ORGANIZERS

Airi ASSOCIAZIONE ITALIANA PER LA RICERCA INDUSTRIALE

Nano Associazione Italy

SAPIENZA UNIVERSITÀ DI ROMA

Renaissance Cloister by Sangallo

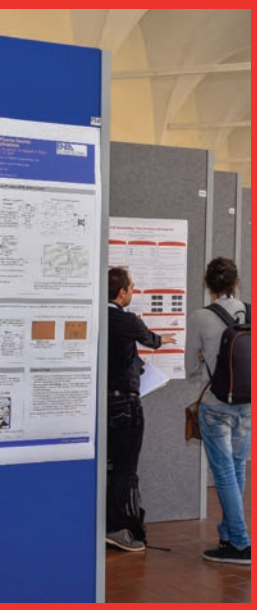
Faculty of Civil and Industrial Engineering

SEPTEMBER **11-14** 2018

Nano 2018 Innovation

Rome, 11-14 September

Conference & Exhibition





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ATOM@ SNNLab CNIS

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SCUOLA NORMALE SUPERIORE

UNIVERSITAS STUDIORUM NEAPOLITANA

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DSCTM

DSFIM Department of Physical Sciences and Technologies of Matter

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

INRiM ISTITUTO NAZIONALE DI RICERCA METROLOGICA

MATERIALI NANOFASICI

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APRE Agency for the Promotion of European Research

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nanoforum

www.nanoinnovation.eu

index

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The printed version of NanoInnovation 2018 programme *is updated at September 3rd.*

All subsequents changes and updates will be available on the official website: **www.nanoinnovation.eu**

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

WELCOME

After the successful experience of the former events NanoItaly and Nanotechitaly, their promoting Organizations, namely **NanoItaly Association and Airi - Italian Association for Industrial Research**, respectively, have agreed in 2016 to organize a new joined event: NanoInnovation.

The second edition of **NanoInnovation** has successfully finished with the following numbers: 1.150 participants, 23 co-organizers, 27 exhibitors, 24 industrial sponsors, 4 scientific sponsors, 1 corporate partner, 70 chairs, more than 300 speakers, 3 plenary sessions, 4 tutorial lectures, 13 international keynote lectures, 54 technical thematic symposia, 8 special sessions, 1 round table, 4 workshops, 4 satellite events, 2 poster sessions, 2 prizes for young researchers, 4 international delegations coming from South Korea, Poland, Switzerland and Taiwan and 50 networking participants with 171 B2B meetings organized.

The third edition of **NanoInnovation** will be held from 11 to 14 September 2018, still hosted in the renaissance cloister by Sangallo at the Faculty of Civil and Industrial Engineering of "Sapienza" University of Rome.
NanoInnovation is 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.

Main goals of **NanoInnovation 2018** still are:

- Providing a **meeting forum** among academy, research and companies.
- Displaying the **State of the Art** in applied research on nanotechnology.
- Acting as a **showcase** for the most important innovation deriving from nanotechnology and KETs
- Supporting the **knowledge transfer** among different application sectors.

The promotion of a **Responsible Research and Innovation**, toward a sustainable development in the social environment and economic frames is one of the driving themes of the event.
The programme of **NanoInnovation 2018**, strongly oriented toward application and market aspects of nanotechnology and KETs, foresees the presence of highly qualified speakers and institutions, coming from national and international companies, research centers and universities.

NanoInnovation also offers to students, PhDs and young researchers an excellent and unique opportunity of updating on the latest developments on nanotechnologies, meeting leading players in the field. Several participation opportunities will be scheduled, ranging from the presentation of the research results on applicative technologies to the organization of technical-scientific sessions, workshops and satellite events, also with the purpose of presenting new instruments or disseminating projects results.

We would like 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 thank to the companies and organizations sponsoring 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 2018 Organizing Committee

Organizing Committee

Marco ROSSI *(chair)*

- Sapienza University of Rome
- NanoItaly Association

marco.rossi@uniroma1.it

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- Airi

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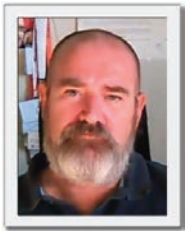

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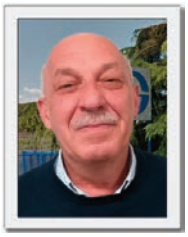

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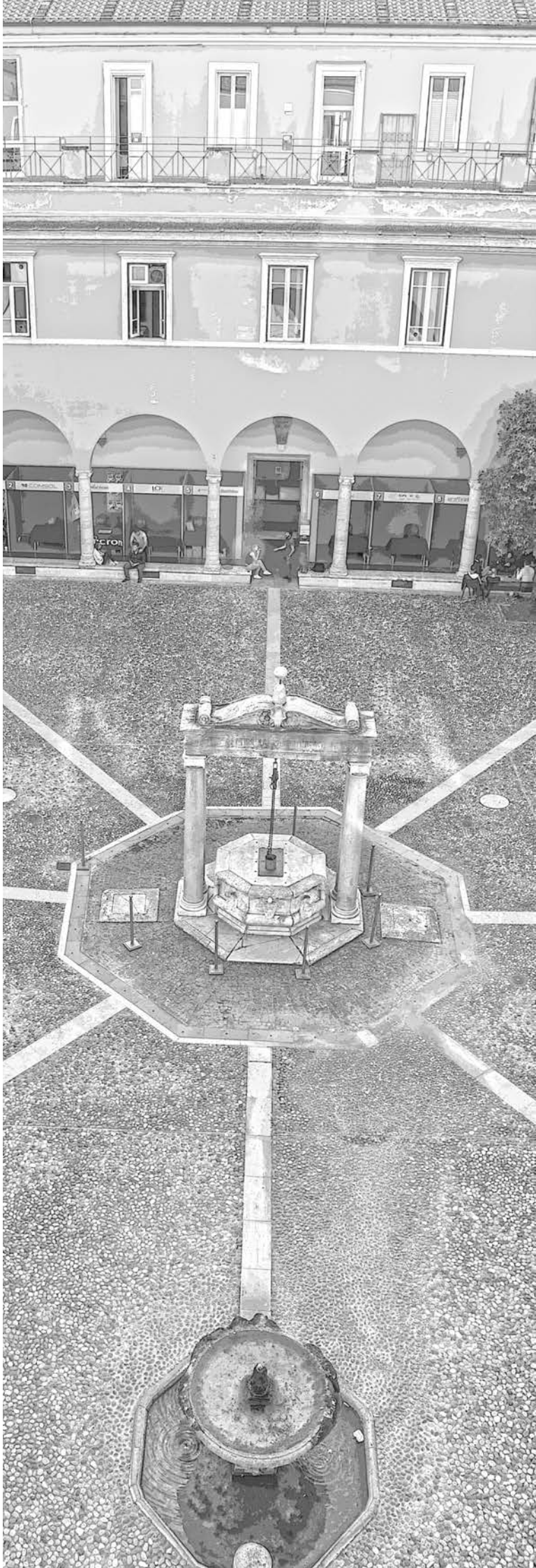

ATOMCENTER

Open Infrastructure for Advanced TOmography and Microscopies (ATOM)

http://www.lazioinnova.it/news/premiati-i-vincitori-dei-bandi-kets-e-infrastrutture-per-la-ricerca/#

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 Rome Sapienza University, 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 region Lazio, as well as in Italy and internationally.

The network that these research institutions intend 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 is 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 to the bio-medical, micro- and nano-electronics, cultural heritage and additive manufacturing sectors.

ATOM is conceived as a link between 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. It, thus, 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

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PARTNER di PROGETTO

SBAI

CNRNANOTEC INSTITUTE OF NANOTECHNOLOGY

CNIS CENTER OF NANOTECHNOLOGY FOR ENGINEERING OF SAPIENZA

DIPARTIMENTO DI CHIMICA

Airi
Associazione Italiana per la Ricerca Industriale

ASSOCIAZIONE ITALIANA PER LA RICERCA INDUSTRIALE

Airi is a private, not-for profit Association, funded in 1974 to promote industrial Research and Innovation in Italy and to enhance co-operation between the private and public sector.

The Association is the focal point for about 100 members, representing private industrial enterprises, large and SMEs, active in Research & Innovation, as well as public research organizations. Researchers of Airi members constitute about the 45% of the researchers in the Country.

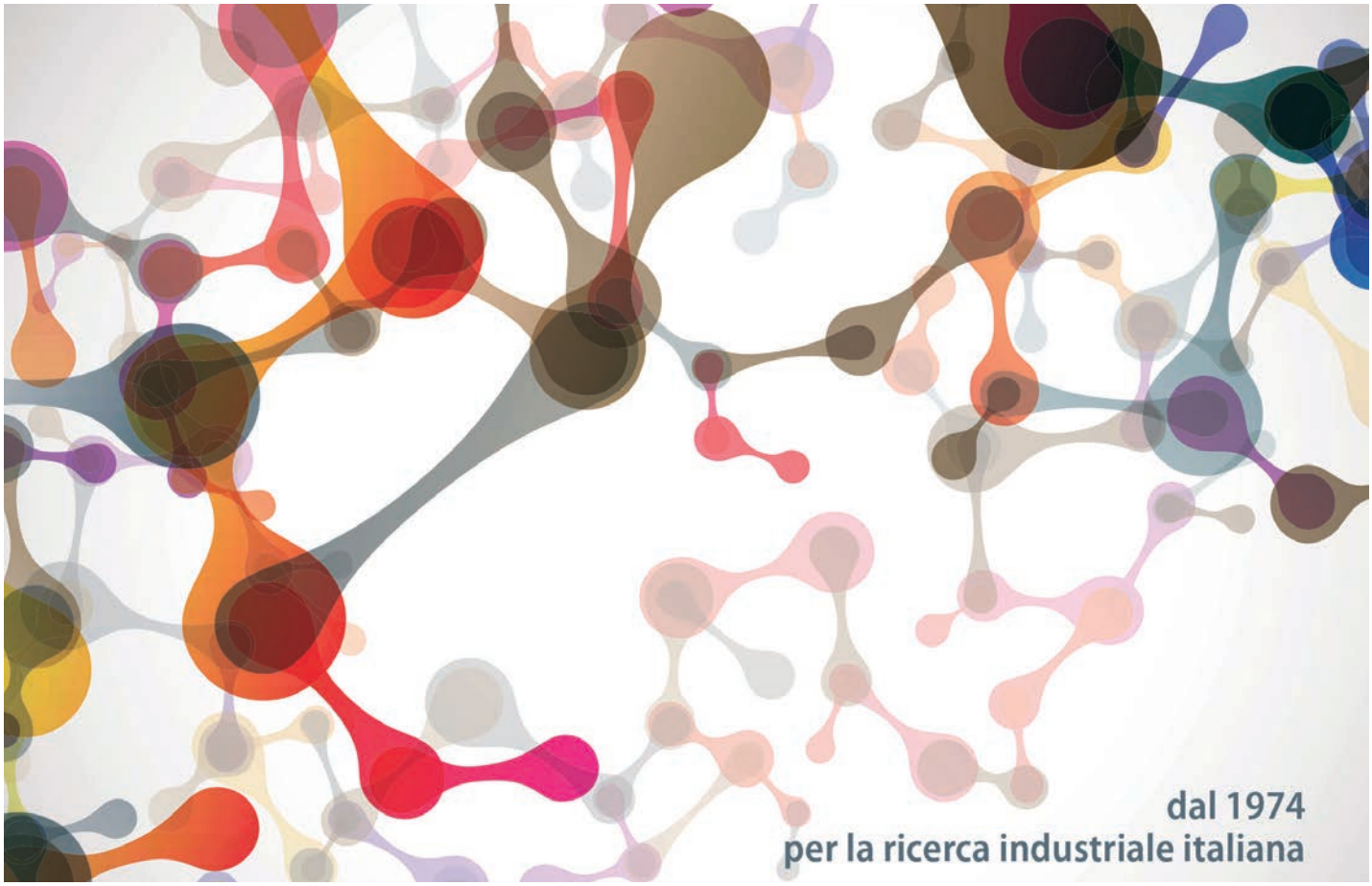
In 2003, Airi has created Airi/Nanotec IT, a division dedicated to promote nanotechnologies and their application. A large part of the Italian players in nanotechnology is member of Airi/Nanotec IT, which, since 2014, has extended its attention to the integration of nanotechnologies with the other Key Enabling Technologies (KETs).

To pursue its mission, Airi, monitors scientific R&D trends and their applications, disseminates information, facilitates technology transfer and promotes Responsible Research and Innovation (RRI). International contacts and cooperation are pivotal to its activity. Airi has a long experience in participation in co-operative European projects (FP 6, FP 7, Horizon 2020). Often as co-ordinator.

Due to its broad representative base and experience, Airi is a key opinion leader for the National decision-makers in addressing industrial research and innovation strategies aimed to sustain the technological development of the Country, strengthen its competitive position. Airi, periodically publish a report "*Prioritary Technologies for the Italian Industry*", which has become a guide for National technology planning. In 2015, together with CNR, Airi has published a report on Responsible Research and Innovation. MIUR has embodied its indications in the National Plan for Research 2015-2020.

The organization, by Airi, of an International Conference dedicated to nanotechnologies (*NanotechItaly*) dates back several years. *NanotechItaly 2015* was at the 8th Edition.

Web Site: www.airi.it - www.nanotec.it



Associazione Nanoitaly

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

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

The main purpose of the Association is to promote and support the integration of the scientific and industrial communities relating the wide field of bio-nano technologies, composed of researchers, technologists and professionals from public research and industrial laboratories, in order to discuss innovative ideas, exchange knowledge and 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 infrastructure for the needs of research in nano-bio-technology and nanoscience.

The association membership is open to both individuals and organizations interested in participating in the development of the variegated world of nano-bio-technology.
For more information and adhesion please refer to the Association website: www.associazione-nanoitaly.it which will be available since October 1st 2015.

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)

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

Since its founding 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 Latin 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 at 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

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

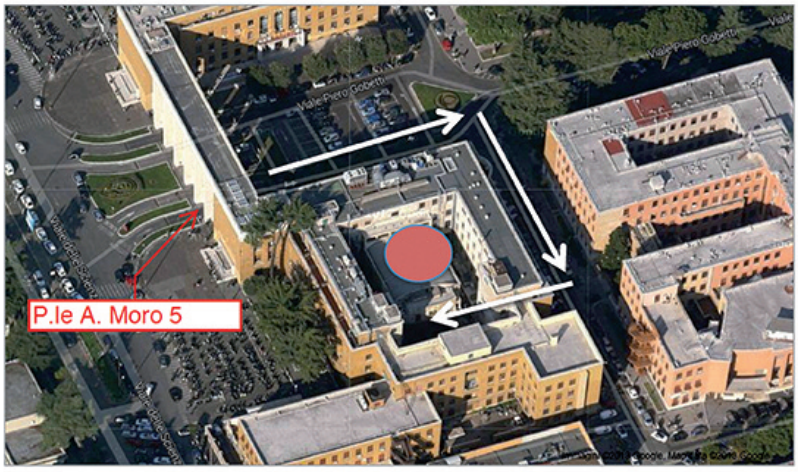
(Centro per le Nanotecnologie applicate all'Ingegneria di Sapienza Università di Roma)

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.

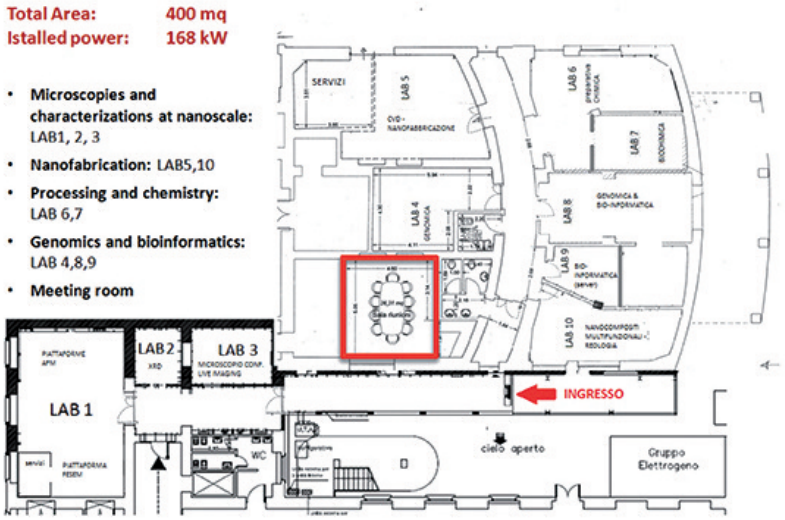
The SNN-Lab is finalized to:

- Integrate the multidisciplinary competencies 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.



Total Area: 400 mq
Istalled power: 168 kW

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



The SNN-Lab has been realized also thanks to financing 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: Ruggero Caminiti (ruggero.caminiti@uniroma1.it) - Contact person: Prof. Marco Rossi (marco.rossi@uniroma1.it)

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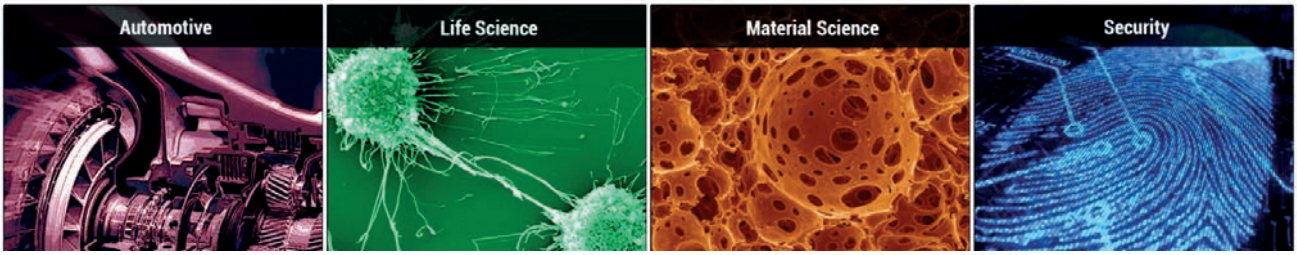


TUTORIAL LECTURES

Nanotechnology is largely based on the peculiar features of nanomaterials, which can be considered as an intermediate state between bulk materials and atoms. In the proper size range, in fact, the properties of a material become dependent on morphological parameters, like dimension, aspect ratio, surface structure and so on.
In order to master the peculiar features of a nanomaterial, the knowledge of the local structure and of the local functional properties are of mandatory importance, considering that the development of a material proceeds generally through the classical iteration among synthesis process, structural characterization and functionality under the supervision of structural and functional numerical simulations.
These short pre-conference tutorials complement the technical program and want to introduce the audience to the basic principles underlying investigation methods, mandatorily requiring the use of electron beams, in cases of interest ranging from material science to life sciences.
The lectures address an audience composed by young researchers, doctorate students and whichever person interested in a basic description of the investigation methods.
The last lecture will give a short overview on the European Marie Skłodowska-Curie Actions (MSCA) providing significant financial support to young researchers in order to enhance their employability and career development.

Chairs: Marco VITTORI ANTISARI, *Nanoitaly Association &* Beatrice VALLONE, *Sapienza University of Rome*

TL.I - MICROSCOPIES, NANOTECHNOLOGY AND CARRIER OPPORTUNITIES FOR YOUNG RESEARCHER

09:00 - 10:40

TL.I.1	Vittorio MORANDI, *CNR-IMM, Bologna* **Why electron microscopies and diffractions for nanotechnology**
TL.I.2	Matteo FERRONI, *University of Brescia* **Introduction to electron tomography for applications in materials science**

10:40 - 11:00 Coffee Break

11:00 - 13:00

TL.I.3	Linda Celeste MONTEMIGLIO, *Sapienza University of Rome* **Single-particle Cryo Electron Microscopy for Structural Biology and Biomedicine: Sample Preparation and Data Collection**
TL.I.4	Claudia TESTI, *Sapienza University of Rome* **Single-particle Cryo Electron Microscopy for Structural Biology and Biomedicine: Data Analysis and Structure Determination**
TL.I.5	Radenka KRSMANOVIC WHIFFEN, *MSCA Individual Fellow, ENEA, Casaccia Research Centre, Rome* **Marie Skłodowska-Curie actions (MSCA) and the Marie Curie Alumni Association (MCAA): Challenges and opportunities for young researchers**

SEPTEMBER 11 AFTERNOON

14:00 - 14:20
WS.I - WELCOME SESSION

Chair: Maria Sabrina SARTO, *Sapienza University of Rome*
(Deputy Rector for Research Tools and Infrastructure)

WS.I.1	**Massimiliano SMERIGLIO** *Regione Lazio (Vice-President)*
WS.I.2	**Eugenio GAUDIO** *Sapienza University of Rome (Rector)*
WS.I.3	**Antonio D'ANDREA** *Sapienza University of Rome (Dean of Faculty of Civil and Industrial Engineering)*
WS.I.4	**Ferdinando PASTORE** *ICE-Italian Trade Agency, Director of the Machinery, Energy and Environment Office*

14:20 - 15:30
PS.I - PLENARY SESSION I

Advances on Nanotechnology and Nanosciences
Chair: Carlo MARIANI, *Sapienza University of Rome*

PS.I.1	**Yulia DYAKOVA** *NRC Kurchatov Institute, Head of the complex of the NBICS-nature-like technologies, Moscow, Russia* Nature-like Technology: The New Challenge and New Risks
PS.I.2	**Juergen PLITZKO** *Max Planck Institute of Biochemistry (Project Group Leader), Martinsried, Germany* Cryo - Electron Microscopy and Tomography - The Past, the Present and the Future

15:30 - 15:50 Coffee Break

15:50 - 17:10
PS.II - PLENARY SESSION II

Innovation at the Nanoscale and Market Exploitation Strategies
Chair: Marco Vittori Antisari, *Associazione Nanoitaly*

PS.II.1	**Sergio GALBIATI**, *LFoundry Vice Chairman* Innovation in a Semiconductor Industry
PS.II.2	**Igor POPKOV**, *Russian Nanoindustry Association - RNA (Head of the committee for development of markets & Chairman of the board of "Ruschembio"), Russia* State support measures for the transfer of nanotechnology and product promotion. Examples of an implementation
PS.II.3	**Sergio GRANDE**, *Innovation and Technology Transfer Officer @ European Commission, Joint Research Centre* The TTO circle workshop on "Technology Transfer in Nanotechnology"
PS.II.4	**Ennio Tito CAPRIA**, *ESRF Grenoble, France* GIANT innovation campus - The hearth of a unique technological ecosystem in Grenoble
PS.II.5	**Michele MUCCINI**, *MIST E-R S.c.r.l.* Bridging the gap from research to market: the innovation ecosystem @ CNR Technopole Bologna
PS.II.6	**Vincenzo RICCO**, *Scientific Director and Founder of CrestOptics s.p.a., Rome* How to build a successful startup in high tech instrumentations, a look at a real case

17:10 - 18:30
PS.III - PLENARY SESSION III

Funding Strategies and Opportunities
Chair: Donata FOLESANI, *Responsabile ASTER - Area Strumenti Finanziari*

PS.III.1	**Gian Paolo MANZELLA,** *Councilor for Economic Development, Trade and Crafts, Start-Up, "Lazio Creative" and Innovation, Regione Lazio* (to be confirmed)
PS.III.2	**Marco FALZETTI**, *Director of APRE* From H2020 to Horizon Europe – how does Material Research governance change?
PS.III.3	**Alexey KACHAY**, *Deputy CEO, Fund for Infrastructure and educational programs (RUSNANO Group), Russia* Fund for Infrastructure and Educational Programs: areas of activities and international cooperation
PS.III.4	**Alessandro OLIVI**, *Councilor for industry, crafts, trade and cooperation, Autonomy Province of Trento* FESR strategy in the Autonomy Province of Trento
PS.III.5	**Fabrizio CIARMATORI**, *ASTER - European and International Development Unit* The Vanguard Initiative: an inspiring approach for the European Industrial Renaissance

