X.B.1 Marco LAZZARINO, *CNR-IOM, Trieste*
Welcome - NanoRegion: where nanotech meets business

X.B.2 Federica RIGONI & Greta BONETTO, *University of Venice – Cà Foscari*
Anna DEL TEDESCO, *NOXORSOKEM GROUP Srl*
University and entrepreneurship: synergies of technology and knowledge transfer for a successful growth. Ca' Foscari case study

X.B.3 Giancarlo GAZZADI, *CNR – Nano, Modena*
Alberto BORGHI, *TEC STAR srl, Castelfranco Emilia (MO)*
Industrial application of nanotools at CNR-NANO Modena

X.B.4 Lorenza FERRARIO, *FBK*
Paolo CONCI, *MicroFabSolutions Srl, Trento*
MicroFabSolutions as "technology transfer facilitator" and MNF as open facility for startups and SMEs

X.B.5 Francesca Romana BERTANI & Luca BUSINARO, *CNR - IFN, Roma*
In collaboration with Takis Biotech S.r.l
High-throughput technologies for rapid screening of antibodies for antitumoral therapies

X.C Electron microscopy in Material Science in Italy: opportunities, organization and networking

Co-organized with CNR-IMM, CNR-IOM & Sapienza University of Rome
Chairs: Vittorio MORANDI, *CNR-IMM*, Marco ROSSI, *Sapienza University of Rome* & Regina CIANCIO, *CNR-IOM*

The symposium is part of the special event SE.III

X.C.1 Vittorio MORANDI, *CNR-IMM*
Introduzione

X.C.2 Regina CIANCIO, *CNR-IOM*
Gli scenari Europei

X.C.3 Marco ROSSI, *Sapienza University of Rome*
L'alta formazione

X.C.4 Vittorio MORANDI, *CNR-IMM*
Esperienze simili ed opportunità

X.C.5 Discussione / Tavola rotonda

X.C.6 Wrap up e prossimi passi

X.D Advances and perspectives in gas detection technology - Part 2

Co-organized with FBK
Chair: Andrea GAIARDO, *FBK*

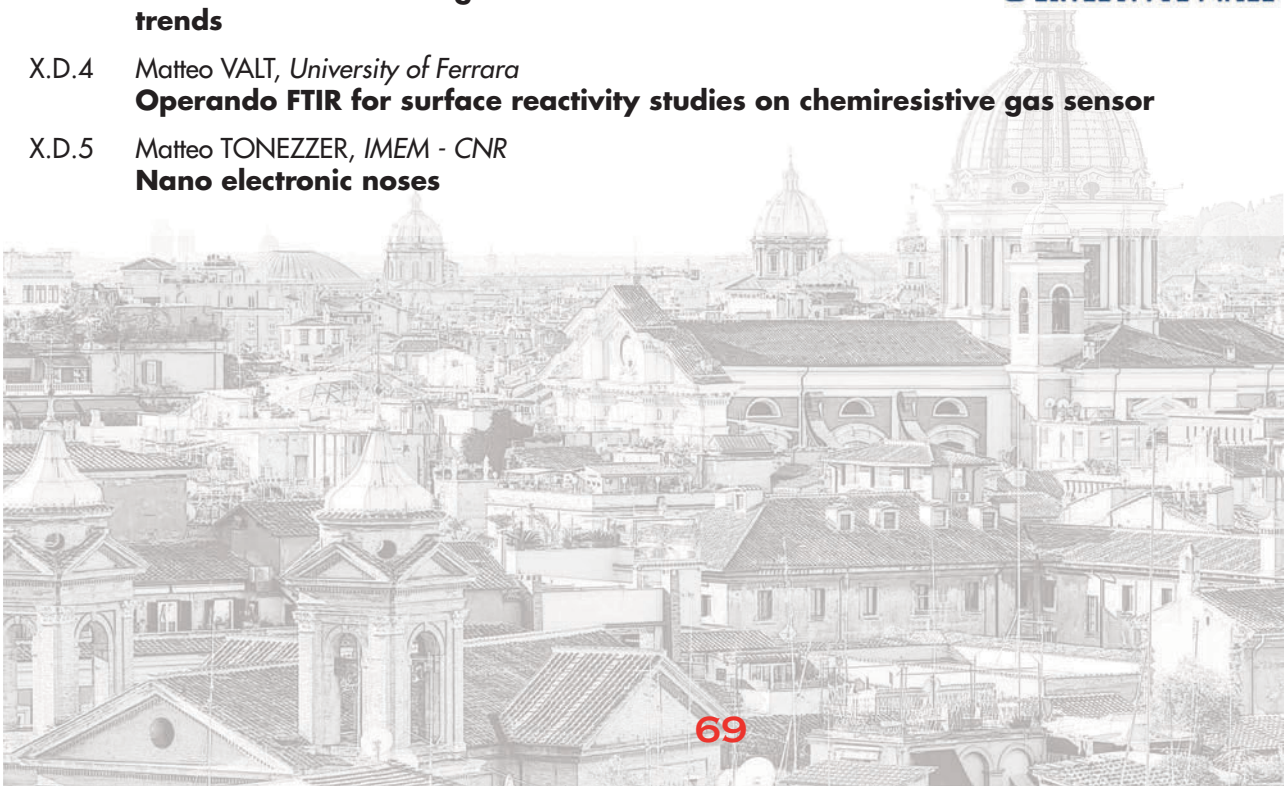
X.D.1 Veronica SBERVEGLIERI, *Institute of Biosciences and BioResources - CNR*
How nanotechnology could help to achieve zero hunger goal

X.D.2 Roberto DI CHIO, *University of Messina*
Enhanced performances of sensors based on ALD-synthesized MOx/CNTs composites

X.D.3 Martina Aurora COSTA ANGELI, *Free University of Bozen-Bolzano*
Carbon-based flexible gas sensors: an overview of current trends

X.D.4 Matteo VALT, *University of Ferrara*
Operando FTIR for surface reactivity studies on chemiresistive gas sensor

X.D.5 Matteo TONEZZER, *IMEM - CNR*
Nano electronic noses



X.E Safe by Design of nanomaterials in industrial production processes

Co-organized with EU Project SbD4Nano & AIRI
Chair: Elisabetta TOSCHI, *ART-ER & SbD4Nano project*

X.E.1 Andrea PORCARI, *AIRI & Gov4Nano project*
Needs and initiatives for risk governance and Safe by Design approaches for nanomaterials

X.E.2 Blanca SUAREZ MERINO, *Temasol AG and Gov4Nano project*
Implementation of Safe by Design: Lessons learnt from the Nanotechnology sector

X.E.3 Lorenzo CALABRI, *ART-ER and SbD4Nano project*
The SbD4Nano case studies structure, and path way to support SMEs

X.E.4 Stefano MANFREDINI & Silvia VERTUANI, *Ambrosialab Srl, University of Ferrara and SbD4Nano project*
The use of nanomaterials in the cosmetic sector

X.E.5 Ivonne TONANI TOMASONI, *Red of View Srl and ASINA project*
Nanostructured capsules delivering active phases in cosmetics

X.E.6 Brain-storming session: needs, tools and practices for Safe by Design implementation in companies

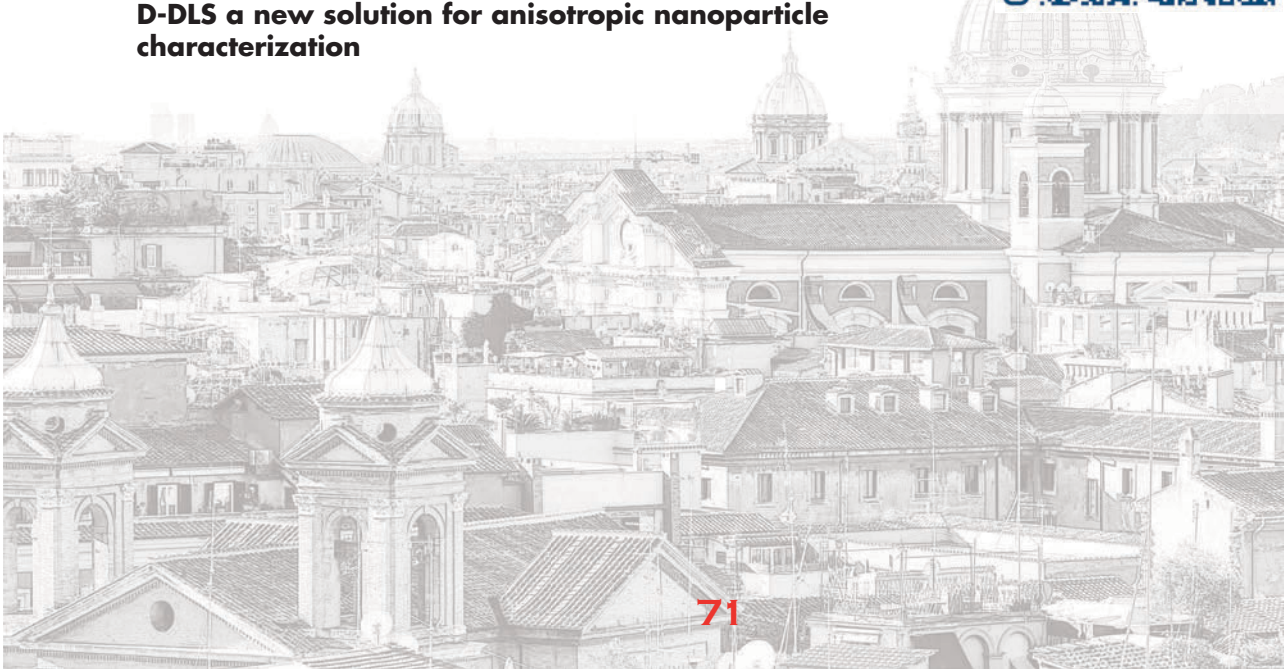
X.F Advanced solutions for characterizations in nanoscience

Co-organized with Sapienza University of Rome
Chair: Daniele PASSERI, *Sapienza University of Rome*

X.F.1 Mathias A. MOSIG, *Protochips*
AXON as Supporting Streamlines Image Acquisition, Metadata Synchronization and Data Analysis for an In-situ Electrochemistry Experiment

X.F.2 Danny STAM, *Eldico Scientific AG*
The nanocrystallography revolution: A dedicated device for 3D-Electron Diffraction experiments on nanocrystals

X.F.3 Francesca SBRANA, *Schaefer Italy*
D-DLS a new solution for anisotropic nanoparticle characterization



14:00 - 15:30 **SEPTEMBER 24**

XI.A Nanomaterials: manufacturing, characterizations and applications - Part 3

Co-organized with University of Catanzaro & Sapienza University of Rome
Chairs: Marta FEROCI & Leonardo MATTIELLO, *Sapienza University of Rome*

The symposium is part of the special event SE.I

XI.A.1 Antonio FERRARO, *University of Calabria*
Hyper resolution in two-photon direct laser writing towards additive manufacturing nanostructures

XI.A.2 Elisabetta SALERNO & Davide CASOTTI, *Univ. of Modena & Reggio Emilia*
The role of substrate surface finishing in determining the tribological properties of DLC coatings on additive manufactured AlSi10Mg components

XI.A.3 Maria D'ANTUONO, *University of Naples, Federico II*
Nanopatterning of oxide heterostructures using cold ion milling

XI.A.4 Rosalia FERRARO, *University of Naples, Federico II*
Phase behavior of Surfactant-Water systems by time-lapse polarized light microscopy

XI.A.5 Francesca RUSSO, *CNR-ITM*
Valerolactone (GVL) as a green polar aprotic solvent for polyvinylidene fluoride (PVDF) membranes preparation

XI.B Electrochemical storage: new materials for the batteries of the future - Part 1

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

XI.B.1 Francesco BOZZA, *ENEA*
Synthesis and characterization of Ni and Li - doped layered Manganese oxide as cathode material for Na ion batteries

XI.B.2 Akiko TSURUMAKI, *Sapienza University of Rome*
Safe Gel Polymer Electrolytes for High Voltage Lithium Batteries

XI.B.3 Omar PEREGO, *RSE*
RSE activities for the development of anode and cathode materials for sodium-ion batteries

XI.B.4 Luca BARGNESI, *University of Bologna*
Sustainable Na-ion batteries for stationary applications

XI.B.5 Gabriele LINGUA, *Polytechnic of Turin*
Towards Solid Batteries Operating at Ambient Temperature Through Safe, Highly Conducting, Solid Polymer-based Electrolytes

XI.B.6 Alessandro BRILLONI, *University of Bologna*
Green design of lithium metal battery

XII.A Innovation through nanomaterials

Co-organized with University of Catanzaro & Sapienza University of Rome
Chairs: Marta FEROCI & Leonardo MATTIELLO, *Sapienza University of Rome*

The symposium is part of the special event SE.I

XII.A.1 Marco FORTUNATO, *Sapienza University of Rome*
Phase Inversion in PVDF Films with Enhanced Piezoresponse Through Spin-Coating and Quenching

XII.A.2 Sara CERRA, *Sapienza University of Rome*
Functionalized gold nanoparticles in colorimetric and chemoresistive sensors: synthesis, sensing mechanism and interface properties

XII.A.3 Ludovico MUSENICH, *University of Genova*
Diatom nanostructured frustule: new insights for the design of novel biomimetic materials

XII.A.4 Monica GRANETTO, *Polytechnic of Turin*
An eco-compatible nanoformulation for the reduction of pesticide environmental impacts

XII.B Electrochemical storage: new materials for the batteries of the future - Part 2

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

XII.B.1 Alessandra DI BLASI, *CNR*
High Performance Electrocatalyst for Vanadium Redox Flow Battery

XII.B.2 Vincenzo MULONE, *University of Rome Tor Vergata*
Stationary battery design and control for renewable integration in Local Energy Communities

XII.B.3 Arcangelo CELESTE, *IIT & ENEA*
Electrochemical storage: new materials for the batteries of the future

XII.B.4 Leonardo SBRASCINI, *University of Camerino*
Sustainable Conversion and Alloying Composite Anodes for Li- and Na-ion batteries

XII.B.5 Anna MANGINI, *Polytechnic of Turin*
New polymer electrolytes for Li-O_2 batteries

10:50 - 11:30	
Parallel Scientific Lectures (SL.I.A-B) and Technical Lecture (TL.I)	
22 SEPTEMBER	
Chair: Donatella PAOLINO, *University Magna Graecia of Catanzaro*	
SL.I.A	Mauro FERRARI, *Houston Methodist Research Institute, President and CEO* **The Covid Nanovaccines**
Chair: Marco VITTORI ANTISARI, *Nanoltaly Association*	
SL.I.B	Giorgio GRADITI, *ENEA, Dipartimento Tecnologie Energetiche e Fonti Rinnovabili (TERIN), Director* **Hydrogen value chain: the development of new technologies for the italian energy transition pathway**
Chair: Daniele PASSERI, *Sapienza University of Rome*	
TL.I	Giulio LAMEDICA, *ZEISS, Microscopy Director* **Digital Transformation in the Research World**

10:50 - 11:30	
Parallel Scientific Lectures (SL.II.A-B)	
23 SEPTEMBER	
Chair: Guglielmo FORTUNATO, *CNR-IMM*	
SL.II.A	Maria Victoria SANCHEZ-VIVES *August Pi i Sunyer Biomedical Research Institute (IDIBAPS), Spain* **Brain and technology: first words of a future conversation**
Chair: Vittorio MORANDI, *CNR-IMM*	
SL.II.B	Luigi COLOMBO *University of Texas, USA* **Integration of 2D materials in electronic devices: Challenges and Opportunities**

YOUNGINNOVATION

The State of Research communicated by Young Researchers

September 22 - 23 - 24

Chair: Donatella PAOLINO, *University Magna Graecia of Catanzaro*
Co-chairs: Daniele TORELLA, *University Magna Graecia of Catanzaro*, Marta FEROCI & Leonardo MATTIELLO, *Sapienza University of Rome*

ORGANIZING BOARD

Stefano ALCARO, *University Magna Graecia of Catanzaro*
Paolo CALICETI, *University of Padova*
Giovanni CUDA, *University Magna Graecia of Catanzaro*
Giovanni TOSI, *University of Modena and Reggio Emilia*

Co-organized with

Today science, technology and innovation are the engine of development all over the world. In a complex and fast-changing world, researchers can contribute to face all big challenges ahead. For this reason, new generations of researchers and scientists are key to world's future development.

NanoInnovation has always tried to promote science and research at all levels, to encourage exchanges between universities, research institutions and companies, to facilitate participation of early stage researchers in the scientific world, to support their careers and promote mentorship activities. For this reason, **YoungInnovation**, the special event dedicated to young researchers, will take place again during this edition.

Co-organized with University Magna Graecia of Catanzaro and Sapienza University of Rome, the three-days event will host a series of symposia where the state of research will be presented by young researchers, who daily work in laboratory to produce innovation. The focus of YoungInnovation is to evaluate the current status of the research. In particular, very innovative aspects will be analysed, ranging from life science, i.e precision and translational medicine, to material science.

Today, many research issues are becoming increasingly complex, and learning new perspectives on future research is a vital element for scientific progression. The event meets the need to encourage the exchange of ideas and to support young researchers in their activities.

22 SEPTEMBER

09:00 - 10:30	SE.I.1
Tissue Regeneration	
Co-organized with University of Catanzaro & Sapienza University of Rome Chairs: Konrad URBANEK & Fabiola MARINO, *University Magna Graecia of Catanzaro*	
SE.I.1.1	Maurilio SAMPAOLESI, *KU Leuven, Belgium* **2D and 3D human iPSC-based models to reveal new therapeutic targets for Duchenne muscular dystrophy**
SE.I.1.2	Eleonora CIANFLONE, *University Magna Graecia of Catanzaro* **Targeting stem cell senescence to rejuvenate the aged heart**
SE.I.1.3	Dalila MIELE, *University of Pavia* **Production of polydioxanone (PDO) microfibers obtained by centrifugal spinning technology as skin/tendon tissue substitutes**
SE.I.1.4	Barbara VIGANI, *University of Pavia* **Spermidine as multifunctional agent in the design of innovative tools for nervous tissue repair**
SE.I.1.5	Mariangela SCALISE, *University Magna Graecia of Catanzaro* **Endogenous resident multipotent progenitors as cardiac tumor initiating cells**

11:30 - 13:00	SE.I.2
Advanced technologies in cardiovascular diseases	
Co-organized with University of Catanzaro & Sapienza University of Rome Chairs: Daniele TORELLA, *University Magna Graecia of Catanzaro* & Mattia TIBONI, *University of Urbino*	
SE.I.2.1	Konrad URBANEK, *University Magna Graecia of Catanzaro* **Cellular and molecular basis of cardio-oncology**
SE.I.2.2	Fabiola MARINO, *University Magna Graecia of Catanzaro* **From spheroids to organoids: the evolution of model system for human cardiac regeneration in a dish**
SE.I.2.3	Cristina CASADIDIO, *University of Camerino* **Cardiac Delivery of therapeutics via injectable thermosensitive hydrogels**
SE.I.2.4	Nadia SALERNO, *University Magna Graecia of Catanzaro* **In vivo advanced cardiac imaging in small animals**

22 SEPTEMBER

14:00 - 15:30	SE.I.3
Hot topics in Life Sciences - Focus on natural compound	
Co-organized with University of Catanzaro & Sapienza University of Rome Chairs: Stefano ALCARO, *University Magna Graecia of Catanzaro* & Ettore NOVELLINO, *University of Naples Federico II*	
SE.I.3.1	Bruno BOTTA, *Sapienza University of Rome* **The Role of Natural Products in Promoting Well-being: From Foods to Drugs**
SE.I.3.2	Federica MORACA, *University of Naples Federico II* **Nucleic acids as target of natural small molecules**
SE.I.3.3	Isabella ROMEO, *University Magna Graecia of Catanzaro* **Natural agents against SARS-CoV-2**
SE.I.3.4	Francesca Alessandra AMBROSIO, *University Magna Graecia of Catanzaro* **Targeting HuD with natural compounds**

16:00 - 17:30	SE.I.4
Pluripotent Stem Cell as a Multidisciplinary Platform in Clinical Research	
Co-organized with University of Catanzaro & Sapienza University of Rome Chairs: Giovanni CUDA & Heather BOND, *University Magna Graecia of Catanzaro*	
SE.I.4.1	Graziano MARTELLO, *University of Padova* **Generation of human induced Pluripotent Stem cells in microfluidics**
SE.I.4.2	Elvira I. PARROTTA, *University Magna Graecia of Catanzaro* **Identification of retinoic acid-responsive transcriptional regulators in human ESCs**
SE.I.4.3	Stefania SCALISE, *University Magna Graecia of Catanzaro* **In vitro model of febrile seizures and epilepsy using patient-specific induced pluripotent stem cells-derived neurons**
SE.I.4.4	Valeria LUCCHINO, *University Magna Graecia of Catanzaro* **Generation of human induced pluripotent stem cell lines from two Italian siblings affected by Unverricht-Lundborg disease**
SE.I.4.5	Luana SCARAMUZZINO, *University Magna Graecia of Catanzaro* **Uncovering the function of Ferritin heavy chain (FHC) in human embryonic stem cells**

23 SEPTEMBER

09:00 - 10:30	SE.I.5
Innovative technologies in drug delivery: Extracellular Vesicles	
Co-organized with University of Catanzaro & Sapienza University of Rome Chairs: Maria CARAFA, *Sapienza University of Rome* & Maria Chiara CRISTIANO, *University Magna Graecia of Catanzaro*	
SE.I.5.1	Paolo CIANA, *University of Milan* **Transplantation of autologous extracellular vesicles for cancer-specific targeting**
SE.I.5.2	Mariangela GAROFALO, *University of Padova* **Extracellular Vesicles: new frontiers for modern delivery of therapeutics**
SE.I.5.3	Alessandro VILLA, *University of Milan* **EVs as tools for enhanced imaging: insights from preclinical studies**
SE.I.5.4	Nicolò SIMONOTTI, *Istituto Nazionale Tumori - IRCCS Foundation (INT)* **Perspectives for real-time EVs applications in surgical oncology**
SE.I.5.5	Marta VALENZA, *University of Milan* **Nanoparticles crossing the blood-brain barrier for cholesterol delivery to Huntington's disease brain**

11:30 - 13:00	SE.I.6
Brain Delivery	
Co-organized with University of Catanzaro & Sapienza University of Rome Chairs: Teresa MUSUMECI, *University of Catania* & Federica DE GAETANO, *University of Messina*	
SE.I.6.1	Giovanni TOSI, *University of Modena and Reggio Emilia* **Brain & Nanomedicine: where we are and where to go**
SE.I.6.2	Maria Camilla BERGONZI, *University of Florence* **Thymoquinone-Loaded Soluplus® -Solutol® HS15 Mixed Micelles: Preparation, In Vitro Characterization, and Effect on the SH-SY5Y Cell Migration**
SE.I.6.3	Luca CERRI, *University of Pisa* **Camouflage nanosystems based on chitosan and cellular membranes for the rivastigmine delivery to the brain**
SE.I.6.4	Angela BONACCORSO, *University of Catania* **Design of nanonized carbamazepine for nose-to-brain delivery**
SE.I.6.5	Ilaria OTTONELLI, *University of Modena and Reggio Emilia* **Intercellular crosstalk and brain targeted nanomedicines**

23 SEPTEMBER

14:00 - 15:30	SE.I.7
Ophtalmic/Topical Delivery	
Co-organized with University of Catanzaro & Sapienza University of Rome Chairs: Rosario PIGNATELLO, *University of Catania* & Maria Camilla BERGONZI, *University of Florence*	
SE.I.7.1	Claudio BUCOLO, *University of Catania* **Ocular Drug Delivery: the Pharmacologist Perspective**
SE.I.7.2	Brunella GRASSIRI, *University of Pisa* **Thiolated hydroxypropyl-β-cyclodextrin as a promising mucoadhesive tool to prolong poorly soluble drugs ocular residence time**
SE.I.7.3	Francesco RACANIELLO, *University of Bari* **Chitosan/SBE-β-CD NPs with external coating of thiolated hyaluronic acid for ophthalmic delivery of Indomethacin**
SE.I.7.4	Federica DE GAETANO, *University of Messina* **Biodegradable nanospheres containing Sulfobutyl-ether-β-cyclodextrin for levofloxacin ocular delivery**
SE.I.7.5	Alessia ROMEO, *University of Catania* **Topical administration of melatonin-loaded lipid-polymer hybrid nanoparticles for posterior segment eye diseases**

16:00 - 17:30	SE.I.8
Regenerative Medicine	
Co-organized with University of Catanzaro & Sapienza University of Rome Chairs: Giovanni TOSI, *University of Modena and Reggio Emilia* & Angela BONACCORSO, *University of Catania*	
SE.I.8.1	Laura CALZÀ, *University of Bologna* **Neurodegeneration: moving from technology to application note**
SE.I.8.2	Luca LORENZINI, *University of Bologna* **Nanoformulation and multitarget therapy for early spinal cord injury**
SE.I.8.3	Margherita MONTANARI, *ISTEC - CNR* **Bioprinting of Biomimetic Nano-Hydroxyapatite Functionalized Bioinks for Bone Tissue Engineering**
SE.I.8.4	Mattia TIBONI, *University of Urbino* **Could microfluidics become accessible and revolutionize the manufacturing of nanomedicines?**

24 SEPTEMBER

09:00 - 10:30	SE.I.9
Nanomaterials: manufacturing, characterizations and applications - Part 1	
Co-organized with University of Catanzaro & Sapienza University of Rome Chairs: Marta FEROCI & Leonardo MATTIELLO, *Sapienza University of Rome*	
SE.I.9.1	Pierfrancesco ATANASIO, *Sapienza University of Rome* **Preparation of Carbon/Silicon Hybrid Nanostructured Anodes for Lithium ion Batteries by CVD and Liquid Phase Deposition**
SE.I.9.2	Serena DE SANTIS, *University of Roma Tre* **Nanoindentation protocol to characterize surface free energy of micro and nano-structured titanium**
SE.I.9.3	Anastasia FORNARI, *Sapienza University of Rome* **Nanocellulose as bio-inspired consolidant for degraded wood**
SE.I.9.4	Federica MITRI, *University of Roma Tre* **Quantum Dots-based sensors for Explosive Detection**

11:00 - 12:30	SE.I.10
Nanomaterials: manufacturing, characterizations and applications - Part 2	
Co-organized with University of Catanzaro & Sapienza University of Rome Chairs: Marta FEROCI & Leonardo MATTIELLO, *Sapienza University of Rome*	
SE.I.10.1	Fabiana PANDOLFI, *University of Tuscia* **Chitosan-based nanocapsules to prevent marine biofouling**
SE.I.10.2	Daniele ROCCO, *Sapienza University of Rome* **Synthesis and Characterization of New Plastic Scintillators for Fast Timing Detectors**
SE.I.10.3	Vincenzo SCARANO, *Sapienza University of Rome* **Oligothiophenes: electrochemically obtained smart materials**
SE.I.10.4	Simone SOTGIU, *Sapienza University of Rome* **Raman Scattering at Infrared Energies of Extremely Thin Semiconductors**
SE.I.10.5	Andrea GALLO, *Polytechnic of Turin* **Laboratory approach for the 3D visualization of the generation of an in-situ reactive zone for aquifer remediation**

24 SEPTEMBER

14:00 - 15:30	SE.I.11
Nanomaterials: manufacturing, characterizations and applications - Part 3	
Co-organized with University of Catanzaro & Sapienza University of Rome Chairs: Marta FEROCI & Leonardo MATTIELLO, *Sapienza University of Rome*	
SE.I.11.1	Antonio FERRARO, *University of Calabria* **Hyper resolution in two-photon direct laser writing towards additive manufacturing nanostructures**
SE.I.11.2	Elisabetta SALERNO & Davide CASOTTI, *University of Modena & Reggio Emilia* **The role of substrate surface finishing in determining the tribological properties of DLC coatings on additive manufactured AlSi10Mg components**
SE.I.11.3	Maria D'ANTUONO, *University of Naples, Federico II* **Nanopatterning of oxide heterostructures using cold ion milling**
SE.I.11.4	Rosalia FERRARO, *University of Naples, Federico II* **Phase behavior of Surfactant-Water systems by time-lapse polarized light microscopy**
SE.I.11.5	Francesca RUSSO, *CNR-ITM* **Valerolactone (GVL) as a green polar aprotic solvent for polyvinylidene fluoride (PVDF) membranes preparation**

16:00 - 17:30	SE.I.12
Innovation through nanomaterials	
Co-organized with University of Catanzaro & Sapienza University of Rome Chairs: Marta FEROCI & Leonardo MATTIELLO, *Sapienza University of Rome*	
SE.I.12.1	Marco FORTUNATO, *Sapienza University of Rome* **Phase Inversion in PVDF Films with Enhanced Piezoresponse Through Spin-Coating and Quenching**
SE.I.12.2	Sara CERRA, *Sapienza University of Rome* **Functionalized gold nanoparticles in colorimetric and chemoresistive sensors: synthesis, sensing mechanism and interface properties**
SE.I.12.3	Ludovico MUSENICH, *University of Genova* **Diatom nanostructured frustule: new insights for the design of novel biomimetic materials**
SE.I.12.4	Monica GRANETTO, *Polytechnic of Turin* **An eco-compatible nanoformulation for the reduction of pesticide environmental impacts**

GENETIC POINT OF CARE

The New Frontier of Bio-Technologies for Future Outbreaks Management

September 22

Chair: Sabrina CONOCI, *University of Messina, CNR-IMM & Distretto Tecnologico Sicilia Micro e Nano Sistemi*

Co-chairs: Fabrizio PIRRI and Francesca FRASCELLA, *Polytechnic of Turin*
Leandro LORENZELLI and Cecilia PEDERZOLLI, *Bruno Kessler Foundation*

Co-organized with

Università degli Studi di Messina

Politecnico di Torino

FONDAZIONE BRUNO KESSLER

The pandemic infection caused by SARS-CoV-2 virus, currently affecting worldwide more than 129 million of people with more than 3 million of deaths (WHO March 28th, 2021 weekly report), has dramatically highlighted the importance of availability of technologies allowing rapid molecular diagnostic tests for timely prevention and control of outbreak.
In this context, the genetic point-of-care technologies (POCT) becomes very relevant offering the advantages to be fast, sensitive and specific, low cost and, above all, able to be used on-site by not-specialized people. Recent progresses in the development of POC devices including lab-on-a-chip (LOC) devices, lab-on-a-disc (LOAD) devices, miniaturized PCR devices, isothermal nucleic acid amplification (INAA) devices, microfluidic paper-based analytical devices (μPADs) and lateral flow devices. In this Special Session an overview of most innovative approaches for genetic point care technologies rapid test will be presented and discussed in a dedicated round table.

22 SEPTEMBER

09:00 - 10:30	SE.II.1
The Genetic Point of Care: the New Frontier of Bio-Technologies for Future Outbreaks Management - Part 1	
Co-organized with University of Messina, Polytechnic of Turin and FBK Chair: Sabrina CONOCI, *University of Messina, CNR-IMM & Distretto Tecnologico Sicilia Micro e Nano Sistemi*	
SE.II.1.1	Introduction
SE.II.1.2	Wolfgang KNOLL, *Austrian Institute of Technology, Austria* **Recent trends in electronic biosensing**
SE.II.1.3	Giovanni VALENTI, *University of Bologna* **Electrochemiluminescence-based biosensor: from academic curiosity to an industrial success**
SE.II.1.4	Cristina POTRICH, *FBK* **SARS-CoV-2 detection using isothermal amplification in genetic point-of-care**

22 SEPTEMBER

11:30 - 13:00	SE.II.2
The Genetic Point of Care: the New Frontier of Bio-Technologies for Future Outbreaks Management - Part 2	
Co-organized with University of Messina, Polytechnic of Turin and FBK Chair: Sabrina CONOCI, *University of Messina, CNR-IMM & Distretto Tecnologico Sicilia Micro e Nano Sistemi*	
SE.II.2.1	Alek DEDIU, *CNR-INSM, Bologna* **Magnetic Biosensing for Early Diagnostics - towards the detection of ultra-low concentration of biomarkers**
SE.II.2.2	Lucia NAPIONE, *Polytechnic of Turin* **Integrated Nanotechnologies in Lateral Flow Devices for the Diagnosis and Monitoring of Covid-19 and other Complex Diseases**
SE.II.2.3	Alessia IRRERA, *CNR-IPCF, Messina* **New Generation Label-Free Optical Biosensors Based On Silicon Nanowires**
SE.II.2.4	Alberto DANIELLI, *University of Bologna* Maria Giovanna RIZZO, *University of Messina* **Innovative Biotechnological Systems for The Detection of Eukaryote Cells, Microorganisms And Proteins With Phage Display Biotechnology**

14:30 - 16:30	SE.II.3
The Genetic Point of Care: the New Frontier of Bio-Technologies for Future Outbreaks Management - Round Table	
Co-organized with University of Messina, Polytechnic of Turin and FBK Chair: Sabrina CONOCI, *University of Messina, CNR-IMM & Distretto Tecnologico Sicilia Micro e Nano Sistemi* & Rosario Corrado SPINELLA, *DSFTM-CNR, Director*	
SE.II.3.1	**Massimo GALLI** *Professore Ordinario di Malattie Infettive - 'L.Sacco'- Milano*
SE.II.3.2	**On. Patrizia TOIA** *Vicepresidente della Commissione Industria, la Ricerca e l'Energia al Parlamento europeo*
SE.II.3.3	**Giorgio GHIGNONI** *Federchimica Assobiotec* *Corporate VP Scientific Affairs di DiaSorin*

ELECTRON MICROSCOPY IN MATERIAL SCIENCE IN ITALY

Opportunities, organization and networking

September 24

Chairs: Vittorio MORANDI, *CNR-IMM*; Marco ROSSI, *Sapienza University of Rome and* Regina CIANCIO, *CNR-IOM.*

Co-organized with

Il meeting ha lo scopo di fotografare l'attuale panorama della microscopia elettronica in trasmissione in scienza dei materiali in Italia, in termini di attività, progetti ed iniziative in corso, promuovere sinergie ed attività di networking e ragionare delle opportunità di coordinamento e di attività congiunte, in ambito scientifico, infrastrutturale e di formazione.

La partecipazione all'evento è solo su invito

24 SEPTEMBER

11:00 - 12:30	SE.III.2
Electron Microscopy in Material Science in Italy: opportunities, organization and networking	
Co-organized with CNR-IMM, CNR-IOM & Sapienza University of Rome Chairs: Vittorio MORANDI, *CNR-IMM*, Marco ROSSI, *Sapienza University of Rome and* Regina CIANCIO, *CNR-IOM*	
SE.III.2.1	Vittorio MORANDI, *CNR-IMM* **Introduzione**
SE.III.2.2	Regina CIANCIO, *CNR-IOM* **Gli scenari Europei**
SE.III.2.3	Marco ROSSI, *Sapienza University of Rome* **L'alta formazione**
SE.III.2.4	Vittorio MORANDI, *CNR-IMM* **Esperienze simili ed opportunità**
SE.III.2.5	Discussione / Tavola rotonda
SE.III.2.6	Wrap up e prossimi passi

NEW FRONTIERS IN ELECTRON MICROSCOPY

September 22

Chair: Marco VITTORI ANTISARI, *Nanoltaly Association*

Co-organized with

JEOL

SAPIENZA
UNIVERSITÀ DI ROMA

Ultrafast Electron Microscopy (UEM) is a newly developed experimental technique for nanoscale dynamic visualization of matter. UEM has been pioneered by Nobel Laureate Ahmed H. Zewail (Chemistry, 1999) and is based on a modified TEM coupled to a femtosecond pulsed laser. The technique combines the high spatial resolution of a TEM with the high temporal resolution of a pulsed laser, providing an enhanced spatiotemporal resolution of several orders of magnitude larger than conventional optical and electron techniques. For nanoscience, this approach has unique advantages with respect to conventional methods. The high versatility of this configuration can provide the direct probing of atomic motions, the real-space evolution of single particles, as well as the dynamics of low- and high-energy material excitations, such as plasmons and excitons.

22 SEPTEMBER

16:00 - 17:30	SE.IV.1
New Frontiers in Electron Microscopy	
Co-organized with JEOL & Sapienza University of Rome Chair: Marco VITTORI ANTISARI, *Nanoltaly Association*	
SE.IV.1.1	Keynote Lecture Fabrizio CARBONE, *EPFL, Losanna, Switzerland* **Transmission electron microscopy with engineered electrons**
SE.IV.1.2	Giovanni Maria VANACORE, *University of Milano-Bicocca* **Ultrafast Electron Microscopy: Femtosecond imaging, diffraction and spectroscopy for material science and quantum applications**
SE.IV.1.3	Nehal Aboulfotoh ALI, *Zewail City of Science and Technology, Egypt* **Explore the horizons of 4D imaging using ultrafast Electron Microscope**
SE.IV.1.4	Vincenzo GRILLO, *CNR-NANO, Modena* **Adaptive optics and where to find them. A guide to new ideas and application to material science**

Poster Session

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

01 Irfan Aamer ANSARI, *University of Torino*
Developing albumin nanoparticle thermoresponsive hydrogel composite for the ocular delivery of dexamethasone

02 Francesco ANTOLINI, *ENEA*
Water soluble CdTe Quantum dots for High Luminescent Patterns obtained by Laser Writing

03 Monica ARGENZIANO, *University of Torino*
Employing topical film forming spray for the antibiotic delivery in the management of chronic wounds

04 Pierfrancesco ATANASIO, *Sapienza University of Rome*
Preparation of Carbon/Silicon Hybrid Nanostructured Anodes for Lithium ion Batteries by CVD and Liquid Phase Deposition

05 Rinea BARBIR, *Institute for Medical Research and Occupational Health, Croatia*
Nanoformulations reduce cardiotoxicity of doxorubicin – in vivo animal study

06 Mariangela BELLUSCI, *ENEA Casaccia Reserach Center*
Metal-organic-frameworks enclosing magnetic nanoparticles for induction triggered release of carbon dioxide

07 Milos BERAN, *Food Research Institute Prague,Czech Republic*
Micronization of proteins by new technology of spray nebulisation drying

08 Alessia BEZZON, *RINA Consulting - CSM*
Nanostructured Transparent Hydrophobic Coatings with Fast Room Temperature curability

09 ~~*Sankha BHATTACHARYA, *NMIMS University, India*~~
~~**Fabrication of intravesical cationic polymeric nano-formulations of Gemcitabine against ovarian cancer**~~

10 Ramanand BISAURIYA, *University of Rome Tor Vergata*
Colorimetric Detection of Cu2+ Ions in Water by N and S Co-doped Water Soluble Carbon Dots

11 Lucija BOZICEVIC, *Institute for Medical Research and Occupational Health, Croatia*
In vitro modulation of estrogen receptor activity by checmial mixture of selected drugs and polystyrene nanoparticles

12 ~~*Simone BROZZESI, *University of Rome Tor Vergata*~~
~~**Ab initio study of graphene/hBN Van der Waals heterostructure: from bilayer phase to coincidence lattices**~~

13 Maria Chiara BRUNO, *University "Magna Graecia" of Catanzaro*
Cationic ethosomes: new perspectaive for transdermal application

14 Alessio BUZZIN, *Sapienza University of Rome*
Characterization of disposable Face Masks for COVID-19 through colorimetric analysis

15 Giancarlo CAPPELLINI, *University of Cagliari*
Mercapto-Benzamide Inhibitors effects on HIV NCp7 Protein: a DFT based structural study

16 Roberto CARDIA, *University of Rome Tor Vergata*
Ti / Ni doping effects on formation energy and electronic structure of NaMnO2 cathodes

17 Hossein CHERAGHI BIDSORKHI, *Sapienza University of Rome*
Graphene based Antibacterial Coatings for Dental Applications

18 Denia Marlenis CID PEREZ, *Pontificia Universidad Catòlica Madre y Maestra, Dominican Republic*
A critical review of novel applications of combinations of graphene-based materials and meso/microporous materials

19 Francesco COGNINI, *ENEA Casaccia*
Pyroelectric measurements of wurtzite ZnS ceramics for thermal energy harvesting

20 Ana-Maria CRACIUN, *Babes-Bolyai University, Romania*
Two-photon excited photoluminescence lifetime imaging microscopy and spectroscopy studies on gelatin-coated gold nanorods

21 Rosaria D'AMATO, *Enea*
Laser synthesis of Silicon nanoparticles and surface functionalization for tuning luminescence

22 Maria D'ANTUONO, *University of Naples Federico II*
Nanopatterning of oxide heterostructures using cold ion milling

23 Giuseppe D'AVENIO, *ISS*
Medical devices obtained with nanoprinting: elements for risk analysis

24 Angelantonio DE BENEDETTO, *University of Salento*
From Nanomaterial to Laser engraving: Carbon based Electrochemical Sensor engineering for Metal Contaminants monitoring in Water

25 Federica DE CASTRO, *University of Salento*
Pomegranate peel extract adsorbed on calcium carbonate nanocrystals: enhanced bioactivity and controlled release

26 Anna DEL TEDESCO, *Noxor Sokem*
Phosphonate primers as new Cr-free nanotech coating

27 Marco DI LUIGI, *INAIL*
Nanotechnologies: possible support for sustainable agriculture?

28 Guilleme DOMENECH-GIL, *Linköping University, Sweden*
A wireless sensor node for quantification of volatile organic compounds

29 Jason Thomas DUSKEY, *University of Modena and Reggio Emilia*
Stabilization of β-Glucosidase in Polymeric Nanomedicines: Formulation and Activity Studies

30 Ermelinda FALLETTA, *INSTM*
Dark and light mediated NO_2 abatement by TiO_2- and WO_3-polyaniline

31 Emma FENUDE, *CNR*
Chiral, Biological Nanostructures: Conformational Changes and Elasticity

32 Antonio FERRARO, *University of Calabria*
Hyper resolution in two-photon direct laser writing towards additive manufacturing nanostructures

33 *~~Rosalia FERRARO, *University of Naples Federico II*~~
~~**Phase behavior of Surfactant-Water systems by time-lapse polarized light microscopy**~~

34 Roberta FIORINO, *University of Modena and Reggio Emilia*
Preclinical safety assessment of Superparamagnetic Iron Oxide Nanoparticles: exploring the Pomacea canaliculata as a suitable model for screening toxicity. Preliminary results

35 Celestino FONTANETO, *ITIOMAR*
CUORE: the artificial leaf (Cu_2O nanoparticles for energy recovery)

36 Nils GOEDECKE, *Heidelberg Instruments Mikrotechnik GmbH, Germany*
NanoFrazor - A Nanofabrication Tool for 2D & 3D Devices

37 Marco GRAMEGNA, *INRIM*
Quantum Metrology: results and perspectives in the context of the EURAMET European Metrology Network for Quantum Technologies

38 Farid HAJAREH HAGHIGHI, *Sapienza University of Rome*
In situ conjugation of silver nanoparticles with silane-functionalized TiO_2 nanoparticles for antibacterial applications

39 Alessandra IMBROGNO, *Tyndall National Institute, Ireland*
"Green" Electrodes for Electrochemical Sensors and Supercapacitors Fabricated by One-step Visible Direct Laser Writing of Cork Natural Substrates

40 Jahidul ISLAM, *Tyndall National Institute,Ireland*
Development of an electrochemical sensor combined with SERS-LFIA for the sensitive detection of tetracycline-hydrochloride antibiotic

41 Nikolina KALCEC, *Institute for Medical Research and Occupational Health, Croatia*
In vivo investigation of inflammatory response of different doxorubicin formulations

42 Eliana LEO, *University of Modena and Reggio Emilia*
Development of solid lipid nanoparticles for the delivery of an anti-inflammatory drug to muscle skeletal cells

43 *~~Noureddine MAHDHI, *University of Tunis, Tunisia*~~
~~**Theoretical investigation of the dielectric constant, surface energy, and work of adhesion self-disinfectant nanocomposites for use as a coating**~~

44 Laura MANCINI, *ISM - CNR*
Sustainable approaches to the synthesis and functionalization of phthalocyanines for optoelectronic applications

45 Antonia MANCUSO, *University "Magna Graecia" of Catanzaro*
Unsaturated fatty acid vesicles as topical nanodelivery systems to improve the efficacy of natural antioxidant

46 Magda MARCHETTI, *ISS*
Comparison of biological activity of N-Acetyl-D-Glucosamine in bulk and nano form

47 Daniele MARRA, *University of Napoli Federico II*
Design of nanostructured coating to prevent biofilm formation on polycarbonate surfaces

48 Emanuele MAURI, *University Campus Bio-Medico di Roma*
Microfluidic droplet-based synthesis of polymeric nanoparticles as controlled drug delivery systems

49 Marina MINOLI, *Royal Society of Biology, UK*
STEM Innovative graphene didactic to promote interdisciplinary strategies in high school

50 Silvia MIZZONI, *University of Verona*
Complexes of Yb^{3+} embedded in poly(lactic-co-glycolic acid) (PLGA) nanoparticles as NIR-emitting bioprobes

51 Elena MOLTENI, *ISM - CNR & University of Milan*
Ab initio circular dichroism: developments and applications to biomolecules and drug molecules

52 Amelia MONTONE, *ENEA*
Low temperature "green" synthesis of ZnO wurtzite nanoparticles: tailoring the process for effective production yield

53 Stephanie MORRIS, *NanoComposix*
Silica in Nanomedicine: Developing Next-Gen Therapeutic Platforms

54 Simonetta MUCCIFORA, *University of Siena*
Effects and translocation of nano and submicron fluorescent polystyrene particles in seedlings of Cichorium endivia L

55 Zunaira MUNIR, *University of Turin*
Application of Curcumin-loaded NBs with and without Photodynamic light (LED) for food preservation

56 ~~*Elena NAVARRETE-ASTORGA, *University of Malaga, Spain*~~
~~**ZnO nanorods arrays for flexible and transparent supercapacitors**~~

57 Ionela Cristina NICA, *University of Bucharest, Romania*
Could iron/nitrogen doping influence the cytotoxicity of TiO_2 nanoparticles?