18:30 - 19:30

WELCOME Cocktail & NEST PRIZE Winners

09:00 - 10:30
HT.I - HIGHLIGHT MULTI-TRACK - PARALLEL COLLOQUIA

HT.I.A **WS.I.1**	Keynote Session **Ultimate TEM characterization and imaging** Chair: Vittorio MORANDI, *CNR - IMM, Bologna* *The symposium is part of the workshop WS.I on* ***Advanced Characterization Techniques for Nanotechnologies and Nanosciences***
HT.I.B	Keynote Session **Challenges in semiconductor technologies** Chair: Romeo BECCHERELLI, *CNR IMM, Roma* *In collaboration with:* MICRON
HT.I.C	Keynote Session **Nanotechnology and nanofabrication: opportunities for innovation** Chair: Fabrizio PIRRI, *Polytechnic of Turin*
HT.I.D	Keynote Session **Nanotechnology and Advances in Biotech Applications** Chair: Stefano LINARI, *Linari Engineering Srl*
10:30 - 11:00 Coffee Break	

11:00 - 12:30
TT.I - TECHNICAL MULTI-TRACK - PARALLEL SYMPOSIA

TT.I.A **WS.I.2**	**X-Ray Microscopy** Chair: Narciso GAMBACORTI, *Cea-Leti & PAC-G, Grenoble, France* *The symposium is part of the workshop WS.I on* ***Advanced Characterization Techniques for Nanotechnologies and Nanosciences***
TT.I.B **WS.II.1**	**Nano perspectives in the Agri-Food sector** Chair: Nelson MARMIROLI, *University of Parma* *The symposium is part of the workshop WS.II on* ***AgriNanoTechniques***
TT.I.C	**Photocatalytic nanomaterials for water remediation** Chair: Roberto GIANNANTONIO, *DHITECH* *In collaboration with:* DHITECH
TT.I.D **JE.I.1**	**Synthesis and Microstructural properties I** Chair: Gaspare VARVARO, *CNR ISM, Roma* *The symposium is part of the Joint Event JE.I* ***Materiali Nanofasici***
TT.I.E	**Nanotechnology for bio-medical applications** Chair: Eugenio AMENDOLA, *CNR IPCB, Portici, Napoli (to be confirmed)*
TT.I.F	**Electrochemical Energy Storage: use of nanomaterials as components of batteries** Chair: Pierpaolo PROSINI, *ENEA Casaccia* *In collaboration with:* ENEA
TT.I.G	**Innovative nano-materials and methods for fuel cell electrodes implementation** Chair: Marcello ROMAGNOLI, *University of Modena & Reggio Emilia* *In collaboration with:* University of Modena & Reggio Emilia

12:30 - 14:00 Light Lunch

SEPTEMBER 12 AFTERNOON

14:00 - 15:30
TT.II - TECHNICAL MULTI-TRACK - PARALLEL SYMPOSIA

TT.II.A **WS.I.3**	**Advances in Microscopy-based Nanocharacterization Methodologies** Chair: Elvio CARLINO, *CNR-IMM, Lecce (to be confirmed)* *In collaboration with:* ZEISS *The symposium is part of the workshop WS.I on* ***Advanced Characterization Techniques for Nanotechnologies and Nanosciences***
TT.II.B **WS.II.2**	**Nanomaterials and Plant Nutrition** Chair: Zeno VARANINI, *University of Verona* *The symposium is part of the workshop WS.II on* ***AgriNanoTechniques***
TT.II.C	**European nanotechnology research infrastructures: their support to innovation 1** Chair: Lorenza FERRARIO, *FBK, Trento* *In collaboration with:* FBK
TT.II.D	**Sustainable (bio-)technologies for CO2 capture and usage** Chair: Angela RE, *IIT, Torino* & Sergio BOCCHINI, *IIT, Torino* *In collaboration with:* Polytechnic of Turin & IIT
TT.II.E	**Nanotechnology in medicine** Chair: Donatella PAOLINO, *University "Magna Graecia" of Catanzaro* *In collaboration with*: University "Magna Graecia" of Catanzaro
TT.II.F	**Computer aided design of innovative materials** Chair: Massimo CELINO & Francesco BUONOCORE, *ENEA Casaccia* *In collaboration with:* ENEA
TT.II.G	**Nanomaterials fabrication and characterization advances** Chair: Francesco MARRA, *Sapienza University of Rome*

15:30 - 16:00 Coffee Break

16:00 - 17:30
TT.III - TECHNICAL MULTI-TRACK - PARALLEL SYMPOSIA

TT.III.A **WS.I. 4**	**Cryo Electron Microscopy: the resolution revolution** Chair: Beatrice VALLONE, *Sapienza University of Rome* *In collaboration with:* JEOL, THERMO FISHER SCIENTIFIC & ZEISS *The symposium is part of the workshop WS.I on* ***Advanced Characterization Techniques for Nanotechnologies and Nanosciences***
TT.III.B **WS.II. 3**	**Research Pathways** Chair: Luca MARCHIOL, *University of Udine* *The symposium is part of the workshop WS.II on* ***AgriNanoTechniques***
TT.III.C	**Physical Characterizations on semiconductor devices** Chair: Onofrio Antonino CACIOPPO, *LFoundry* *In collaboration with:* LFOUNDRY, RENISHAW
TT.III.D **JE.I.2**	**Synthesis and Microstrucral Properties II** Chair: Amelia MONTONE, *CNR ISM, Roma* *The symposium is part of the Joint Event JE.I* ***Materiali Nanofasici"***
TT.III.E	**From Nanotherapeutics to NanoBiomaterials** Chair: Giovanni TOSI, *University of Modena & Reggio Emilia* *In collaboration with:* University of Modena & Reggio Emilia
TT.III.F	**Nanostructures and Spectroscopy for Quantum confined Systems, Photonics, Biosystems and Cultural Heritage** Chair: Carlo MARIANI, *Sapienza University of Rome* *In collaboration with:* Sapienza University of Rome
TT.III.G	**European nanotechnology research infrastructures: their support to innovation 2** Chair: Riccardo BERTACCO, *Polytechnic of Milan - PoliFAB* *In collaboration with:* FBK

09:00 - 10:30
HT.II - Highlight multi-Track - parallel COLLOQUIA

HT.II.A **WS.I.5**	Keynote Session: **Scanning Ion Microscopy: Nanocharacterization and Nanofabrication** Chair: Marco VITTORI ANTISARI, *Asssociazione Nanoitaly* *In collaboration with:* ASSING/Tescan *The symposium is part of the workshop WS.I on* ***Advanced Characterization Techniques for Nanotechnologies and Nanosciences***
HT.II.B **WS.III.1**	Keynote Session: **Scanning Probe Microscopy: Touching and Probing Matter at the Nanoscale** Chair: Daniele PASSERI, *Sapienza University of Rome* *In collaboration with:* ASSING/Bruker *The symposium is part of the workshop WS.III on* ***Advanced Scanning Probe Microscopies***
HT.II.C **WS.V.1**	Keynote Session: **Nanotechnologies for innovative medicine** Chair: Sabrina CONOCI, *STMicroelectronics* *In collaboration with:* Distretto Tecnologico Sicilia Micro e Nano Sistemi *The symposium is part of the workshop WS.V on* ***Nanotechnologies for innovative medicine***
HT.II.D	Keynote Session **Nanotechnology and advances in electronic devices** Chair: Guglielmo FORTUNATO, *CNR IMM, Roma*
10:30 - 11:00 Coffee Break	

11:00 - 12:30
TT.IV - Technical multi-Track - parallel SYMPOSIA

TT.IV.A **WS.I.6**	**Advance in FIB/SEM Technology and its Contribution to Scientific Problem Solving** Chair: Daniele DE FELICIS, *University of Roma Tre* *In collaboration with:* TESCAN & ASSING *The symposium is part of the workshop WS.I on* ***"Advanced Characterization Techniques for Nanotechnologies and Nanosciences"***
TT.IV.B **WS.III.2**	**Advanced SPM techniques: methods and applications 1** Chair: Marco RENZELLI, *LFoundry* *In collaboration with:* LFoundry *The symposium is part of the workshop WS.III on* ***"Advanced Scanning Probe Microscopies"***
TT.IV.C **WS.V.2**	**New Materials and Nanotechnologies for Innovative therapeutic Approaches** Chair: Rosalba PARENTI, *University of Catania* *In collaboration with:* Distretto Tecnologico Sicilia Micro e Nano Sistemi *The symposium is part of the workshop WS.V on* ***"Nanotechnologies for innovative medicine"***
TT.IV.D	**Standardisation of nanomaterials in the VAMAS project** (the Versailles project on Advanced Materials Standardisation) Chair: Laura DEPERO, *University of Brescia & VAMAS Italia and* Luca BOARINO, *INRIM* *In collaboration with:* INRIM
TT.IV.E **JE.I.3**	**Nanomaterials for next generation of electric motors** Chair: Emanuela TAMBURRI, *Nanoshare Srl* *The symposium is part of the Joint Event JE.I* ***Materiali Nanofasici***
TT.IV.F	**Advanced science and surfaces engineering on the multi-scale** Chair: Sergio VALERI, *University of Modena & Reggio Emilia* *In collaboration with:* University of Modena & Reggio Emilia
TT.IV.G	**NanoInnovation's Got Talent** Chair: Fulvio UGGERI, *Bracco Imaging* *In collaboration with:* Fondazione Bracco

12:30 - 14:00 Light Lunch

SEPTEMBER 13 AFTERNOON

14:00 - 15:30
TT.V - Technical multi-Track - parallel SYMPOSIA

TT.V.A **WS.I.7**	**Innovation in Scanning Electron Microscopy** Chair: Luca ORTOLANI, *CNR IMM, Bologna* *In collaboration with:* ZEISS, THERMO FISHER SCIENTIFIC & JEOL *The symposium is part of the workshop WS.I on* ***Advanced Characterization Techniques for Nanotechnologies and Nanosciences***
TT.V.B **WS.III.3**	**Advanced SPM techniques: methods and applications 2** Chair: Daniele PASSERI, *Sapienza University of Rome* *The symposium is part of the workshop WS.III on* ***Advanced Scanning Probe Microscopies***
TT.V.C	**Electrochemical Energy Storage: new materials and technologies for batteries and supercapacitors** Chair: Andrea LAMBERTI, *Polytechnic of Turin* *In collaboration with:* Polytechnic of Turin
TT.V.D **WS.V.3**	**Materials and Devices for implants and regenerative medicine** Chair: Salvo PETRALIA, *STMicroelectronics* *In collaboration with:* Distretto Tecnologico Sicilia Micro e Nano Sistemi *The symposium is part of the workshop WS.V on* ***Nanotechnologies for innovative medicine***
TT.V.E	**Nanoemulsions: a versatile platform in health and wellness products** Chairs: Maria CARAFA *&* Carlotta MARIANECCI, *Sapienza University of Rome* *In collaboration with:* Sapienza University of Rome
TT.V.F **JE.I.4**	**Magnetic, Transport and Optical Properties** Chair: Gaspare VARVARO, *ISM CNR, Roma* *The symposium is part of the Joint Event JE.I* ***Materiali Nanofasici***
TT.V.G	**Gallium Nitride for power and high-frequency electronics** Chair: Guglielmo FORTUNATO, *CNR IMM, Roma* *In collaboration with:* CNR-DSFTM

15:30 - 16:00 Coffee Break

16:00 - 17:30
TT.VI - Technical multi-Track - parallel SYMPOSIA

TT.VI.A **WS.I.8**	**Innovation in Transmission Electron Microscopy** Chair: Andrea PARISINI, *CNR-IMM, Bologna* *The symposium is part of the workshop WS.I on* ***Advanced Characterization Techniques for Nanotechnologies and Nanosciences***
TT.VI.B **WS.III.4**	**Advance in Near Field Probe Microwave and mm-wave Microscopy for Surface and Subsurface Characterization of Materials** Chair: Emanuela PROIETTI, *CNR IMM, Roma* *In collaboration with:* CNR IMM - Ministry of Foreign Affairs and International Cooperation - National Institute of Standards and Technology (NIST) *The symposium is part of the workshop WS.III on* ***Advanced Scanning Probe Microscopies***
TT.VI.C **WS.V.4**	**Molecular Biosensors: the next generation devices** Chair: Filippo D'ARPA, *Distretto Tecnologico Sicilia Micro e Nano Sistemi* *In collaboration with:* Distretto Tecnologico Sicilia Micro e Nano Sistemi *The symposium is part of the workshop WS.V on* ***Nanotechnologies for innovative medicine***
TT.VI.D	**Advanced technologies and nanomaterials for sustainability in oil & gas off-shore platforms** Chair: Elena TRESSO, *Polytechnic of Turin &* Roberto CIANELLA, *Ministry of the Economic Development* *In collaboration with:* Polytechnic of Turin
TT.VI.E	**Responsible Innovation in Nanotech applications for healthcare and wellbeing** Chair: Elvio MANTOVANI, *AIRI &* Andrea PORCARI, *AIRI* *In collaboration with:* AIRI/PRISMA PROJECT
TT.VI.F **JE.I.5**	**Synthesis and Microstructural Properties III** Chair: Sara LAURETI, *ISM CNR, Roma* *The symposium is part of the Joint Event JE.I* ***Materiali Nanofasici***
TT.VI.G	**Nanocomposite materials applications** Chair: Isella VICINI, *Warrant Group* *In collaboration with:* Warrant Group

SEPTEMBER 14 MORNING

09:00 - 10:30
HT.III - Highlight multi-Track - parallel COLLOQUIA

HT.III.A **WS.I.9**	Keynote Session: **Spectroscopic characterization and imaging** Chair: Regina CIANCIO, *CNR-IOM, Trieste* *The symposium is part of the workshop WS.I on* ***Advanced Characterization Techniques for Nanotechnologies and Nanosciences***
HT.III.B	Keynote Session **2D materials and beyond** Chair: Fabiola LISCIO, *CNR IMM, Bologna*
HT.III.C **WS.IV.1**	Keynote Session: **Advanced approaches for investigating cells and neurons** Chair: Leandro LORENZELLI, *FBK, Trento* *In collaboration with:* FBK *The symposium is part of the workshop WS.IV on* ***Microfluidics and Biosystems for personalized medicine***
HT.III.D **JE.II.1**	Special Session: **Il rapporto tra Innovazione e Conoscenza in Italia. Il sistema della ricerca privata.** Chair: Alberto CIGADA, *Polytechnic of Milan & President Comitato Scientifico Cluster Made in Italy* *In collaboration with: Airi, Associazione NanoItaly and Sapienza* *The symposium is part of the Joint Event JE.II* ***Open innovation and Open Science***
HT.III.E	Special Session: **3D Additive Manufacturing** Chair: Francesco VENIALI, *Sapienza Università di Roma*
10:30 - 11:00 Coffee Break	

11:00 - 12:30
TT.VII - Technical multi-Track - parallel SYMPOSIA

TT.VII.A **WS.I.10**	**Microscopy techniques for industrial needs 1** Chair: Onofrio Antonino CACIOPPO, *LFoundry* *In collaboration with:* LFoundry *The symposium is part of the workshop WS.I on* ***Advanced Characterization Techniques for Nanotechnologies and Nanosciences***
TT.VII.B	**Nanotechnologies for space: missions, opportunities and challenges** Chair: Roberto FORMARO & Marco DI CLEMENTE, *ASI* *In collaboration with:* Italian Space Agency (ASI)
TT.VII.C	**2D materials beyond graphene: from fundamental physics to device applications** Chair: Giancarlo CICERO, *Polytechnic of Turin &* Paola PRETE, *CNR IMM, Lecce* *In collaboration with:* Polytechnic of Turin & CNR IMM
TT.VII.D **JE.I.6**	**Applications: Catalysis, Micro/Nanoelectronics, Biomedicine and other I** Chair: Elisabetta AGOSTINELLI, *CNR ISM, Roma* *The symposium is part of the Joint Event JE.I* ***Materiali Nanofasici***
TT.VII.E **WS.IV.2**	**Microfluidics concepts, technologies and applications** Chair: Leandro LORENZELLI, *FBK, Trento* *In collaboration with:* FBK & Polytechnic of Turin *The symposium is part of the workshop WS.IV on* ***Microfluidics and Biosystems for personalized medicine***
TT.VII.F	**Nanomaterials and advanced solutions for the restoration of Cultural Heritage** Chair: Rodorico GIORGI, *CSGI* and Isella VICINI, *Warrant Group* *In collaboration with:* CSGI & WARRANT GROUP
TT.VII.G **JE.II.2**	**Il rapporto tra Innovazione e Conoscenza in Italia. Il sistema della ricerca pubblica** Chair: Alberto CIGADA, *Polytechnic of Milan & President Comitato Scientifico Cluster Made in Italy* *In collaboration with: Airi, Associazione Nanoltaly and Sapienza* *The symposium is part of the Joint Event JE.II* ***Open innovation and Open Science***

12:30 - 14:00 Light Lunch

SEPTEMBER 14 AFTERNOON

14:00 - 15:30
TT.VIII - Technical multi-Track - parallel SYMPOSIA

TT.VIII.A **WS.I.11**	**Innovation in Optical Microscopy** Chair: Marco LEONETTI, *IIT@SAPIENZA* *The symposium is part of the workshop WS.I on* ***Advanced Characterization Techniques for Nanotechnologies and Nanosciences***
TT.VIII.B **JE.II.3**	**Promozione e sviluppo del trasferimento tecnologico e dell'innovazione a livello territoriale** Chair: In definition (by Regione Lazio) *The symposium is part of the Joint Event JE.II* ***Open innovation and Open Science***
TT.VIII.C **JE.I.7**	**Applications: Catalysis, Micro/Nanoelectronics, Biomedicine and other II** Chair: Davide PEDDIS, *CNR ISM, Roma* *The symposium is part of the Joint Event JE.I* ***Materiali Nanofasici***
TT.VIII.D	**Trend topics in PV** Chair: Mario TUCCI, *ENEA Casaccia* *In collaboration with:* ENEA
TT.VIII.E **WS.IV.3**	**Advances in biosensors and microfluidic devices in life science** Chair: Fabrizio PIRRI, *Polytechnic of Turin &* Pietro SICILIANO, *CNR IMM, Lecce* *In collaboration with:* FBK & Polytechnic of Turin *The symposium is part of the workshop WS.IV on* ***Microfluidics and Biosystems for personalized medicine***
TT.VIII.F	**Multifunctional Nanocomposites for Energy and Sensing applications** Chair: Giovanni DEBELLIS, *Sapienza University of Rome* *In collaboration with:* Sapienza University of Rome
TT.VIII.G	**Nanochemistry meets heritage science for the creation, analysis and conservation of artworks** Chair: Alessandra SANSON, *CNR ISTEC, Faenza* *In collaboration with:* CNR DSTCM

15:30 - 16:00 Coffee Break

16:00 - 17:30
TT.IX - Technical multi-Track - parallel SYMPOSIA

TT.IX.A **WS.I.12**	**Microscopy techniques for industrial needs 2** Chair: Onofrio Antonino CACIOPPO, *LFoundry* I*n collaboration with:* Leonardo *The symposium is part of the workshop WS.I on* ***Advanced Characterization Techniques for Nanotechnologies and Nanosciences***
TT.IX.B **JE.I.8**	**Carbon-based materials** Chair: Maria Letizia TERRANOVA, *University of Rome Tor Vergata* *The symposium is part of the Joint Event JE.I* ***Materiali Nanofasici***
TT.IX.C **WS.IV.4**	**Applications in personalized medicine** Chair: Cecilia PEDERZOLLI, *FBK &* Pietro SICILIANO, *CNR IMM, Lecce* *In collaboration with:* FBK & Polytechnic of Turin *The symposium is part of the workshop WS.IV on* ***Microfluidics and Biosystems for personalized medicine***
TT.IX.D	**Technological Integration of graphene and 2D materials** Chair: Rita RIZZOLI, *CNR IMM, Bologna* *In collaboration with:* with CNR-IMM
TT.IX.E **JE.II.4**	**Un approccio innovativo della Regione Lazio: Infrastrutture Aperte per la Ricerca** Chair: Marco ROSSI, *Sapienza University of Rome* *The symposium is part of the Joint Event JE.II* ***Open innovation and Open Science***
TT.IX.F	**Smart Textiles** Chair: Giuseppe ROSACE, *University of Bergamo*

Boaga Library *Wednesday 12 September,* 14:00 - 17:30 - *Thursday 13 September,* 10:40 - 13:00

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 collaboration between NanoInnovation and APRE- Italian Agency for the Promotion of European Research - is renewed also this year.
On the 12th and 13th of September, NanoInnovation 2018 offers 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 for the conference participants.

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

TOPICS

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

- CONSTRUCTION, BUILDING & RESTORATION
- ELECTRONICS, MICRO AND NANOSYSTEMS
- ENERGY & ENVIRONMENT
- FOOD AND AGRICULTURE
- INNOVATIVE AND SMART TEXTILES
- NANO-BIO RELATED PRODUCTS
- HEALTH & NANOMEDICINE
- NANO-MATERIALS BASED INNOVATION
- NANOSCALE CHARACTERIZATION AND MEASUREMENTS
- SAFETY AND SOCIAL IMPACTS
- SMART MANUFACTURING
- TRANSPORT, SPACE & AERONAUTICS

HOW IT WORKS

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

FIRST STEP

- Go to *https://nanoinnovation2018.b2match.io/* and click on "register"
- Insert your data, write a brief description of your organisation 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 https://nanoinnovation2018.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
- Attend the networking event!

Elevator Pitch

Cloister Area *Wednesday 12 September,* 17:30 - 18:30

Share your best ideas, present your innovative products or research results, draw commercial partners attention and win a prize for your pitch!

Innovation and Market Uptake Elevator Pitch

You have the opportunity to make a 5-minutes elevator pitch in the Renaissance Cloister, the best networking and crowded point of the NanoInnovation 2018 conference.
Catch the eye of the participants, boost your partnering opportunities and try to win a publication in the AIP Conference Proceedings 2018 (http://www.nanoinnovation.eu/2018/index.php/proceedings).

Elevator Pith is free for the conference participants. The event will take place during NanoInnovation 2018, in the Renaissance Closter of the Faculty of Civil and Industrial Engineering, Sapienza University of Rome on the 12th of September from 17:30 to 18:30.

The whole event is managed by APRE – Agency for the Promotion of European Research

Contacts: Matteo Sabini (sabini@apre.it) and Serena Borgna (borgna@apre.it)

Registration form, pitches evaluation criteria and rules are available at this link:
https://nanoinnovation2018.b2match.io/page-2061

H2020 Flash Presentation

Thursday 13 September, 09:40 - 10:30

Horizon 2020 NMBP Work Programme 2019 will fund researchers, entrepreneurs and industrial representatives with more than **540 million €**. Find suitable partners for your project ideas and participate to Horizon 2020 thanks to the **H2020 Flash Presentation**, and to the networking event!

H2020 Flash Presentation is a simple presentation format where speakers talk showing 15 slides advancing automatically every 20 seconds. Selecting topics of your interest, you have the possibility to show your expertise and propose your organization for joining an existing consortium; otherwise, you can present your proposal idea aiming at finding the missing and suitable international partner.

You can also choose to attend the session, receiving more information and practical inputs on the H2020 NMBP Call 2019 thanks to the topic presentation made by the NMBP National Contact Point.

H2020 Flash Presentation is free for the conference participants. The event will take place during NanoInnovation 2018, at the Faculty of Civil and Industrial Engineering, Sapienza University of Rome on the 13th of September from 09:00 to 10:30.

The whole event is managed by APRE – Agency for the Promotion of European Research

Contacts: Matteo Sabini *(sabini@apre.it)* and Serena Borgna *(borgna@apre.it)*

Find more on the session and apply for the H2020 Flash Presentation at the following link: https://nanoinnovation2018.b2match.io/page-341

Wednesday 12 September, 09:00 - 10:30

HT.I.A - Ultimate TEM characterization and imaging

Single Particle Cryo-EM structure of the complex between human Ferritin and Transferrin Receptor: a gateway for targeted delivery and theranostics

Beatrice VALLONE, *Sapienza University of Rome*

The human transferrin receptor 1 (TfR1) is a heavy duty carrier capable of recognizing and internalizing iron-loaded transferrin and ferritin in order to guarantee adequate cellular iron supply, providing the main contribution to the regulation of intracellular iron homeostasis. The receptor is also opportunistically exploited by several viruses and malaria parasites as a preferential entry for cell invasion. The structural features of TfR1 interaction with transferrin and viruses have been recently clarified and specific transferrin and viruses recognition epitopes have been identified. Conversely, information on the structural elements that guide the TfR1-ferritin recognition was missing and we obtained by single-particle cryo-electron microscopy the CD71/H-ferritin complex at 3.9 Å resolution, revealing the structural basis of this interaction. We observed that two short motifs upon the H-ferritin homopolymer recognize a precise epitope on CD71 that overlaps the arenaviruses and Plasmodium vivax binding region in the apical part of the receptor ectodomain. Our structural data account for transferrin independent binding of ferritin to CD71 and suggest that viruses and parasites have adapted to enter cells by mimicking ferritin access gate. The use of single-particle cryo-electron microscopy in designing nanoparticles for targeted delivery and theranostics will be discussed highlighting its potential in the field of nanomedicine.