58 Valentina NIGRO, *ENEA*
Enhanced colour-centre photoluminescence in LiF films for proton beam detectors

59 Ilaria OTTONELLI, *University of Modena and Reggio Emilia*
Hybrid nanomedicines production: from benchtop to microfluidics

60 Barbara PEM, *Institute for Medical Research and Occupational Health, Croatia*
Computational study on the binding of L-dopa, dopamine and oxidised derivatives to gold nanoparticles

61 ~~*Massimiliano PERDUCA, *University of Verona*~~
~~**Enhanced Cytotoxic Effect of TAT–PLGA-Embedded DOXO Carried by Biomimetic Magnetic Nanoparticles upon Combination with Magnetic Hyperthermia and Photothermia**~~

62 ~~*Evgeniya PESHKOVA, *University of Genova*~~
~~**Protein's Langmuir-Blodgett nanofilms studied by X-Ray nanodiffraction (nanoXRD), X-ray free electron laser (XFEL) and Cryo-Electron Microscopy (Cryo-EM)**~~

63 ~~*Filippo PIERINI, *Polish Academy of Sciences, Poland*~~
~~**Enhanced Efficiency in Hollow Core Electrospun Nanofiber-Based Organic Solar Cells**~~

64 Valentina PROTA, *ISS*
Characterization of mucus expression in the Caco-2 based in vitro model of intestinal barrier: relevance for NPs interaction

65 Donatella PUGLISI, *Linköping University, Sweden*
Machine learning, chemical sensors, and 3D-printing technology for preventive conservation of Cultural Heritage

66 Francesca RODÀ, *Don Gnocchi Foundation*
Characterization of dual functionalized - drug loaded liposomes by biophotonics techniques

67 Marco RUGGERI, *Sapienza University of Rome*
Graphene: a life cycle thinking approach for a sustainable production

68 ~~*Barbara RUOZI, *University of Modena and Reggio Emilia*~~
~~**Stabilization of β-Glucosidase in polymeric nanomedicines: formulation and activity studies**~~

69 ~~*Francesca RUSSO, *ITM - CNR*~~
~~**γ-Valerolactone (GVL) as a green polar aprotic solvent for polyvinylidene fluoride (PVDF) membranes preparation**~~

70 Alessia SAMBUGARO, *University of Verona*
Porous silicon microparticles for immunologic adjuvants delivery

71 *~~Filomena SANNINO, *University of Naples "Federico II"*~~
~~Magnetic Fe_3O_4 – Chitosan composite: an adsorbent for efficient removal of dyes from wastewater~~

72 Debora SANTONOCITO, *University of Catania*
Stealth Lipid Nanoparticles as Tools for the Administration of Astaxanthin Aimed to the Treatment of Alzheimer's Disease

73 Marta SARTIRANA, *INSTM*
Floating Smart-Materials For Water Decontamination Under Solar light

74 Davide SAVY, *University of Naples Federico II*
Novel antimicrobial nanoparticles made with humic substances from green composts

75 Marta SENOFONTE, *ISS*
Metal oxide nanoparticles in stainless-steel welders: a pilot human biomonitoring study

76 Matteo SENSI, *University of Modena and Reggio Emilia*
Electrolyte-Gated Transistors Biosensors for Healthcare Applications

77 Seyed SHAHROOZ ZARGARIAN, *Polish Academy of Sciences, Poland*
Fabrication of Poly(N-isopropylacrylamide-co-Glycidyl Methacrylate) Electrospun Hydrogel Fibers

78 Laura Maria SLAVU, *University of Salento*
Different Aspect Ratio Polysaccharide-Assisted Assembling of Magnetic Nanoparticles

79 Foozieh SOHRABI, *IIT*
Surface-Enhanced Raman Spectroscopy (SERS) of Transmembrane Protein in Purple Membranes using Self-Organized Hybrid Nanostripe Antenna Arrays

80 Miruna Silvia STAN, *University of Bucharest, Romania*
Assessment of the in vitro biocompatibility of graphene quantum dots

81 Mariamelia STANZIONE, *Institute of Polymers, Composites and Biomaterials (IPCB) - CNR*
Nanostructured coatings with antimicrobial activity to prevent pathogen transmission on high touch hospital settings

82 Martine TARSITANO, *University "Magna Graecia" of Catanzaro*
Effects of guest molecules on GMO-based lyotropic mesophases

83 Davide TERZI, *STMicroelectronics*
MEMS Micromirror and SPAD for a LIDAR Module

84 Margherita TIRADRITTI, *Sapienza University of Rome*
Nanomaterials in food products: quality and safety

85 Cinzia Lucia URSINI, *INAIL*
Investigation on genotoxic-oxidative effects of SiO_2 50nm exposure: comparison between in vitro study and in vivo results on exposed workers

86 Francesca VARSANO, *ENEA Casaccia Reserach Center*
Magnetic nanoparticles to drive reforming of methane by induction heating

87 Eoghan VAUGHAN, *Tyndall National Institute, Ireland*
Visible Laser Scribing Fabrication of Porous Graphitic Carbon Electrodes: Applications as a Disposable Biosensor Platform

88 Sonja VISENTIN, *University of Torino*
Nanomug: mucosomes, a novel glycosylated protein based drug delivery system

89 Yasamin ZIAI, *Polish Academy of Sciences, Poland*
Chameleon-inspired multifunctional plasmonic nanoplatforms for biosensing applications

*(withdrawn)

LAST MINUTE

01 Anastasia FORNARI, *Sapienza University of Rome*
Nanocellulose as bio-inspired consolidant for degraded wood

02 Salvatore Calogero GAGLIO, *University of Verona*
Enhanced Cytotoxic Effect of TAT–PLGA-Embedded DOXO Carried by Biomimetic Magnetic Nanoparticles upon Combination with Magnetic Hyperthermia and Photothermia

03 Alessandro GRADONE, *University of Bologna & CNR IMM*
Hexakis(4-methyl-1-phenylthio)benzene molecular asterisk as high -sensitivity phosphorescent probe for investigating nanoscale polymeric properties

04 Mohammad Ali HAGHIGHAT BAYAN, *Polish Academy of Sciences, Poland*
Conductive Hollow Nanofibers for Buffer Layer of Bulk Heterojunction Solar Cells

05 Ilaria CARDACE, *University of Salento & CNR Nanotec*
Biological photoreceptors for quantum technologies

06 Clodomiro CAFOLLA, *Durham University, UK*
Lubricated friction around nano-defects

INNOVATION FOR THE ENERGY TRANSITION

September 22 - 23

Co-organized with:

Politecnico di Torino

ISTITUTO ITALIANO DI TECNOLOGIA

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

FONDAZIONE BRUNO KESSLER

WORKSHOP COMMITTEE

Giancarlo CICERO, *Polytechnic of Turin*
Stefano BIANCO, *Polytechnic of Turin*
Fabrizio PIRRI, *IIT Center for Sustainable Future Technologies - CSFT@POLITO*
Nicola LISI, *ENEA*
Nadhira BENSAADA LAIDANI, *Bruno Kessler Foundation*

In recent years, the negative impact of anthropogenic CO_2 emissions on our planet's climate has motivated a progressive transition from a global energy scenario heavily reliant on fossil fuels to one based on environmentally benign, renewable energy sources. Several studies highlighted that advanced nanomaterials and nanotechnology have the potential to achieve a breakthrough in the development of novel applications for a sustainable future and for the energy transition. This session gathers contributions from both the academic and industrial world to strengthen their synergistic contribution to technological growth for sustainability.
Renewable energy sources produce energy following a mostly unpredictable pattern, linked to meteorological winds and clouds. However, the energy network is rigid and production must closely match consumption daily curves. That implies the necessity to store the mismatched generated energy for later use, a technologically advanced, industrially demanding and scientifically challenging task. Electrochemical energy storage can help to some extent but it is not suited for long term high power GW systems. Hydrogen can be seen as an ideal energy vector, that faces however the issue of storage and requires efficient generation and compression.

While the long-term solution is abandoning fossil fuels for renewable sources, it has been shown that in the short-to-medium term conventional fuels will still be used and CO_2 emissions will have to be compensated for. In this scenario, one of the most interesting and challenging strategies to mitigate the disastrous effect of carbon dioxide on earth's climate, is to consider CO_2 as valuable raw material to obtain value-added fuels and chemicals through its photo/electrochemical reduction (CO2RR). The key challenge for this application is to develop highly selective, stable, efficient, environmental-friendly and inexpensive photo/electrocatalysts. Combining H_2 and CO_2 technologies is also emerging as a positive strategy for a progressive and economically sustainable energy transition, capable to reduce fuels' impact on the environment, while still granting their use where necessary. Moreover, it's worth noting that the scenario appears strategically suited for Italy, that has several mayor and technologically advanced gas industries, a capillary methane distribution system and erratic meteorological patterns while it has abandoned the alternative nuclear energy.

LCA is finally vital to understand if technologies proposed by researchers are, however fascinating for the layman and for the legislator, overall counterproductive for the planet.
In all the boiling mix of ideas that are currently emerging in the landscape, we suggest that a few major, plurennial, country size, research programs should be activated for exploiting some long term technological and scientific developments in the field.

22 SEPTEMBER

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

Future Technology for large scale hydrogen production, storage

Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies CSFT@POLITO, FBK and ENEA
Chair: Elena TRESSO, *Polytechnic of Turin*

WS.I.1.1 TT.I.B.1	Massimo SANTARELLI, *Polytechnic of Turin* **Scenarios for hydrogen production, transport and final use**
WS.I.1.2 TT.I.B.2	Alfonso POZIO, *ENEA* **The role of LT electrolysis for the italian hydrogen production in energy transition**
WS.I.1.3 TT.I.B.3	Matteo TESTI, *Bruno Kessler Foundation* **Water electrolysis for hydrogen production: technologies and applications**
WS.I.1.4 TT.I.B.4	Marcello BARICCO, *University of Turin* **Challenges for hydrogen storage and handling**

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

Future Technology for large scale hydrogen use and distribution

Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies CSFT@POLITO, FBK and ENEA
Chair: Giulia MONTELEONE, *ENEA*

WS.I.2.1 TT.II.B.1	Nora GOURDOUPI, *Advent Technologies, Greece* **Overview of Advent Technologies activities to the hydrogen economy and energy transition**
WS.I.2.2 TT.II.B.2	Barbara MENIN, *CSFT - IIT* **Research activity on H_2 @CSFT: Biological production, storage and use**
WS.I.2.3 TT.II.B.3	Jan VAN HERLE, *EPFL, Switzerland* **Materials aspects considering H_2 use and generation on a practical scale**
WS.I.2.4 TT.II.B.4	Giulia MASSAGLIA, *Polytechnic of Turin* **Design and development of new nanostructures as efficient catalyst toward ORR**
WS.I.2.5 TT.II.B.5	Nadia GARINO, *Polytechnic of Turin* **Innovative nanomaterial catalysts for ORR**

22 SEPTEMBER

14:00 - 15:30	WS.I.3 - TT.III.B
The virtuous CO_2 circle: integration with hydrogen	
Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies CSFT@POLITO, FBK and ENEA Chair: Stefano STENDARDO, *ENEA*	
WS.I.3.1 TT.III.B.1	Angelica CHIODONI, *CSFT - IIT* **Roadmap to CO_2 capture, storage and valorization @CSFT**
WS.I.3.2 TT.III.B.2	Luca TURCHETTI, *ENEA* **Is there still room for steam reforming in the green hydrogen era?**
WS.I.3.3 TT.III.B.3	Fausto GALLUCCI, *Technical University Eindhoven, The Netherlands* **Membrane and plasma reactors for H_2 production**
WS.I.3.4 TT.III.B.4	Vincenzo SPALLINA, *University of Manchester, UK* **Advanced Solids Cycles for CO_2 capture and H_2 production**

16:00 - 17:30	WS.I.4 - TT.IV.B
Nanomaterials and Nanotechnology for CO_2: Capture and Conversion	
Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies CSFT@POLITO, FBK and ENEA Chair: Stefano BIANCO, *Polytechnic of Turin*	
WS.I.4.1 TT.IV.B.1	Deepack PANT, *VITO, Belgium* **Technological advances in carbon dioxide capture & utilization (CCU)**
WS.I.4.2 TT.IV.B.2	Daniele SASSONE, *Polytechnic of Turin & CSFT@POLITO* **Synergic effect of Carbon Nanotubes on Zeolitic Organic Framework catalyst for CO_2 electroreduction**
WS.I.4.3 TT.IV.B.3	Paolo PESCARMONA, *University of Groningen, The Netherlands* **Supported bismuth nanoparticles as upscalable and highly selective electrocatalyst for the conversion of CO_2 into formate**
WS.I.4.4 TT.IV.B.4	Stefano STENDARDO, *ENEA* **Deep decarbonisation of hard-to-abate industry via inherently circular CCUS processes**
WS.I.4.5 TT.IV.B.5	Enrico BOCCI, *Università Guglielmo Marconi* **Steam indirectly heated gasification for biofuels productions from residual biomass**

23 SEPTEMBER

09:00 - 10:30	WS.I.5 - TT.V.B

Design and Characterization of nanomaterials for the energy transition

Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies CSFT@POLITO, FBK and ENEA
Chair: Giancarlo CICERO, *Polytechnic of Turin*

WS.I.5.1 TT.V.B.1	Nadhira Bensaada LAIDANI, *Bruno Kessler Foundation* **Overview of facilities and materials for renewable energy in FBK**
WS.I.5.2 TT.V.B.2	Pieter GLATZEL, *ESRF, France* **Combining advanced spectroscopic techniques with operando measurements**
WS.I.5.3 TT.V.B.3	Massimo CELINO, *ENEA* **The ENEA computational infrastructure for materials design**
WS.I.5.4 TT.V.B.4	Michele RE FIORENTIN, *CSFT@POLITO* **Ab initio 2D material design for sustainable applications**

11:30 - 13:00	WS.I.6 - TT.VI.B

Electrochemical energy storage from fundamental studies to pilot engineering: Li ion batteries

Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies CSFT@POLITO, FBK and ENEA
Chair: Pier Paolo PROSINI, *ENEA*

WS.I.6.1 TT.VI.B.1	Silvia BODOARDO, *Polytechnic of Turin* **Advanced materials for European Li-ion batteries: from raw materials to manufacturing and recycling**
WS.I.6.2 TT.VI.B.2	Pier Paolo PROSINI, *ENEA* **The ENEA objectives within IPCEI Battery**
WS.I.6.3 TT.VI.B.3	Laura SILVESTRI, *ENEA* **Development of a Co-free Li-rich layered oxide material to use as positive electrode in Li-ion batteries**
WS.I.6.4 TT.VI.B.4	Alessandro AGOSTINI, *ENEA* **The role of sustainability assessment in the technological innovation**

23 SEPTEMBER

14:00 - 15:30	WS.I.7 - TT.VII.B
Electrochemical energy storage from fundamental studies to pilot engineering: new generation batteries - Part 1	
Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies CSFT@POLITO, FBK and ENEA Chair: Margherita MORENO, *ENEA*	
WS.I.7.1 TT.VII.B.1	Yongil KIM, *Ulsan National Institute of Science and Technology, South Korea* **Seasonal Energy Storage: The new challenge for electrochemistry**
WS.I.7.2 TT.VII.B.2	Maria Rosa PALACIN PEIRÒ, *Institut de Ciència de Materials de Barcelona (ICMAB CSIC), Spain* **Multivalent ion batteries**
WS.I.7.3 TT.VII.B.3	Caroline CELLE, *CEA, France* **Solid State Electrolytes for next generation of batteries: materials and processes**

16:00 - 17:30	WS.I.8 - TT.VIII.B
Electrochemical energy storage from fundamental studies to pilot engineering: new generation batteries - Part 2	
Co-organized with Polytechnic of Turin, IIT Center for Sustainable Future Technologies CSFT@POLITO, FBK and ENEA Chair: Nadhira BENSAADA LAIDANI, *FBK*	
WS.I.8.1 TT.VIII.B.1	Lucia FAGIOLARI, *Polytechnic of Turin* **Exploring promising materials platforms for potassium batteries**
WS.I.8.2 TT.VIII.B.2	Mattia PALERMO, *Green Energy Storage* **On the quest for new RFB redox couples: a computational approach**
WS.I.8.3 TT.VIII.B.3	Peter FISCHER, *Fraunhofer ICI, Germany* **Redox flow battery technology – from vanadium flow battery to next generation systems**
WS.I.8.4 TT.VIII.B.4	Vito DI NOTO, *University of Padova* **Beyond Lithium batteries: New materials and Devices**

22 SEPTEMBER

INNOVATIVE APPROACHES IN UNMET CLINICAL NEEDS FOR MAXIMUM HEALTH CARE IMPACT

Co-organized with:

UNIMORE UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

Fondazione Don Carlo Gnocchi Onlus

UMG dubium sapientiae initium

SAPIENZA UNIVERSITÀ DI ROMA

WORKSHOP COMMITTEE

Giovanni TOSI, *University of Modena and Reggio Emilia*
Marzia BEDONI, *Don Gnocchi Foundation*
Donatella PAOLINO, *University Magna Graecia of Catanzaro*
Maria CARAFA, *Sapienza University of Rome*

In this day, different actors (academia, industry, regulatory) will discuss and describe the development of innovative and enabling technologies for facing unmet clinical needs, varying from diagnosis to therapeutic aims. In line with Horizon Europe pipelines, pathological focuses will be devoted on cancer, brain related diseases, cardiovascular pathologies.
A comprehensive overview of the recent and established innovation in health technologies will be highlighted with a special focus on several aspects strongly impacting on the success of innovation approaches and its application into clinical setting and shown by different sides of view, from design, to materials, characterization, production and scale up, ending to successful stories of yet approved and on market technologies.

09:00 - 10:30	WS.II.1 - TT.I.D
Innovative approaches in UNMET clinical needs for maximum health care impact - Medical Needs	
Co-organized with Don Gnocchi Foundation, University of Modena and Reggio Emilia, University of Catanzaro and Sapienza University of Rome Chairs: Maria CARAFA, *Sapienza University of Rome* & Marzia BEDONI, *Don Gnocchi Foundation*	
WS.II.1.1 TT.I.D.1	Lorena PASSONI, *Humanitas Research Hospital* **Delivering Drug-Loaded Liposomes to Glioblastoma Stem Cells**
WS.II.1.2 TT.I.D.2	Emmanuel GARCION, *University of Angers, France* **Design & Application of Innovative Locoregional Treatments in Glioblastoma: Vectorization versus interventionnal tumor traps**
WS.II.1.3 TT.I.D.3	Deborah QUAGLIO, *Sapienza University of Rome* **Cell metabolomics: a strategy to study crucial pathways in glioma development**
WS.II.1.4 TT.I.D.4	Alessia SARICA, *University Magna Graecia of Catanzaro* **Unveiling the Brain and its disorders through Artificial Intelligence**

22 SEPTEMBER

11:30 - 13:00	WS.II.2 - TT.II.D
Innovative approaches in UNMET clinical needs for maximum health care impact - Innovation in Academia	
Co-organized with Don Gnocchi Foundation, University of Modena and Reggio Emilia, University of Catanzaro and Sapienza University of Rome Chairs: Furio GRAMATICA, *Don Gnocchi Foundation* & Giovanni TOSI, *Univ. of Modena and Reggio Emilia*	
WS.II.2.1 TT.II.D.1	Raymond SCHIFFELERS, *UTRECHT University, The Netherlands & European Technology Platform for Nanomedicine, EU* **Synthetic or natural lipid nanoparticles for RNA delivery**
WS.II.2.2 TT.II.D.2	Jason DUSKEY, *University of Modena & Reggio Emilia* **Improved GBM Targeting: Nanomedicines approaches from conception to testing**
WS.II.2.3 TT.II.D.3	Carlo BORTOLOTTI, *University of Modena & Reggio Emilia* **Nanoinnovation in biosensoring: Label-free Organic Biosensors for Diagnostics**
WS.II.2.4 TT.II.D.4	Michele DI LAURO, *IIT* **Organic Neuroelectronics: a cross-fertilisation story**
WS.II.2.5 TT.II.D.5	Amel DJOUDI, *University of Angers, France* **Development of innovative nanocomposite hydrogels for the treatment of Glioblastoma Multiforme**

14:00 - 15:30	WS.II.3 - TT.III.D
Innovative approaches in UNMET clinical needs for maximum health care impact - Translational aspects	
Co-organized with Don Gnocchi Foundation, University of Modena and Reggio Emilia, University of Catanzaro and Sapienza University of Rome Chairs: Marzia BEDONI, *Don Gnocchi Foundation* & Giovanni TOSI, *Univ. of Modena and Reggio Emilia*	
WS.II.3.1 TT.III.D.1	Furio GRAMATICA, *Don Gnocchi Foundation* **Crosstech innovation in Horizon Europe**
WS.II.3.2 TT.III.D.2	Dora MEHN, *European Commission, Directorate General Joint Research Centre, Directorate F – Health, Consumers and Reference Materials, Consumer Products Safety (EU)* **Advanced methods for sizing nanomedicine materials**
WS.II.3.3 TT.III.D.3	Fanny CAPUTO, *Sintef, Norway* **Measuring physical properties of liposomes and of lipid-based nanoparticles for RNA delivery: from method development to standardization**
WS.II.3.4 TT.III.D.4	Michele DE LUCA, *University of Modena and Reggio Emilia & Holostem* **Combined cell and gene therapy for epidermolysis bullosa**
WS.II.3.5 TT.III.D.5	Sabrina PRICI, *University of Trieste & COST Action Nano2Clinic* **Cancer nanomedicine from the bench to the bedside**
WS.II.3.6 TT.III.D.6	Maria DE LA FUENTE, *Oncomet, Spain* **DIVERSA, Delivery Innovation for VERsatile Solutions in Advanced Therapeutics**

22 SEPTEMBER

AGRINANOTECHNIQUES: NANOMATERIALS FOR PRODUCTS AND APPLICATION IN AGRICULTURE

Co-organized with:

UNIVERSITÀ DEGLI STUDI DI UDINE

UNIVERSITÀ DEGLI STUDI DELLA TUSCIA

ISTITUTO SUPERIORE DI SANITÀ

WORKSHOP COMMITTEE

Luca MARCHIOL, *University of Udine*
Giorgio Mariano BALESTRA, *University of Tuscia*
Flavia BARONE, *ISS*

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 AgriNanoTechniques 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 2021 hosts the 5th edition of the workshop "AgriNanoTechniques" co-organized by the Universities of Udine, Tuscia, and the Italian National Institute of Health (ISS). The workshop will be the forum for discussing the perspective of nanotechnologies in the primary sector among the stakeholders and scientific research.

22 SEPTEMBER

11:30 - 13:00	WS.III.1 - TT.II.A

AgriNanoTechniques: Nanomaterials for products and application in agriculture - Nano-Enabled Agriculture and EU Green Deal

Organized by University of Udine
Chair: Luca MARCHIOL, *University of Udine*

Under the patronage of the Italian Society of Agronomy

WS.III.1.1 TT.II.A.1	Claudia CRESTINI, *University of Venezia Cà Foscari* **Lignin and tannins from plants to laboratory and back: nanostructures for active delivery**
WS.III.1.2 TT.II.A.2	Matteo GIGLI, *University of Venezia Cà Foscari, Spin off T3* **Lignin nanostructures: from Lab to market**
WS.III.1.3 TT.II.A.3	Sara FALSINI, *University of Firenze* **Lignin nanocapsules for bioactive compound delivery to plants**
WS.III.1.4 TT.II.A.4	Michele IAFISCO, *CNR ISTEC - Spin Off Recover Ingredients* **Agriculture applications of nano-structured calcium phosphates derived from fish industry by-products**

14:00 - 15:30	WS.III.2 - TT.III.A

AgriNanoTechniques: Nanomaterials for products and application in agriculture - Nanosafety in Food: Regulatory Needs

Organized by ISS
Chairs: Flavia BARONE & Isabella DE ANGELIS, *Environment and Health Department - ISS*

WS.III.2.1 TT.III.A.1	Flavia BARONE, *Environment and Health Department - ISS* **Introduction**
WS.III.2.2 TT.III.A.2	Josefa BARRERO, *European Commission, Joint Research Center, Ispra* **Nano in Food project: A collaborative effort to increase the analytical capacity in EU Member States**
WS.III.2.3 TT.III.A.3	Stefania SABELLA, *IIT, Genova* **In vitro simulated digestion models: state of the art**
WS.III.2.4 TT.III.A.4	Isabella DE ANGELIS, *Environment and Health Department - ISS* **Advanced in vitro model of intestinal barrier**
WS.III.2.5 TT.III.A.5	Federico BENETTI, *ECSIN-European Center for the Sustainable Impact of Nanotechnology, ECAMRICERT SRL* **Analytical methodologies for the detection of nanomaterials: state of the art**

22 SEPTEMBER

16:00 - 17:30	WS.III.3 - TT.IV.A

AgriNanoTechniques: Nanomaterials for products and application in agriculture - ENMs and Plant Protection

Organized by University of Tuscia
Chair: Giorgio Mariano BALESTRA, *University of Tuscia*

Under the patronage of

SIPaV
Società Italiana di Patologia Vegetale
Italian Phytopathological Society

WS.III.3.1 TT.IV.A.1	Stefano TACCONI, *Sapienza University of Rome* **Phytochemical delivery in olive plants: microscopic and proteomic evaluation**
WS.III.3.2 TT.IV.A.2	Francesca BALDASSARRE, *University of Salento* **Biosourced active ingredients and chemical nanotechnologies for sustainable plants protection**
WS.III.3.3 TT.IV.A.3	Daniele SCHIAVI, *University of Tuscia* **Nanotechnology for wastes valorization in hazelnut and industrial crops sustainable protection strategies**
WS.III.3.4 TT.IV.A.4	Mathews L. PARET, *University of Florida, USA* **Recent trends in application of nanomaterials for management of bacterial and viral pathogens affecting vegetable crops and research and development opportunities**

23 SEPTEMBER

COMPETITIVE AND RESPONSIBLE INDUSTRY TOWARD THE EU NEW GREEN DEAL AND NATIONAL RECOVERY AND RESILIENCE PLAN

Co-organized with:

Airi ASSOCIAZIONE ITALIANA PER LA RICERCA INDUSTRIALE

The event focuses on the competitiveness of the Italian industrial research system, toward the challenges and opportunities of the EU New Green Deal and National Recovery and Resilience Plan. Technological innovation shapes our future. The ability of the national private and public research system to take advantage and master the rapid dynamics of technological development and, at the same time, manage its impacts, will be essential to generate value and enhance the competitive position of the country.

This event will underline how a responsible approach, combining economic, environmental and social aspects in the research and innovation process, could help to address the digital, energy mobility and circular economy transitions.

09:00 - 10:30	WS.IV.1 - TT.V.A
The Digital Transition	
Co-organized with AIRI Chair: Sesto VITICOLI, *AIRI*	
WS.IV.1.1 TT.V.A.1	Margot BEZZI, *APRE* **The importance of Responsible Research and Innovation (RRI) in EU R&I Programming**
WS.IV.1.2 TT.V.A.2	Marco ARDOLINO, *University of Brescia* **The digital transformation in the manufacturing industry**
WS.IV.1.3 TT.V.A.3	Laura MORGAGNI, *Fondazione TORINO WIRELESS* **The Italian Way for the Digital Transition and the key role of Innovation Ecosystems to drive SMEs towards an effective digital transformation**
WS.IV.1.4 TT.V.A.4	Roberto SABELLA, *ERICSSON* **Digitization of production systems and ports: recount of innovation projects**
WS.IV.1.5 TT.V.A.5	Claudio PERISSINOTTI BISONI, *UNI* **Standardisation and digital transformation: the challenges for sustainable innovation**

23 SEPTEMBER

11:30 - 13:00	WS.IV.2 - TT.VI.A
The Green Transition - Part 1: Energy	
Co-organized with AIRI Chair: Andrea PORCARI, *AIRI*	
WS.IV.2.1 TT.VI.A.1	Pasquale SALZA, *ENEL* **The role of Energy Storage in the future decarbonized electricity system**
WS.IV.2.2 TT.VI.A.2	Massimo MAZZER, *Consorzio MISTER* **Photovoltaics is more than a KET**
WS.IV.2.3 TT.VI.A.3	Francesca DE GIORGIO, *CNR* & Stefano SAGUATTI, *Manz Italy* **The strategic role of batteries for the energy transition**
WS.IV.2.4 TT.VI.A.4	Giulia MONTELEONE, *ENEA* **Hydrogen: sectors of application and development perspectives of technologies for production, transport and final use**
WS.IV.2.5 TT.VI.A.5	Rossella ILLIANO, *AYMING* **Grants funding and Tax Credit incentives as driving force towards the energy transition**

14:00 - 15:30	WS.IV.3 - TT.VII.A
The Green Transition - Part 2: Mobility and Circular Economy	
Co-organized with AIRI Chair: Andrea PORCARI, *AIRI*	
WS.IV.3.1 TT.VII.A.1	**Presentation of the books: L'impresa saggia and Innovazione Responsabile** *(ed. Guerini & Associati)* • L'Impresa saggia: Ikujiro Nonaka e Hirotaka Takeuchi, *Italian edition by Fabio Corno, Milano-Bicocca University* • Innovazione Responsabile: Sesto Viticoli, *Airi* Moderator: Maria Cristina Origlia *(socio-economic journalist)*
WS.IV.3.2 TT.VII.A.2	Filippo DI GIOVANNI, *STMicroelectronics* **The role of semiconductor industry for carbon-free mobility**
WS.IV.3.3 TT.VII.A.3	Alessandro MORBI, *ITALCEMENTI* **High Performance Fiber Reinforced Concrete for infrastructural retrofitting**
WS.IV.3.4 TT.VII.A.4	Enrico BRENA, *FEDERCHIMICA* **Chemistry as a driving force to develop the circular economy**
WS.IV.3.5 TT.VII.A.5	Giancarlo PEPPONI, *FBK* **Use of XRF technique for multi approach metal sorting**

23 SEPTEMBER

16:00 - 17:30	WS.IV.4 - TT.VIII.A
The Green Transition - Part 3: Circular Economy	
Co-organized with AIRI Chair: Andrea PORCARI, *AIRI*	
WS.IV.4.1 TT.VIII.A.1	Giovanni PINTO, *ITALCEMENTI* **Recycled aggregates for green concretes**
WS.IV.4.2 TT.VIII.A.2	Francesca NANNI, *Consorzio INSTM* **The role of Additive Manufacturing Technologies**
WS.IV.4.3 TT.VIII.A.3	Antonio ROMEO, *DINTEC* **SMEs environmental sustainability assessment**

23 SEPTEMBER

NANOSTRUCTURED MATERIALS COMPOSITES AND 2D MATERIALS

Co-organized with:

WORKSHOP COMMITTEE

Giuliana FAGGIO, *University of Reggio Calabria*
Giacomo MESSINA, *University of Reggio Calabria*
Vittorio MORANDI, *CNR-IMM*

At the heart of the fascinating field of nanotechnology, there is a class of materials with nanometer-scale dimensions and unique and tailored features: the nanostructured materials. Among these, 2D materials and composites are of considerable relevance in physics, chemistry, engineering and environmental sciences thanks to the possibility of manipulating their structure and tuning their properties. The potential of such materials opens up new frontiers for innovation in these areas of interests.
The purpose of this workshop is to connect both young and experienced scientists working in the field of nanostructured materials to share their knowledge and to provide a great opportunity for inspiring discussions and tightening scientific cooperation. The topics cover all aspects of 2D nanostructured materials and composites, including their synthesis and characterizations finalized to fundamental studies, technological integration and present and future applications.

09:00 - 10:30	WS.V.1 - TT.V.H
Zero-dimensional materials and nanocomposites	
Co-organized with University of Reggio Calabria & CNR-IMM Chairs: Giuliana FAGGIO & Giacomo MESSINA, *University of Reggio Calabria* and Vittorio MORANDI, *CNR-IMM*	
WS.V.1.1 TT.V.H.1	Fabrizio MESSINA, *University of Palermo* **Using carbon dots as light harvesters and light emitters in functional nanocomposites: current developments and future perspectives**
WS.V.1.2 TT.V.H.2	Marco PAPAGNO, *University of Calabria* **Scanning tunneling microscopy and photoemission investigation of 2D Supramolecular Assembly of 4-DecyloxyBenzoic Acid on Au(111)**
WS.V.1.3 TT.V.H.3	Manuela MELUCCI, *CNR-ISOF* **Challenges and opportunities for graphene composites in water treatment**
WS.V.1.4 TT.V.H.4	Meganne CHRISTIAN, *CNR-IMM* **Opportunities for nanomaterials to facilitate research in extreme environments**

23 SEPTEMBER

11:30 - 13:00	WS.V.2 - TT.VI.D
Carbon-based 2D materials	
Co-organized with University of Reggio Calabria & CNR-IMM Chairs: Giuliana FAGGIO & Giacomo MESSINA, *University of Reggio Calabria* and Vittorio MORANDI, *CNR-IMM*	
WS.V.2.1 TT.VI.D.1	Maurizio CASALINO, *CNR-IMM, Napoli* **How graphene can enable the development of near-infrared silicon-based resonant cavity enhanced photodetectors**
WS.V.2.2 TT.VI.D.2	Maria Luisa GRILLI, *ENEA Casaccia* **Enhancing the absorption of Single Layer Graphene: simulation and experimental study in symmetric and asymmetric NIR Fabry-Perot filters**
WS.V.2.3 TT.VI.D.3	Alfonso POLICICCHIO, *University of Calabria* **Copper impregnated activated carbon for gas storage applications**
WS.V.2.4 TT.VI.D.4	Camilla COLETTI, *IIT* **Wafer-scale integration of graphene for waveguide-integrated optoelectronics**

16:00 - 17:30	WS.V.3 - TT.VIII.H
Beyond graphene	
Co-organized with University of Reggio Calabria & CNR-IMM Chairs: Giuliana FAGGIO & Giacomo MESSINA, *University of Reggio Calabria* and Vittorio MORANDI, *CNR-IMM*	
WS.V.3.1 TT.VIII.H.1	Antonio POLITANO, *University of L'Aquila* **Ambient-stable transition-metal dichalcogenides hosting type-II Dirac fermions and their applications in catalysis, nanoelectronics, and plasmonics**
WS.V.3.2 TT.VIII.H.2	Francesco BONACCORSO, *IIT* **Large-scale production of 2D crystals for energy applications**
WS.V.3.3 TT.VIII.H.3	Andrea IENCO, *CNR-ICOMM* **Recipes for Few-layer Black Phosphorus Functionalization**
WS.V.3.4 TT.VIII.H.4	Alessandro MOLLE, *CNR-IMM* **Nanoscale Engineering of emerging Two-Dimensional Materials**

22 SEPTEMBER

AEROSPACE
3D Additive Manufacturing & Radiation Damage

Co-organized with:

Agenzia Spaziale Italiana

ESRF
The European Synchrotron

WORKSHOP COMMITTEE

Marco DI CLEMENTE, *ASI*
Ennio CAPRIA, *ESRF*

Aerospace is definitely one of the fields where the impact of innovation is the most important. This is the direct consequence of the need for excellence related to the extreme conditions of operation, the very demanding specifications, the complexity of the equipment and the need for high level of reliability (very low rates of failure). In this session we will present and discuss two of the key technologies for the so-called ": New Space": a) the use of COTS (components on the shelf) in electronic systems for space applications; b) the extensive use of metallic parts made by additive manufacturing for aerospace.

The New Space denomination indicates a change of paradigm within the business model of the space industry, characterised by a continued democratisation of space technology. This is mainly achieved with a constant decrease of the cost of the launching and of the satellite constellations and a consequent growing need for components with novel functionalities at lower costs. In this configuration the interest for COTS, i.e. components that are not especially conceived to operate in harsh radiative environments (RadHard), is growing considerably.

As a consequence, the fact of properly characterising and understanding the limitations and the performance of standard components in a radiation environment gains momentum, with respect to the intention to design specific components dedicated for space. In this kind of perspective, the development of novel testing methodologies and the possibility to have access to opportune nuclear physics facilities to carry on some testing campaigns become strategic. A complete picture around this topic will be provided in the first part of the workshop.

Complementary to the aspects related to embedded electronics, the advanced manufacturing is another topic of primary importance for the future of the race for space. In this respect, Additive Manufacturing (AM) is the absolute game changer. AM offers the possibility to obtain unique shapes that can implement outstanding mechanical performances with reduced weight. Furthermore, AM is ideal when small series of pieces with very high added value are conceived, and when a continuous product development is envisaged.

For these reasons, the second part of the workshop will be dedicated to the AM of metallic parts. The challenges related with the manufacturing will be discussed, but also the characterisation methodologies.

22 SEPTEMBER

09:00 - 10:30	WS.VI.1 - TT.I.H
Introduction to the electronic solutions for aerospace applications	
Co-organized with ASI & ESRF Chair: Ennio CAPRIA, *ESRF, Grenoble*	
WS.VI.1.1 TT.I.H.1	Silvia NATALUCCI, *ASI* **Usage of COTS EEE Components in ASI Space Programs**
WS.VI.1.2 TT.I.H.2	Gianluigi CASSE, *FBK* **Radiation hardened sensors and electronics: studies and guidelines**
WS.VI.1.3 TT.I.H.3	Francesco PINTACUDA, *STMicroelectronics* **Design strategy for RadHard components**

11:30 - 13:00	WS.VI.2 - TT.II.I
Testing of radiation hardness of electronic components	
Co-organized with ASI & ESRF Chair: Ennio CAPRIA, *ESRF, Grenoble*	
WS.VI.2.1 TT.II.I.1	Jan BUDROWEIT, *German Aerospace Center, Germany* **The use of irradiation facility for the testing of electronic components for space**
WS.VI.2.2 TT.II.I.2	Giovanni CUCINELLA, *IMT* **Electron Beam Radiation Tests - The eRAD Project experience**
WS.VI.2.3 TT.II.I.3	Salvatore FIORE, *ENEA* **RADNEXT: the widest network of facilities for the testing of radiation hardness of electronic components**
WS.VI.2.4 TT.II.I.4	Ennio CAPRIA, *ESRF, France* **A competence center on irradiation for electronic components in Grenoble**
WS.VI.2.5 TT.II.I.5	Rita CARPENTIERO, *ASI* **ASIF initiatives in support of Italian irradiation facilities**

22 SEPTEMBER

14:00 - 15:30	WS.VI.3 - TT.III.C
The strategic role of additive manufacturing for aerospace applications	
Co-organized with ASI & ESRF Chair: Marco PIZZARELLI, *ASI*	
WS.VI.3.1 TT.III.C.1	Mariangela LOMBARDI, *Polytechnic of Turin* **Additive Manufacturing of metallic parts: essential paradigms and trends**
WS.VI.3.2 TT.III.C.2	Francesco LUMACA, *Thales Alenia Space* **Additive Manufacturing for the Space Components: Present And Trends in TAS-I**
WS.VI.3.3 TT.III.C.3	Pietro TADINI, *AVIO* **Attività ALM in Avio: Programmi di Ricerca, sviluppo del combustore M10, evoluzioni e sviluppi futuri**

16:00 - 17:30	WS.VI.4 - TT.IV.C
Advanced imaging charcterisation of metallic parts manufactured via additive manufacturing	
Co-organized with ASI & ESRF Chair: Marco PIZZARELLI, *ASI*	
WS.VI.4.1 TT.IV.C.1	Bianca Maria COLOSIMO, *Polytechnic of Milan* **Additive Manufacturing and big data mining: opportunities and challenges of in-situ monitoring and qualification**
WS.VI.4.2 TT.IV.C.2	Rosario BORRELLI, *CIRA* **Metallic Additive Manufacturing at the Italian Aerospace Research Centre**
WS.VI.4.3 TT.IV.C.3	Romaine ISAACS, *ZEISS* **Nanotomography characterization and phase identification of high temperature 3D printed Al-Ce alloys**
WS.VI.4.4 TT.IV.C.4	Julio Cesar DA SILVA, *CNRS & ESRF, France* **Characterization of an ultrafine eutectic Ti-Fe-based alloy processed by additive manufacturing via Near-Field Ptychographic Tomography**

Aggiornamento Ingegneri CFP

NANOMATERIALI E NANOTECNOLOGIE

corsi per aggiornamento professionale

September 21, 22, 23, 24

in collaborazione con

Ordine degli Ingegneri della Provincia di Roma

Fondazione Ordine degli Ingegneri Provincia di Roma

Comitato Organizzativo
Massimo CERRI, *Ordine degli Ingegneri della Provincia di Roma - Vice-Presidente*
Luigi Carlo CHIARENZA, *Fondazione Ordine degli Ingegneri di Roma - Consigliere*
Filippo CASCONE, *Fondazione Ordine degli Ingegneri di Roma - Vice-Presidente Vicario; Ordine degli Ingegneri della Provincia di Roma - Consigliere Segretario*
Giovanni NICOLAI, *Ordine degli Ingegneri della Provincia di Roma - Presidente Commissione "Aerospazio"*

Chairs: Manuel CASALBONI *(Ordine degli Ingegneri, Vice-Presidente)* & Marco ROSSI *(Sapienza Università di Roma, Presidente del Consiglio d'Area Didattica in Ingegneria delle Nanotecnologie)*

21 SEPTEMBER

NANOMATERIALI E NANOTECNOLOGIE: RISCHI E OPPORTUNITÀ	
08:45 - 09:00	**Saluti Istituzionali** Massimo CERRI *Vice - Presidente dell'Ordine degli Ingegneria della Provincia di Roma*
09:00 - 09:45	**Innovazione e nanotecnologie** Elena MOCCHIO, *UNI - Ente Italiano di Normazione*
09:45 - 10:30	**Nanomateriali e dispositivi medici: aspetti regolatori** Giuseppe D'AVENIO, *ISS - Centro Nazionale per le Tecnologie Innovative in Sanità Pubblica*
Break	
11:00 - 11:45	**Differenza tra mascherine chirurgiche (Dispositivi Medici) e FFP2 (DPI): la diversità dei metodi di validazione e le ricadute in tema di salute e sicurezza sul lavoro** Paolo GIRAUDI, *Università di Genova - CEI*
11:45 - 12:30	**Metodologie di analisi, misura e caratterizzazione dell'esposizione a nanomateriali aerodispersi nei luoghi di lavoro** Fabio BOCCUNI, *Istituto nazionale Assicurazione Infortuni sul Lavoro - INAIL*
Break	

Il programma di aggiornamento sulle applicazioni dei nanomateriali e delle nanotecnologie in ambito ingegneristico ha una durata totale di quattro giorni. Il corso prevede una prima mezza giornata introduttiva, inclusiva di tematiche orizzontali quali terminologia e definizioni, caratterizzazione e certificazione ed a seguire tre giornate dedicate ad applicazioni nei settori dell'ingegneExplore the horizons of 4D imaging using ultrafast Electron Microscoperia civile, industriale e dell'informazione. Durate il corso verrà affrontato l'utilizzo delle nanotecnologie in molteplici settori applicativi, quali chimica & materiali, costruzioni & architettura, energia, tessili, ICT, elettronica, fotonica e opto-elettronica. Ogni giornata, basata su lezioni frontali da 45 minuti, si articola su quattro moduli della durata di un'ora e mezza ciascuno. I singoli corsi saranno tenuti da esperti provenienti sia dal settore accademico sia da quello industriale. Per i soggetti interessati, il rilascio della certificazione della partecipazione quale riconoscimento di crediti formativi professionali (CFP) verrà gestito direttamente dalle strutture dell'Ordine degli Ingegneri della Provincia di Roma; in questo caso è obbligatoria anche la registrazione sul sito ufficiale dell'Ordine degli Ingegneri della provincia di Roma.