Atomic Resolution Transmission Electron Microscopy: On the way toward the ultimate spatial resolution and accuracy

Elvio CARLINO, *CNR-IMM, Lecce*

The capability to see where the atoms are in the matter, distinguishing from atom to atom, has been an old dream since the time of Democritus. This dream has contributed along the centuries to milestone stories in the Science Fiction. Today we are close to make this dream true by atomic resolution methods in electron microscopy. Nevertheless, despite the recent strong advances, still significant efforts are necessary to achieve the ultimate resolution and accuracy, overcoming the intrinsic limitations related to the physics of the electron-matter interaction and to the electron optics. In this lecture I shall discuss, with the help of many experimental examples, the features of atomic resolution imaging methods in a Transmission Electron Microscope (TEM) and Scanning TEM (STEM). The intention is to make evident how the ultimate result is a puzzle that, in order to be solved, needs equipment capable to achieve the spatial resolution down to the diffraction limit, but this is definitely not enough. Definitely it needs knowledge and relevant methods capable to maximize and quantify the information that can be extracted from the experimental data. In particular, electron coherent diffraction imaging in a TEM has demonstrated promising results that will be discussed in this lecture. The strong electron-matter interaction makes TEM/STEM approaches very effective in achieving information from nano-volumes of the matter but at the same time it complicates the quantitative interpretation of results, posing also the issue of the damage of the specimen structure. This is of particular relevance for materials containing weakly-bound low atomic number atoms, like polymers or proteins, with a paramount relevance for basic and applicative points of view. It is widely recognized that, in many cases, the spatial resolution in a TEM experiment on radiation sensitive specimens is not related only to the electron-optic limitations of a TEM but mainly on the damage threshold of the specimen. Hence, TEM methods capable to handle the radiation damage in a specimen are of paramount importance as testified by the Nobel prize in chemistry in 2017 to Henderson, Dubochet and Frank for the development of cryo-microscopy in TEM to image the structure of biomolecules at spatial resolution otherwise not achievable. The development of TEM/STEM methodologies capable to tackle these issues will be discussed underlining how the concurrence of theoretical, experimental and computational efforts are definitively necessary to awake and make the dream true.

Wednesday 12 September, 09:00 - 10:30

HT.I.B - Challenges in semiconductor technologies

Semiconductor characterization challenges addressed by Large Scale Facilities

Narciso GAMBACORTI, *CEA-Leti/PAC-G, Grenoble, France*

The performances of the modern nanoelectronics devices are tightly connected with the properties of the different materials and with their organization in three-dimensional space. Information on material composition, dopant distribution, dimensions, roughness, interface quality, strain, grain size, phase, defects and so on need to be extracted to support the development of these devices. The possibility to access Large Scale Facilities (LSF) to address some characterization challenges presents in modern nanoelectronic materials and devices will be presented. Three examples of the use of LSF facilities will be shown and discussed: 1) The use of Neutron Reflectivity (NR) to characterize the penetration of water into direct bonded SiO2/SiO2 interface. 2) in-situ X-ray diffraction study of solid-state reaction of Ni and GeSn on Si substrate. Smooth phase transformation is observed during the annealing and some kinetic parameters could be withdrawn. 3) X-ray nano-tomography with 30nm spatial resolution at LSF for the characterization of Through Silicon Vias (TSV) and Copper Pillars (CuP).

Neural network and Pattern recognition implemented on memory technology

Tommaso VALI, *Micron*

Nowadays five big technology trends, namely, networking, machine to machine, mobile, cloud, big data, are shaping the modern society and all human interaction. At the same time, memories are becoming more and more important in driving the system performance and cost in all electronic systems. Moreover, these trends are requiring a higher memory density lower power and improved performance. Such evolution is also facilitating the implementation of specific applications directly on the memory hardware. Neural network and Pattern recognition system my find a good substrate to implement in hardware key building blocks needed for their functionality.

Wednesday 12 September, 09:00 - 10:30

HT.I.C - Nanotechnology and nanofabrication: opportunities for innovation

Research and innovation Dilemma on Nanotechnology

Massimo BERSANI, *FBK, Trento*

The Horizon 2020 program represents a paradigm shift with respect to the past introducing a strong focus on innovation. In fact, two of the three pillars of the European program and numerous instruments are aimed to promote and develop innovation processes. Despite the resources committed by the H2020 program and various national and regional programs, the effects on society and the productive system are in many cases below expectations. An emblematic case is that of nanotechnologies, which have the potential to strongly affect vital fields such as healthcare, energy, environment and manufacturing. To unlock potential benefits at the most, it is necessary to reduce the 'valley of death' and enhance the track record in transforming breakthroughs into commercially valuable innovations. Meeting these challenges involves understanding the internal (to the innovation process) and external (related to the surrounding environment) bottlenecks of the innovation cycle. Europe is therefore in need of studies aiming at developing an analytical framework for offering a novel perspective on innovation in nanotechnologies and for strengthening their systemic economic impact. In the present talks is based on the analysis of the situation following two main way the studies undertaken by EC and the evaluation of specific case. The European scenario on nanotechnology innovation is pointed out as well the main challenges and obstacles are analyzed in order to stimulate a participating discussion and promote further studies to support the EU innovation processes on nanotechnology field.

Design, characterization and lithographic application of Si nanocrystals patterns via templated dewetting

Monica BOLLANI, *CNR IFN, Milano*

The Horizon 2020 program represents a paradigm shift with respect to the past introducing a strong focus on innovation. In fact, two of the three pillars of the European program and numerous instruments are aimed to promote and develop innovation processes. Despite the resources committed by the H2020 program and various national and regional programs, the effects on society and the productive system are in many cases below expectations. An emblematic case is that of nanotechnologies, which have the potential to strongly affect vital fields such as healthcare, energy, environment and manufacturing. To unlock potential benefits at the most, it is necessary to reduce the 'valley of death' and enhance the track record in transforming breakthroughs into commercially valuable innovations. Meeting these challenges involves understanding the internal (to the innovation process) and external (related to the surrounding environment) bottlenecks of the innovation cycle. Europe is therefore in need of studies aiming at developing an analytical framework for offering a novel perspective on innovation in nanotechnologies and for strengthening their systemic economic impact. In the present talks is based on the analysis of the situation following two main way the studies undertaken by EC and the evaluation of specific case. The European scenario on nanotechnology innovation is pointed out as well the main challenges and obstacles are analyzed in order to stimulate a participating discussion and promote further studies to support the EU innovation processes on nanotechnology field.

Wednesday 12 September, 09:00 - 10:30

HT.I.D - Nanotechnology and Advances in Biotech Applications

Drug, medical device and cosmetic containing nanocarrier: regulatory perspective

Paola MINGHETTI, *University of Milan*

The growing application of nanomaterials in healthcare products (i.e., cosmetics, medical devices and medicinal products) within the European Union (EU) has encouraged the regulatory authorities to upgrade the regulatory framework for improving the quality of healthcare products and managing the risk of negative effects on human health and environment due to nanotoxicity. The first definition of nanomaterial in EU was established in 2011. However, such definition presents several criticisms and cannot be strictly applied to all healthcare products on the EU market. Considering the complexity of nanotechnology-based products, the EMA issued several reflection papers on nanomedicine-specific topics (i.e., coated nanomedicine products, micellar systems, liposomal systems, iron-core nanoparticles). Moreover, specific requirements for the use of nanomaterials (and nanocarriers) in cosmetic products are reported in the Regulation (EC) No 1223/2009, whereas a new Regulation on medical devices was released in 2017. In conclusion, the current European regulatory framework supervising the presence of nanomaterials in healthcare products is stratified and far from being harmonized. Despite the efforts of European Authorities, inevitably there are several criticisms to deal with due to the lack of well-established scientific knowledge of properties and characterization of nanosystems.

Electrospinning of nanofibers for tissue engineering

Carlo Alberto MARCOALDI, *LINARI Nanotech*

Tissue engineering is the new frontier for body organ regeneration or replacement. Extra cellular matrixes or scaffoldings can be manufactured by non woven tissues having specific profiles of biocompatibility, biodegradability,porosity, mechanical properties, topology.
Effectiveness depends also on the capacity to create multi-material (biobased as well as synthetic polimers or ceramics) and multiscale (from micro to nano meter diameters) fibers.
Electrospinning is probably the most complete answer to all those challenges by combining several extrusion heads with different target shapes and materials and by controlling continuously the production variables (pressure, temperature, voltage, flowrate).
Hundreds of Linari electrospinning machines are currently used in research centers around the world to test the new generation of nanofibers most suitable for "tissue engineering".

Thursday 13 September, 09:00 – 10:30

HT.II.A - Scanning Ion Microscopy: Nanocharacterization and Nanofabrication

Preparation of Aluminum Specimen with Gallium and Xenon Plasma Focused Ion Beam for Further Nano-characterization

Petr KLIMEK, *Tescan Orsay Holding*

Focused ion beam scanning electron microscopes (FIB-SEM) enable highly-localized and site-specific material removal with practically no restriction on sample composition. Depending on the ion source (e.g. Ga+, Xe+), the rate of material removal differs significantly. In general, the design of Xe+ source allows using high ion beam currents that can be up to a few μA while maintaining beam quality and performance, something which is not possible with the Ga+ sources. Such high ion currents are achievable due to the fact that the Xe+ source is broader, more collimated and has higher angular intensity. In addition, Xe+ ions are more massive than Ga+ thus more atoms are ejected from the target per incident ion, which also contributes to obtain significantly higher sputtering rates. However, the most relevant feature of Xe ions for this study is their non-metallic and inert nature which prevents any chemical interaction with the target material and formation of unwanted metallic compounds that alter the original properties of the sample that is being analyzed. Furthermore, the penetration depth of Xe ions is significantly less than Ga ion for a given energy resulting in less ion implantation that could induce local changes in the crystalline structure of the sample and, in turn, lead to changes in the mechanical properties of the sample. As some materials such as Al, Cu and Ga are sensitive to Ga ions, Xe+ ion milling can be a good asset for many FIB applications that involve working with these materials. This can be considered as a significant advantage over Ga ion source FIBs especially in microanalysis and nano-mechanical characterization. A way to perform nano-mechanical characterization of materials is to prepare nano-pillars to test their mechanical properties. As the Ga+ ions penetrating into the material (aluminum in our case) during the FIB milling process, they get implanted and can even weaken the material intended for testing. In contrast, it is advantageous to prepare aluminum nano-pillars with Xe+ plasma FIB since – for the reasons mentioned above – does not introduce significant changes in the material and, as a consequence, the results will be more reliable compared to those in which the pillars had been prepared with a Ga source FIB. Taking these facts into consideration, we pursue the following objectives: (1) Demonstrate the process of pillar preparation with Ga+ and Xe+ FIB and show the advantages of the wider ion beam range offered by the Xe+ plasma FIB. (2) Indicate the influence of gallium implantation on Al materials, (3) Describe the effect of gallium on properties of micron-range grains of aluminum sample treated by the ECAP method via different methods.

Focused Ion Beam (FIB) and Focused Electron Beam Induced Deposition (FEBID) for advanced nanocharacterization and nanofabrication

Gian Carlo GAZZADI, *CNR - Nano, Modena*

Focused Ion Beam (FIB) combined with scanning electron microscope (SEM) is a powerful and versatile instrument for the nanoscience lab. Besides the well-established capabilities in sample preparation for transmission electron microscopy (TEM), cross-section material analysis, device prototyping and sample nanomachining, the recent developments in beam-induced deposition using gas precursors have opened interesting perspectives in 3D nanofabrication, nanomagnetism and sensors. In this keynote lecture, the latest advances and applications of these techniques will be reviewed.

Thursday 13 September, 09:00 – 10:30

HT.II.B - Scanning Probe Microscopy: Touching and Probing Matter at the Nanoscale

Exploring Nanoscale Viscoelasticity with a Surface Coupled Scanning Probe Microscope

Jason KILLGORE, *NIST, USA*

Viscoelastic properties dictate a material's ability to withstand loads over time and dissipate various forms of energy. In nanoscale materials, such as nanoparticles, nanocomposites and copolymers, viscoelastic properties can vary substantially over distances of a few nanometers, with characteristics very different than bulk counterparts. The need for rigorous viscoelastic measurement tools capable of probing the nanoscale and providing robust, quantitative property measurement is thus significant. With a periodic stress state, and quantification rooted in frequency determination rather than absolute displacement, viscoelastic contact resonance force microscopy (VE-CRFM), an advanced scanning probe microscopy method, is uniquely suited to the task. In VE-CRFM, the storage modulus, loss modulus and loss tangent of the probed material are determined from variations in the resonance frequency and quality factor of the coupled tip-sample system.
Here, we will discuss the development of VE-CRFM from experimental protocols to theoretical models. We will show how measurements can be performed in air and liquid environments, while still providing accurate quantification. Two recent developments within VE-CRFM will be discussed in detail. The first employs VE-CRFM as a local, in-situ probe of photorheological changes in polymer materials. A 405 nm laser is used to induce photopolymerization of the volume immediately beneath the tip. The fast mechanical bandwidth of the contact resonance enables transformation of the viscoelastic properties to be resolved with sub-millisecond temporal resolution; far faster than afforded by conventional rheological methods. In situ viscoelastic nanorheology is demonstrated on a rubber-to-glass transition and during voxel-scale cure of an additive manufacturing resin. In addition to demonstrating this new rheological tool, we will exhibit a new method of VE-CRFM wherein data are deliberately resolved at a constant CR frequency for all pixels in the image, rather than letting frequency vary. In existing CR methods, the variation in CR frequency leads to a nonmonotonic relationship between quality factor and material damping – making intuitive interpretation of raw data difficult. Furthermore, the variation in frequency means that viscoelast ic properties (which themselves are frequency dependent) are measured at a different frequency for each pixel in the image. This calls into question whether observed variations are because of intrinsic differences in dissipation, or simply a result of the frequency change. We achieve constant CR frequency by varying the static load and hence contact stiffness in a force volume map while exciting the cantilever near the contact resonance frequency. The force at constant CR frequency becomes a measurable parameter that can be directly used to quantify variations in elastic modulus while the quality factor becomes an intuitive and monotonic function of loss tangent.

Advance measurement in Atomic Force Microscopy. What's the latest in mechanical and electrical AFM characterization?

Emmanuel PARIS, *Bruker Europe*

New DataCube modes will be presented for correlative electrical and mechanical data. For materials scientists and engineers these new capabilities provide simultaneous capture of nanometer-scale electrical and mechanical characteristics in high-density data cubes, previously impossible to attain in a single measurement.

Thursday 13 September, 09:00 – 10:30

HT.II.C - Nanotechnologies for innovative medicine

Dye Doped Silica Nanoparticles as Luminescent Organized Systems for Nanomedicine

Luca PRODI, *University of Bologna*

Silica nanoparticles are versatile platforms with many intrinsic features, including a low toxicity. Proper design and derivatization yield particularly stable, very bright nanosystems displaying multiple functions, which can be used for either photoluminescence (PL), or electrochemi-luminescence (ECL) sensing, labelling or imaging applications. For these reasons silica nanoparticles already offer unique opportunities, and further improvement and optimization can substantially expand their possible applications in fields of high impact, such as medical diagnostics and therapy, environmental and food analysis, and security. In this context, we have developed a direct micelle assisted strategy based on the use of Pluronic F127 as high molecular weight surfactanTT. The one-pot synthesis yields PEGylated silica nanoparticles endowed with very high monodispersity, colloidal stability and core-shell structure. These nanoparticles were recently reported with the acronym PluS NPs (Pluronic Silica NanoParticles). These NPs had a silica core of about 10 nm and an overall hydrodynamic diameter of about 25 nm. Interestingly, PluS NPs can be tailored for optimization of processes such as directional energy transfer, which provide those systems with extremely valuable functions: high light-harvesting capability, signal-to-noise maximization, multiplex output, and signal amplification. In-vivo experiment proved the absence of toxic effects on mice even after three months after injection. We also found that cellular uptake was influenced by nanoparticle functionalization while the drug loading ability can bue tuned with a suitable choice of the silica precursor.

Nanomedicine in the field of Ortopedic surgery

Francesco TRAINA, *University of Messina*

The application of nanotechnology to bone substitutes is relatively a new frontier in orthopedic research, nevertheless they have been utilized in a number of applications, that include targeted drug delivery for orthopedic oncology, implantable materials for bone, cartilage and vertebral disk regeneration, surface enhancement for joint prosthesis, and diagnostic modalities. A variety of nanostructures with unique chemical, physical, and biological properties have been engineered to improve to achieve all these goals, including ceramics, polymers, metals, and composites. All these nanomaterials can be used to improve orthopedic implant by controlling their surface properties and their interaction with host environment. Since natural tissues are nanometer in dimensions and cells directly interact with nanostructured extracellular matrices, the biomimetic features and excellent physiochemical properties of nanomaterials play a crucial role in stimulating cell growth as well as tis- sue regeneration. Some of the key characteristics that make nanomaterials attractive for orthopedic applications include high strength-to-weight ratio, wear/corrosion resistance, antimicrobial/drug release potentials, and tissue integration/ regeneration capabilities. However, mimicking living bone tissue is still a challenge. The scope of this presentation is to highlight the most recent accomplishments and trends in designing nanomaterials and their applications in orthopedics with an outline on future directions and challenges.

Thursday 13 September, 09:00 – 10:30

HT.II.D - Nanotechnology and advances in electronic devices

Iontronics or controlling electronics via ionic motion and arrangement: fundamentals and applications

Francesco ROSSELLA, *Scuola Normale Superiore/NEST*

Iontronics targets the control of electrical properties and functionality of electronic devices by exploiting ionic motion and arrangement. It represents an interdisciplinary field encompassing electrochemistry, solid-state physics, energy storage, electronics and biological sciences. A key element driving the functionality of iontronic devices is the electric-double-layer (EDL) formed at the interface between an (electronically-insulating) ionic conductor and an electronic conductor such as an organic system or an inorganic semiconductor. In particular, the use of ionic liquids for the realization of EDL transistors (EDLTs) yields very high local electric fields and efficient carrier-density modulation. These approaches are widely exploited for the control of semiconductor nanostructure-based devices such as nanowire-FETs. In this case, the perspectives include fundamental studies such as carrier density induced phase-transitions and also applications in bioelectronics, light emission and detection at the nanoscale, bio-sensing.

Physics and technology of gallium nitride materials for power electronics

Fabrizio ROCCAFORTE, *CNR-IMM, Catania*

Since decades, silicon (Si) is the "lord" of microelectronics industry. However, to meet the current societal need of reducing the global energy consumption, the next generation of power devices will have to guarantee an improved energy efficiency with respect to the existing Si devices. For this purpose, the introduction of new semiconductors technologies has become mandatory. Owing to its outstanding physical and electronic properties, gallium nitride (GaN) and related alloys are promising materials that can find application in the fields of high-power and high-frequency electronics, with a high energy efficiency. However, several hurdles are still hindering the full exploitation of these materials. For that reason the scientific community working on GaN-based materials is intensively involved in the solution of a variety of physical and technological problems encountered in the fabrication of GaN devices. This keynote speech aims to give an overview on some selected scientific aspects of GaN technology for power electronics devices, with a special attention to the case of high electron mobility transistors (HEMTs). In particular, after an introduction on the fundamental physical properties of the material, emphasis will be given to the current transport at metal/GaN interfaces, considering either Ohmic and Schottky contacts, which are important bricks of any power device. Afterwards, the relevance of dielectrics for GaN, either as passivation or gate insulation layers, will be briefly highlighted. Finally, the possible approaches to control the two dimensional electron gas (2DEG) in AlGaN/GaN heterostructures and to fabricate normally-OFF HEMTs will be presented, thus being one of the most important challenges in GaN technology.

Friday 14 September, 09:00 – 10:30

HT.III.A - Spectroscopic characterization and imaging

HIM with SIMS - High resolution Imaging and Nano-analytics with He and Ne ions

Lars- Oliver KAUTSHOR, *Carl Zeiss Microscopy GmbH*

The Helium Ion Microscope (HIM) has been described as an impact technology offering new insights into the structure and function of nanomaterials. Combining a high brightness Gas Field Ion Source (GFIS) with unique sample interaction dynamics, the helium ion microscope provides images, offering unique contrast and complementary information to existing charged particle imaging instruments such as the SEM and TEM. Formed by a single atom at the emitter tip, the helium probe can be focused to below 0.25 nm offering the highest recorded resolution for secondary electron images. The small interaction volume between the helium beam and the sample also results in images with stunning surface detail. By analyzing the sputtered material by means of SIMS the Helium Ion microscope can be transferred into a powerful nano-analytical system. The combination of the high-brightness He/Ne GFIS source with secondary ion mass spectrometry detection capabilities opens up the prospect of obtaining chemical information with high lateral resolution and high sensitivity on the ZEISS ORION helium ion microscope. A lateral resolution for SIMS imaging <20 nm has been shown. Simulation based study reveals that a lateral resolution <10 nm can be obtained.

Chemical and spectroscopic characterization from nm to sub-nm scale with EFTEM and STEM-EELS

Giovanni BERTONI, *CNR IMEM, Trento*

Advanced materials require control of the structural properties at the sub-nanometer or atomic scale. To fully characterize these systems, the chemical information at high spatial resolution must be achieved. This is possible by using electron energy loss spectroscopy in a scanning transmission microscope (STEM-EELS), or in filtered mode with a parallel beam (EFTEM). The latter can be used, for instance, to reveal the oxidized shell after treatments in assembled nanocrystals. Taking advantage of probe aberration correction in STEM and high-resolution spectrometers, sub-nm and atomic resolution is possible. Here I will show some examples of the use of this technique for mapping the chemical composition and the oxidation state (valence) of atoms in different nanosystems. An example is a CeO2/Pt epitaxial heterostructure, in which EELS from the Ce-M ionization edge reveals a one atomic thick layer with partly reduced Ce 3+ atoms at the interface in agreement with theory predicting 1 reduced Ce 3+ atom per cell to be stable at the interface. Other examples focus on nanoparticles and functionalized nanostructures. For instance, EELS mapping can be used to resolve the oxidation state of the metal atoms in core/shell particles. Moreover, EELS can be used to determine the bandgap in ultrathin perovskite nanosheets, or to map the extension of the plasmons and excitons states in a coupled system such as Au functionalized ZnO nanostructures.

Friday 14 September, 09:00 – 10:30

HT.III.B - 2D materials and beyond

Designer artificial 2D materials

Alessandro MOLLE, *CNR-IMM Agrate*

Making adjustable two-dimensional (2D) materials is an emerging route to reach a superior control of new functional properties. With this aim in mind, here I will give consideration to two distinct cases. On one hand is the case of the epitaxial Xenes, an emerging class of 2D monoelemental lattice beyond graphene; on the other hand is the anisotropy design in MoS2 nanosheets. By close analogy with graphene, epitaxial Xenes are comprised of monoelemental atoms arranged in a honeycomb lattice but unlike graphene, Xenes are epitaxially grown on substrates and exhibit a varying degree of buckling and/or puckering in the lattice structure. Examples in this respect are silicene, germanene, stanene, borophene, epitaxial phosphorene, and recently synthesized antimonene and tellurene. Buckling in Xenes can be taken as a leverage to tune the electronic and quantum properties making it possible for Xenes to appear as semiconductors, semimetals, metals topological and trivial insulators. Not only the wealth of electronic states in the Xenes makes them suitable as nanotechnology platform, but also topological transitions among these electronic states are predicted to take place as a function of an external solicitation (e.g. vertical electric field, applied stress) thus paving the way to the full exploitation of topology in devices at the 2D level. I will show the route and challenges for Xenes to be integrated in nanoelectronic devices by briefly describing a universal approach to Xene processing and eventually the concept of a topological field effect transistor.
A different case of morphology design at the 2D level is the chemical vapour deposition of MoS2 nanosheets on patterned substrates. The highly conformal character of the MoS2 growth allows for the achievement of an anisotropically modulated MoS2 nanosheet where the phonon and electronic properties are observed to be strongly morphology dependent. The so-induced morphological anisotropy is reflected in the anisotropy of the physical characteristics, such as the phonon spectrum, intrinsic charge fluctuations, and the exciton dynamics. Implications on the band-gap and exciton engineering will be discussed, and the potential for applications envisioned.