22 SEPTEMBER

NANOTECNOLOGIE NELL'INGEGNERIA CIVILE E NELL'ARCHITETTURA	
08:45 - 09:00	**Saluti Istituzionali** Luigi Carlo CHIARENZA *Consigliere Fondazione Ordine degli Ingegneri di Roma*
09:00 - 09:45	**Supermodificante a base di grafene contenente plastiche dure selezionate per migliorare le prestazioni delle pavimentazioni stradali - parte I** Loretta VENTURINI, *Iterchimica Srl, Suisio, Bergamo*
09:45 - 10:30	**Supermodificante a base di grafene contenente plastiche dure selezionate per migliorare le prestazioni delle pavimentazioni stradali - parte II** Loretta VENTURINI, *Iterchimica Srl, Suisio, Bergamo*
Break	
11:30 - 12:15	**Green Deep Technology** Francesco MATTEUCCI, *EIC - European Innovation Council*
12:15 - 13:00	**Propagazione delle onde in materiali con microstruttura. Approccio multiscala alla modellazione di un mezzo poroso** Anna Maria PAU, *Sapienza Università di Roma*
Break	
14:00 - 14:45	**Nanomateriali per smart buildings - parte I** Danilo DINI, *Sapienza Università di Roma*
14:45 - 15:30	**Nanomateriali per smart buildings - parte II** Danilo DINI, *Sapienza Università di Roma*
Break	
16:00 - 16:45	**I nanomateriali per la conservazione di edifici storici e monumentali: pregi e difetti della loro applicazione - parte I** Maria Laura SANTARELLI, *Sapienza Università di Roma*
16:45 - 17:30	**I nanomateriali per la conservazione di edifici storici e monumentali: pregi e difetti della loro applicazione - parte II** Maria Laura SANTARELLI, *Sapienza Università di Roma*

23 SEPTEMBER

NANOTECNOLOGIE NELL'INGEGNERIA INDUSTRIALE	
08:45 - 09:00	**Saluti Istituzionali** Filippo CASCONE *Consigliere Segretario dell'Ordine degli Ingegneri della Provincia di Roma* *Vice Presidente Vicario Fondazione Ordine degli Ingegneri di Roma*
09:00 - 09:45	**Le nanotecnologie nell'industria tessile: dagli smart wearables alla sensoristica integrata** Francesca Anna SCARAMUZZO, *Sapienza Università di Roma*
09:45 - 10:30	**Nanotecnologie per la protezione dalla corrosione** Federica DE RICCARDIS, *ENEA*
Break	
11:30 - 12:15	**Ricerca ed innovazione per le nanotecnologie - Parte I** Massimo BERSANI, *FBK – Fondazione Bruno Kessler, Trento*
12:15 - 13:00	**Ricerca ed innovazione per le nanotecnologie - Parte II** Massimo BERSANI, *FBK – Fondazione Bruno Kessler, Trento*
Break	
14:00 - 14:45	**Stoccaggio di sistemi di accumulo Litio-Ione: caratterizzazione, profili di rischio e scenari incidentali** Paolo GIRAUDI, *Università di Genova - CEI*
14:45 - 15:30	**Applicazioni dell'Elettronica Organica nella sintesi e nella funzionalizzazione di sistemi RFID-HF** Riccardo MISCIOSCIA, *ENEA*
Break	
16:00 - 16:45	**Introduzione alle nanotecnologie e ai nanomateriali nell' ingegneria industriale** Francesco MARRA, *Sapienza Università di Roma*

24 SEPTEMBER

NANOTECNOLOGIE NELL'INGEGNERIA DELL'INFORMAZIONE	
08:45 - 09:00	**Saluti Istituzionali** Giovanni NICOLAI, *Presidente della Commissione "Aerospazio" dell'Ordine degli Ingegneri della Provincia di Roma*
09:00 - 09:45	**Valorizzazione delle Nanotecnologie** Roberto GIANNANTONIO, *CNR-IRSA*
09:45 - 10:30	**Nanotecnologie industriali: approcci multifunzionali** Nicola MIROTTA, *Commissione "Aerospazio" dell'Ordine degli Ingegneri della Provincia di Roma"*
Break	
11:00 - 11:45	**Nanomateriali per l'optoelettronica - parte I** Antonio D'ALESSANDRO, *Direttore CNIS, Sapienza Università di Roma*
11:45 - 12:30	**Nanomateriali per l'optoelettronica - parte II** Antonio D'ALESSANDRO, *Direttore CNIS, Sapienza Università di Roma*
Break	
14:00 - 14:45	**Nanostrutturazione di superfici di semiconduttore tramite fascio ionico: teoria, esperimenti ed applicazioni - Parte I** Rossana DELL'ANNA, *FBK – Fondazione Bruno Kessler, Trento*
14:45 - 15:30	**Nanostrutturazione di superfici di semiconduttore tramite fascio ionico: teoria, esperimenti ed applicazioni - Parte II** Rossana DELL'ANNA, *FBK – Fondazione Bruno Kessler, Trento*
Break	
16:00 - 16:45	**Tecnologie della microelettronica per l'analisi biomolecolare - Parte I** Giampiero DE CESARE, *Sapienza Università di Roma*
16:45 - 17:30	**Tecnologie della microelettronica per l'analisi biomolecolare - Parte II** Giampiero DE CESARE, *Sapienza Università di Roma*

SCHOOL ON NANOTECHNOLOGIES: PROCESSES AND APPLICATIONS TO SENSORS AND ACTUATORS

September 22, 23, 24

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 workshop will be completed with a demo and live sessions from different cleanrooms, to practically show some of the fundamental silicon processing steps. The school is organized by It-fab (http://itfab.bo.imm.cnr.it/), the Italian network for Micro and Nano Fabrication research infrastructures.

The School will be held REMOTELY and IN PERSON

22 SEPTEMBER

09:00 - 09:15	**Welcome and Introduction** Vittorio MORANDI, *CNR-IMM, Bologna*
09:15 - 09:45	**Cleanroom, introduction to the functioning** Lorenza FERRARIO, *FBK*
09:45 - 10:30	**Ionic implantation** Antonino PICCIOTTO, *FBK*
break	
11:30 - 12:15	**Depostion techniques 1** Riccardo BERTACCO, *PoliFAB*
12:15 - 13:00	**Depostion techniques 2** Claudio SOMASCHINI, *PoliFAB*
break	

22 SEPTEMBER

14:00 - 14:45	**Plasma Etching 1** Fulvio MANCARELLA, *CNR-IMM*
14:45 - 15:30	**Plasma Etching 2** Fulvio MANCARELLA, *CNR-IMM*
break	
16:00 - 16:45	**Lithography 1** Massimo CUSCUNA', *CNR NANOTEC*
16:45 - 17:30	**Lithography 2** Massimo CUSCUNA', *CNR NANOTEC*

23 SEPTEMBER

09:00 - 09:45	**Self-assembling lithography for nanoscale metrology** Federico FERRARESE LUPI, *INRIM*
09:45 - 10:30	**Metrology in Nanotechnologies** Davide CALONICO, *INRIM*
break	
11:30 - 12:15	**Suspended structures: patterning and release** Ilaria GELMI, *STMicroelectronics*
12:15 - 13:00	**When 3D process integration turns into 3D optical sensing** Emmanuel JOSSE, *STMicroelectronics*
break	
14:00 - 14:45	**Technology Platform 2 - Organic electronics and applications** Matteo RAPISARDA, *CNR-IMM, Roma*
14:45 - 15:30	**Technology Platform 4/Scanning Probe Lithography** Alessia ROMEO, *PoliFAB*
break	
16:00 - 16:45	**Technology Platform 5 - Two photon polymerization 3D printing** Valentina BERTANA, *Chilab & Polytechnic of Turin*
16:45 - 17:30	**Discussion and Conclusion**

24 SEPTEMBER

09:00 - 09:45	**LIVE DEMO - CNR NANOTEC** Massimo CUSCUNA', *CNR NANOTEC*
09:45 - 10:30	**LIVE DEMO - SEM/FIB FBK** Damiano GIUBERTONI, *FBK*
break	
11:00 - 11:30	**APPLICATIONS - Applications 1: System level 3D integration and system-in-package for chemical sensing microsystems** Stefano ZAMPOLLI, *CNR-IMM, Bologna*
11:30- 12:00	**APPLICATIONS - Applications 2: Microfluidics and biosensors** Simone MARASSO, *Polytechnic of Turin*
12:00 - 12:30	**APPLICATIONS - Applications 3: Fabrication of micro-vibrating wire strain sensors by micromachining of Silicon On Insulator substrates with wafer-level vacuum packaging** Alberto RONCAGLIA, *CNR-IMM*

The School will send a certificate of participation with the programme and the total number of lessons hours. The document will be sent to registered people only and has to be requested explicitly to ferrario@fbk.eu

24 SEPTEMBER

SCHOOL ON NANOMEDICINE

Chairs: Agnese MOLINARI, Annarica CALCABRINI & Annarita STRINGARO, *ISS*

Co-organized with

Nanomedicine has the potential to drastically change the way patients will be treated in the upcoming years: numerous benefits, including improved efficacy, bioavailability, dose–response, targeting ability, personalization, and safety compared to conventional medicines can be hypothesized.
The Nanomedicine Course is dedicated to Master students, PhD students, early stage researchers, and whoever is interested in an introduction to this field of research. The scientific program includes overview of the contribution of different microscopy techniques to the development of nanomedicine (Super-resolution microscopy; Scanning and transmission electron microscopy; AFM). Moreover, potential and emerging applications of nanomedicine in therapies will be explored.

The course will be held exclusively REMOTELY with maximum 35 participants

14:00 - 14:40	**From Dynamics and Function to Structure: bridging the gap between high-resolution light microscopy and Electron Microscopy** Ilaria COSTA, *Leica Microsystems, Piacenza*
14:40 - 15:20	**The contribution of electron microscopy techniques to the research in Nanomedicine** Andrea VALDRÈ, *Media System Lab Srl, Macherio*
15:20 - 16:00	**Atomic Force Microscopy: a versatile tool for characterization at the nanoscale** Francesca Anna SCARAMUZZO, *Basic and Applied Sciences for Engineering (SBAI), Sapienza University of Rome*
16:00 - 16:40	**Challenges and safety of nanodrug delivery systems** Annarita BILIA, *Chemistry Department "Ugo Sciff", University of Firenze*
16:40 - 17:20	**Nanotechnology in dentistry: novel approaches to enhance osseointegration** Marco LOLLOBRIGIDA, *Department of Oral and Maxillo Facial Sciences, Sapienza University of Rome*
17:20 - 18:00	**From a nanotechnology product to a nanomedicine. The regulatory constraints and the example of vaccine** Carla CARAMELLA, *Department of Drug Sciences, University of Pavia*
18:00	**Concluding remarks**

COVID-19: ASPETTI TECNICI OLTRE L'EFFICACIA DEI VACCINI

Chair: Donatella PAOLINO, *University Magna Graecia of Catanzaro*
Co-Chair: Paolo CALICETI, *University of Padova*

Co-organized with

A.D.R.I.T.E.L.F.

La situazione emergenziale in cui sono stati sviluppati e autorizzati i vaccini per il COVID-19 ha generato confusione e perplessità nella popolazione a causa della breve tempistica usata. A 9 mesi di distanza dalle prime somministrazioni si analizzeranno gli aspetti tecnici e regolatori che hanno portato all'approvazione dei vaccini ad oggi disponibili.

21 SEPTEMBER

11:00 - 12:30	JE.I
COVID-19: aspetti tecnici oltre l'efficacia dei vaccini	
Co-organized with ADRITELF Chair: Donatella PAOLINO, *University Magna Graecia of Catanzaro* Co-Chair: Paolo CALICETI, *University of Padova*	
JE.I.1	Paola MINGHETTI, *University of Milan* **Le agenzie regolatorie sono state all'altezza della sfida posta dall'approvazione dei vaccini covid-19?**
JE.I.2	Francesca SELMIN, *University of Milan* **Cosa conosciamo della stabilità dei vaccini a mRNA in nanoparticelle lipidiche?**
JE.I.3	Gianluca TRIFIRÒ, *University of Verona* **Le segnalazioni di farmacovigilanza e il loro ruolo nella valutazione della sicurezza dei vaccini**
JE.I.4	Claudia PILEGGI, *University Magna Graecia of Catanzaro* **Serological response to SARS-CoV-2 messanger RNA vaccines in Italian adult population: first results of a prospective study**

WIKIMEDIA FOR OPEN SCIENCE

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

Co-organized with

IMM Institute for Microelectronics and Microsystems

SAPIENZA UNIVERSITÀ DI ROMA

After 20 years since its creation, the online encyclopedia Wikipedia is a well known source of information. While being now part of pop culture, the freely editable online encyclopedia is also a source of data for scholars and enterprises, and a way to disseminate scientific knowledge. Wikipedia is part of an ecosystem of projects, each devoted to a different subject like quotes, public domain texts and pictures. Among these projects, Wikidata is a structured data repository at the forefront of open science. In Wikidata, each item, being a topic, a person, an event or a concept, is connected to others, creating a vast graph linking different fields and entities. The only '.org's among the most visited sites the web – the volunteer created, nonprofit operated, ecosystem of websites has become a critical piece of knowledge infrastructure equally for every student as for every knowledge graph. This topic will be discussed in two sessions on consecutive days. In the first one (Wednesday, September 22nd), it will be explained how Wikipedia and Wikidata work and related Q&A. The second one (Thursday, September 23rd) will be a practical workshop. Attendees at the workshop are requested to bring their own laptop and to register for a free Wikimedia user account in advance.

Invited Participants

Giuseppe PROFITI, *Wikimedia Italia*
Liam WYATT, *Wikimedia Foundation, Senior Program Manager*
Luca MARTINELLI, *Wikimedia Italia and Wikimedia Foundation*

22 SEPTEMBER

17:30 - 19:00 | **JE.II.1**

How Wikipedia and Wikidata work

Co-organized with CNR-IMM & Sapienza University of Rome
Chairs: Vittorio MORANDI, *CNR-IMM* & Marco ROSSI, *Sapienza University of Rome*

Wikipedia and Wikidata will be introduced, with a particular attention for the needs of scholars and inquisitive people, by showing practical examples of science communication and research projects which use them. Specific examples will be demonstrated from tools including Scholia as an automatic research profile generator for scholars (publications, employments etc) thanks to the collection of citation of scientific papers in Wikidata; and the Wikidata Query Service - how to utilise it, and how to incorporate new information within it.

23 SEPTEMBER

17:30 - 19:00 | **JE.II.2**

Hands-on session on Wikimedia projects

Co-organized with CNR-IMM & Sapienza University of Rome
Chairs: Vittorio MORANDI, *CNR-IMM* & Marco ROSSI, *Sapienza University of Rome*

As the saying goes "Wikipedia works in practice, but not in theory". This workshop will demonstrate tools, and teach basic skills, necessary to perform key tasks of Wikipedia and Wikidata use – both as a reader/researcher, and as a contributor/editor.

Based on the interests of attendees, the session will divide into groups and provide practical instruction in such tasks as: editing a Wikipedia article and adding footnotes and references; creating Wikidata items; and performing queries on Wikidata.

TRANSITION PHASE MATERIAL IN ELASTOMERIC COMPOUND

Chair: Alessandro PEGORETTI, *University of Trento*

Co-organized with

FONDAZIONE BRUNO KESSLER

NOVURANIA *Ahead of Our Times*

24 SEPTEMBER

11:00 - 12:30	JE.III
Transition Phase material in elastomeric compound	
JE.III.1	Massimo BERSANI, *FBK* **Overview and solutions on transition phase material for building applications**
JE.III.2	Francesco VALENTINI, *FBK* **Innovative epdm/nbr panels with paraffin for thermal energy storage of buildings**

24 SEPTEMBER

OPEN INNOVATION & OPEN SCIENCE
IV Edition

In collaboration with

Airi ASSOCIAZIONE ITALIANA PER LA RICERCA INDUSTRIALE

Nano Italy Associazione

SAPIENZA UNIVERSITÀ DI ROMA

Also this year, following the success of the previous three editions, the event "Open Innovation and Open Science" will be organized during NanoInnovation, thus reaching its fourth edition.

It was decided, for continuity, to maintain the same title, but the contents and aims of the 2021 edition have been revised and reconfigured to keep in due consideration the post-Covid-19 scenarios, in terms of sustainability, 'local' re-industrialization, rethinking of globalization policies and new requirements of university and post-graduate training courses.

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.

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 research and innovation.

With the advent of the fourth industrial revolution (model 4.0), new and more effective models for matching technology supply and demand are required and a cultural change involving R&I management, as well as dedicated professional figures, is needed to make the most of the opportunities offered by the development of enabling and emerging technologies.

During the sessions of the event 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:

- Training and skills
- Technology transfer
- Local initiatives and approach
- Policies for the creation of research infrastructures
- Creation of spin-offs and start-ups
- Process and product sustainability
- Principles and methods for open science
- Principles and methods for open innovation

24 SEPTEMBER

09:00 - 10:30	JE.IV.1
Italian Research: Public system and Industrial world	
Chair: Antonio FALONE, *INFN*	
JE.IV.1.1	Cristina BATTAGLIA, *CNR, Responsabile Unità Valorizzazione della Ricerca* **Innovazione e trasferimento tecnologico: le attività del CNR, i risultati e le prospettive**
JE.IV.1.2	Nello LI PIRA, *Material Engineering Methods & Tools, CRF-Stellantis, Global Materials R&I and Roadmap Manager* **Evolution of Infotainment in Future Vehicles: Functionalities and Interactions**
JE.IV.1.3	Fabio BOCCUNI, *INAIL* **Prevention in the workplace and responsible innovation: the role of INAIL research**
JE.IV.1.4	Gianfranco DURIN, *INRIM* **The open science movement**

11:00 - 13:00	JE.IV.2
Technology Transfer and Regulatory Policies	
Chair: Pietro GIMONDO, *RINA Consulting – CENTRO SVILUPPO MATERIALI SpA*	
JE.IV.2.1	Sesto VITICOLI, *AIRI, Vice President* **Airi's Contribution on Italian IPR Strategies**
JE.IV.2.2	Fabiola MASSA, *University of Rome Tor Vergata* **Technology transfer public research institutions and the consequences of the obligations contracted by researchers and institutions**
JE.IV.2.3	Ivano VISINTAINER, *Comitato Elettrotecnico Italiano, Technical Director* Fabrizio BARBERIS, *Commissione Ricerca e Technology Transfer Unige, President CT 113 Comitato Elettrotecnico Italiano and Member TC 113 International Electrotechnical Commission – IEC* **The support of CEI and IEC standards for sustainable development. Energy transition to renewable sources and sustainable mobility**
JE.IV.2.4	Andrea PARODI, *PRAXI Spa* **The Evaluation of intangibles assets**
JE.IV.2.5	Alissa IOANNONE, *Telespazio* **Open Innovation for new generation of satellite services**

24 SEPTEMBER

14:00 - 15:30	JE.IV.3
Innovation Policies	
Chair: Narciso GAMBACORTI, *CEA-Leti, Program Manager Nanocharacterization & Metrology*	
JE.IV.3.1	Lorenzo LO CASCIO, *Regione Lazio, Assessorato allo Sviluppo Economico, Commercio e Artigianato, Ricerca, Start-Up e Innovazione* **Innovation Policies of Regione Lazio**
JE.IV.3.2	Bernardino D'AURIA, *INVITALIA, Area Innovazione* **Challenges and opportunities of national policies and programs to support research and innovation**
JE.IV.3.3	Daniela BAGLIERI, *Regione Sicilia, Assessore dell'energia e dei servizi di pubblica utilità Università degli Studi di Messina, Pro-Rettore alla Ricerca, Innovazione e Trasferimento Tecnologico* **Energy transition and decarbonisation policies in Sicily**
JE.IV.3.4	Roberto GIANNANTONIO, *Freelance professional on Technological Innovation* **Let's be brave, let's do!**
JE.IV.3.5	Ilaria SALVATORI, *RINA Consulting – CENTRO SVILUPPO MATERIALI SpA* **Materials' innovation in new industrial development trends**

16:00 - 17:15	JE.IV.4
Ecosystems	
Chair: Guglielmo FORTUNATO, *CNR-IMM*	
JE.IV.4.1	Rosario Corrado SPINELLA, *CNR-DSFTM, Direttore* **University-CNR-Industry interaction models: the example of Etna Valley**
JE.IV.4.2	Narciso GAMBACORTI, *CEA-Leti, Program Manager Nanocharacterization & Metrology* **CEA-Leti Ecosystem in France**
JE.IV.4.3	Ennio CAPRIA, *ESRF, Grenoble, France* **Fully exploiting the potential of Research Infrastructures centers as an Innovation Hub: actions and opportunities in the framework of publicly funded initiatives. The case of ESRF**
JE.IV.4.4	Marco LAZZARINO & Mattia FANETTI, *CNR-IOM Area Science Park & NanoRegion Project, Università di Nova Gorica* **NanoRegion - A network of nanolaboratories open to the small-medium enterprises**

HORIZON EUROPE, LIFE PROGRAMME, INNOVATION FUND AND PNRR: THE TOOLS IN PLACE TO SUPPORT THE SCIENTIFIC AND INDUSTRIAL DEVELOPMENT

Co-organized with

Warrant Hub
TINEXTA GROUP

The EU has supported research and innovation through its framework programme since 1986. Horizon Europe, starting on January 2021, is the 9th framework programme that facilitates collaboration and strengthens the impact of research and innovation in developing, supporting and implementing EU policies while tackling global challenges. It supports creating and better dispersing of excellent knowledge and technologies. It creates jobs, fully engages the EU's talent pool, boosts economic growth, promotes industrial competitiveness and optimises investment impact within a strengthened European Research Area. The next 7 years of Horizon Europe will be focused on environment and sustainability and new opportunities will open also for Nanotechnology inside the European Green Deal and LIFE Programme. Isella Vicini will give an overview of funding opportunities and instruments, explaining how to make the most of European funding programmes.

Moreover, from the 21st to 24th of September 2021, Isella Vicini will be available for an hour a day dedicated to one-to-one conference call for everyone interested to have a preliminary evaluation of a possible project idea or to understand how to take avantage of EU research and innovation funds: the virtual meetings will last about 15 minutes upon registration. For further information and appointments please write to stefania.melandri@warranthub.it

23 SEPTEMBER

17:30 - 19:00	JE.V
Horizon Europe, LIFE Programme, Innovation fund and PNRR: the tools in place to support the scientific and industrial development	
Chair: Maria Sabrina SARTO, *Deputy Rectress for Research, Sapienza University of Rome*	
JE.V.1	Isella VICINI, *Warrant HUB* **Horizon Europe**
JE.V.2	Isella VICINI, *Warrant HUB* **LIFE Programme and Innovation Fund**
JE.V.3	Vittoria PRIMICERI, *PRAXI Spa* **How to improve the quality of patents**
JE.V.4	Antonio Marco PANTALEO, *European Innovation Council (EIC), Programme Manager for Energy and Green Technologies* **Tools and actions to support research and innovation within the European Innovation Council: the role of Programme managers**
JE.V.5	*Q&A session, conclusion and 'arrivederci' to the next NanoInnovation 2022*

AN INTRODUCTION TO PIEZOELECTRIC FORCE MICROSCOPY

September 22nd, 2021 - 09:00 - 10:30

ABSTRACT

Piezo- and ferroelectricity are physical properties exhibited by a wide range of different materials, which are currently generating a huge interest and are under investigation both for fundamental and applied research (as for sensors and actuators). Piezoelectric Force Microscopy (PFM) is a scanning probe-based technique that allows to access unique spatially resolved and quantitative information on these materials. In this talk, an introduction about the main concepts and implementation of PFM experiments will be given, and results obtained with Park Systems microscopes on selected samples of scientific relevance will be shown.

NANOINDENTATION: MEASURE MODULUS, HARDNESS & MORE

September 22nd, 2021 - 16:30 - 18:00

ABSTRACT

Nanoindentation is often used for measuring Modulus and Hardness at small scales. With KLA Nanoindetation techniques, much more is possible to obtain. Dominik Weil, Applications Engineer of KLA, discusses standard techniques as well as applications beyond standard nanoindentation methods.

INTRODUCTION OF PVD SOLUTIONS BY POLYTEKNIK AS

September 23rd, 2021 - 09:00 - 10:30

NANOFRAZOR A NANOLITHOGRAPHY TOOL FOR 2D & 3D DEVICES

September 23rd, 2021 - 16:00 - 17:30

ABSTRACT

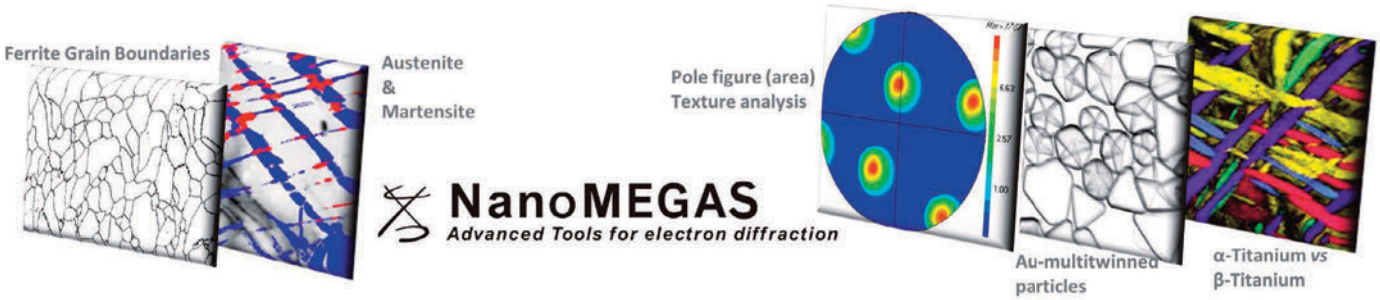
NanoFrazor lithography systems were developed as a first true alternative or extension to standard mask-less nanolithography methods like electron beam lithography (EBL). In contrast to EBL they are based on thermal scanning probe lithography (t-SPL). Here a heatable ultra-sharp probe tip with an apex of a few nm is used for patterning and simultaneously inspecting complex nanostructures. The heat impact from the probe on a thermal responsive resist generates those high-resolution nanostructures. The patterning depth of each individual pixel can be controlled with better than 1 nm precision using an integrated in-situ metrology method. Furthermore, the inherent imaging capability of the Nanofrazor technology allows for markerless overlay, which has been achieved with sub-5 nm accuracy as well as it supports stitching layout sections together with < 10 nm error. Pattern transfer from such resist features below 10 nm resolution were demonstrated. The application range for this new nanolithography technique is very broad. The presentation will include examples for (i) high-quality metal contacting of 2D materials, (ii) tuning photonic molecules, (iii) generating nanofluidic devices and (iv) generating spintronic circuits. Some of these applications have been enabled only due to the various unique capabilities of NanoFrazor lithography like the absence of damage from a charged particle beam.

NanoMEGAS
Advanced Tools for electron diffraction

ASTAR:
PHASE & ORIENTATION MAPPING AT THE NM SCALE USING 4D SPED IN TEM

September 22nd, 2021
16:00 - 17:30

Faculty of Civil and Industrial Engineering - Sapienza University of Rome



ABSTRACT

The satellite event during NanoInnovation 2021, will cover an introduction to Precession enhanced Phase & Orientation mapping for TEM (4D-Scanning Precession Electron Diffraction – 4D-SPED*). ASTAR is like the traditional EBSD method in SEM, and the major benefit is the spatial resolution that can be up to 1-3 nm (in case of FEG-TEM). Such resolution makes the application unique, able to shed light to local properties of materials, like thin **films, metals, batteries, ceramics, semiconductors, nanoparticles, etc**.

Recent examples of ASTAR will be presented. We hope you take this opportunity to learn about this advanced technique for TEM and visualize the wide range of exciting results obtained by 4D-SPED (ASTAR).

*4D SPED method is precession enhanced 4D-STEM technique

SPEAKERS:

Prof. Edgar RAUCH, *Laboratoire SIMAP, Univ. Grenoble Alpes, CNRS, Grenoble, France*
Dr. Thanos GALANIS, *Applications Specialist, Europe Area Manager, NanoMEGAS*

The Event will be held both REMOTELY and IN PERSON

ADVANCED CHARACTERIZATION TECHINQUES

September 22nd, 2021
09:00-12:30 & 14:00 - 15:30

Faculty of Civil and Industrial Engineering - Sapienza University of Rome

Introduction

Dynamic micro-CT - Pushing the temporal and spatial boundaries for true in situ experimentation
Lars Oliver KAUTSCHOR
TESCAN ORSAY HOLDING

ABSTRACT
X-ray micro-computed tomography (micro-CT) has opened new avenues of research and understanding. It is now recognized as an essential technique for non-destructive 3D imaging. Extending the technique to the temporal regime, through time-resolved 3D imaging (or 4D imaging), provides a new route to better and more complete understanding of materials evolution, facilitating in situ investigations ranging from mechanical deformation to fluid flow in porous materials. Imaging of dynamic processes has historically been one of the key applications at synchrotron micro-CT beamlines, extending the limits of temporal resolution further and further. However, access to those facilities is often limited and highly selective.

In lab based micro-CT, image quality and spatial resolution have been significantly improved over the last two decades, often at the cost of temporal resolution. In addition to sub-micron spatial resolution, TESCAN Dynamic micro-CT solutions make it possible to visualize and inspect multi-dimensional dynamic processes in the laboratory with a temporal resolution below 3 seconds.

In this talk we explore the general technique of micro-CT as well as the different aspects and challenges of temporally resolved dynamic X-ray 3D imaging. The use of dynamic CT across the fields of materials science, life science, and geoscience will be highlighted through a number of application examples.

Innovative FIB/SEM Lift-out Solutions for Advanced TEM Lamella Preparation Requirements
Martin SUCHANEK
TESCAN ORSAY HOLDING

From data to information with selective BSE contrast methods of TESCAN's CLARA Field-Free UHR-SEM
Giuliano CASATI
ASSING

Discussion and conclusion

NenoVision

Multi-modal correlative microscopy using AFM in SEM

Jan NEUMAN
Nenovision

ABSTRACT
Scanning electron microscopy (SEM) and atomic force microscopy (AFM) are two of the most used, complementary techniques for surface analysis at the nanoscale. Combining them by integrating a compact AFM into SEM brings novel possibilities for true correlative microscopy and advanced multi-modal sample characterization that would be often unfeasible using each imaging modality separately. LiteScope 2.0 produced by NenoVision company is a unique AFM designed for „plug & play" integration into the SEMs allowing the use of Correlative Probe and Electron Microscopy (CPEM) technique which represents a hardware correlative technology, enabling simultaneous data acquisition of AFM (3D topography, electrical, mechanical, and magnetic measurements) and SEM signals (chemical analysis, FIB/GIS surface modification, etc.). This combination opens door for very complex surface investigation in a variety of fields such as Material science, Nanotechnology, Semiconductors, Life science and other areas of research and industry.

BRUKER
Surface Analysis

Infrared (IR) Chemical Identification at the Nanoscale – When AFM meets IR

Miriam UNGER
Bruker Surface Analysis

ABSTRACT
This presentation will overview atomic force microscope based infrared spectroscopy (Photothermal AFM-IR). The technique is based on the combination of a tunable infrared laser with an atomic force microscope that can locally map and measure thermal expansion of nanoscale regions of a sample resulting from the absorption of infrared radiation. The photothermal AFM-IR technique uses the tip of an AFM as a nanoscale detector of absorption of IR radiation. Therefore, AFM-IR can be used to obtain IR absorption spectra and chemical imaging with resolution as fine as the AFM tip radius, >100X smaller than spatial resolution limits of conventional infrared spectroscopy. One of the key benefits is that AFM-IR directly correlates to FT-IR transmission spectroscopy which makes it possible to use existing IR libraries for chemical identification at the nanoscale.
In the presentation we will introduce the underlying technology and highlight numerous applications ranging from polymer characterization, life and material sciences.

High-Speed Atomic Force Microscopy and Super-Resolution Optics - Multiparametric Correlative Microscopy Solutions from Bruker Nano Surfaces

Dimitar STAMOV
Bruker Surface Analysis

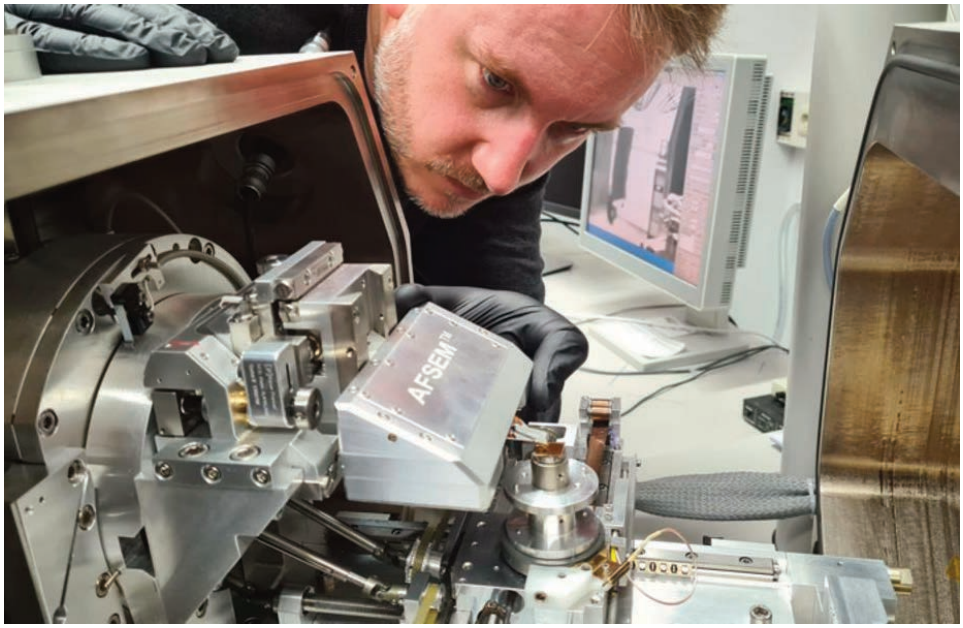
ABSTRACT
AFM currently offers premium spatial resolution of the analysed samples while simultaneously being able to correlate topography and mechanics at near native/physiological imaging conditions. Recent technology developments from Bruker Nano Surfaces have led to unprecedented imaging rates in fluid, setting new milestones for high-speed scanning at 50 frames/sec in life science scenarios. We will introduce the concept and applications of high-speed imaging for real-time visualization of protein binding kinetics, as well as molecular and cellular dynamics. We will further discuss and show examples of how the combination of fast imaging with advanced super-resolution optics leverages the advantages of immunolabelling techniques for truly correlative microscopy. Through an innovative sample stage design, we will show how a wide choice of scanners, together with optical tiling and multi-region AFM probing, enables multiparametric mechanical characterization of soft samples over a large area and provides additional optical data sets.

Quantum Design
MICROSCOPY

IN-SITU CORRELATIVE ANALYSIS OF MECHANICAL, ELECTRICAL, AND MAGNETIC PROPERTIES BY COMBINATION OF AFM AND SEM- INCLUDING LIVE-DEMO

September 23rd, 2021
11:00 - 12:30

Faculty of Civil and Industrial Engineering - Sapienza University of Rome



ABSTRACT

Combining different analytical methods into one instrument is of great importance for the simultaneous acquisition of complementary information. Especially highly localized probing of mechanical, electrical, magnetic, chemical, and crystallographic properties on the nanoscale represents a key success factor for gaining new insights into the micro and nano-world.

We combine two of the most powerful microscopy methods, scanning electron microscopy (SEM) and atomic force microscopy (AFM). Especially the capability to integrate the AFM system directly inside the high-vacuum environment of the SEM enables a completely new way to perform your research and your experiments.

We will present a variety of case studies to highlight the advantages of interactive correlative in-situ nanoscale characterization for different materials and nanostructures.

In the second part of the presentation, we will conduct a Live-Demo of the AFSEM system. We will show you how easily a measurement is carried out and correlative data is obtained. We will demonstrate both a topography measurement on a free-standing graphene membrane and MFM measurement on a multilayer Pt/Co-sample. Furthermore, we will focus on the mount and demount of the system, the localization of the region of interest, and the typical workflow when working with the AFSEM.

SPEAKERS:

Christian SCHWALB, Chief Operating Officer at Quantum Design Microscopy
Marion WOLFF, Assistant Industrial Engineer at Quantum Design Microscopy
Hajo FRERICHS, Application Specialist at Quantum Design Microscopy

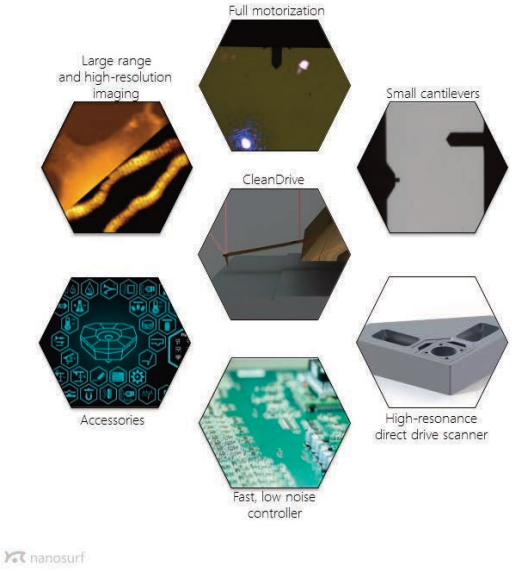
The Event will be held REMOTELY

nanosurf

7 REASONS TO USE THE DRIVEAFM HIGH-END ATOMIC FORCE MICROSCOPE SYSTEM – INCLUDING LIVE DEMO

September 23rd, 2021
14:00 - 15:30

Faculty of Civil and Industrial Engineering - Sapienza University of Rome



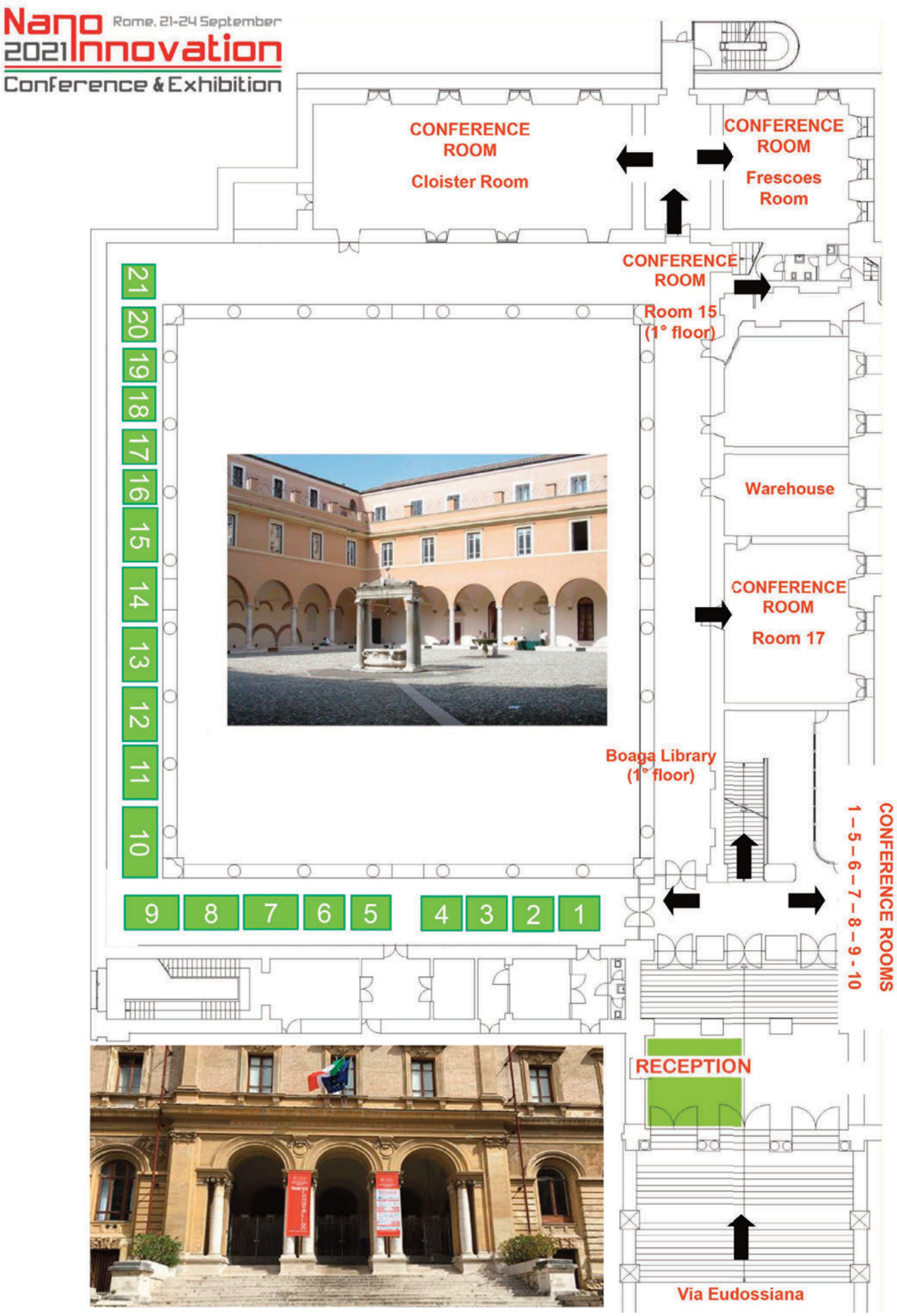
ABSTRACT

In this webinar Dr. Christian Bippes explains the 7 key technologies behind the DriveAFM, as well as how it handles different applications and research environments. He also shows different kinds of example measurements and details how he was able to achieve them using the DriveAFM. After a presentation there will be a remote live demonstration where you will be able to see this powerful new instrument in action, experience its handling, flexibility and ease of use, and ask questions.