Single and multilayer graphene embedded in a Fabry-Perot cavity for tunable NIR absorption

Maria Luisa GRILLI, *ENEA Casaccia*

Recently, optical absorption enhancement of graphene in the visible and near infrared (NIR) regions has attracted increasing interest of researchers. While field induced enhanced optical absorption has been modeled by some authors, reports on its experimental validation are still lacking.
In this work we report on our preliminary study on the design and experimental fabrication of a Fabry- Perot (FP) filter which employs single layer graphene or multilayer graphene in its cavity. The FP filter was modeled by COMSOL Multiphysics. The central wavelength of the FP filter, consisting of Si and SiO2 layers, was chosen in the wavelength range of 2200-2500 nm. FP was fabricated by radio frequency sputtering starting from a 99,999 % purity Si target. Oxygen gas was used for the deposition of the SiO2 layers. After the first mirror fabrication, graphene single layer (or multilayers) grown by Chemical Vapour Deposition on a Cu foil was successfully transferred on the stack. Several experimental conditions were investigated with the aim to not oxidize nor damage the graphene layer during the sputtering process of the SiO2 layer of the subsequent mirror.
Results showed an enhanced NIR absorption (close to the central FP wavelength) of the graphene layers when embedded in the FP filter. Absorption wavelength may be tuned by opportunely choosing the materials and the thickness of the layers of the FP filter.

Friday 14 September, 09:00 – 10:30

HT.III.C - Advanced approaches for investigating cells and neurons

Advanced Diagnosis at single cell level by Coherent Imaging in Lab on Chip Platforms

Pietro FERRARO, *CNR - ISASI , Pozzuoli (Napoli)*

Tomography is one of the most powerful imaging tools for analyzing biological samples, able to furnish complete mapping of the object in 3D. In particular, tomographic phase microscopy (TPM) exploits quantitative phase imaging (QPI) techniques to map the 3D refractive index (RI) of cells, by adopting laser beam deflection, direct mechanical rotation or holographic optical tweezers (HOTs) to probe the sample along a number of controlled directions. In general, all TPM set-ups require the sample to be observed along different directions with respect to the probing beam. To date, all tomographic methods require a high-precision, opto-mechanical and/or opto-electronic device to acquire a set of many images by probing the sample along a large number of controlled directions. Here we report on a smart solution to obtain TPM of samples at lab-on-chip scale, by exploiting their tumbling inside microfluidic channels. This method, recently developed, presents the following advantages: (i) Permits to observe full 360° of rotating cells, this avoiding the limitation in the accuracy of tomograms; (ii) no mechanical contact neither holographic optical tweezers are needed to rotate the sample; (iii) it is suitable for application in flowing conditions with high-throughput performances. This would allow real microfluidic biomedical applications on a large scale. The results shown in [4] for RBCs and diatoms are here extended to quasi-spherical cells, by exploiting a new algorithm for rolling angle recovery in TPM. In particular, we performed the 3D imaging of human breast adenocarcinoma MCF-7 cells, opening the way for the full characterization of circulating tumor cells (CTCs) in the new paradigm of liquid biopsy.

Networking brain and silicon spiking neurons with nanoscale memristors: first steps, next challenges and perspectives for brain-machine interfaces

Stefano VASSANELLI, *University of Padova*

Neural interfaces for recording and stimulation of brain neurons are experiencing a dramatic development, boosting large-scale and high-density implementations that represent an ideal bi-directional gateway to micro- and nanoelectronic devices emulating fundamental properties of neurons, such as action potential firing and synaptic plasticity. Thus, in perspective, a new concept of brain-machine interfacing may emerge where brain and silicon neurons are physically connected for seamless spike-based computation, and differently from current signal processing approaches based on Von Neumann machines. As a first step in this direction, we will present results in vitro from the RAMP project (http://www.rampproject.eu/) where nanoscale memristors are used as part of synaptic-like elements between biological and very-large integration spiking neurons. We show that memristors can mimic synapses in compressing information on spikes occurrence and with minimal power consumption and emulate plasticity across an elementary biohybrid network.

Friday 14 September, 09:00 – 10:30

HT.III.E - 3D Additive Manufacturing

Additive manufacturing of nanocomposite materials for optics

Andrea CAMPOSEO, *Scuola Normale Superiore/NEST*

Additive manufacturing technologies are currently introducing novel paradigms for the design of optical devices and for their fabrication. The object fabrication can be accomplished by either curing a liquid pre-polymer via exposure to UV radiation, or by depositing fused polymers and viscous inks, in a layer-by-layer approach. In this framework, the production of 3D optical structures is still challenging, because such components require optical transparent matrices, which can be optionally doped with nanoparticles and active molecular compounds to achieve specific optical properties, such as light diffusion, absorption, emission at particular wavelengths and nonlinear optical response. In this presentation, 3D printing processes for both passive and active optical components developed in our laboratories will be presented. We investigated 3D printing process of transparent matrices and nanocomposite functional optical materials, and characterized the process variables of various composite materials.

Virtual reality tools for advanced modeling

Giordano MANCINI, *Scuola Normale Superiore/SMART*

The role of Virtual Reality (VR) tools in molecular sciences is analyzed in this contribution through the presentation of the Caffeine software. Caffeine, developed at Scuola Normale Superiore, is specifically tailored for molecular representation and data visualization with VR systems, such as VR theaters and helmeTT. Researchers are cast into the world of atoms and molecules, where they can visualize at a human time and spatial scale phenomena such as the density of molecules around a specified coordinates set, bond formation, biopolymers structure, electron charge rearrangement or vector fields. Common chemical abstractions for (macro) molecular structures such as ball and stick and ribbon representations are used, in conjuction with isosurfaces and glyphs for non atomic data. The application is coupled by a desktop version and integrates (both in 2D and 3D) data analysis tools to allow plot 2D charts in an augmented reality like fashion or select molecular structures with specific features.

I.A Keynote Session: Ultimate TEM characterization and imaging

Chair: Vittorio MORANDI, *CNR - IMM, Bologna*

The symposium is part of the workshop WS.I on "Advanced Characterization Techniques for Nanotechnologies and Nanosciences"

I.A.1 Beatrice VALLONE, *Sapienza University of Rome*
Single Particle Cryo-EM structure of the complex between human Ferritin and Transferrin Receptor: a gateway for targeted delivery and theranostics

I.A.2 Elvio CARLINO, *CNR-IMM, Lecce*
Atomic Resolution Transmission Electron Microscopy: On the way toward the ultimate spatial resolution and accuracy

I.B Keynote Session: Challenges in semiconductor technologies

Chair: Romeo BECCHERELLI, *CNR IMM, Roma*
***In collaboration with:* MICRON**

I.B.1 Narciso GAMBACORTI, *CEA-Leti/PAC-G, Grenoble, France*
Semiconductor characterization challenges addressed by Large Scale Facilities

I.B.2 Tommaso VALI, *Micron*
Neural network and Pattern recognition implemented on memory technology

I.C Keynote Session: Nanotechnology and nanofabrication: opportunities for innovation

Chair: Fabrizio PIRRI, *Polytechnic of Turin*

I.C.1 Massimo BERSANI, *FBK, Trento*
Research and innovation Dilemma on Nanotechnology

I.C.2 Monica BOLLANI, *CNR IFN, Milano*
Design, characterization and lithographic application of Si nanocrystals patterns via templated dewetting

I.D Keynote Session: Nanotechnology and Advances in Biotech Applications

Chair: Stefano LINARI, *Linari Engineering Srl*

I.D.1 Paola MINGHETTI, *University of Milan*
Drug, medical device and cosmetic containing nanocarrier: regulatory perspective

I.D.2 Carlo Alberto MARCOALDI, *LINARI Nanotech*
Electrospinning of nanofibers for tissue engineering

I.A X-Ray Microscopy

Chair: Narciso GAMBACORTI, *Cea-Leti & PAC-G, Grenoble, France*

The symposium is part of the workshop WS.I on "Advanced Characterization Techniques for Nanotechnologies and Nanosciences"

I.A.1 Lars-Oliver KAUTSHOR, *Carl Zeiss Microscopy*
Extending Synchrotron X-ray Microscopy to the Laboratory" (to be confirmed)

I.A.2 Alessia CEDOLA, *CNR Nanotec, Roma*
X-Ray Phase Contrast Tomography for Regenerative medicin

I.A.3 Tevfik Onur MENTES, *Elettra-Sincrotrone Trieste*
X-ray photoemission electron microscopy studies in ultrathin film magnetism

I.A.4 Manuel DIERICK, *Tescan Orsay Holding*
Exploring Materials Evolution with Laboratory-based Dynamic X-ray Tomography

I.B Nano perspectives in the Agri-Food sector

Chair: Nelson MARMIROLI, *University of Parma*

The symposium is part of the workshop WS.II on "AgriNanoTechniques"

I.B.1 Ana Maria RINCON, *European Food Safety Authority (EFSA)*
A regulatory perspective on nanomaterials or engineering nanomaterials in food in the European Union

I.B.2 Rossella BENGALLI, *University of Milano-Bicocca*
Safe(r) nanomaterials for the Agri-Food sector: The Nano bioscience perspective

I.B.3 Michele IAFISCO, *CNR ISTEC, Faenza*
From food industry by-products to smart nano-fertilizers: towards a circular economy of phosphorus

I.B.4 Giuseppe CIUFFREDA, *Fabbrica Coop Perfosfati Cerea*
Market perspectives for smart fertilizers

I.C Photocatalytic nanomaterials for water remediation

Chair: Roberto GIANNANTONIO, *DHITECH*
***In collaboration with:* DHITECH**

I.C.1 Francesco MATTEUCCI, *DHITECH*
The FONTANAPULIA project

I.C.2 Roberto COMPARELLI, *CNR IPCF, Bari*
Photocatalytic nanomaterials for water remediation

I.C.3 Giuseppe MASCOLO, *CNR IRSA, Bari*
Water treatments and nanotechnologies for water remediation

I.C.4 Daniela SOTTOCORNOLA, *Biotec Srl, Bari*
From water disinfection by UV to UV-based technologies for water remediation

I.D Synthesis and Microstructural properties I

Chair: Gaspare VARVARO, *CNR ISM, Roma*

The symposium is part of the Joint Event JE.I "Materiali Nanofasici"

I.D.1 Federico SCAGLIONE, *University of Turin*
Modified Nanoporous Gold for Hydrogen Evolution Reaction

I.D.2 Leonardo GIORGI, *ENEA Casaccia, Rome*
Self-organized $Ti0_2$ anatase nanotube direct fabricated by anodization without annealing

I.D.3 Ahmad KHODADADI, *NTU, Singapore*
A new route to develop nanocompound composite based on sepiolite and Mg Al layered double hydroxide

I.D.4 Antonio RUBINO, *Sapienza University of Rome*
$Ti/TiO_2/Cu_2O$ electrodes for photocatalytic applications: synthesis and characterization

I.E Nanotechnology for bio-medical applications

Chair: Eugenio AMENDOLA, *CNR IPCB, Portici, Napoli*

I.E.1 Sabato D'AURIA, *CNR ISA, Napoli*
Robust biomolecules as advanced tools for biotech applications

I.E.2 Cristiano DE MICHELE, *Sapienza University of Rome*
Liquid Crystals of DNA-based Nanoparticles

I.E.3 Barbara CORTESE, *CNR NANOTEC, Roma*
Role of Mechanical cues in the control and guidance of Glioma Progression

I.E.4 Giacinto SCOLES, *CNR NANOTEC, Lecce*
Cytofind Dx: a company that has the ambition to innovate cancer diagnostics

I.F Electrochemical Energy Storage: use of nanomaterials as components of batteries

Chair: Pierpaolo PROSINI, *ENEA Casaccia*
***In collaboration with:* ENEA**

I.F.1 Francesco NOBILI, *University of Camerino*
High-capacity Si-based nanocomposite anodes for Li-ion batteries

I.F.2 Sergio BRUTTI, *University of Basilicata*
Synergistic electro-catalysis of core/shell Pd/PdO nanoparticles and Cr(III)-doped NiCo2O4 nanofibers in aprotic Li-O2 batteries

I.F.3 Claudio GERBALDI, *Polytechnic of Turin*
Towards Solid Batteries Operating at Ambient Temperature Exploiting Highly-Crosslinked (Composite) PEO-based Polymer Electrolytes

I.F.4 Catia ARBIZZANI, *University of Bologna*
Nanomaterials for new separators in lithium/sulfur batteries

I.F.5 Marisole DI CARLI, *ENEA Casaccia*
Electrospinning nanofibers as separators for lithium-ion batteries

I.G Innovative nano-materials and methods for fuel cell electrodes implementation

Chair: Marcello ROMAGNOLI, *University of Modena & Reggio Emilia*
***In collaboration with:* University of Modena & Reggio Emilia**

I.G.1 Paola LUCHES, *CNR Istituto Nanoscienze, Modena*
Nano structured reducible oxides for PGM-free fuel cell anodes

I.EG.2 Gianluca MALAVASI, *University of Modena and Reggio Emilia*
Development of new ceria-based catalysts: modelling, synthesis and characterization

I.G.3 Marcello ROMAGNOLI, *University of Modena and Reggio Emilia*
Innovative deposition methods to prepare test electrodes

I.G.4 Maria CANNIO, *University of Modena and Reggio Emilia*
Nanofluids for thermal exchange

II.A Advances in Microscopy-based Nanocharacterization Methodologies

Chair: Elvio CARLINO, *CNR-IMM, Lecce (to be confirmed)*
***In collaboration with:* ZEISS**

The symposium is part of the workshop WS.I on "Advanced Characterization Techniques for Nanotechnologies and Nanosciences"

II.A.1 Matteo FERRONI, *University of Brescia*
The implementation of the STEM imaging mode in the SEM for electron tomography

II.A.2 Giulio LAMEDICA, *Carl Zeiss Italia*
Latest Advances in Electron and Ion Microscopy

II.A.3 Joerg LINDENAU, *Carl Zeiss Microscopy*
Large Volume and Correlative Scanning Electron Microscopy

II.A.4 Umberto CELANO, *IMEC, Belgium*
Site-specific analysis for nanoelectronics using hybrid SPM-TEM metrology

II.B Nanomaterials and Plant Nutrition

Chair: Zeno VARANINI, *University of Verona*

The symposium is part of the workshop WS.II on "AgriNanoTechniques"

II.B.1 Luca MARCHIOL, *University of Udine*
Smart fertilizers: Nano-options towards an improvement of Nutrient Use Efficiency

II.B.2 Marta MARMIROLI, *University of Parma*
Possible applications of engineered nanomaterials in agriculture: the issue of interaction

II.B.3 Davide SEGA, *University of Verona*
FePO4 nanoparticles as a source of nutrients for plants

II.B.4 Ilaria CLEMENTE, *University of Florence*
Contributions of nanoscience in designing innovative vectors for agrochemical delivery

II.C European nanotechnology research infrastructures: their support to innovation 1

Chair: Lorenza FERRARIO, *FBK, Trento*
***In collaboration with:* FBK**

II.C.1 Mariam DEBS, *International Iberian Nanotechnology Laboratory, Portugal*
Presentation INL

II.C.2 Onofrio Antonino CACIOPPO, *LFoundry, Avezzano*
LFoundry network in support of innovation

II.C.3 Giovanni ISELLA, *Polytechnic of Milan*
Laboratory for Nanostructures Epitaxy and Spintronics on Silicon LNESS, semiconductor deposition, characterization and modeling.

II.C.4 Vittorio MORANDI, *CNR IMM, Bologna*
It-fab and EuroNanoLab: Italian and European networks of micro and nano-fabrication facilities

II.C.4 Pierluigi BELLUTTI, *FBK, Trento*
The Key enabling technologies Facility in Trento FBK FESR Project

II.D Sustainable (bio-)technologies for CO_2 capture and usage

Chair: Angela RE, *IIT, Torino* & Sergio BOCCHINI, *IIT, Torino*
***In collaboration with:* Polytechnic of Turin & IIT**

II.D.1 Klaas HELLINGWERF, *Swammerdam Institute for Life Sciences, University of Amsterdam, The Netherlands*
On the use of oxygenic photosynthesis for the sustainable production of commodity chemicals

II.D.2 Tomas MOROSINOTTO, *University of Padova*
Unicellular algae for sustainable production of bio-commodities and nanoparticles

II.D.3 Simelys HERNANDEZ, *CREST Group, Polytechnic of Turin & IIT@Polito*
Current Status and Challenges for the Implementation of Electrocatalytic CO_2 Reduction

II.D.4 Valentina CROCELLÀ, *University of Turin*
Bio-inspired materials for CO_2 capture and utilization

II.D.5 Stefano SANTABARBARA, *CNR, Biophysical Institute, Milano*
Photosynthesis on the red edge

II.E Nanotechnology in medicine

Chair: Donatella PAOLINO, *University "Magna Graecia" of Catanzaro*
***In collaboration with:* University "Magna Graecia" of Catanzaro**

II.E.1 Lorenzo PRADELLA, *GreenBone Ortho srl*
Nanotechnology commercialisation: from research to successful development

II.E.2 Adriele PRINA-MELLO, *Trinity College Dublin & AMBER Centre and CRANN Institute, Dublin, Ireland*
Next generation Nanomedicine development. The importance of Size and Concentration characterisation as key quality attributes

II.E.3 Adriana TRAPANI, *University of Bari "Aldo Moro"*
Solid Lipid Nanoparticles made of gelucire® 50/13: a suitable delivery system for hydrophobic or hydrophilic active substances

II.E.4 Ilenia VIOLA, *CNR NANOTEC*
Membrane-based microfluidic devices for real-time sensing and autonomous pumping

II.F Computer aided design of innovative materials

Chair: Massimo CELINO & Francesco BUONOCORE, *ENEA Casaccia*
***In collaboration with:* ENEA**

II.F.1 Massimo CELINO, *ENEA Casaccia*
High Performance Computing technologies to design new materials for energy applications

II.F.2 Giuseppe ZOLLO, *Sapienza University of Rome*
Transverse tunneling current signals across nano-gaps in graphene nano-ribbons for peptide bonds sequencing

II.F.3 Daniele VARSANO, *CNR Istituto di Nanoscienze, Modena*
Carbon nanotubes as excitonic insulators

II.F.4 Olivia PULCI, *University of Rome Tor Vergata*
Two-dimensional nitrides for ultraviolet to infrared detectors

II.F.5 Francesco BUONOCORE, *ENEA Casaccia*
Beyond Just Graphene: a Viable Synthesis Route to Graphane

II.G Nanomaterials fabrication and characterization advances

Chair: Francesco MARRA, *Sapienza University of Rome*

II.G.1 Giacinto SCOLES, *CNR NANOTEC, Lecce*
Cellular materials for organ on chip research

II.G.2 Dmitry MURATOV, *National University of Science and Technology MISiS, Moscow, Russia*
2D crystals of transition metal trichalcogenides for nanoelectronics and photovoltaics

II.G.3 Eugenio AMENDOLA, *CNR IPCB, Portici, Napoli*
In definition

II.G.4 Maria CENSABELLA, *University of Catania*
Fabrication of Metal Nanoparticles-Graphene Nanocomposites and Study of the Charge Transfer Effect

II.G.5 Federica BERTOLOTTI, *Aarhus University, Denmarknd & To.Sca.Lab, Como, Italy*
Advanced X-ray Total Scattering Methods based on the Debye Scattering Equation for characterizing nanomaterials

III.A Cryo Electron Microscopy: the resolution revolution

Chair: Beatrice VALLONE, *Sapienza University of Rome*
***In collaboration with:* JEOL, THERMO FISHER SCIENTIFIC & ZEISS**

The symposium is part of the workshop WS.I on "Advanced Characterization Techniques for Nanotechnologies and Nanosciences"

III.A.1 Giuseppe ZANOTTI, *University of Padova*
Cryo-electron microscopy: a crystallographer view

III.A.2 Ludovic RENAULT, *Leiden University, Leiden, The Netherlands*
Running an International service facility for cryoEM

III.A.3 Massimiliano MALETTA, *Thermo Fisher Scientific*
The role of Cryo-electron microscopy in structural biology after the "resolution revolution"

III.A.4 Guillaume BRUNETTI, *JEOL EUROPE*
New JEOL TEM developments for cryo biology

III.A.5 Joerg LINDENAU, *Carl Zeiss Microscopy*
Workflow for Correlative Cryo-Imaging

III.B Research Pathways

Chair: Luca MARCHIOL, *University of Udine*

The symposium is part of the workshop WS.II on "AgriNanoTechniques"

III.B.1 Ilaria COLZI, *University of Florence*
Copper nanoparticles from agricultural wastes: a case study on blueberry local processing

III.B.2 Enrico BRAIDOT, *University of Udine*
Impact of Hydroxyapatite NPs on tomato plantlet metabolism and seed germination

III.B.3 Alessandra ZAMBONELLI, *University of Bologna*
Iron exopolysaccharide nanoparticles to improve the production of truffle mycorrhized plants

III.B.4 Federica TRAMER, *University of Trieste*
Chitosan nanoparticles as vectors for the release of bioactive plant substances: application in the medical and agri -food fields

III.C Physical Characterizations on semiconductor devices

Chair: Onofrio Antonino CACIOPPO, *LFoundry*
***In collaboration with:* LFoundry, Renishaw**

III.C.1 Marco RENZELLI, *LFoundry*
UV emission from Silicon; evidences for possible physical explanations

III.C.2 Giuseppe MOCCIA, *LFoundry*
Study of Raman Spectroscopy capability on SRP beveled samples for implant and anneal characterization

III.C.3 Riccardo TAGLIAPIETRA, *Renishaw*
Accurate Raman imaging of rough samples and/or those with complex surface topographies

III.C.4 Narciso GAMBACORTI, *PAC-G/CEA Leti, Grenoble, France*
Atomic Probe Tomography of of elements diffused by poly gate in to gate-oxide- to be confirmed

III.D Synthesis and Microstrucral Properties II

Chair: Amelia MONTONE, *CNR ISM, Roma*

The symposium is part of the Joint Event JE.I "Materiali Nanofasici"

III.D.1 Alexey DRONOV, *National Research University of Electronic Technology (MIET), Russia*
Electrochemical routes for functional nanostructures synthesis for energy and heterogeneous catalysis applications

III.D.2 Francesco ANTOLINI, *ENEA*
Solid state synthesis of CdS Quantum Dots through laser direct writing

III.D.3 Antonietta TAURINO, *CNR IMM, Lecce*
Fluence-dependent distributions of Au nanoparticles produced by sub-picosecond UV pulsed laser ablation

III.D.4 Iman FARAHBAKHSH, *University of Applied Science and Technology, Shirvan Center, Iran*
Coating of Fe, Cu and SiC Nano Particles Mixture on Fe plate by Mechanical Alloying

III.E From Nanotherapeutics to NanoBiomaterials

Chair: Giovanni TOSI, *University of Modena & Reggio Emilia*
***In collaboration with:* University of Modena & Reggio Emilia**

III.E.1 Francesca PEDERZOLI, *University of Modena and Reggio Emilia*
Nanomedicine in Brain Disorders

III.E.2 Samantha POZZI, *University of Modena and Reggio Emilia*
Cell-Penetrating $CaCO_3$ Nanocrystals for Improved Transport of NVP-BEZ235 across Membrane Barrier in T-Cell Lymphoma

III.E.3 Paola BORELLA, *University of Modena and Reggio Emilia*
Development and on field experimentation of nanomaterials replacing traditional methods for controlling microbial contamination in confined environments

III.E.4 Leonardo ORAZI, *University of Modena and Reggio Emilia*
Laser nano-patterning of materials for implants

III.E.5 Michele DI LAURO, *University of Modena and Reggio Emilia*
Implantable Organic Neuroelectronics

III.E.6 Marcello BERTO, *University of Modena and Reggio Emilia*
Biosensing with organic electronic transistors

III.F Nanostructures and Spectroscopy for Quantum confined Systems, Photonics, Biosystems and Cultural Heritage

Chair: Carlo MARIANI, *Sapienza University of Rome*
***In collaboration with:* Sapienza University of Rome**

III.F.1 Stefania PANERO, *Sapienza University of Rome*
Down to Nanoscale: Observations of archaeological copper based artifacts from the Late Pre-dynastic site of Maadi

III.F.2 Sergei ARAKELIAN, *Vladimir State University, Russia*
Femto- nanophotonics as a new basis in modern Hi-Tech industry

III.F.3 Francesco BASSO BASSET, *Sapienza University of Rome*
Epitaxial Quantum Dots: Nanostructures for Quantum Communication

III.F.4 Ilaria RAGO, *Sapienza University of Rome*
Tuning cellular functionality and development via carbon nanotubes directly grown on supporting surfaces

III.G European nanotechnology research infrastructures: their support to innovation 2

Chair: Riccardo BERTACCO, *Polytechnic of Milan - PoliFAB*
***In collaboration with:* FBK**

III.G.1 Ida NODDELAND, *Norwegian University of Science and Technology (NTNU), Gløshaugen, Norway*
Presentation NTNU

III.G.2 Laura BOSCHIS, *Trustech*
Presentation Trustech

III.G.3 Alessandro NOTTOLA, *Inphotec*
Presentation Inphotec

III.G.4 Alina SUSLOVA, *Venture Club, Russia*
New areas of technology transfer in Eastern Europe and Middle East countries: Specificity of technology transfer, risks and obstacles in «bridging» corporations and entrepreneurs

II.A Keynote Session: Scanning Ion Microscopy: Nanocharacterization and Nanofabrication

Chair: Marco VITTORI ANTISARI, *Asssociazione Nanoitaly*
***In collaboration with:* ASSING/Tescan**

The symposium is part of the workshop WS.I on "Advanced Characterization Techniques for Nanotechnologies and Nanosciences"

II.A.1 Petr KLIMEK, *Tescan Orsay Holding*
Preparation of Aluminum Specimen with Gallium and Xenon Plasma Focused Ion Beam for Further Nano-characterization

II.A.2 Gian Carlo GAZZADI, *CNR - Nano, Modena*
Focused Ion Beam (FIB) and Focused Electron Beam Induced Deposition (FEBID) for advanced nanocharacterization and nanofabrication

II.B Keynote Session: Scanning Probe Microscopy: Touching and Probing Matter at the Nanoscale

Chair: Daniele PASSERI, *Sapienza University of Rome*
***In collaboration with:* ASSING/Bruker**

The symposium is part of the workshop WS.III on "Advanced Scanning Probe Microscopies"

II.B.1 Jason KILLGORE, *NIST, USA*
Exploring Nanoscale Viscoelasticity with a Surface Coupled Scanning Probe Microscope

II.B.2 Emmanuel PARIS, *Bruker Europe*
Advance measurement in Atomic Force Microscopy. What's the latest in mechanical and electrical AFM characterization?