SPEAKERS:

Christian BIPPES, *Head of Product Management / Application Scientist at Nanosurf*

The Event will be held REMOTELY


Nano Innovation 2021
Rome, 21-24 September
Conference & Exhibition
CONFERENCE ROOM
Cloister Room
CONFERENCE ROOM
Frescoes Room
CONFERENCE ROOM
Room 15
(1° floor)
Warehouse
CONFERENCE ROOM
Room 17
Boaga Library
(1° floor)
CONFERENCE ROOMS
1 – 5 – 6 – 7 – 8 – 9 - 10
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
RECEPTION
Via Eudossiana

ALPHABETICAL ORDER

19	**AIRI**
20	**ALFATEST**
5	**ANTON PAAR**
2	**ASITALY**
10	**ASSING** AGAR SCIENTIFIC BRUKER SURFACE & DIMENSIONAL ANALYSIS CRESTEC CORPORATION IMINA TECHNOLOGIES NENOVISION PHYSICAL ELECTRONICS RIBER RIGAKU TESCAN
7	**BRUKER**
17	**ELDICO SCIENTIFIC**
15	**EMME 3**
14	**GAMBETTI KENOLOGIA** KLA INSTRUMENTS OXFORD INSTRUMENTS PLASMA TECHNOLOGY PARK SYSTEMS POLYTEKNIK
13	**INRIM**
11	**JEOL**
16	**MICRON SEMICONDUCTOR ITALIA**
4	**NANOMEGAS**
6	**PLATINUM**
1	**PRODOTTI GIANNI** GOODFELLOW NANOCOMPOSIX
18	**PROJECT ACTPHAST4R**
12	**QUANTUM DESIGN ITALY** QUANTUM DESIGN MICROSCOPY NANOSURF
3	**RENISHAW**
8	**SCHAEFER ITALY**
21	**SENSE-RISC & SENSE MASC**
9	**ZEISS**

BOOTHS ORDER

1	**PRODOTTI GIANNI** GOODFELLOW NANOCOMPOSIX
2	**ASITALY**
3	**RENISHAW**
4	**NANOMEGAS**
5	**ANTON PAAR**
6	**PLATINUM**
7	**BRUKER**
8	**SCHAEFER ITALY**
9	**ZEISS**
10	**ASSING** AGAR SCIENTIFIC BRUKER SURFACE & DIMENSIONAL ANALYSIS CRESTEC CORPORATION IMINA TECHNOLOGIES NENOVISION PHYSICAL ELECTRONICS RIBER RIGAKU TESCAN
11	**JEOL**
12	**QUANTUM DESIGN ITALY** QUANTUM DESIGN MICROSCOPY NANOSURF
13	**INRIM**
14	**GAMBETTI KENOLOGIA** KLA INSTRUMENTS OXFORD INSTRUMENTS PLASMA TECHNOLOGY PARK SYSTEMS POLYTEKNIK
15	**EMME 3**
16	**MICRON SEMICONDUCTOR ITALIA**
17	**ELDICO SCIENTIFIC**
18	**PROJECT ACTPHAST4R**
19	**AIRI**
20	**ALFATEST**
21	**SENSE-RISC & SENSE MASC**

BOOTH 19

ASSOCIAZIONE ITALIANA PER LA RICERCA INDUSTRIALE

AIRI

Viale Gorizia, 25/c
00198 Roma (RM), ITALIA
Tel. +39 06 8848831

website: www.airi.it
contact person: **Andrea PORCARI**
e-mail: info@airi.it

Airi (Italian Association for Industrial Research) is a not-for-profit private organization. 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 works with its members - large industrial enterprises and SMEs, leading universities, public research institutions, technology clusters and financial organizations- to analyse, promote and sustain industrial innovation, R&I policies and strategies, sustainability and social responsibility aspects of technological innovation, co-creation and open innovation practices, and the exploitation and dissemination of scientific knowledge.
Visit the stand to have updated information on activities and opportunities for cooperation with Airi, including the following publications, projects and initiatives:

- Airi Report: Le Innovazioni del prossimo futuro – Tecnologie prioritarie per l'industria
- SocKETs (H2020): Societal engagement on Key Enabling Technologies
- TechEthos (H2020): Ethics for technologies with high socio-economic impact.
- Gov4Nano (H2020): Risk and Innovation governance of nanotechnologies
- PEROSH Nano Training Project: Training on emerging risks in R&D and production of new and advanced materials and nanomaterials
- TernAria: Internet of Things sensors for air quality monitoring

BOOTH 20

ALFATEST strumentazione scientifica

ALFATEST SRL

Via Giulio Pittarelli, 97
00166 Roma (RM), ITALIA
Tel. +39 06 87465557
Fax +39 06 87465555

website: www.alfatest.it
contact person: **Alice BRUN**

Alfatest is distributing scientific equipment dedicated to Materials science and Bio-sciences, providing its customers with leading technologies and high-level technical and applicative support based on a 30 years' experience. In addition, the contract analysis laboratory AlfatestLab is available to anyone for training, demonstrations, method development, and general scientific support on all our technologies.

Alfatest srl is the exclusive distributor in Italy for Malvern Panalytical products dedicated to particle size and shape analysis, rheology, GPC/SEC and microcalorimetry.

Alfatest is also distributor in Italy for: Thermo Fisher Scientific Desktop SEM, Micromeritics, Formulaction, Postnova Analytics, Haver&Boecker, Microfluidics, Freeman Technologies, Sopat, Alpha-MOS, Armfield, Syrris, Dolomite Microfluidics, Applied Photophysics, Molecular Devices.

BOOTH 5

ANTON PAAR ITALIA

Via Albenga, 78
10098 Rivoli (TO), ITALIA
Tel. + 39 011 9537560
Fax +39 011 9593542

website: www.anton-paar.com
contact person: **Valentina LIPPOLIS**
e-mail: info.it@anton-paar.com

Anton Paar develops, produces and distributes highly accurate laboratory instruments and process measuring systems, and provides custom-tailored automation and robotic solutions. It is the world leader in the measurement of density, concentration and CO_2 and in the field of rheometry. Anton Paar GmbH is owned by the charitable Santner Foundation. Progress and innovation, high-precision craft and the passion for research – these define Anton Paar. Our measuring instruments reflect our thoughts and actions: Components produced with the highest precision, innovative measuring principles and well-designed user interfaces represent our understanding of quality. Our products are created in a dialog with our customers and integrate seamlessly into their working environment. They exactly meet customers' requirements and are the solutions for the challenges they face. The notion of continually pushing back the limits of what is technically feasible inspires and motivates us each day to produce the best measuring instruments for our customers. As the world leader in the fields of density and concentration measurement, rheometry, material characterization and the determination of dissolved CO_2 we are already well on our way to achieving this. A company that wants to be able to provide customers with the best solutions always has to do more than other companies on the market. Innovation is the basis for progress and part of our DNA. It is rooted in the close cooperation with our customers and is created via outstanding work in the field of research and development (R&D). For decades the company has invested around 20 percent of Anton Paar GmbH's turnover in R&D. This team develops new measuring principles, sensor generations and technologies which contribute in the long term to expanding our market leadership and achieving this position in other fields. Using state-of-the-art production technologies, Anton Paar produces high-precision measuring instruments which are designed to meet the requirements of customers.

BOOTH 2

ASITALY

Via della Mola, 1
00037 Segni (RM), ITALIA
Tel. +39 06 56556496
Fax +39 06 56556496

website: www.asitaly.it
contact person: **Gildo DI DOMENICO**
e-mail: info@asitaly.it

AsItaly srl is a company established in 2019 as a spin-off of the "Hypatia Research Consortium" which started its activity in 2008. AsItaly is specialized in providing latest generation nanomaterials, graphene in its various forms, nanoparticles of many metals, carbon nanotubes, fullerenes, nanowires and nano-inks and recently also graphene supercapacitors, for research and industry in a wide range of applications.
We operate largely with public procurement whose legislation is characterized by a sectoral language in which it is sometimes difficult to navigate, but now in this area we move with ease and competence. We also provide scientific advice and technical support through our network of consultants and researchers. The company headquarters is on the outskirts of Rome where the assistance center and commercial offices are located.
We, at AsItaly, have the difficult task of satisfying our customers and our suppliers at the same time, so our mission is to obtain absolute satisfaction from both.
Our core values are: A careful selection of the product and supplier, reliability, speed and punctuality in the offer; competence and professionalism of collaborators, courtesy, respect and friendly behavior, maximum availability for customers and suppliers, mitigation of risks and dangers, credibility and honesty.
The CEO of the company has a long experience in the field of scientific research, consumer electronics, innovative materials and environmental protection, his collaborators have specific skills in nanomaterials and industrial electronics. The set of our skills, professionalism and passion are fundamental for our success. We manage every single step of our customer interactions to ensure positive results and great future relationships.

BOOTH 10

ASSING SPA

Via Edoardo Amaldi, 14
00015 Monterotondo (RM), ITALIA
Tel. +39 06 906701
Fax +39 06 90670200

website: www.assing.it
contact person: **Ettore GAROFALO**
e-mail: sales@assing.it

Assing S.p.A 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.

Special attention has always been given to the nanotechnology. **Assing** can propose observation, analysis and process instruments such as: electronic microscopes, X-ray microscopes, dual beam systems (**Tescan - Orsay**), a wide range of diffraction and X-ray fluorescence equipment (**Rigaku**), Electronic lithography systems (**Crestec**), atomic force microscopies, optical and stylus profilometers (**BRUKER Nano Surfaces**), XPS, TOF SIMS, AUGER (**PHi**), In situ AFMs, designed for easy integration into variety of SEMs, enabling fast correlative sample characterization in the nanoscale (NenoVision), nanomanipulators (**Imina**).

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.

BOOTH 10

AGAR SCIENTIFIC

Unit 7, M11 Business Link
Parsonage Lane
Stansted, Essex
CM24 8GF, UNITED KINGDOM
Tel. +44 (0)1279 215 506
Fax +44 (0)1279 813 105

website: www.agarscientific.com
contact person: **Ettore GAROFALO**
e-mail: sales@assing.it

A leading international supplier of scientific instruments and accessories for over 40 years, Agar Scientific specialises in consumables and equipment supporting all forms of microscopy.

BOOTH 10

BRUKER SURFACE & DIMENSIONAL ANALYSIS

7, rue de la Croix Martre
91120 Palaiseau, FRANCE
Tel. +33 172 86 61 00
Fax +33 172 86 61 20

website: www.bruker.com/products/surface-and-dimensional-analysis.html
contact person: **Ettore GAROFALO**
e-mail: sales@assing.it

Bruker Nano Surfaces provides industry-leading surface analysis instruments for the research and production environment. Our broad range of 2D and 3D surface profiler solutions supply the specific information needed to answer R&D, QA/QC, and surface measurement questions with speed, accuracy, and ease. Bruker's AFMs are enabling scientists around the world to make discoveries and advance their understanding of materials and biological systems. Our tribometers and mechanical testers deliver practical data used to help improve development of materials and tribological systems.

BOOTH 10

CRESTEC CORPORATION

9-2, Owada-machi, Hachioji-shi,
Tokyo 192-0045, JAPAN
Tel. +81 042-660-1195
Fax +81 042-660-1198

website: www.crestec8.co.jp
contact person: **Ettore GAROFALO**
e-mail: sales@assing.it

Crestec Corporation provides Dedicated electron beam lithography systems, tailored to deliver extremely high currents in a minimal diameter beam spot.

BOOTH 10

IMINA TECHNOLOGIES SA

EPFL Innovation Park, Bâtiment E
CH-1015 Lausanne, SWITZERLAND
Tel. +41 21 552 40 50
Fax +41 21 552 40 50

website: www.imina.ch
contact person: **Ettore GAROFALO**
e-mail: sales@assing.it

Imina Technologies is the maker of the miBot™, an extremely versatile and intuitive to use piezo-based sample manipulator. These innovative robotic solutions for positioning, handling and electrical sensing at micro and nano scales in combination with various third party instruments are used to position with precision probe tips on electronic devices , sensors, semiconductors , MEMS, etc or to handle and characterize electric properties of nanoparticles, nano wires & fibers in material science. These techniques can be used in combination with the SEM, Optical Microscope, X-Ray, AFM, Raman, etc or at an electrical probing workbench.

BOOTH 10

NENOVISION

Purky ova 649/127
612 00 Brno – Kohoutovice, ESKÁ REPUBLIKA
Tel. +420 605 287 732
Fax +420 605 287 732

website: www.nenovision.com
contact person: **Ettore GAROFALO**
e-mail: sales@assing.it

NenoVision is a technology company based in Brno, in the Czech Republic. We were the first spin-off from the Brno University of Technology and Central European Institute of Technology.

NenoVision develops, manufactures, and sells a revolutionary type of atomic force microscope (AFM) LiteScope™ which was designed for fast and easy integration into scanning electron microscopes (SEMs).

BOOTH 10

PHYSICAL ELECTRONICS INC. (PHI)

18725 Lake Drive East
Chanhassen, MN 55317
Tel. +952 8286100
Fax +952 8286100

website: www.phi.com
contact person: **Ettore GAROFALO**
e-mail: sales@assing.it

Physical Electronics (PHI) the world's leading supplier of UHV surface analysis instrumentation used for research and development of advanced materials in a number of high technology fields including: nanotechnology, microelectronics, storage media, bio-medical, and basic materials such as metals, polymers, and coatings. PHI's innovative XPS, AES, and SIMS technologies provide our customers with unique tools to solve challenging materials problems and accelerate the development of new materials and products.

BOOTH 10

RIBER

31 Rue Casimir Périer
95870 Bezons, FRANCE
Tel. +33 (0)1 39 96 65 03
Fax +33 (0)1 39 96 65 03

website: www.riber.com
contact person: **Ettore GAROFALO**
e-mail: sales@assing.it

Riber is the world's leading provider of molecular beam epitaxy (MBE) equipment, the most versatile and precise tool to deposit precise amounts of material onto substrates and which are used to design and create the newest semiconductor structures for manufacturing many novel devices. It is also a leading supplier of high-quality material evaporation sources.

BOOTH 10

RIGAKU CORPORATION

3-9-12, Matsubara-cho, Akishima-shi
Tokyo 196-8666, JAPAN
Tel. +81 3-3479-0618
Fax +81 3-3479-6171

website: www.rigaku.com/en
contact person: **Ettore GAROFALO**
e-mail: sales@assing.it

Since its inception in 1951, Rigaku has been at the forefront of analytical and industrial instrumentation technology. Today, with hundreds of major innovations to their credit, the Rigaku group of companies are world leaders in the fields of general X-ray diffraction, thin film analysis, X-ray fluorescence spectrometry, small angle X-ray scattering, protein and small molecule X-ray crystallography, Raman spectroscopy, X-ray optics, semiconductor metrology, X-ray sources, computed tomography, non-destructive testing and thermal analysis.

Rigaku is based in Tokyo (Japan) with additional production and laboratory facilities in both Japan and the United States.

European facilities are located in United Kingdom, Germany, Czech Republic and Poland.

Rigaku products are worldwide well known for the top-level design, the high performance and the unequaled reliability.

BOOTH 10

TESCAN

Libušina tř. 21
623 00 Brno – Kohoutovice, ČESKÁ REPUBLIKA
Tel. +420 530 353 411
Fax +420 530 353 415

website: www.tescan.com
contact person: **Ettore GAROFALO**
e-mail: sales@assing.it

TESCAN is a global suppliers of scientific instruments. The company is building its reputation and brand name in the field of designing and manufacturing scanning electron microscopes and system solutions for different applications.
The company is focused on research, development and manufacturing of scientific instruments and laboratory equipment such as:

- scanning electron microscopes
- dual beam
- supplementary accessories for SEMs
- light optical microscopy accessories and image processing
- special vacuum chambers and custom systems
- detection systems
- scientific hardware and software development

BOOTH 7

BRUKER ITALIA

Viale V. Lancetti, 43
20158 Milano (MI), ITALIA
Tel. + 39 02 70636370
Fax +39 02 2361294

website: www.bruker.com/en/products-and-solutions/elemental-analyzers/eds-wds-ebsd-SEM-Micro-XRF.html
contact person: **Cristian VAILATI**
e-mail: bruker.italy@bruker.com

Unique Range of Analytical Tools for Electron Microscopes

Bruker's electron microscope analyzers EDS, WDS, EBSD and Micro-XRF on SEM offer the most comprehensive compositional and structural analysis of materials available today. The full integration of all these techniques into the ESPRIT 2 software allows you to easily combine data obtained by these complementary methods for best results.

QUANTAX FlatQUAD - Where Conventional SDDs Reach Limitations

QUANTAX FlatQUAD is the EDS microanalysis system based on the revolutionary XFlash® FlatQUAD. This annular four-channel silicon drift detector is inserted between SEM pole piece and sample, achieving maximum solid angle in EDS. In combination with the ESPRIT analytical software suite, QUANTAX FlatQUAD provides unrivaled mapping performance, even for the most difficult samples.

BOOTH 17

ELDICO SCIENTIFIC

PARK INNOVAARE: delivery LAB
5234 Villigen, SWITZERLAND

website: www.eldico-scientific.com
contact person: **Danny STAM**
e-mail: info@eldico.ch

ELDICO Scientific AG (The Electron Diffraction Company) is a Swiss technology and service company that was founded in 2019. ELDICO develops, manufactures and commercializes solutions based on the electron diffractometer. ELDICO's clients are industrial and academic researchers in large and fast-growing areas such as the health care, energy storage and advanced materials applications.
ELDICO's headquarters is based in Villigen, Switzerland, at the Park Innovaare next to Paul Scherrer Institute. At ELDICO's experience centre and application lab in Basel, we offer product demonstrations, customer training and routine analysis on commercial samples.

ELDICO's Electron Diffractometer, the ELDICO ED-1, is a novel analytical instrument for electron crystallography, enabling researcher to investigate nano-crystalline samples with particle size below 1000 nm.
The ELDICO ED-1 is an Electron Diffractometer developed by scientist for scientists and is therefore intuitive to operate. The unique patented goniometer enables researchers to get molecular structure information on their nanoparticles in less than a minute also under cryogenic conditions.
ELDICO offers the following analyses on your nanosized materials: Crystal structure determination, Absolute configuration confirmation, Crystal mapping of phase mixtures, Identification of crystalline impurities, Polymorphism characterisation, Detection of micro-crystallinity in amorphous materials.
Customer-specific needs can also be discussed and tailored to provide solutions together with our experts.

BOOTH 15

EMME 3 S.R.L.

Via Meraviglia, 31
20045 Lainate (MI), ITALIA
Tel. +39 02 93466541

website: www.emme3-srl.it
contact person: **Gianvito ARPINO**
e-mail: g.arpino@emme3-srl.it

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, FIB milling, holders, **Gatan**)
- 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**).

BOOTH 14

GAMBETTI KENOLOGIA

Via A. Volta, 27
20082 Binasco (MI), ITALIA
Tel. +39 02 90093082
Fax +39 02 952778

website: www.gambetti.it
contact person: **Stefania FABBRI**
e-mail: sales@gambetti.it

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 solid and consolidated presence 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 propose these new instruments and systems in addition to our historical partners, including Park Systems, KLA, Oxford Instruments Plasma Technology and others.

BOOTH 14

KLA INSTRUMENTS

Three Technology Drive
Milpitas, 9503 California, USA
Tel. +1-408-875-3000

website: www.kla.com

A global technology leader. We make an impact by creating solutions that drive progress and transform industries.

We provide leading-edge technology and devices using advanced inspection tools, metrology systems, and computational analytics. Our solutions accelerate tomorrow's electronic devices.

We enable The evolution and innovation in the data era across key industries including automotive, mobile and data center.

BOOTH 14

OXFORD INSTRUMENTS PLASMA TECHNOLOGY

66.8 mi Yatton
BS49 4AP, Bristol, UK
Tel. +44 (0)1934 837000

website: www.oxinst.com

Oxford Instruments Plasma Technology is a leading provider of etch & deposition processing equipment & solutions.

Plasma technology is used in the fabrication of most semiconductor devices created today across a wide range of industries. It is able to provide unique solutions for the creation and manipulation of matter with atomic-scale accuracy.

BOOTH 14

PARK SYSTEMS

KANC 4F, Gwanggyo-ro 109
Suwon 16229, SOUTH KOREA
Tel. +82-31-546-6800
Fax +82-31-546-6805

website: www.parksystems.com

Park Systems. Leading innovation in emerging nanoscale microscopy and metrology technology

Products from Park Systems are used by some of the most notable researchers and corporations across the globe. We strive to meet the needs of our clients by constantly working to create the most accurate, easy to use nanoscale microscopy technology available.

BOOTH 14

POLYTEKNIK

Moellegade, 21
DK-9750 Oestervraa, DENMARK
Tel. +45 9689 2800

website: www.polyteknik.com
e-mail: sales@polyteknik.dk

Polyteknik AS - WHEN THIN FILM MATTERS

Polyteknik AS is a PVD equipment manufacturer with an innovative and best service approach. With more than twenty years in business, a global reference list, and an excellent platform of technology, Polyteknik AS has turned to be an appreciated partner in the thin film industry.

PVD Systems

The portfolio of platform systems range from small scale R&D to high volume or large area deposition systems - covered by the FLEXTURA and INFINITY VB platforms. Polyteknik AS cover several deposition processes including sputtering, evaporation, and varieties of these. At Polyteknik AS you will meet a dedicated team interested in a strong cooperation towards the best solution.

BOOTH 13

INRIM

Strada delle Cacce, 91
10135 Torino (TO), ITALIA
Tel. + 39 011 39191
Fax + 39 011 346384

website: www.inrim.it
contact person: **Luca BOARINO**
e-mail: inrim@inrim.it

INRIM is a public research centre and is Italy's national metrology institute (NMI).
INRIM realises, maintains, and develops the national reference standards of the measurement units of the International System (SI), consisting of seven base units - metre, kilogram,second, ampere, kelvin, mole, and candela - and derived units. Thanks to these standards, the Institute ensures measurements that are reliable and comparable on both a national and international scale.

INRIM's research spans many other areas such as materials science, nanoscience, quantum optics, studies on the fundamental constants of physics. Basic and applied research and the development of new measurement technologies and instruments enhance the metrology activity.
Through seminars, exhibitions, events and conferences, INRIM presents and disseminates its scientific findings and advancements. The Institute promotes education and training for young scientists organising PhD courses and financing scholarships and research grants.
To meet the needs of industry, INRIM has a dedicated department working in close contact with the world of production and providing consultancy, calibration, and testing services.
The Institute supports the National Laboratory Accreditation System by ensuring the quality of measurement standards and procedures and promoting the dissemination of the national standards of the SI measurement units.

BOOTH 11

JEOL ITALIA

Palazzo Pacinotti - Milano 3 City
Via Ludovico il Moro, 6/A
20080 Basiglio (MI), ITALIA
Tel. +39 02 9041431
Fax +39 02 90414343

website: www.jeol.it
contact person: **Gabriele BULLA**
e-mail: info@jeol.it

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 16

MICRON SEMICONDUCTOR ITALIA

Sede Legale
Via Trento, 26
20871 Vimercate (MB), ITALIA

Unità Locale
Via Newton, 34
67051 Avezzano (AQ), ITALIA
Tel. +39 0863 456001
Fax +39 0863 423283

website: www.micron.com
contact person: **Tommaso VALI**
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

NanoMEGAS SPRL

Rue Èmile Claus, 49 bte, 9
1050 BRUSSELS, BELGIUM
Tel. +32 2346 5637
Fax +32 2647 4760

website: www.nanomegas.com
contact person: **Athanassios GALANIS**
e-mail: info@nanomegas.com

NanoMEGAS (www.nanomegas.com) founded in Brussels in 2004, is a world leader SME in the development and commercialization of unique transmission electron microscopy (TEM) accessories for several scientific / industrial applications based on precession electron diffraction. NanoMEGAS was the first company to develop and commercialize Precession Electron Diffraction (PED) equipment that is compatible for almost all type of commercial TEM and has been installed in more than 150 laboratories all over the world. Based on PED method that consist a breakthrough in electron diffraction, various applications have been developed. Electron crystallography has been considered as an alternative powerful tool for the structure analysis of crystals of few nm size and many important materials and compounds have been analyzed. In 2008 in collaboration with CNRS-INP Grenoble-France (common Patent) the Automated Phase-Orientation Mapping application, called "ASTAR", has been launched which allows 1-5 nm resolution maps (EBSD like) for any material (for FEG-TEM). ASTAR received the "Microscopy Today 2011 Innovation Award" during M&M 2011 Congress in USA. NanoMEGAS has also developed, in collaboration with NanoMEGAS USA, a Strain Analysis method using TEM that provides results with high strain sensitivity (up to 0.02% of strain) and spatial resolution (up to 1-5 nm when FEG-TEM is used). In September 2015 NanoMEGAS was proudly announced a novel solution in collaboration with Columbia University, for the analysis of amorphous materials using the electron Pair Distribution Function (ePDF) algorithm specifically prepared for data obtained by TEM, reducing dramatically the acquisition time compared to conventional x-ray techniques. Due to the large number of NanoMEGAS devices and applications installed worldwide, the scientific production on Electron Diffraction applications has been exponentially increased since 2004 with high lever peer reviewed published articles.

BOOTH 6

PLATINUM "Aziende&Protagonisti"

Publiscoop Più Srl
Piazza della Serenissima, 40/A
31033 Castelfranco Veneto (TV), ITALIA
Tel. +39 0423 425411
Fax +39 0423 425402

website: www.platinum-online.com
contact person: **Gaetano FERRETTI**
e-mail: gaetano.ferretti@platinum-online.com

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. Inoltre, è interamente fruibile al sito www.platinum-online.com, in modalità ***"Open Access"***, in italiano ed in inglese, con condivisione dei contenuti nei maggiori social network (galleria fotografica, video-intervista e link al sito progetto) con possibilità di effettuare il download della pubblicazione in formato pdf. Rubrica RICERCA&INNOVAZIONE, importante appuntamento editoriale su PLATINUM completamente dedicato alla divulgazione scientifica di grandi progetti Nazionali ed Europei, con contributi redazionali a cura delle maggiori Istituzioni Nazionali ed Europee, nonchè,una presenza costante della Commissione Europea CCR-Ispra (Joint Research Centre, JRC) http://www.platinum-online.com/rubrica-ricerca-innovazione/ La rubrica RICERCA&INNOVAZIONE è costruita intorno alle Istituzioni Nazionali ed Estere, Università, Centri di Ricerca, Piattaforme e Distretti Tecnologici e alle Imprese che si distinguono per eccellenza ed innovazione, in un connubio perfetto e unico che evidenzia un quadro globale nazionale ed internazionale.

BOOTH 1

PRODOTTI GIANNI

Via Quintiliano, 30
20138 Milano (MI), ITALIA
Tel. +39 02 5097 220
Fax: +39 02 5097 276

website: www.ricerca.it
contact person: **Carlo COLOMBO**
e-mail:ricerca.assistenza@prodottigianni.com

Prodotti Gianni is a solid reality born in 1948, active in the distribution of ingredients for the Food, Cosmetic and Pharmaceutical industries and of materials and reagents destined to Scientific Research.

In 1961 Prodotti Gianni established the Life Science division. Its mission has been to select and represent the most reliable and innovative providers in the field, supporting researchers in upgrading their technological tools while ensuring the quality of the provided products. In addition to catalogue items, Prodotti Gianni offers a comprehensive custom service program.

Prodotti Gianni's portfolio includes:

- *"top-brand" suppliers with large catalogues: Abcam, Merck, Luminex Flow Cytometry e Imaging, Goodfellow*
- *small but extremely cutting-edge companies investing in the future: Lexogen, BioHelix, nanoComposix*
- *"rising stars" in the field of biotech: Ray Biotech, Genetex, SinoBiological*

Prodotti Gianni guarantees scientific and commercial pre and post sale support to the customers and a reliable delivery of its products, in terms of time and preservation.

Visit our web-site: www.ricerca.it

BOOTH 1

GOODFELLOW

Ermine Business Park, Huntingdon
PE29 6WR, ENGLAND
Tel. 0800 731 4653
Fax: 0800 328 7689

website: www.goodfellow.com
contact person: **Roberta BIANCHI**
e-mail: ricerca.assistenza@prodottigianni.com

Goodfellow is a leading global supplier of metals, alloys, ceramics, glasses, polymers, compounds, composites and other materials to meet the research, development and specialist production requirements of science and industry. The company has an extensive range of 70,000 catalogue products in multiple forms available off the shelf, most subject to free delivery within 48 hours and with no minimum order quantities.

With over 6000 customers supported by a worldwide network of offices, agents and distributors Goodfellow also offers a comprehensive range of bespoke processing services, effectively operating as an extension of the production team in order to develop custom fabricated components in any quantity required. Our in-house team is comprised of fellow scientists and engineers with extensive knowledge of materials and processing – through their technical expertise and a supporting range of specification tools the company has built an unrivalled reputation for helping to find solutions to even the most challenging of research problems. All of our products are also underpinned by the ISO 9001 quality accreditation.

BOOTH 1

NANOCOMPOSIX

4878 Ronson Ct Ste J
San Diego, CA 92111, USA
Tel. (+1) 858 565 4227
Fax: (+1) 619 330 2556

website: nanocomposix.com
contact person: **Roberta BIANCHI**
e-mail: ricerca.assistenza@prodottigianni.com

Founded in 2004, nanoComposix, is headquartered in San Diego, CA, USA. nanoComposix was built with the mission of providing precisely engineered and highly characterized nanomaterials to a global customer base. The product portfolio contains hundreds of different variants of materials, size, shape, and surface backed by extensive technical documentation and support. Development services are provided by a technical team with extensive expertise in nanotechnology, biology, chemistry, physics, and optics. nanoComposix produced the NIST nanosilver reference material and its materials have been utilized in over 3000 peer-reviewed publications. nanoComposix is an ISO 13485 certified company. This helps to ensure that our products and services are of the highest quality and continue to meet customer expectations.

Fortis Life Sciences is a strategic platform providing capital, expertise, and operational resources enabling the growth and success of founder-led life sciences tools companies. Fortis Life Sciences was founded in 2020, with the vision of creating a unique life sciences company focused on offering world class products coupled with the best in class customer experience.

BOOTH 18

PROJECT ACTPHAST4R

Central contact point
Brussels Photonics Team (B-Phot), Vrije Universiteit Brussel (VUB)
Tel. +32 479 79 46 00
contact person: **Peter DOYLE**
e-mail: pdoyle@b-phot.org
Tel. +32 494 82 49 41
contact person: **Nathalie DEBAES**
e-mail: ndebaes@b-phot.org

ACTPHAST 4R Accelerating Photonics Deployment via one Stop Shop Advanced Technology Access for Researchers. ACTPHAST 4R is a unique one-stop-shop photonics technology access and support centre for European researchers which is perfectly aligned with their needs in bridging the gap between fundamental research at TRL1-2 and applied research up to TRL4-5. Driven by the deployment ambitions and capabilities of a critical mass of European top-class researchers -in particular non-photonics researchers for whom advanced photonics is a key enabling technology to the realisation of so many exciting and diverse new applications and products, ACTPHAST 4R will directly support the accelerated deployment of existing cutting-edge photonics technologies by providing them with action-oriented solutions on two complementary levels. In the first instance, ACTPHAST 4R will provide researchers with one-stop-shop access to the photonics expert know-how and mature technologies of 24 of Europe's leading competence centres. The photonics technology platform capabilities of ACTPHAST 4R cover the entire integrated supply chain from design to packaging. Through intensive technology coaching, leading to focused innovation projects involving transnational internships and hands-on working with the advanced photonics technologies at the host institutes, the goal is to turn the researchers' scientific conceptual breakthroughs into industrially-relevant demonstrators. In parallel, ACTPHAST 4R will provide researchers with expert business coaching to help foster their entrepreneurial mindset and deployment capabilities, with guidance to pathways for further scaling of their demonstrators and financing of innovation in the industrial domain. Ambitious targets are set for commercial valorisation successes by "star performing" researchers in the form of patents, licensing deals and spin-outs. As a result, ACTPHAST 4R will be a game-changer in strengthening the European innovation ecosystem and improving the cross-fertilisation of photonics with other technology areas.

BOOTH 12

QUANTUM DESIGN ITALY

Via Francesco Sapori, 27
00143 Roma (RM), ITALIA
Tel. +39 06 5004204
Fax +39 06 5010389

website: https://qd-europe.com/it/it/
contact person: **Diego VITAGLIONE**
e-mail: italy@qd-europe.com

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**).

BOOTH 12

QUANTUM DESIGN MICROSCOPY

Im Tiefen See, 60a
64293 Darmstadt, GERMANY
Tel. +49 6151 8806-0
Fax +49 6151 8806-0

website: www.qd-microscopy.com
contact person: **Alessio SPAZIANI**
e-mail: aspaziani@qd-europe.com

At Quantum Design Microscopy we exploit the possibilities to combine different high-resolution microscopes and tools, in order to obtain information faster and more accurately than when using these methods separately.

In close cooperation with our mother company Quantum Design Int., we develop new instruments that enable this correlative analysis.

The AFSEM® is our solution to easily combine two of the most powerful microscopy methods– scanning electron microscopy (SEM) and atomic force microscopy (AFM) – to gain completely new insights into the micro- and nano-world.

Especially the capability to integrate the AFM system directly inside the high-vacuum environment of the SEM enables a completely new way to perform your research and your experiments.

Our team here at Quantum Design Microscopy consists of experts in the fields of physics, chemistry, material science, and engineering. We are passionate about correlative microscopy and know that it can also benefit your application.

BOOTH 12

NANOSURF AG

Gräubernstrasse, 12
4410 Liestal, SWITZERLAND
Tel. +41 61 927 47 47
Fax +41 61 927 47 00

website: https://www.nanosurf.com/en/
contact person: **Stefano PERGOLINI**
e-mail: pergolini@qd-europe.com

Nanosurf was founded in 1997 in Liestal, Switzerland, and has since become **one of the most trusted and established AFM brands in the market today**. While we continue to develop and manufacture our AFMs from our headquarters in Switzerland, we have grown to be a global company with direct sales, service and support operations in China, Germany, India, Singapore, UK and the US. Since its inception, **Nanosurf has focused on designing and manufacturing modular, high-quality and easy-to-use AFMs with excellent price to value ratio**.
Nanosurf has a vast knowledge base in scanning probe microscopy, with an average of more than **15 years of AFM experience** in our sales, service and development teams. Thanks to their extensive research backgrounds in AFM, our sales and application scientists can help you choose the most suitable AFM for your application and provide you with class-leading support.
Nanosurf was established as **a customer-centric company** and that tradition continues today. In case a standard instrument does not optimally meet your needs, our team is capable and willing to develop a tailored system for you. Such **tailored individualizations** are commonly required for samples that are non-planar, large or heavy — a field where our team has unparalleled experience. Nanosurf is the only AFM company to offer you this level of flexibility and customizability.
With the introduction of the **DriveAFM** in December 2020, Nanosurf was able to firmly plan their foot in the **high-end sector of the AFM research market**.

BOOTH 3

RENISHAW
Via dei Prati, 5
10044 Pianezza (TO), ITALIA
Tel. + 39 011 9666700
Fax + 39 011 9664083

website: www.renishaw.it
contact person: **Riccardo TAGLIAPIETRA**
e-mail: italy@renishaw.com

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 8

SCHAEFER ITALY
Via Luigi Einaudi, 23/2
45100 Rovigo (RO), ITALIA
Tel. +39.0425.073130
Fax +39.0425.27228

website: www.schaefer-tec.it
contact person: **Paolo BARIANI**
e-mail: info@schaefer-tec.it

Dal 2005 rappresentiamo aziende internazionali selezionate accuratamente che sviluppano strumentazione innovativa di misura e analisi sulla micro-nano-scala.

I nostri punti di forza sono:

- Attenzione alle esigenze del cliente
- Capacità di customizzare degli strumenti di misurazione
- Capacità di fornire supporto tecnico post-vendita qui in Italia.

La ns offerta tecnologica nel 2021 comprende:

- Tecniche di analisi di nano-particelle a nano-vescicole
- Microscopie 3D e 4D
- Metrologia ottica 3D
- SEM compatto con opzione di microanalisi.
- Strumentazione e componentistica per il vuoto ed il controllo di processo

BOOTH 21

SENSE-RISC

website: https://web.uniroma1.it/senseriscproject/
contact person: **Maria Sabrina SARTO**
e-mail: mariasabrina.sarto@uniroma1.it

The SENSE RISC project is developing an innovative multi-sensory wearable system integrated with sensors (looking as a simple a T-shirt) which allows the assessment of the risk of injury to the workers.
The system - based on nanotechnologies and nanomaterials (graphene, ZnO nanostructures, nanoparticles and highly biocompatible polymeric films, fiber Bragg grating -FBG- functionalized) - communicates via wireless with mobile devices (smartphones) and works through innovative bio-operational algorithms. The project sees the collaboration of 8 highly qualified partners:

1. Sapienza Università di Roma, Dipartimento di Ingegneria Astronautica, Elettrica, Energetica (Coordinatore)
2. Università di Pisa, Dipartimento di Chimica e Chimica Industriale
3. Università Campus Bio-Medico di Roma
4. Scuola Universitaria Superiore Sant'Anna di Pisa, Istituto di Biorobotica
5. Sapienza Università di Roma, Dipartimento Biologia e Biotecnologie "Charles Darwin"
6. Fondazione Don Carlo Gnocchi Onlus, Polo Tecnologico "IRCCS"
7. Università di Pisa, Centro di Ricerca E. Piaggio
8. INAIL, Dipartimento innovazioni tecnologiche e sicurezza degli impianti, prodotti e insediamenti antropici

SENSE MASC

contact person: **Maria Sabrina SARTO**
e-mail: mariasabrina.sarto@uniroma1.it

Il progetto SensE MAsc si inquadra nell'area di specializzazione "Scienze della Vita" della S3 della Regione Lazio e nel primo ambito tematico "Salute" del Pilastro 2 del programma Horizon Europe.

Obiettivo è lo sviluppo e il trasferimento tecnologico verso azienda di dispositivi di protezione individuali di tecnologia innovativa per la produzione di mascherine facciali sensorizzate ad elevata indossabilità per la prevenzione e mitigazione di rischi associati ad affaticamento respiratorio nei lavoratori, indotto dall'uso prolungato ai fini del contenimento dei contagi da COVID-19.

La mascherina è funzionalizzata mediante integrazione nel tessuto di sensori piezoresistivi a base grafene e di sensori di pressione ad elevata sensibilità in schiuma polimerica caricata con grafene. I sensori sono integrati in una piattaforma multisensoriale che riconosce e segnala situazioni di rischio associato ad affaticamento respiratorio, progettata in modo tale da operare tramite protocollo wireless.

BOOTH 9

Seeing beyond

CARL ZEISS SPA con socio unico
Via Varesina, 162
20156 Milano (MI), ITALIA
Tel. +39 02 93773.1
Fax +39 02 93773.539

website: www.zeiss.it
contact person: **MarComm Office**
e-mail: marketing.czi@zeiss.com

What Drives Us

As the pioneer of scientific optics, we continue to challenge the limits of human imagination. With our passion for excellence, we create value for our customers and inspire the world in new ways.

ZEISS is an internationally leading technology enterprise operating in the optics and optoelectronics industries. In the past fiscal year, the ZEISS Group generated annual revenue totaling 6.3 billion euros in the four segments Semiconductor Manufacturing Technology, Industrial Quality & Research, Medical Technology, and Consumer Markets, and invested 13% of its revenue in research and development (as of 30/09/2020). ZEISS has a long tradition of similarly high expenditures for research and development, which also represent an investment in the future. Research Microscopy Solutions - Seeing even the finest details. As a leading manufacturer of microscopes ZEISS offers inspiring solutions and services for your life sciences and materials research, teaching and clinical routine. Reliable ZEISS systems are used for manufacturing and assembly in high tech industries as well as exploration and processing of raw materials worldwide. With its unique portfolio, constant innovations and strong partnerships, ZEISS Microscopy enables leading researchers to find answers to our society's most pressing challenges and drive scientific discovery forward. A dedicated and well-trained sales force and a responsive service team enable customers to use their ZEISS microscopes to their full potential. ZEISS microscopes visualize tiny structures in nano dimensions, and highly efficient metrology systems guarantee productivity and quality assurance in industry. Prominent scientists put their trust in ZEISS microscopes when conducting their research.

ELDICO SCIENTIFIC
THE ELECTRON DIFFRACTION COMPANY

Crystal structure at the nanoscale?
use ELECTRON DIFFRACTION

ELDICO's Electron Diffractometer: the ELDICO *ED-1* is a novel analytical instrument for electron crystallography, enabling researcher to investigate nanocrystalline samples with particle size below 1000 nm.

AVAILABLE NOW!

The concept:
- Designed by scientist for scientists
- Device optimized for diffraction experiments of nanoparticles
- Easy-to-use hardware and software
- Low dose for beam-sensitive materials
- Patented goniometer for stable and precise nanorotation

Applications:
- Crystal structure determination
- Crystal mapping of multiphase mixtures
- Identification of impurities
- Micro-crystallinity in amorphous materials

ELDICO Scientific AG, PSI West, 5234 Villigen, Switzerland
www.eldico-scientific.com , info@eldico.ch

ALFATEST strumentazione scientifica

Interreg ITALIA-SLOVENIJA NANO-REGION

NANO REGION

AMERICAN ELEMENTS THE ADVANCED MATERIALS MANUFACTURER®

nanosurf

ELDIGO SCIENTIFIC THE ELECTRON DIFFRACTION COMPANY

OXFORD INSTRUMENTS

emme3 your lab choice

Park SYSTEMS

FEDERCHIMICA CONFINDUSTRIA

POLYTEKNIK

Gambetti Vacuum Technology and Related Solutions

PRODOTTIGIANNI Our competence, your value.

GoodFellow Your global supplier for materials

Quantum Design ITALY

KLA INSTRUMENTS

Quantum Design MICROSCOPY

nanoComposix | FORTIS LIFE SCIENCES

schaefer

NanoMEGAS Advanced Tools for electron diffraction

KLOPMAN INTERNATIONAL

"There's Plenty of Room at the Bottom"

Richard Feynman

2021