II.C Keynote Session: Nanotechnologies for innovative medicine

Chair: Sabrina CONOCI, *STMicroelectronics*
***In collaboration with:* Distretto Tecnologico Sicilia Micro e Nano Sistemi**

The symposium is part of the workshop WS.V on "Nanotechnologies for innovative medicine"

II.C.1 Luca PRODI, *University of Bologna*
Dye Doped Silica Nanoparticles as Luminescent Organized Systems for Nanomedicine

II.C.2 Francesco TRAINA, *University of Messina*
Nanomedicine in the field of Ortopedic surgery

II.D *Keynote Session:* Nanotechnology and advances in electronic devices

Chair: Guglielmo FORTUNATO, *CNR IMM, Roma*

II.D.1 Francesco ROSSELLA, *Scuola Normale Superiore/NEST*
Iontronics or controlling electronics via ionic motion and arrangement: fundamentals and applications

II.D.2 Fabrizio ROCCAFORTE, *CNR-IMM, Catania*
Physics and technology of gallium nitride materials for power electronics

IV.A Advance in FIB/SEM Technology and its Contribution to Scientific Problem Solving

Chair: Daniele DE FELICIS, *University of Roma Tre*
***In collaboration with:* TESCAN & ASSING**

The symposium is part of the workshop WS.I on "Advanced Characterization Techniques for Nanotechnologies and Nanosciences"

IV.A.1 Petr KLIMEK, *Tescan Orsay Holding*
Advanced FIB/SEM techniques and applications

IV.A.2 Enrico SALVATI, *University of Oxford, UK*
Nanostructural aspects of human dental enamel and their evolution due to dental caries

IV.A.3 Alessandro LAVACCHI, *CNR ICCOM, Firenze*
2D materials imaging and nanofabrication in the FIB/SEM

IV.A.4 Audrey GARNIER, *STMicroelectronics*
Plasma FIB: enlarge your field of view and your field of applications

IV.B Advanced SPM techniques: methods and applications 1

Chair: Marco RENZELLI, *LFoundry*
***In collaboration with:* LFoundry**

The symposium is part of the workshop WS.III on "Advanced Scanning Probe Microscopies"

IV.B.1 Livia ANGELONI, *University of Delf, Delft, The Netherlands*
Use of Scanning Capacitance Microscopy as a tool for detecting damage to Lightly Doped Drain (LDD) implants in SRAM

IV.B.2 Stefano VERONESI, *CNR, Istituto Nanoscienze, Pisa*
An atomically flat gold film thermometer on mica to study energy (heat) exchange at the nano-scale

IV.B.3 Francesco MARINELLO, *University of Padua, Italy*
NSOM limits and potential in nano-optical characterization

IV.B.4 Cristiano ALBONETTI, *CNR-ISMN, Bologna*
The growth of organic ultra-thin films on silicon oxides with variable vacancy states: a Scanning Force Microscopy approach

IV.C New Materials and Nanotechnologies for Innovative therapeutic Approaches

Chair: Rosalba PARENTI, *University of Catania*
***In collaboration with:* Distretto Tecnologico Sicilia Micro e Nano Sistemi**

The symposium is part of the workshop WS.V on "Nanotechnologies for innovative medicine"

IV.C.1 Emanuela ESPOSITO, *University of Messina*
Laser-produced Au nanoparticles as X-ray contrast agents for diagnostic imaging

IV.C.2 Gianfranco PASUT, *University of Padova*
Monoclonal antibody for drug delivery and targeting

IV.C.3 Gennara CAVALLARO, *University of Palermo*
Nano into micro formulations based on functionalized polymers for pulmonary drug delivery

IV.C.4 Francesco GIULIANO, *SIFI*
Nanostructured carriers for effective delivery of drugs to the back of the eye

IV.D Standardisation of nanomaterials in the VAMAS project (the Versailles project on Advanced Materials Standardisation)

Chair: Laura DEPERO, *University of Brescia & VAMAS Italia and* Luca BOARINO, *INRIM*
***In collaboration with:* INRIM**

IV.D.1 Ian GILMORE, *NATIONAL PHYSICAL LABORATORY, SURFACE AND NANOANALYSIS, UK*
The activities of Technical Working Group 2 Surface Analysis

IV.D.2 Burkhard BECKHOFF, *PHYSIKALISCH-TECHNISCHE BUNDESANSTALT (PTB), Germany*
X ray spectrometry for nanoscaled materials and systems

IV.D.3 Caterina MINELLI, *NPL MATERIALS GROUP, NATIONAL PHYSICAL LABORATORY, UK*
Advancements in nanoparticle standardisation through VAMAS inter-laboratory comparisons

IV.D.4 Andrea GIOVANNOZZI, *INRIM*
Recognition and Quantification of Anatase, Rutile and Brookite in Binary Mixtures: a Raman Spectroscopy and Chemometric Study

IV.E Nanomaterials for next generation of electric motors

Chair: Pietro TAGLIATESTA, *University of Rome Tor Vergata*

The symposium is part of the Joint Event JE.I "Materiali Nanofasici"

IV.E.1 Enzo CHIRICOZZI, *University of L'Aquila*
Nanotechnology and Innovation in electric motors development

IV.E.2 Alessandro TALONE, *ISM CNR, Roma*
Design of Magntic nanoarchitecture with tunable properties

IV.E.3 Sara LAURETI, *ISM CNR, Roma*
Low temperature synthesis of L10 MPt (M = Fe, Co, Ni) nanoparticles by salt layered precursors

IV.E.4 Rocco CARCIONE, *NanoShare srl, Roma*
Carbon nanotubes for electric motors: fibers, composites and metal decorated systems

IV.F Advanced science and surfaces engineering on the multi-scale

Chair: Sergio VALERI, *University of Modena & Reggio Emilia*
***In collaboration with:* University of Modena & Reggio Emilia**

IV.F.1 Alberto ROTA, *FIM-Intermach & University of Modena and Reggio Emilia*
Coupling different strategies for surface functionalization

IV.F.2 Giovanni BOLELLI, *University of Modena and Reggio Emilia*
Finely structured coatings by thermal spraying: case studies

IV.F.3 Francesco BOZZA, *Turbocoating Spa*
Industrialization of nanostructured thermal barrier coatings

IV.F.4 Leonardo ORAZI, *University of Modena and Reggio Emilia*
Ultrashort Laser Micro and Nanotexturing: advances and applications

IV.G NanoInnovation's Got Talent

Chair: Fulvio UGGERI, *Bracco Imaging*
***In collaboration with:* Fondazione Bracco**

IV.G.1 Francesca TRUFFA GIACHET, *CNR ISMAC, Biella*
Antibacterial keratin nanofibers on titanium surfaces for fibroblast adhesion and prevention of biofilm formation

IV.G.2 Ilaria PECORARI, *University of Trieste*
Biomechanical characterization of cardiac fibroblasts in an in vitro progeria model

IV.G.3 Matteo AVOLIO, *University of Pavia & INSTM*
Magnetic Nanoparticles for Magnetic Fluid Hyperthermia and Nuclear Magnetic Resonance: influence of key physical parameters

IV.G.4 Sara POLITI, *University of Rome Tor Vergata*
From carbon-rich natural source to an innovative nanocomposites in the field of nanotechnology

V.A Innovation in Scanning Electron Microscopy

Chair: Luca ORTOLANI, *CNR IMM, Bologna*
***In collaboration with:* ZEISS & JEOL**

The symposium is part of the workshop WS.I on "Advanced Characterization Techniques for Nanotechnologies and Nanosciences"

V.A.1 Joerg LINDENAU, *Carl Zeiss Microscopy*
Large Volume and Correlative Scanning Electron Microscopy

V.A.2 Guillaume BRUNETTI, *JEOL EUROPE*
JSM-IT200: A versatile tungsten SEM

V.A.3 Federico MECARINI, *ASSING, Rome*
Triglav Lens: collection system and imaging modes

V.A.4 Paolo DE NATALE, *Hitachi High-Technologies Europe GmbH*
Hitachi new signals detection technique in cold and Schottky Field Emission SEM

V.B Advanced SPM techniques: methods and applications 2

Chair: Daniele PASSERI, *Sapienza University of Rome*

The symposium is part of the workshop WS.III on "Advanced Scanning Probe Microscopies"

V.B.1 Michele ORTOLANI, *Sapienza University of Rome*
Light-induced functional conformational changes of bacteriorhodopsin probed by mid-infrared nanospectroscopy

V.B.2 Giuseppe BARILLARO, *University of Pisa*
Advanced characterization of nanoporous materials for biosensing and nanomedice

V.B.3 Antonietta LA STORIA, *University of Naples Federico II*
Atomic force microscopy study of antimicrobial activity of Carvacrol against food spoilage bacteria

V.B.4 Leonetta BALDASSARRE, *Sapienza University of Rome*
Observation of phonon-polaritons on thin flakes of hBN on gold

V.C Electrochemical Energy Storage: new materials and technologies for batteries and supercapacitors

Chair: Andrea LAMBERTI, *Polytechnic of Turin*
***In collaboration with:* Polytechnic of Turin**

V.C.1 Mojtaba ALIDOOST, *Polytechnic of Turin*
Lithium Sulfur Batteries: Electrolytes and alternative anodes

V.C.2 Francesca SOAVI, *University of Bologna*
Supercapacitive microbial fuel cells : key systems of the water-energy nexus

V.C.3 Pietro ZACCAGNINI, *IIT@Polito*
Innovative materials for supercapacitor

V.C.4 Daniela FONTANA, *Lithops Srl*
A new European player perspective on Li-ion cell production: the "E-Lithium" project

V.D Materials and Devices for implants and regenerative medicine

Chair: Salvo PETRALIA, *STMicroelectronics*
***In collaboration with:* Distretto Tecnologico Sicilia Micro e Nano Sistemi**

The symposium is part of the workshop WS.V on "Nanotechnologies for innovative medicine"

V.D.1 Rodolfo QUARTO, *University of Genova*
Engineered bone-biomaterial interface

V.D.2 Elisa FIGALLO, *Finceramica, Faenza*
Experimental design approach for engineering biomimetic osteochondral device

V.D.3 Giovanna CALABRESE, *University of Catania*
Biomaterials and adipose-derived stem cells for osteo-chondral regeneration in vitro and in vivo

V.D.4 Alberto RIMINUCCI, *CNR ISMN, Bologna*
Magnetic Assembling of 3D cellular architectures

V.E Nanoemulsions: a versatile platform in health and wellness products

Chairs: Maria CARAFA & Carlotta MARIANECCI, *Sapienza University of Rome*
***In collaboration with:* Sapienza University of Rome**

V.E.1 Rino RAGNO, *Sapienza University of Rome*
Back to the future: essential oils as remedies that never set. Acquisition of experimental chemical, (micro) biological data processed with machine learning algorithms to define predictive models and shed light on essential oils mechanism of action

V.E.2 Alessandro MACCELLI, *Sapienza University of Rome*
Highly-accurate untargeted metabolomics mass spectrometry approach to determine the elemental composition of Satureja Montana essential oil

V.E.3 Anna IMBRIANO, *Sapienza University of Rome*
Nanoemulsions: versatile formulations for active substance delivery and targeting

V.E.4 Luca VITANZA, *Sapienza University of Rome*
Antimicrobial, antibiofilm and cytotoxic effect of essential oils and essential oil-based nanoemulsions

V.F Magnetic, Transport and Optical Properties

Chair: Gaspare VARVARO, *ISM CNR, Roma*

The symposium is part of the Joint Event JE.I "Materiali Nanofasici"

V.F.1 Christian RINALDI, *Polytechnic of Milan & Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany*
Control of ferroelectricity in the Rashba semiconductor GeTe

V.F.2 Giulia AVVISATI, *Sapienza University of Rome*
Tuning the magnetic coupling of molecules at the nanoscale: the role of graphene

V.F.3 Mateusz WEIS, *University of Silesia in Katowice, Poland*
Impact of quantum size confinment, in nanolayers of topological insulators Bi2Te3, on new generation of spintronic devices

V.F.4 Adriano VERNA, *University of Roma Tre*
Proximity effect in Co/Pt multilayer investigated through X-ray resonant magnetic Reflect

V.G Gallium Nitride for power and high-frequency electronics

Chair: Guglielmo FORTUNATO, *CNR IMM, Roma*
***In collaboration with:* CNR-DSFTM**

V.G.1 Ferdinando IUCOLANO, *STMicroelectronics*
RF GaN on Si in ST

V.G.2 Claudio LANZIERI, *Leonardo spa, Rome*
Technological solutions for GaN based Radars

V.G.3 Raffaella CALARCO, *Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany*
Growth, structural, optical and electrical properties of (In,Ga)N/GaN short period superlattices and their possible usage in laser diodes and high-power devices

V.G.4 Caroline CHÈZE, *Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany*
Advantages of synthesis of III-nitride heterostructures on N-polar substrates for lighting and high-power applications

VI.A Innovation in Transmission Electron Microscopy

Chair: Andrea PARISINI, *CNR-IMM, Bologna*

The symposium is part of the workshop WS.I on "Advanced Characterization Techniques for Nanotechnologies and Nanosciences"

VI.A.1 Federico VENTURI, *CNR NANO & University of Modena and Reggio Emilia*
Improving the transmission electron microscope capabilities through holography and phase manipulation

VI.A.2 Mauro GEMMI, *IIT, Pisa*
3D electron diffraction on hard and soft matter

VI.A.3 Angelica CHIODONI, *Polytechnic of Turin & IIT*
Tin and copper - based catalysts for CO2 reduction

VI.A.4 Regina CIANCIO, *CNR IOM, Trieste*
Multifunctional nanoreactors for combined in-operando STEM and synchrotron spectroscopy

VI.B Advance in Near Field Probe Microwave and mm-wave Microscopy for Surface and Subsurface Characterization of Materials

Chair: Emanuela PROIETTI, *CNR IMM, Roma*
***In collaboration with:* CNR IMM - Ministry of Foreign Affairs and International Cooperation - National Institute of Standards and Technology (NIST)**

The symposium is part of the workshop WS.III on "Advanced Scanning Probe Microscopies"

VI.B.1 Samuel BERWEGER, *National Institute of Standards and Technology - NIST, Boulder, USA*
Nanoelectronic Characterization using Microwave Near-Field Microscopy

VI.B.2 Marco FARINA, *Marche Polytechnic University*
Application of Scanning Microwave Microscopy to Biological Samples

VI.B.3 Giovanni Maria SARDI, *CNR IMM, Roma*
Near-field Microwave Microscopy for Surface and Subsurface Characterization of Materials

VI.B.4 Venkatachalam SUBRAMANIAN, *Indian Institute of Technology Madras, Chennai, India*
Feedback control for constant height mode operation in scanning near-field microwave microscopy

VI.C Molecular Biosensors: the next generation devices

Chair: Filippo D'ARPA, *Distretto Tecnologico Sicilia Micro e Nano Sistemi*
***In collaboration with:* Distretto Tecnologico Sicilia Micro e Nano Sistemi**

The symposium is part of the workshop WS.V on "Nanotechnologies for innovative medicine"

VI.C.1 Maria Jose LO FARO, *CNR IPCF, Messina*
Biosensors based on the innovative optical properties of silicon nanowires

VI.C.2 Salvatore PERNAGALLO, *DestiNA Genomics*
Chem-NAT bead-based assays for quantifying microRNAs directly from biological sources

VI.C.3 Salvatore PETRALIA, *STMicroelectronics*
Molecular Surface-cooperative-hybridization: an innovative approaches for Nucleic AcidsDetection

VI.C.4 Roberta D'AGATA, *University of Catania*
Nanoparticle-enhanced surface plasmon resonance imaging for advanced clinical diagnostics

VI.D Advanced technologies and nanomaterials for sustainability in oil & gas off-shore platforms

Chairs: Elena TRESSO, *Polytechnic of Turin* & Roberto CIANELLA, *Ministry of the Economic Development*
***In collaboration with:* Polytechnic of Turin**

VI.D.1 Debora COCCO, *Microla Optoelectronic Srl*
Environmental monitoring system integrated in an Autonomous Underwater Vehicle for automatized analysis of sea water quality near offshore sites

VI.D.2 Enrico DRIOLI, *CNR ITM & University of Calabria*
Membrane Distillation, Membrane Crystallization and Membrane Condenser for innovation in Process Engineering

VI.D.3 Giovanni BRACCO, *Polytechnic of Turin*
Blue Energy: perspective analysis and case study

VI.D.4 Alberto SCALIA, *Polytechnic of Turin*
Flexible and Floating Photovoltaics

VI.D.5 CONCLUSIONS and DISCUSSION

VI.E Responsible Innovation in Nanotech applications for healthcare and wellbeing

Chair: Elvio MANTOVANI & Andrea PORCARI, *AIRI*
***In collaboration with:* AIRI/PRISMA PROJECT**

VI.E.1 Marzia BEDONI, *Fondazione Don Gnocchi*
Nanotech for health care and wellbeing: social and scientific challenges and opportunities

VI.E.2 Giovanni BALDI, *Colorobbia Consulting*
A personalized, patient-centric, nano-based technology platform for the diagnosis and treatment (theranostic) of cancer system diseases

VI.E.3 Francesca BRACA, *Laboratori Archa*
Sustainable nano-structured devices with controlled release of bioactive agents for dermo-cosmesis and skin lesions care

VI.E.4 Emad YAGHMAEI & Steven FLIPSE, *University of Delft, Netherlands*
Assessing and improving social performances in R&I projects: Key Performance Indicators for RRI

VI.F Synthesis and Microstructural Properties III

Chair: Sara LAURETI, *ISM CNR, Roma*

The symposium is part of the Joint Event JE.I "Materiali Nanofasici"

VI.F.1 Nicola PATELLI, *University of Bologna*
Gas Phase Condensation for the growth of Metal/Metal Oxide nanocomposites with application in thermocatalytic CO_2 reduction

VI.F.2 Hajieh BASTAMI, *University of Tehran, Iran*
Preparation of TiO_2 photocatalyst nanoparticle supported on a new persistent luminescence material

VI.F.3 Stanislav EVLASHIN, *Skolkovo Institute of Science and Technology, Russia*
Optical and gas sensors based on laser reduced graphene oxide

VI.F.4 Luca BURRATTI, *University of Rome Tor Vergata*
Potential applications of fluorescent silver nanoclusters

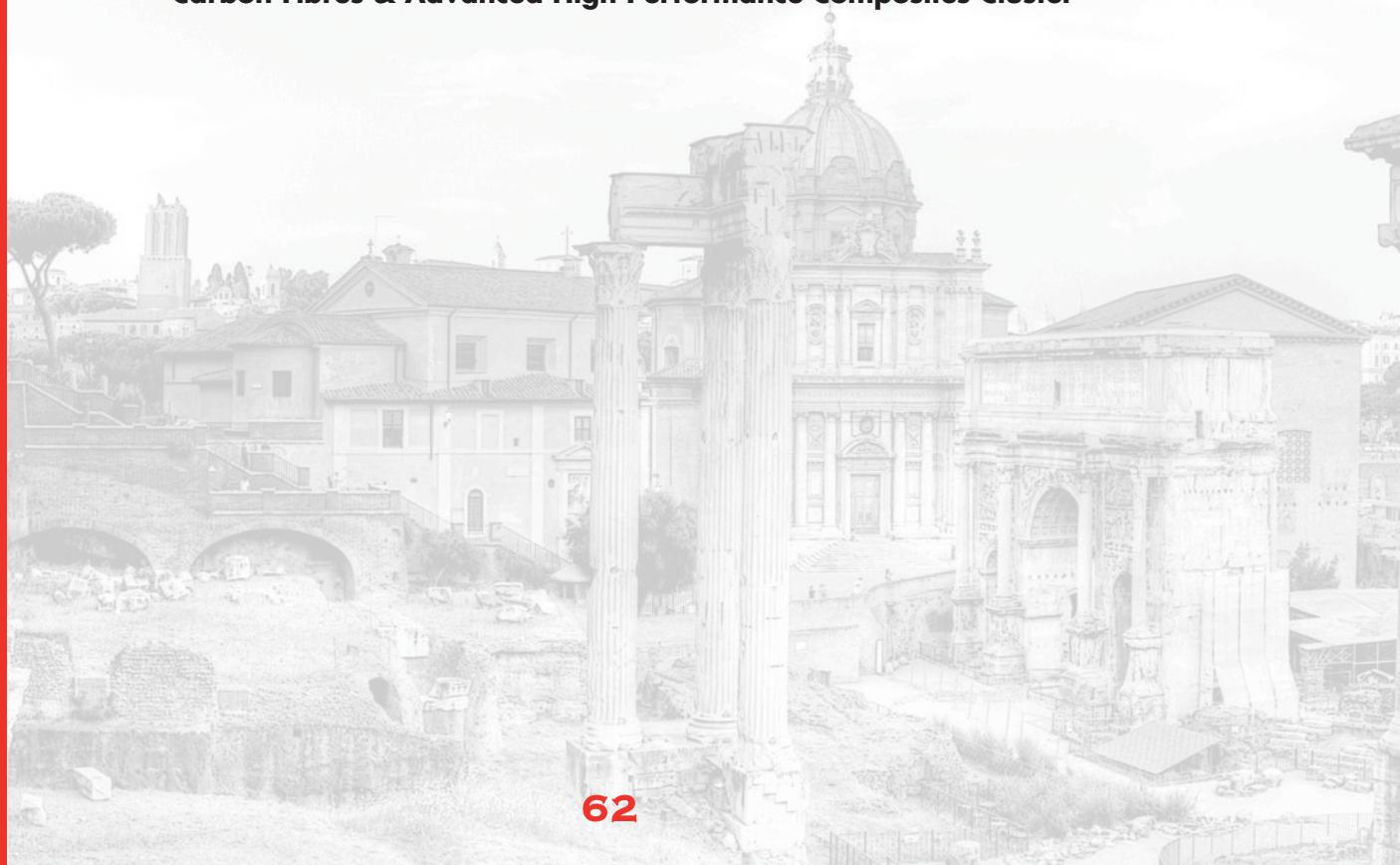
VI.G Nanocomposite materials applications

Chair: Isella VICINI, *Warrant Group*
***In collaboration with:* Warrant Group**

VI.G.1 Tanja KOSANOVIC MILICKOVIC, *National Technical University of Athens*
Smart by Design and Intelligent by Architecture Nanocomposites Materials: The SMARTFAN project

VI.G.2 Mauro CASTELLO, *Elica Spa*
Industrial demo case based on smart nanocomposites materials: Fan for ventilation systems

VI.G.3 Massimo RINALDI, *Warrant Group*
Carbon Fibres & Advanced High Performance Composites Cluster



III.A Keynote Session: **Spectroscopic characterization and imaging**

Chair: Chair: Regina CIANCIO, *CNR-IOM, Trieste*

The symposium is part of the workshop WS.I on "Advanced Characterization Techniques for Nanotechnologies and Nanosciences"

III.A.1 Lars-Oliver KAUTSCHOR, *Carl Zeiss Microscopy GmbH*
HIM with SIMS - High resolution Imaging and Nano-analytics with He and Ne ions

III.A.2 Giovanni BERTONI, *CNR IMEM, Trento*
Chemical and spectroscopic characterization from nm to sub-nm scale with EFTEM and STEM-EELS

III.B Keynote Session: **2D materials and beyond**

Chair: Fabiola LISCIO, *CNR IMM, Bologna*

III.B.1 Alessandro MOLLE, *CNR-IMM Agrate*
Designer artificial 2D materials

III.B.2 Maria Luisa GRILLI, *ENEA Casaccia*
Single and multilayer graphene embedded in a Fabry-Perot cavity for tunable NIR absorption

III.C Keynote Session: **Advanced approaches for investigating cells and neurons**

Chair: Leandro LORENZELLI, *FBK, Trento*
***In collaboration with:* FBK**

The symposium is part of the workshop WS.IV on "Microfluidics and Biosystems for personalized medicine"

III.C.1 Pietro FERRARO, *CNR - ISASI , Pozzuoli (Napoli)*
Advanced Diagnosis at single cell level by Coherent Imaging in Lab on Chip Platforms

III.C.2 Stefano VASSANELLI, *University of Padova*
Networking brain and silicon spiking neurons with nanoscale memristors: first steps, next challenges and perspectives for brain-machine interfaces

III.D Sessione Speciale: **Il rapporto tra Innovazione e Conoscenza in Italia. Il sistema della ricerca privata.**

Chair: Alberto CIGADA, *Polytechnic of Milan & President Comitato Scientifico Cluster Made in Italy*

The symposium is part of the Joint Event "Open innovation and Open Science"

III.D.1 Teodoro VALENTE, *Pro-Rettore alla Ricerca, Innovazione e Trasferimento Tecnologico, Sapienza University of Rome*
Sesto VITICOLI, *Vice Presidente AIRI*
OPENING

III.D.2 Sergio D'ALBERTO, *LFoundry, General Affairs Senior Manager*
Innovation in a Semiconductor Industry and .... Opportunities

III.D.3 Sergio JESI, *CEO Office Vice Presidente Institutional Relations Italy & Public Financing, ELETTRONICA*
La crescente importanza della collaborazione pubblico/privato sui temi strategici della ricerca e dell'innovazione

III.D.4 Giuseppe CARUSO, *Capo Area Ricerca, FARMINDUSTRIA*
Ricerca, sviluppo e innovazione: l'impegno delle imprese del farmaco

III.D.5 Francesca BRACA, *Research Project Manager, ARCHA*
Creare valore dalla ricerca responsabile e sostenibile

III.D.6 Pier Francesco MORGANTI, *Direttore R&D Nanoscience Center MAVI*
Progetto EU PolyBioSkin: Polimeri naturali e tessuti biodegradabili a salvaguardia dell'ambiente

III.D.7 Giuseppe SALONIA, *Responsabile Servizio Innovazione e Proprietà Industriale, UNIONCAMERE*
La politica di Unioncamere per l'innovazione

III.D.8 Cesarina BONFANTI, *R&D Financing Manager, ENI*
L'innovazione collaborativa: ampliare l'accesso all'energia

III.E Special Session: **3D Additive Manufacturing**

Chair: Francesco VENIALI, *Sapienza Università di Roma*

III.E.1 Andrea CAMPOSEO, *Scuola Normale Superiore/NEST*
Additive manufacturing of nanocomposite materials for optics

III.E.2 Giordano MANCINI, *Scuola Normale Superiore/SMART*
Virtual reality tools for advanced modeling

VII.A Microscopy techniques for industrial needs 1

Chair: Onofrio Antonino CACIOPPO, *LFoundry*
***In collaboration with:* LFoundry**

The symposium is part of the workshop WS.I on "Advanced Characterization Techniques for Nanotechnologies and Nanosciences"

VII.A.1 Simona BONINELLI, *CNR IMM, Catania*
Defects, activation and morphological modification by out of equilibrium processes in Si and Ge-based materials

VII.A.2 Domenico MELLO, *STMicroelectronics*
New Approach in TEM-EDS Quantitative Analysis, Used for Auger Calibration in Order to Set an Advanced Back Metal Control

VII.A.3 Andrea PARISINI *CNR IMM, Bologna*
Scanning Transmission Electron Microscopy (STEM) Quantitative X-Ray Microanalysis methods for Application to Silicon Oxycarbides Thin Films

VII.A.4 Massimo VIGHI, *ENI Versalis, Mantova*
Repetita iuvant... Polymer Microscopy

VII.A.5 Francesco ROSSELLA, *Scuola Normale Superiore/NEST, Pisa*
Electroluminescence and crystal phases in hybrid metal-GaAs nanowire devices

VII.B Nanotechnologies for space: missions, opportunities and challenges

Chair: Roberto FORMARO & Marco DI CLEMENTE, *ASI*
***In collaboration with:* Italian Space Agency (ASI)**

VII.B.1 Marco DI CLEMENTE, *ASI*
ASI technology developments: results and opportunities for Italian space economy

VII.B.2 Gianni CIOFANI, *IIT*
Smart nanomaterials for biomedical applications: from Earth to Space

VII.B.3 Simone ANTONIA, *Thales Alenia Space*
Application of Innovative Materials for SMART Products in Space

VII.B.4 Davide PATTI, *STMicroelectronics*
Analog Power and MEMS for space applications

VII.C 2D materials beyond graphene: from fundamental physics to device applications

Chairs: Giancarlo CICERO, *Polytechnic of Turin* & Paola PRETE, *CNR IMM, Lecce*
***In collaboration with:* Polytechnic of Turin & CNR IMM**

VII.C.1 Camilla COLETTI, *CNI@NEST & Graphene Labs, IIT, Pisa*
CVD WS2 on graphene: synthesis, properties and applications

VII.C.2 Maurizia PALUMMO, *University of Rome Tor Vergata*
Novel 2D materials for opto-electronic applications: insight from parameter-free quantum-mechanical methods

VII.C.3 Yuewen SHENG, *University of Oxford, UK*
Multi-layered Heterostructures Based on Pure 2D Materials for Optoelectronic Devices

VII.C.4 Giuseppe IANNACCONE, *University of Pisa*
Transistors and memories based on 2D materials for integrated circuits dedicated to machine learning

VII.D Applications: Catalysis, Micro/Nanoelectronics, Biomedicine and other I

Chair: Elisabetta AGOSTINELLI, *CNR ISM, Roma*

The symposium is part of the Joint Event "Materiali Nanofasici"

VII.D.1 Giorgio KARAGHIOSOFF, *PRAXI IP Spa*
Recent status of Intelectual Property protection in Nanotechnology

VII.D.2 Erica CIOTTA, *University of Rome Tor Vergata*
Synthesis of LDHs (Layered double hydroxide) powders and films by hydrothermal growth for electrochemical applications

VII.D.3 Zuzana MALA', *Palacky University in Olomouc, Czech Republic*
Synergistic antibacterial effect of photodynamic therapy combined with silver nanoparticles

VII.D.4 Jiri RATHOUSKY, *J. Heyrovský Institute of Physical Chemistry, Czech Republic*
Smart materials for the environmentally friendly conservation of culture heritage artefacts

VII.E Microfluidics concepts, technologies and applications

Chair: Leandro LORENZELLI, *FBK, Trento*
***In collaboration with:* FBK & Polytechnic of Turin**

The symposium is part of the workshop WS.IV on "Microfluidics and Biosystems for personalized medicine"

VII.E.1 Donats ERTS, *University of Latvia, Riga, Latvia*
Welcome and general introduction

VII.E.2 Andrea ADAMI, *FBK, Trento*
Microfluidics for life science: an overview

VII.E.3 Tommaso SANTANIELLO, *Centro Interdisciplinare Materiali e Interfacce Nanostrutturati (CIMaINa), University of Milan*
Advanced functional polymeric materials for smart microfluidics

VII.E.4 Maria Lucia CURRI, *CNR IPCF, Bari*
Multifunctional nanomaterials based on colloidal nanoparticles for theranostic applications

VII.E.5 Flavio GIACOMOZZI, *FBK, Trento*
Silicon microtechnology for microfluidics

VII.F Nanomaterials and advanced solutions for the restoration of Cultural Heritage

Chairs: Rodorico GIORGI, *CSGI* and Isella VICINI, *Warrant Group*
***In collaboration with:* CSGI & WARRANT GROUP**

VII.F.1 David CHELAZZI, *CSGI & University of Florence*
An overview of Nanorestart Project: A new paradigm for the conservation of modern/contemporary art

VII.F.2 María J. MOSQUERA, *University of Cádiz, Spain*
An Overview of InnovaConcrete Project

VII.F.3 Lucia TONIOLO, *INSTM and Polytechnic of Milan*
Innovative materials for the conservation of stones in historical architecture: the experience of the NanoCathedral consortium

VII.F.4 Paola DE POLO, *Fratelli Alinari IDEA Spa*
Innovative packaging solutions for storage and conservation of 20th century cultural heritage of artefacts based on cellulose derivative: the Nemosine Project

VII.F.5 Isella VICINI* and Rodorico GIORGI°, **Warrant Group - °CSGI*
Concluding remarks from the chairs: the Echoes cluster on Cultural Heritage conservation

VII.G Il rapporto tra Innovazione e Conoscenza in Italia. Il sistema della ricerca pubblica

Chair: Alberto CIGADA, *Polytechnic of Milan & President Comitato Scientifico Cluster Made in Italy*

The symposium is part of the Joint Event "Open innovation and Open Science"

VII.G.1 Andrea CANESCHI, *Direttore Consorzio Interuniversitario INSTM*
Ricerca e innovazione in INSTM

VII.G.2 Luigi MANCINI, *Sapienza University of Rome*
Università e Impresa 4.0: la sfida dei Competence Center

VII.G.3 Marco RAUGI, *Prorettore per la ricerca applicata e il trasferimento tecnologico, University of Pisa*
Ricerca e innovazione all'Università di Pisa

VII.G.4 Oscar AMERIGHI, *Industry and Business Associations Unit, ENEA*
ENEA Knowledge Exchange Strategy: moving towards an ecosystem approach to innovation and technology transfer

VII.G.5 Massimo BONINI, *consorzio interuniversitario CSGI*
Colloidi, Nanoscienze e Formulazioni: Sfide ed Opportunità

VII.G.6 Corrado SPINELLA, *Direttore DSFTM-CNR*
Ricerca e innovazione nel CNR

VIII.A Innovation in Optical Microscopy

Chair: Marco LEONETTI, *IIT@SAPIENZA*

The symposium is part of the workshop WS.I on "Advanced Characterization Techniques for Nanotechnologies and Nanosciences"

VIII.A.1 Marco LEONETTI, *IIT, CLNS@SAPIENZA Roma*
Scattering Assisted Localization Fluorescence Imaging

VIII.A.2 Francesca CELLA ZANACCHI, *IIT Genova*
Quantitative super-resolution microscopy using dna origami

VIII.A.3 Francesca INTONTI, *University of Florence & European Laboratory for Non-Linear spectroscopy - LENS*
Deep Sub-wavelength imaging of localized photonic modes

VIII.A.4 Hilton BARBOSA DE AGUIAR, *Ecole Normale Supérieure de Paris, France*
Compressive Raman microspectroscopy

VIII.B Promozione e sviluppo del trasferimento tecnologico e dell'innovazione a livello territoriale

Chair: *in definition (by Regione lazio)*

The symposium is part of the Joint Event JE.II "Open innovation and Open Science"

VIII.B.1 Guido FABIANI, *Presidente del Comitato Direttivo del Centro Ricerche Economiche e Sociali Manlio Rossi-Doria*
Opening

VIII.B.2 Alfonso MARRA, *Amministratore Delegato di Klopman International, Frosinone*
Internet of Textile

VIII.B.3 Marina SILVERII, *Direttore ASTER*
Strategie e strumenti per sistemi d'innovazione territoriali

VIII.B.4 Roberto ZAMBONI, *Direttore di CNR-ISOF e Presidente Area della Ricerca CNR di Bologna*
Ricerca, Innovazione, Impresa: strategie e risultati dell'AdR del CNR di Bologna

VIII.B.5 Roberto GIANNANTONIO, *Dhitech, Lecce*
Innovazione e Trasferimento Tecnologico in Regione Puglia: problemi e opportunità

VIII.C Applications: Catalysis, Micro/Nanoelectronics, Biomedicine and other II

Chair: Davide PEDDIS, *CNR ISM, Roma*

The symposium is part of the Joint Event JE.I "Materiali Nanofasici"

VIII.C.1 Celestino FONTANETO, *I.T.I.G OMAR, Novara*
Answers from nature, from the pan to the laboratory: onions, garlic and potatoes for the green synthesis of AgNPs at the service

VIII.C.2 Samiyah TASLEEM, *Federal Urdu University of Arts, Science & Technology, Pakistan*
Synthesis of silver nanoparticles with different plant extracts and antibacterial property of undergarment fabrics treated with

VIII.C.3 Ludmila ZARSKA, *Palacky University in Olomouc, Czech Republic*
Developmentofcompositeshydrogelscontaininghyaluronicacidandpoly-lactic-coglycolic microparticles for cell delivery

VIII.C.4 Claudio CARA, *University of Cagliari*
Mesostructured Iron-based sorbents for mid-temperature H2S...

VIII.D Trend topics in PV

Chair: Mario TUCCI, *ENEA Casaccia*
***In collaboration with:* ENEA**

VIII.D.1 Massimo IZZI, *ENEA Casaccia*
AMPERE: from research to industrial innovation; the new European PV heterojuntion production line

VIII.D.2 Enrico LAMANNA, *University of Rome Tor Vergata*
2-Terminal mechanically stacked perovskite/silicon tandem solar cells

VIII.D.3 Edmondo GILIOLI, *CNR IMEM, Parma*
Overview of Cu(In,Ga)Se2-based solar cells and light management solutions for Building-Integrated Photovoltaics

VIII.D.4 Matteo VALENTINI, *ENEA Casaccia*
Kesterite Thin Film Solar Cells: Present Status and Future Prospects

VIII.E Advances in biosensors and microfluidic devices in life science

Chair: Fabrizio PIRRI, *Polytechnic of Turin* & Pietro SICILIANO, *CNR IMM, Lecce*
***In collaboration with:* FBK & Polytechnic of Turin**

The symposium is part of the workshop WS.IV on "Microfluidics and Biosystems for personalized medicine"

VIII.E.1 Giuseppe BARILLARO, *University of Pisa*
Enabling (Bio)Sensing And (Nano)Medicine Applications Through Electrochemical Structuring of Silicon at the Micro and Nanoscale)

VIII.E.2 Corrado DI NATALE, *University of Rome Tor Vergata*
In-vivo and in-vitro metabolomics with porphyrins based sensor array

VIII.E.3 Carlo BORTOLOTTI, *University of Modena and Reggio Emilia*
Electrolyte-Gated Organic Field Effect Transitors (EGOFETs) integrating microfluidics and electronic transduction for label-free, ultra-sensitive biosensing

VIII.E.4 Georg PUCKER, *FBK, Trento*
Photonic integrated sensors for life science

VIII.F Multifunctional Nanocomposites for Energy and Sensing applications

Chair: Giovanni DEBELLIS, *Sapienza University of Rome*
***In collaboration with:* Sapienza University of Rome**

VIII.F.1 Antonella D'ALESSANDRO, *University of Perugia*
Multifunctional RC structures using self-sensing nano-modified cementitious composites

VIII.F.2 Paolo CIAMBELLI, *University of Salerno*
Towards the development of nanocomposite based supercapacitor

VIII.F.3 Domenico CAVALLINI, *Sapienza University of Rome*
PFM Characterization of Piezoelectric PVDF/ZnO-Nanorod thin films

VIII.F.4 Marco FORTUNATO, *Sapienza University of Rome*
Graphene-Gold Electrodes for Flexible Nanogenerators Based on Porous Piezoelectric PVDF

VIII.G Nanochemistry meets heritage science for the creation, analysis and conservation of artworks

Chair: Alessandra SANSON, *CNR ISTEC, Faenza*
***In collaboration with:* CNR DSTCM**

VIII.G.1 Costanza MILIANI, *CNR ISTM, Perugia*
Nanochemistry of artists' materials

VIII.G.2 Rosa PONTERIO, *CNR IPCF, Messina*
Novel nanostructured substrates for SERS analysis of dyes

VIII.G.3 Gabriella DI CARLO, *CNR ISMN, Roma*
Innovative strategies for the corrosion inhibition in metal artefacts and concrete monuments

VIII.G.4 Luca NODARI, *CNR ICMATE, Padova*
Atmospheric plasma: an innovative tool in Cultural Heritage cleaning procedures

VIII.G.5 Sabrina GUALTIERI, *CNR ISTEC, Faenza*
Geopolymers: smart materials for the sustainable protection of artworks

IX.A Microscopy techniques for industrial needs 2

Chair: Onofrio Antonino CACIOPPO, *LFoundry*
***In collaboration with:* Leonardo**

The symposium is part of the workshop WS.I on "Advanced Characterization Techniques for Nanotechnologies and Nanosciences"

IX.A.1 Massimo VANZI, *University of Cagliari*
Combined techniques for advanced failure analysis of Photonic Devices

IX.A.2 Luca ORTOLANI, *CNR IMM, Bologna*
Transmission Electron Interferometric Methods for Materials Characterization

IX.A.3 Paolo MENGUCCI, *Marche Polytechnic University*
Advanced material characterization for additive manufacturing

IX.A.4 Tiziana DEL BUONO, *Lfoundry*
Optimization of FIB lamellas preparation for gate-oxide pinholes characterization

IX.B Carbon-based materials

Chair: Maria Letizia TERRANOVA, *University of Rome Tor Vergata*

The symposium is part of the Joint Event JE.I "Materiali Nanofasici"

IX.B.1 Silvia ORLANDUCCI, *University of Rome Tor Vergata*
From nanotube to nanodiamond: a world of opportunities for innovation and new applications

IX.B.2 Denise BELLISARIO, *University of Rome Tor Vergata*
Shape memory polymer composites with carbon nanotubes

IX.B.3 Michela OTTAVIANI, *Sapienza University of Rome*
Cu-catalyzed SiNW grown on carbon paper as anode for Li-ion cells

IX.B.4 Maria Cristina ROSSI, *University of Roma Tre*
Conduction mechanisms and microstructure of femtosecond laser induced nanographitic phases in single-crystal diamond

IX.C Applications in personalized medicine

Chair: Cecilia PEDERZOLLI, *FBK* & Pietro SICILIANO, *CNR IMM, Lecce*
***In collaboration with:* FBK & Polytechnic of Turin**

The symposium is part of the workshop WS.IV on "Microfluidics and Biosystems for personalized medicine"

IX.C.1 Sabrina CONOCI CV, *STMicroelectronics*
Silicon Micro Devices and Systems for Healthcare Applications

IX.C.2 Giorgio SCORDO, *Polytechnic of Turin*
Lab-on-chip for precision medicine

IX.C.3 Luca FRANCIOSO, *CNR IMM, Lecce*
Sensors & MicroPhysiological Systems: the Organ-On-Chip case

IX.C.4 Francesca DEMICHELIS, *University of Trento, Centre of Integrative Biology, Laboratory of Computational and Functional Oncology*
Emerging opportunities in precision medicine

IX.D Technological Integration of graphene and 2D materials

Chair: Rita RIZZOLI, *CNR IMM, Bologna*
***In collaboration with:* CNR-IMM**

IX.D.1 Andrea GAMUCCI, *BeDimensional S.r.l., Genova*
Industrial-scale production of graphene and other 2D materials

IX.D.2 Emanuela SCHILIRO', *CNR IMM, Catania*
Influence of substrate on the Atomic Layer Depositi on of Al2O3 onto Graphene

IX.D.3 Andrea LISCIO, *CNR IMM, Roma*
Understanding the exfoliation processes of Graphene and Related Materials: from a single piece to a standardized production

IX.D.4 Antonio AGRESTI, *University of Rome Tor Vergata*
The emerging role of 2D materials in perovskite solar cell technology

IX.E Un approccio innovativo della Regione Lazio: Infrastrutture Aperte per la Ricerca

Chair: Marco ROSSI, *Sapienza University of Rome*

The symposium is part of the Joint Event JE.II "Open innovation and Open Science"

IX.E.1 Riccardo PANUNZIO, *Lazio Innova*
Strumenti regionali per l'Open Innovation

IX.E.2 Guglielmo FORTUNATO, *CNR IMM & Leonardo, Rome*
NanoMicroFab - Infrastruttura aperta di ricerca per il supporto di aziende operanti nell'ambito della micro-nanoelettronica

IX.E.3 Giuseppe BARBIERI, *ENEA Casaccia, Rome*
MAIA – Materiali Avanzati in una Infrastruttura Aperta

IX.E.4 Andrea GHIGO, *INFN, Frascati*
LATINO – Laboratory in Advanced Technologies for INnOvation

IX.E.5 Luca LEUZZI, *Sapienza University of Rome & CNR Nanotec*
ATOM - Advanced Tomography and Microscopies

IX.F Smart Textiles

Chair: Giuseppe ROSACE, *University of Bergamo*

IX.F.1 Karen DE CLERCK, *University of Ghent, Belgium*
Dye-functionalized electrospun nanofibers for colorimetric sensors

IX.F.2 Maria Rosaria PLUTINO, *CNR ISMN, Messina*
Design and development of nanostructured functional materials for sensing applications on textiles

IX.F.3 Gianluca TRAVERSI, *University of Bergamo*
Microelectronic systems for signal processing from smart textiles sensors

IX.F.4 Ada FERRI, *Polytechnic of Turin*
Mitigating thermal strain in sports by smart textiles

IX.F.5 Matteo STOPPA, *Polytechnic of Turin*
An unobtrusive integration of electronics and smart materials into textiles for Space applications

IX.F.6 Andrea GAMUCCI, *BeDimensional, S.r.l. Genova*
Smart solutions for manufacturing industry based on graphene and 2D-crystals

Posters will be displayed in the Sangallo Cloister during the event:

Tuesday 11 September, 14.00 – 20.00
Wednesday 12, Thursday 13, and Friday 14 September, 08.30 – 20.00

PS.I - General Poster Session

01 Nazanin ABDI, *Niroo Research Institute (NRI), Iran*
Preparation of Nanostructured Al12Mg17 compound for hydrogen storage applications

02 Graziella AMENDOLA, *ISS*
Development of an analytical platform for the characterization of nanocapsules in products of agricultural interest

03 Fabio BOCCUNI, *INAIL*
Occupational exposure to amorphous silica nanoparticles: integrated approach to evaluate exposure and toxicity using laboratory

04 Giuseppina BOZZUTO, *ISS*
Functionalization of liposomes with glycolipids for targeted drug delivery to breast cancer cells

05 Andrea CALCATERRA, *University of Rome Tor Vergata*
Graphene Oxide Nanosheets and Pristine-Single Wall Carbon Nanotubes Biocompatibility in Different Human Cell Lines

06 Andrea CALCATERRA, *University of Rome Tor Vergata*
In vitro biocompatibility study: a comparison between Graphene and Nanotubes

07 Giancarlo CAPPELLINI, *University of Cagliari*
Optical Properties of Different Eumelanin Protomolecules: The Effects of the Solvent

08 Elisabetta CARATA, *University of Salento*
Size and concentration of Nps influence the endoskeleton organization in larvae of paracentrotus lividus

09 Monica RUFFINI CASTIGLIONE, *University of Pisa*
Mineral nutrients in soil and pea plants after exposition to TiO2 nanoparticles through a biosolid-amended soil

10 Enrico CATALANO, *University of Oslo*
Theranostic iron-oxide nanoparticles for highly efficient targeted delivery of doxorubicin by photothermal bimodal treatment

11 Delia CAVALLO, *INAIL*
Influence of production process and size on toxicological properties of amorphous Silica Nanoparticles on human bronchial cells

12 Gianfranco COLETTI, *University of Genoa*
Composite hydrogels of alginate and brushite cement for biomedical applications as drug release

13 Maria CONDELLO, *ISS*
Liposome-encapsulated plant alkaloid voacamine improves the efficacy of chemotherapy on osteosarcoma resistant cells

14 Antonella D'ALESSANDRO, *University of Perugia*
Multifunctional RC structures using self-sensing nano-modified cementitious composites

15 Giuseppe D'AVENIO, *ISS*
Comparative nanocytotoxicity assessment of nano-engineered medical devices

16 Fabrizio DE CESARE, *University of Tuscia & CNR IIA*
Nanostrategies for iron nutriton to plant

17 Giovanni DI MUCCIO, *University of Rome Tor Vergata*
Computational assessment of peptide sequencing capability of a nanopore sensor

18 Josue FERRI, *Asociación de Investigación de la Industria Textil*
Smart Clothing Gamification to promote Energy-related Behaviours among Adolescents - SMARTLIFE

19 Celestino FONTANETO, *I.T.I.G. OMAR, Novara*
Answers from nature, from the pan to the laboratory: onions, garlic and potatoes for the green synthesis of AgNPs at the service

20 Sonia FREDDI, *Università Cattolica Sacro Cuore*
Development of a gas sensors array based on NPs-decorated SWCNTs to enhance the selectivity of gas molecules in breath analysis

21 Leonardo GIORGI, *ENEA*
Self-organized Ti02 anatase nanotube direct fabricated by anodization without annealing

22 Octavio GRANIEL, *Institut Européen des Membranes IEM, Université de Montpellier, France*
Atomic layer deposition for biosensing applications

23 Muhammad Usman KHAN, *Jinnah Sindh Medical University*
Probiotics; Treatment of Allergic Rhinitis

24 Mukesh KUMARI, *ENEA*
Catalytic effect of Ti-based additives on hydrogenation of MgH2

25 Ileana IELO, *ISMN – CNR, Messina*
Potential roles of fluorine-containing sol-gel coatings against adhesion to control microbial biofilm

26 Stefano LUPI, *IIT@Sapienza*
High Fidelity Sound Production with Three Dimensional Graphene

27 Antonella MACAGNANO, *CNR IIA*
Porphyrin and Graphene as smart nanofillers for eco-friendly, sustainable and selective polymer nanofibrous sensors for IAQ monitoring

28 Uldis MAĻINOVSKIS, *Institute of Chemical Physics, University of Latvia, Latvia*
Fabrication of nanostructured ZnO and metal nanoparticle arrays using porous anodic alumina templates

29 Rasoul SARRAF-MAMOORY, *Tarbiat Modares University*
In situ synthesis of three dimensional graphene- hydroxyapatite nano powders via hydrothermal process

30 Maria Rita MANCINI, *ENEA*
Use of Graphene oxide for the preparation of reinforced cement-based composites

31 Ivania MARKOVA, *University of Chemical Technology and Metallurgy, Bulgaria*
Intermetallic (Co-Sn, Ni-Sn, Co-Ni) nanoparticles and their carbon nanocomposites

32 Saeed MARDI, *University of Rome Tor Vergata*
Comparing different doping strategies and MW in the thermoelectric behavior of P3HT

33 Alfonso MARTONE, *IPCB CNR*
A comprehensive approach to induce self-healing feature in epoxy composites

34 Marco MILIUCCI, *INFN*
Silicon Drift Detectors Acquisition System for Exotic Atoms Research, the SIDDHARTA 2 project

35 Marina MINOLI, *National Biologists Order, Royal Society of Biololgy, Scientific High School Marconi*
Elements of didactic innovation about Nanotechnology for High School: safety and social impact

36 Daniele MIRABILE GATTIA, *ENEA*
Nanostructured materials for energy storage applications based on Magnesium

37 Behrooz MOVAHEDI, *University of Isfahan, Iran*
Mechanical investigation approach to optimize the HVOF Fe-based amorphous coatings reinforced by B4C nanoparticles

38 Simona ORTELLI, *CNR ISTEC, Faenza*
Coatings based on TiO2 nanoparticles and biomacromolecules as a new flame retardant approach for cotton fabrics

39 Fabrizio PALMA, *Sapienza University of Rome*
Low Temperature growth of Silicon Nanowires by Microwave nano-susceptors

40 Elisa PANZARINI, *University of Salento*
Extracellular vesicles as natural nanoconstructs for modulating responses of immune cells in glioblastoma and hyperglycemia

41 Paolo PAPA, *Sapienza University of Rome & CNR IIA*
Nanostructured gold particles applied for ambient vapor mercury monitoring

42 Chiara PELLEGRINO, *Aczon Srl*
Synthetic optimization of core-shell silica nanoparticles with tunable fluorescent characteristic: a novel probe for flow-cytome

43 Roberto PIZZOFERRATO, *University of Rome Tor Vergata*
Detection and removal of heavy metal ions in water by unfolded-fullerene nanoparticles

44 Karlis PLEIKO, *University of Latvia, Latvia*
Selection of renal carcinoma specific aptamers for the development of the optical ZnO biosensor

45 Mariarosa RAIMONDO, *ISTEC CNR*
Industrial materials: the challenges for smart coatings

46 Andrea REALE, *University of Rome Tor Vergata*
Blade and slot-die coated PEDOT:PSS for thermoelectric application

47 Massimiliano RENZI, *Sapienza University of Rome*
Biocompatibility of Silicon NanoWires: a step towards IC detectors

48 Simona SCALBI, *ENEA*
EC for SafeNano Project: European Centre forRisk Management and Safe Innovation in Nanomaterials & Nanotechnologies

49 Suzana SEGOTA, *Ruđer Bošković Institute, Croatia*
Biocompatible nanoparticles with flavonoids in food products mission

50 Nikta SHAHCHERAGHI, *Toosi University of Technology, Iran*
In definition

51 Annarita STRINGARO, *ISS*
Liposome-cell interaction: morphological and ultrastructural studies

52 Fabiana SUPERTI, *ISS*
Impact of different Au nanoparticles on alveolar cell viability and viral respiratory infections

53 Asghar TAHERI-KAFRANI, *University of Isfahan*
Ginsenoside Rh2-, Lysine- and Arginine-treated highly porous graphene oxide nanosheests

54 Alexander TAMASHEVSKI, *Institute of Biophysics and Cell Engineering of National Academy of Sciences of Belarus, Minsk, Belarus*
The photoluminescent zinc oxide nanostructures are a new tool for detection of human B-cells

55 Federica VALENTINI, *University of Rome Tor Vergata*
Draw New Nanomaterials exclusively to restore archival and book Heritages

56 Sara VESELY, *CNR ITB*
Encoding of Colors

57 Ashkan ZOLRIASATEIN, *Niroo Research Institute (NRI), Iran*
Preparation and Characterization of SnSe/CNT Nanocomposite Thermoelectric Materials for Waste Thermal Energy Harvesting

PS.II - Nanoinnovation's Got Talent - Special Poster Session

01 Martina AULITTO, *University of Naples*
Thermophilic virus particles as scaffolds for enzymes immobilisation: the case of the Sulfolobus spindle-shaped virus 1

02 Luigi RIBOTTA, *INRIM*
AFM metrology of shape controlled TiO2 nanoparticles

03 Federico SCAGLIONE, *University of Turin*
Modified Nanoporous Gold for Hydrogen Evolution Reaction

04 Pier Giorgio SCHIAVI, *Sapienza University of Rome*
Electrochemical synthesis of nanowires-structured electrodes and their application in energy storage devices

05 Claudia TESTI, *Center for Life Nano Science@Sapienza & IIT*
Single Particle Cryo-EM structure of human Ferritin and Transferrin Receptor complex

PS.III - Materiali Nanofasici
Joint Poster Session

01 Deepak BALAJI, *Bio-solutions Global, China*
Large scale production of Superparamagnetic Nanoparticle (SPMNP 1.0, SPMNP 2.0 and SPMNP 3.0) for cell biology applications

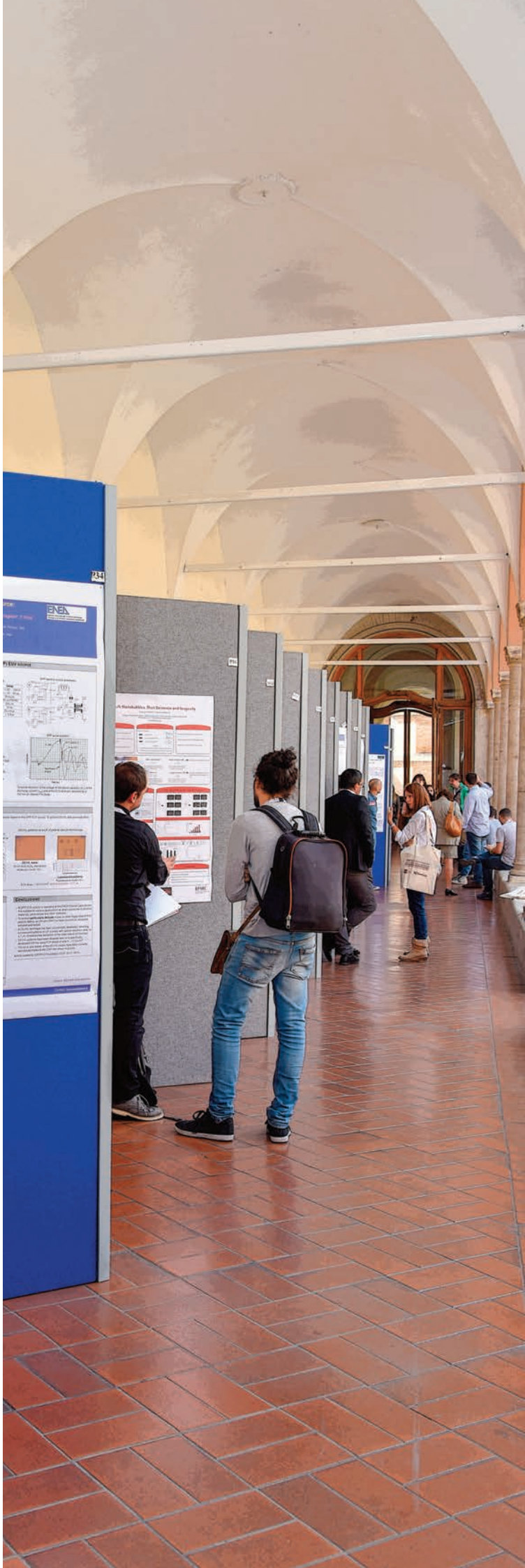
02 Mirko A. VACCA, *University of Cagliari*
Hexaflurosilic acid: from waste to precious resource for MCM-41 synthesis

03 Gholamali KOJOURI, *Shahrekord University, Iran*
Cortisol responses to selenium nanoparticles (Se-NPs) and sodium selenite (Na-Se) supplementation

04 Behrooz MOVAHEDI, *University of Isfahan, Iran*
Mechanical investigation approach to optimize the HVOF Fe-based amorphous coatings reinforced by B4C nanoparticles

05 Federico SCAGLIONE, *University of Turin*
Solubility in nanostructured Borohydrides prepared by Mechanochemistry

06 Elisa TOTO, *Sapienza University of Rome*
Graphene-based nanocomposite materials for applications in space radiation environment



NANOINNOVATION'S GOT TALENT

Thursday 13 September, 11:00 - 12:30

NanoInnovation 2018 has renewed the call for young researchers "**NanoInnovation's Got Talent**" supported by "Bracco Foundation".

The Call is reserved to young nanotechnology researchers (<35 years old) who will have the possibility to present their research activity in an ad-hoc session dedicated to them. The Programme Committee of the conference selected the best proposals and the authors will illustrate their activity in front of a vast audience composed of industry representatives, scientists, experts, investors, entrepreneurs.

Research activities of interest:

- Construction, Building & Restoration
- Electronics, Micro and Nanosystems
- Energy & Environment
- Food and Agriculture
- Innovative and Smart Textiles
- Nano-Bio Related Products
- Health and Nanomedicine
- Nano-Materials Based Innovation
- ICT & Nanoelectronics
- Nanoscale Characterization and Measurements
- Safety and Social Impacts
- Smart Manufacturing
- Transport, Space & Aeronautics

NanoInnovation offers you the opportunity to present your work to a high-profiled audience.

The **Fondazione Bracco** will cover all the participation costs of selected contributions.

Fondazione Bracco

Nanoinnovation's Got Talent - Special Session - TT.IV.G

Chair: Fulvio UGGERI, R&S Director Bracco Imaging

Thursday 13 September, 11:00 - 12:30

Francesca TRUFFA GIACHET
CNR ISMAC, Biella
Antibacterial keratin nanofibers on titanium surfaces for fibroblast adhesion and prevention of biofilm formation

Ilaria PECORARI
University of Trieste
Biomechanical characterization of cardiac fibroblasts in an in vitro progeria model

Matteo AVOLIO
University of Pavia & INSTM
Magnetic Nanoparticles for Magnetic Fluid Hyperthermia and Nuclear Magnetic Resonance: influence of key physical parameters

Sara POLITI
University of Rome Tor Vergata
From carbon-rich natural source to an innovative nanocomposites in the field of nanotechnology

Nanoinnovation's Got Talent - Special Poster Session - PS.II

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Thermophilic virus particles as scaffolds for enzymes immobilisation: the case of the Sulfolobus spindle-shaped virus 1

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Single Particle Cryo-EM structure of human Ferritin and Transferrin Receptor complex

Advanced Characterization Techniques for Nanotechnologies and Nanosciences

Workshop in memory of Pier Giorgio Merli

Wednesday 12 - Friday 14 September

WORKSHOP COMMITTEE

Onofrio Antonino CACIOPPO, LFoundry
Vittorio MORANDI, CNR IMM
Marco ROSSI, Sapienza University of Rome
Beatrice VALLONE, Sapienza University of Rome
Marco VITTORI ANTISARI, NanoItaly Association

organized by

IMM Institute for Microelectronics and Microsystems

SNN Lab Sapienza Nanotechnology & Nanoscience LAB — CNIS Center of Nanotechnology for Engineering of Sapienza

SISM Italian Society for Microscopical Sciences

in collaboration with: **ASSING, JEOL, TESCAN, THERMO FISHER SCIENTIFIC, ZEISS**

Ten years ago, our friend, mentor and colleague, Pier Giorgio Merli passed away. He was a physicist, a Research Director of the CNR-IMM Institute, and a passionate scientist and electron microscopist.

Giorgio graduated at the Bologna University in 1967, he has devoted for 40 years all his energies to research, innovation and formation in the field of electron microscopy, gaining both national and international reputation. He was President of the Italian Society for Electron Microscopy from 1984 to 1987 and Director of the IMM (formerly LAMEL) Institute from 1992 to 1998. He published over 100 articles in international scientific journals and edited or co-edited the proceedings of several national and international schools on electron microscopy.

In 1974 Giorgio, together with two other physicists of the University of Bologna, GianFranco Missiroli and Giulio Pozzi, realized "The double-slit experiment with single electrons", which was chosen in 2002 as the most beautiful experiment in Physics by the magazine Physics World (http://l-esperimento-piu-bello-della-fisica.bo.imm.cnr.it/english/index.html). Above all, this was the result of his passion for the investigation of the fundamental physical phenomena that always drove his scientific activity. He also had well clear the relevance of the transformation of an idea into an invention, which is testified by the various patents on electron guns or electron detectors that he obtained.

He was a scientist and, on top of that, a rigorous and passionate intellectual, one never completely satisfied of the acquired knowledge, aiming always at a deeper and more refined level of understanding. He was aware of his role as an intellectual, he was honest and disinterested, always trusting in coherence, and his professional as well as human relationships were inspired by the values of morality, equity and merit.

The workshop "Advanced Characterization Techniques for Nanotechnologies and Nanosciences" is dedicated to Giorgio's memory, to continue his legacy in studying, developing and understanding microscopic methodologies as fundamental tools for the physical, chemical and life sciences, as well as to promote his professional, cultural and human values, in particular among the younger scientists to whom Giorgio has been dedicating most of his energies and whom he has always trusted and encouraged with all his great enthusiasm.

WS.I

12 SEPTEMBER

Advanced Characterization Techniques for Nanotechnologies and Nanosciences

09:00 - 10:30	WS.I.1 - HT.I.A
Keynote Session: **Ultimate TEM characterization and imaging**	
Chair: Vittorio MORANDI, *CNR - IMM*	
WS.I.1 HT.I.A.1	Beatrice VALLONE, *Sapienza University of Rome* **Single Particle Cryo-EM structure of the complex between human Ferritin and Transferrin Receptor: a gateway for targeted delivery and theranostics**
WS.I.2 HT.I.A.2	Elvio CARLINO, *CNR-IMM, Lecce* **Atomic Resolution Transmission Electron Microscopy: On the way toward the ultimate spatial resolution and accuracy**
10:30 - 11:00 Coffe Break	
11:00 - 12:30	**WS.I.2 - TT.I.A**
X-Ray Microscopy	
Chair: Narciso GAMBACORTI, *Cea-Leti & PAC-G, Grenoble, France*	
WS.I.2.1 TT.I.A.1	Lars-Oliver KAUTSHOR, *Carl Zeiss Microscopy* **Extending Synchrotron X-ray Microscopy to the Laboratory"**
WS.I.2.2 TT.I.A.2	Alessia CEDOLA, *CNR Nanotec* **X-Ray Phase Contrast Tomography for Regenerative medicine**
WS.I.2.3 TT.I.A.3	Tevfik Onur MENTES, *Elettra-Sincrotrone Trieste* **X-ray photoemission electron microscopy studies in ultrathin film magnetism**
WS.I.2.4 TT.I.A.4	Manuel DIERICK, *Tescan Orsay Holding* **Exploring Materials Evolution with Laboratory-based Dynamic X-ray Tomography**
12:30 - 14:00 Light Lunch	

14:00 - 15:30	WS.I.3 - TT.II.A

Advances in Microscopy-based Nanocharacterization Methodologies

Chair: Elvio CARLINO, *CNR-IMM, Lecce*
In collaboration with: ZEISS

WS.I.3.1 TT.II.A.1	Matteo FERRONI, *University of Brescia* **The implementation of the STEM imaging mode in the SEM for electron tomography**
WS.I.3.2 TT.II.A.2	Giulio LAMEDICA, *Carl Zeiss Italia* **Latest Advances in Electron and Ion Microscopy**
WS.I.3.3 TT.II.A.3	Joerg LINDENAU, *Carl Zeiss Microscopy* **Large Volume and Correlative Scanning Electron Microscopy**
WS.I.3.4 TT.II.A.4	Umberto CELANO, *IMEC, Belgium* **Site-specific analysis for nanoelectronics using hybrid SPM-TEM metrology**

15:30 - 16:00 Coffe Break

16:00 - 17:30	WS.I.4 - TT.III.A

Cryo Electron Microscopy: the resolution revolution

Chair: Beatrice VALLONE, *Sapienza University of Rome*
In collaboration with: ZEISS, THERMO FISHER SCIENTIFIC & JEOL

WS.I.4.1 TT.III.A.1	Giuseppe ZANOTTI, *University of Padova* **Cryo -EM : a crystallographer view**
WS.I.4.2 TT.III.A.2	Ludovic RENAULT, *Leiden University, Leiden, The Netherlands* **Running an International service facility for cryoEM**
WS.I.4.3 TT.III.A.3	Massimiliano MALETTA, *Thermo Fisher Scientific* **The role of Cryo-electron microscopy in structural biology after the "resolution revolution"**
WS.I.4.4 TT.III.A.4	Guillaume BRUNETTI, *JEOL EUROPE* **New JEOL TEM developments for cryo biology**
WS.I.4.5 TT.III.A.5	Joerg LINDENAU, *Carl Zeiss Microscopy* **Workflow for Correlative Cryo-Imaging**

WS.I

13 SEPTEMBER

Advanced Characterization Techniques for Nanotechnologies and Nanosciences

09:00 - 10:30	WS.I.5 - HT.II.A

Keynote Session:
Scanning Ion Microscopy: Nanocharacterization and Nanofabrication

Chair: Marco VITTORI ANTISARI, *Associazione Nanoitaly*
In collaboration with: ASSING/Tescan

WS.I.5.1 HT.II.A.1	Petr KLIMEK, *Tescan Orsay Holding & Brno University of Technology* **Preparation of Aluminum Specimen with Gallium and Xenon Plasma Focused Ion Beam for Further Nano-characterization**
WS.I.5.2 HT.II.A.2	Gian Carlo GAZZADI, *CNR – Nano, Modena* **Focused Ion Beam (FIB) and Focused Electron Beam Induced Deposition (FEBID) for advanced nanocharacterization and nanofabrication**

10:30 - 11:00 Coffe Break

11:00 - 12:30	WS.I.6 - TT.IV.A

Advance in FIB/SEM Technology and its Contribution to Scientific Problem Solving

Chair: Daniele DE FELICIS, *University of Roma Tre*
In collaboration with: TESCAN & ASSING

WS.I.6.1 TT.IV.A.1	Petr KLIMEK, *Tescan Orsay Holding & Brno University of Technology* **Advanced FIB/SEM techniques and applications**
WS.I.6.2 TT.IV.A.2	Enrico SALVATI, *Department of Engineering Science, University of Oxford, UK* **Nanostructural aspects of human dental enamel and their evolution due to dental caries**
WS.I.6.3 TT.IV.A.3	Alessandro LAVACCHI, *CNR ICCOM, Firenze* **2D materials imaging and nanofabrication in the FIB/SEM**
WS.I.6.4 TT.IV.A.4	Audrey GARNIER, *STMicroelectronics* **Plasma FIB: enlarge your field of view and your field of applications**

12:30 - 14:00 Light Lunch

14:00 - 15:30	WS.I.7 - TT.V.A

Innovation in Scanning Electron Microscopy

Chair: Luca ORTOLANI, *CNR IMM, Bologna*
In collaboration with: JEOL, THERMO FISHER SCIENTIFIC & ZEISS

WS.I.7.1 TT.V.A.1	Joerg LINDENAU, *Carl Zeiss Microscopy* **Large Volume and Correlative Scanning Electron Microscopy**
WS.I.7.2 TT.V.A.2	Guillaume BRUNETTI, *JEOL EUROPE* **JSM-IT200: A versatile tungsten SEM**
WS.I.7.3 TT.V.A.3	Federico MECARINI, *ASSING* **Triglav Lens: collection system and imaging modes**
WS.I.7.4 TT.V.A.4	Paolo DE NATALE, *Hitachi High-Technologies Europe GmbH* **In definition**

15:30 - 16:00 Coffe Break

16:00 - 17:30	WS.I.8 - TT.VI.A

Innovation in Transmission Electron Microscopy

Chair: Andrea PARISINI, *CNR-IMM, Bologna*

WS.I.8.1 TT.VI.A.1	Federico VENTURI, *CNR NANO & University of Modena and Reggio Emilia* **Improving the transmission electron microscope capabilities through holography and phase manipulation**
WS.I.8.2 TT.VI.A.2	Mauro GEMMI, *IIT, Pisa* **3D electron diffraction on hard and soft matter**
WS.I.8.3 TT.VI.A.3	Angelica CHIODONI, *Polytechnic of Turin & IIT* **Tin and copper - based catalysts for CO2 reduction**
WS.I.8.4 TT.VI.A.4	Regina CIANCIO, *CNR IOM, Trieste* **Multifunctional nanoreactors for combined in-operando STEM and synchrotron spectroscopy**

WS.I

14 SEPTEMBER

Advanced Characterization Techniques for Nanotechnologies and Nanosciences

09:00 - 10:30	WS.I.9 - HT.III.A
Keynote Session: **Spectroscopic characterization and imaging**	
Chair: Regina CIANCIO, *CNR-IOM, Trieste*	
WS.I.9.1 HT.III.A.1	Lars- Oliver KAUTSHOR, *Carl Zeiss Microscopy GmbH* **HIM with SIMS - High resolution Imaging and Nano-analytics with He and Ne ions**
WS.I.9.2 HT.III.A.2	Giovanni BERTONI, *CNR IMEM, Trento* **Chemical and spectroscopic characterization from nm to sub-nm scale with EFTEM and STEM-EELS**
10:30 - 11:00 Coffe Break	
11:00 - 12:30	**WS.I.10 - TT.VII.A**
Microscopy techniques for industrial needs 1	
Chair: Onofrio Antonino CACIOPPO, *LFoundry* *In collaboration with:* LFoundry	
WS.I.10.1 TT.VII.A.1	Simona BONINELLI, *CNR IMM* **Defects, activation and morphological modification by out of equilibrium processes in Si and Ge-based materials**
WS.I.10.2 TT.VII.A.2	Domenico MELLO, *STMicroelectronics* **New approach in Auger elemental relative sensitive factor calculation by using TEM-EDS analysis based on bi-layers of pure elements**
WS.I.10.3 TT.VII.A.3	Andrea PARISINI, *CNR IMM, Bologna* **Scanning Transmission Electron Microscopy (STEM) Quantitative X-Ray Microanalysis methods for Application to Silicon Oxycarbides Thin Films**
WS.I.10.4 TT.VII.A.4	Massimo VIGHI, *ENI Versalis, Mantova* **Repetita iuvant... Polymer Microscopy**
WS.I.10.5 TT.VII.A.5	Francesco ROSSELLA, *Scuola Normale Superiore/NEST, Pisa* **Electroluminescence and crystal phases in hybrid metal-GaAs nanowire devices**
12:30 - 14:00 Light Lunch	

14:00 - 15:30	WS.I.11 - TT.VIII.A

Innovation in Optical Microscopy

Chair: Marco LEONETTI, *IIT@SAPIENZA*

WS.I.11.1 TT.VIII.A.1	Marco LEONETTI, *IIT, CLNS@SAPIENZA Roma* **Scattering Assisted Localization Fluorescence Imaging**
WS.I.11.2 TT.VIII.A.2	Francesca CELLA ZANACCHI, *IIT Genova* **Quantitative super-resolution microscopy using dna origami**
WS.I.11.3 TT.VIII.A.3	Francesca INTONTI, *University of Florence & European Laboratory for Non-Linear spectroscopy - LENS* **Deep Sub-wavelength imaging of localized photonic modes**
WS.I.11.4 TT.VIII.A.4	Hilton BARBOSA DE AGUIAR, *Ecole Normale Supérieure de Paris, France* **Compressive Raman microspectroscopy**

15:30 - 16:00 Coffe Break

16:00 - 17:30	WS.I.12 - TT.IX.A

Microscopy techniques for industrial needs 2

Chair: Onofrio Antonino CACIOPPO, *LFoundry, Avezzano*
In collaboration with: Leonardo

WS.I.12.1 TT.IX.A.1	Massimo VANZI, *University of Cagliari* **Combined techniques for advanced failure analysis of Photonic Devices**
WS.I.12.2 TT.IX.A.2	Luca ORTOLANI, *CNR IMM, Bologna* **Transmission Electron Interferometric Methods for Materials Characterization**
WS.I.12.3 TT.IX.A.3	Paolo MENGUCCI, *Università Politecnica delle Marche* **Advanced material characterization for additive manufacturing**
WS.I.12.4 TT.IX.A.4	Tiziana DEL BUONO, *Lfoundry* **Optimization of FIB lamellas preparation for gate-oxide pinholes characterization**

AgriNanoTechniques

Wednesday 12 September

organized by

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. Organizations including the World Bank and the U.N. Food and Agriculture Organization are calling for more innovation to address the challenges of the agri-food sector.

Agriculture uses inefficiently the conventional inputs (water, energy, fertilizers, pesticides) and a significant fraction of them are lost or became unavailable to the crops. At the same time, agriculture (cultivation of crops, livestock and deforestation) is a major contributor to greenhouse gas emissions.

The developing Agri-Nanotechniques 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 both 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

NanoInnovation 2018 hosts the 2nd edition of the workshop "AgriNanoTechniques" co-organized by the Universities of Bologna, Parma, Verona and Udine. The workshop will be the forum for discussing the perspective of nanotechnologies in the primary sector among the stakeholders and scientific research.

11:00 - 12:30	**WS.II.1 - TT.I.B**
Nano perspectives in the Agri-Food sector	
Chair: Nelson MARMIROLI, *University of Parma*	
WS.II.1.1 TT.I.B.1	Ana Maria RINCON, *European Food Safety Authority (EFSA)* **Towards EU legislation on nanomaterials/ENMs in food**
WS.II.1.2 TT.I.B.2	Rossella BENGALLI, *University of Milano-Bicocca* **Safe(r) nanomaterials for the Agri-Food sector: The Nano bioscience perspective**
WS.II.1.3 TT.I.B.3	Michele IAFISCO, *CNR ISTEC* **From food industry by-products to smart nano-fertilizers: towards a circular economy of phosphorus**
WS.II.1.4 TT.I.B.4	Giuseppe CIUFFREDA, *Fabbrica Coop Perfosfati Cerea* **Market perspectives for smart fertilizers**
12:30 - 14:00 Light Lunch	

12 SEPTEMBER

AgriNanoTechniques

14:00 - 15:30	WS.II.2 - TT.II.B
Nanomaterials and Plant Nutrition	
Chair: Zeno VARANINI, *University of Verona*	
WS.II.2.1 TT.II.B.1	Luca MARCHIOL, *University of Udine* **Smart fertilizers: Nano-options towards an improvement of Nutrient Use Efficiency**
WS.II.2.2 TT.II.B.2	Marta MARMIROLI, *University of Parma* **Possible applications of engineered nanomaterials in agriculture: the issue of interaction**
WS.II.2.3 TT.II.B.3	Davide SEGA, *University of Verona* **FePO4 nanoparticles as a source of nutrients for plants**
WS.II.2.4 TT.II.B.4	Ilaria CLEMENTE, *University of Florence* **Contributions of nanoscience in designing innovative vectors for agrochemical delivery**
15:30 - 16:00 Coffe Break	
16:00 - 17:30	**WS.II.3 - TT.III.B**
Research Pathways	
Chair: Luca MARCHIOL, *University of Udine*	
WS.II.3.1 TT.III.B.1	Ilaria COLZI, *University of Florence* **Copper nanoparticles from agricultural wastes: a case study on blueberry local processing**
WS.II.3.2 TT.III.B.2	Enrico BRAIDOT, *University of Udine* **Hydroxyapatite NPs impact on tomato plantlet metabolism and seed germination**
WS.II.3.3 TT.III.B.3	Alessandra ZAMBONELLI, *University of Bologna* **Iron exopolysaccharide nanoparticles to improve the production of truffle mycorrhized plants**
WS.II.3.4 TT.III.B.4	Federica TRAMER, *University of Trieste* **Chitosan NPs as delivery system for plant bio-agents release: biomedical and agri-food applications**

LFOUNDRY
A SMIC COMPANY

OVERVIEW

LFoundry, a SMIC company, is a leading specialized foundry. From the heart of ancient Europe, with the Headquarter in Avezzano (Italy), LFoundry is focused on providing access to most advanced analogue manufacturing service with a capacity of >40,000 wafers/month, innovative technology extensions, including volume 90nm and copper manufacturing, a strong emphasis on flexibility and customer partnership. LFoundry is supporting own technology IP for 150nm and 110nm with a large portfolio of process-proven libraries, IP, design tools and reference flows. LFoundry's key focus is primarily in automotive and industrial related applications including CIS, security, smart power, embedded memory, and others.
As a SMIC Company, LFoundry can leverage skills and capabilities of one of the leading semiconductor foundries in the world and the largest and most advanced foundry in mainland China.

OUR PLACE

In Avezzano (AQ), LFoundry is enabling innovation worldwide. We have a continuous commitment to guaranteeing a secure environment in which our customers can realise their ideas to the highest standard, relying on LFoundry as an indispensable partner to unleash their full potential.

DEDICATED FOUNDRY AT AVEZZANO

Since 2006, the 8" Avezzano site has been manufacturing imaging process technologies and products using 180nm to 90nm technologies, including a volume copper, Back End of Line (BEOL), Back Side Illumination processes (BSI) and extensive testing capabilities. The Fab provides automotive ISO-TS16949 certification as well as OHSAS 18001 and ISO 14001

SERVICE MODEL

Technology development and production partnership

CONTACT

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www.lfoundry.com

Advanced Scanning Probe Microscopies

Thursday 13 September

WORKSHOP COMMITTEE

Romolo MARCELLI, CNR IMM
Daniele PASSERI, Sapienza University of Rome
Marco RENZELLI, LFoundry

organized by

Invented about 40 years ago, scanning probe microscopy (SPM) refers nowadays to a family of techniques which allows the imaging of the sample surface with nanometer lateral resolution and sub-nanometer vertical resolution by combining accurate positioning and scanning systems with the use of a nanosized probe which interacts with the sample surface.

Beside the improvement of the quality of topographical reconstructions in terms, for instance, of resolution, stability, or scan rate, SPM has been used as a platform to develop several advanced methods for the characterization of many physical parameters of the sample. Thus, from the original use for topographical imaging, SPM is becoming an indispensable nanometrological tool for mechanical, electric, magnetic, thermal, optical, or chemical nanocharacteriazions.

Recent efforts have been aimed at broadening the range of physical properties, investigable samples, imaging environments, as well as to enhance accuracy, sensitivity, and reliability of the analytical methods. Also, recent developments demonstrated the capability of SPM methods to investigate not only surface but also sub-surface properties.

This workshop aims at presenting an overview and a selection of some of the most recent improvements in SPM methods, e.g., atomic force microscopy (AFM) for mechanical, electric, magnetic nanocharacterizations, as well as optical or microwave near field methods. Emphasis will be given to both presenting the techniques and reviewing some of the most interesting fields of application, e.g., from microelectronics to agri-food or biomedicine and nano-bio-technologies.

WS.III

13 SEPTEMBER

Advanced Scanning Probe Microscopies

09:00 - 10:30	WS.III.1 - HT.II.B
Keynote Session: **Scanning Probe Microscopy: Touching and Probing Matter at the Nanoscale**	
Chair: Daniele PASSERI, *Sapienza University of Rome* *In collaboration with:* ASSING/Bruker	
WS.III.1.1 HT.II.B.1	Jason KILLGORE, *NIST, USA* **Exploring Nanoscale Viscoelasticity with a Surface Coupled Scanning Probe Microscope**
WS.III.1.2 HT.II.B.2	Emmanuel PARIS, *Bruker Europe* **Advance measurement in Atomic Force Microscopy. What's the latest in mechanical and electrical AFM characterization?**
10:30 - 11:00 Coffe Break	
11:00 - 12:30	**WS.III.2 - TT.IV.B**
Advanced SPM techniques: methods and applications 1	
Chair: Marco RENZELLI, *LFoundry* *In collaboration with:* LFoundry	
WS.III.2.1 TT.IV.B.1	Livia ANGELONI, *University of Delft* **Use of Scanning Capacitance Microscopy as a tool for detecting damage to Lightly Doped Drain (LDD) implants in SRAM**
WS.III.2.2 TT.IV.B.2	Stefano VERONESI, *CNR NANO* **An atomically flat gold film thermometer on mica to study energy (heat) exchange at the nano-scale**
WS.III.2.3 TT.IV.B.3	Francesco MARINELLO, *University of Padua, Italy* **NSOM limits and potential in nano-optical characterization**
WS.III.2.4 TT.IV.B.4	Cristiano ALBONETTI, *CNR-ISMN* **The growth of organic ultra-thin films on silicon oxides with variable vacancy states: a Scanning Force Microscopy approach**
12:30 - 14:00 Light Lunch	

14:00 - 15:30	WS.III.3 - TT.V.B

Advanced SPM techniques: methods and applications 2

Chair: Daniele PASSERI, *Sapienza University of Rome*

WS.III.3.1 TT.V.B.1	Michele ORTOLANI, *Sapienza University of Rome* **Light-induced functional conformational changes of bacteriorhodopsin probed by mid-infrared nanospectroscopy**
WS.III.3.2 TT.V.B.2	Giuseppe BARILLARO, *University of Pisa* **Advanced characterization of nanoporous materials for biosensing and nanomedice**
WS.III.3.3 TT.V.B.3	Antonietta LA STORIA, *CNR Napoli* **AFM in food characterization**
WS.III.3.4 TT.V.B.4	Leonetta BALDASSARRE, Sapienza University of Rome **Observation of phonon-polaritons on thin flakes of hBN on gold**

15:30 - 16:00 Coffe Break

16:00 - 17:30	WS.III.4 - TT.VI.B

Advance in Near Field Probe Microwave and mm-wave Microscopy for Surface and Subsurface Characterization of Materials

Chair: Emanuela PROIETTI, *CNR IMM*
In collaboration with: CNR IMM, Ministry of Foreign Affairs and International Cooperation, National Institute of Standards and Technology (NIST)

WS.III.4.1 TT.VI.B.1	Sam BERWEGER, *National Institute of Standards and Technology - NIST, Boulder, USA* **Nanoelectronic Characterization using Microwave Near-Field Microscopy**
WS.III.4.2 TT.VI.B.2	Marco FARINA, *Università Politecnica delle Marche* **Application of Scanning Microwave Microscopy to Biological Samples**
WS.III.4.3 TT.VI.B.3	Giovanni Maria SARDI, *CNR IMM, Roma* **Near-field Microwave Microscopy for Surface and Subsurface Characterization of Materials**
WS.III.4.4 TT.VI.B.4	Venkatachalam SUBRAMANIAN, *Indian Institute of Technology Madras, Chennai, India* **Feedback control for constant height mode operation in scanning near-field microwave microscopy**

February 2018

Microfluidics and Biosystems for personalized medicine

Friday 14 September

WORKSHOP COMMITTEE

Leandro LORENZELLI, *FBK*
Fabrizio PIRRI, *Polytechnic of Turin*
Pietro SICILIANO, *CNR IMM*

organized by

FONDAZIONE BRUNO KESSLER

POLITECNICO DI TORINO 1859 1906

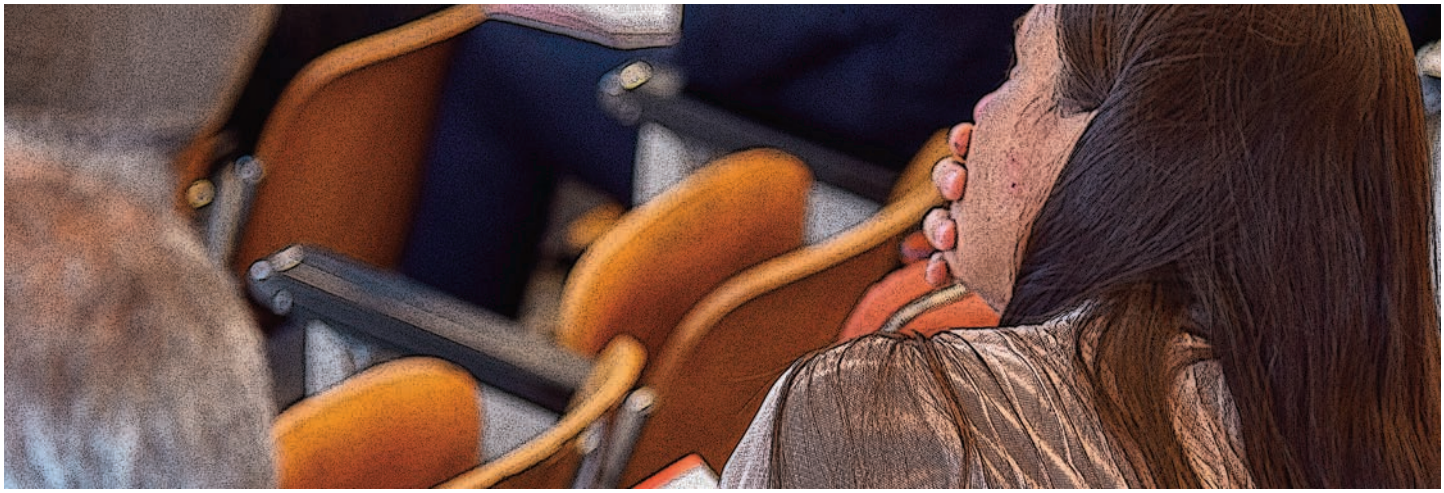
Technologies for the fabrication of devices and systems at micro- and nano-scales continue to advance and diversify due to the rising demands for miniaturisation, cost reduction, functional integration and performance enhancement.

This workshop will provide a broad overview of microfluidics and biosystems technologies as an enabling technology for new product development in diagnostics and in the life sciences. The workshop, co-organized by FBK and the Polytechnic of Turin, is also a training action of the project CanBioSe (H2020-MSCA-RISE-2017) targeted to strengthen collaboration, sharing new ideas and knowledge transfer from research to market in the field of biosensors for cancer cells detection.

The objective of the workshop is twofold: a) to share the progress in the field and b) to identify the technological orientation and future challenges offered by the connection between innovative materials and micro/nanotechnologies.

The involvement of representatives of key research disciplines will offer a podium to enable community building and networking, the sharing of progress in both technology and application development, and the identification of common interests. Emphasis is put on the complete development process for microfluidics/biosystems devices, covering aspects of design, manufacturing technologies, and latest trends in the personalized medicine.

Application case examples will be presented as well as lessons learned during all stages of the development process of microfluidics and biosystems based devices.



WS.IV

14 SEPTEMBER

Microfluidics and Biosystems for personalized medicine

09:00 - 10:30	WS.IV.1 - HT.III.C
Keynote Session: **Advanced approaches for investigating cells and neurons**	
Chair: Leandro LORENZELLI, *FBK, Trento* *In collaboration with:* FBK	
WS.IV.1.1 HT.III.C.1	Pietro FERRARO, *CNR - ISASI , Pozzuoli (Napoli)* **Advanced Diagnosis at single cell level by Coherent Imaging in Lab on Chip Platforms**
WS.IV.1.2 HT.III.C.2	Stefano VASSANELLI, *University of Padova* **Networking brain and silicon spiking neurons with nanoscale memristors: first steps, next challenges and perspectives for brain-machine interfaces**
10:30 - 11:00 Coffe Break	
11:00 - 12:30	**WS.IV.2 - TT.VII.E**
Microfluidics concepts, technologies and applications	
Chair: Leandro LORENZELLI, *FBK, Trento* *In collaboration with:* FBK & Polytechnic of Turin	
WS.IV.2.1 TT.VII.E.1	Donats ERTS, *University of Latvia, Riga, Latvia* **Welcome and general introduction**
WS.IV.2.2 TT.VII.E.2	Andrea ADAMI, *FBK, Trento* **Microfluidics for life science: an overview**
WS.IV.2.3 TT.VII.E.3	Tommaso SANTANIELLO, *Centro Interdisciplinare Materiali e Interfacce Nanostrutturati (CIMaINa), University of Milan* **Advanced functional polymeric materials for smart microfluidics**
WS.IV.2.4 TT.VII.E.4	Maria Lucia CURRI, *CNR IPCF, Bari* **Multifunctional nanomaterials based on colloidal nanoparticles for theranostic applications**
WS.IV.2.5 TT.VII.E.5	Flavio GIACOMOZZI, *FBK, Trento* **Silicon microtechnology for microfluidics**
12:30 - 14:00 Light Lunch	

14:00 - 15:30	WS.IV.3 - TT.VIII.E

Advances in biosensors and microfluidic devices in life science

Chair: Fabrizio PIRRI, *Polytechnic of Turin &* Pietro SICILIANO, *CNR IMM*
In collaboration with: FBK & Polytechnic of Turin

WS.IV.3.1 TT.VIII.E.1	Giuseppe BARILLARO, *University of Pisa* **Enabling (Bio)Sensing And (Nano)Medicine Applications Through Electrochemical Structuring of Silicon at the Micro and Nanoscale)**
WS.IV.3.2 TT.VIII.E.2	Corrado DI NATALE, *University of Rome Tor Vergata* **In-vivo and in-vitro metabolomics with porphyrins based sensor array**
WS.IV.3.3 TT.VIII.E.3	Carlo BORTOLOTTI, *University of Modena and Reggio Emilia* **Electrolyte-Gated Organic Field Effect Transitors (EGOFETs) integrating microfluidics and electronic transduction for label-free, ultra-sensitive biosensing**
WS.IV.3.4 TT.VIII.E.4	Georg PUCKER, *FBK, Trento* **Photonic integrated sensors for life science**

15:30 - 16:00 Coffe Break

16:00 - 17:30	WS.IV.4 - TT.IX.C

Applications in personalized medicine

Chair: Cecilia PEDERZOLLI, *FBK &* Pietro SICILIANO, *CNR IMM*
In collaboration with: FBK & Polytechnic of Turi

WS.IV.4.1 TT.IX.C.1	Sabrina CONOCI, *STMicroelectronics* **Silicon Micro Devices and Systems for Healthcare Applications**
WS.IV.4.2 TT.IX.C.2	Giorgio SCORDO, *Polytechnic of Turin* **Lab-on-chip for precision medicine**
WS.IV.4.3 TT.IX.C.3	Luca FRANCIOSO, *CNR IMM, Lecce* **Sensors & MicroPhysiological Systems: the Organ-On-Chip case**
WS.IV.4.4 TT.IX.C.4	Francesca DEMICHELIS, *University of Trento, Centre of Integrative Biology, Laboratory of Computational and Functional Oncology* **Emerging opportunities in precision medicine**


VNIVERSITA DEGLI STVDI - FACOLTA DI INGEGNERIA

Nanotechnologies for innovative medicine

Thursday 13 September

WORKSHOP COMMITTEE

Sabrina CONOCI, STMicroelectronics
Rosalba PARENTI, University of Catania
Salvo PETRALIA, STMicroelectronics
Filippo D'ARPA, Distretto Tecnologico Sicilia Micro e Nano Sistemi

organized by

DISTRETTO TECNOLOGICO
SICILIA MICRO E NANO SISTEMI
S.C.A.R.L.

Nanotechnologies are a key tool to create innovative materials and devices in the medical field. Thanks to the possibility to manipulate the matter at the nanometer scale, nanotechnologies offer several opportunities to generate fundamental revolution in many areas of medicine.

In this workshop three special sessions will gain insight on research topics relevant for medical applications in which nanotechnologies play a key role. More in details, the first session will deal with "New Materials and Nanotechnologies for Innovative therapeutic Approaches" presenting some of the most recent advances in the achievement of nanoarchitectures releasing bio-active compounds for therapeutic purposes.

The second session will focus on "Materials and Devices for Implants and Regenerative Medicine" where a survey of the most innovative approaches for implants and osteo-chondral regeneration based on nanomaterials will be illustrated. Finally, the third session will address "Molecular Biosensors: the next generation devices", highlighting the most recent developments and emerging nanotechnologies on integrated nanobiosensors for early diagnosis and prevention of diseases.

Two key notes will open the workshop dedicated to "On Dye Doped Silica Nanoparticles as Luminescent Organized Systems for Nanomedicine" by Luca Prodi from University of Bologna and "Nanomedicine in the field of Ortopedic surgery" by Francesco Traina from University of Messina.

WS.V

13 SEPTEMBER

Nanotechnologies for innovative medicine

09:00 - 10:30	WS.V.1 - HT.II.C
Keynote Session: **Nanotechnologies for innovative medicine**	
Chair: Sabrina CONOCI, *STMicroelectronics* *In collaboration with:* Distretto Tecnologico Sicilia Micro e Nano Sistemi	
WS.V.1.1 HT.II.C.1	Luca PRODI, *University of Bologna* **Dye Doped Silica Nanoparticles as Luminescent Organized Systems for Nanomedicine**
WS.V.1.2 HT.II.C.2	Francesco TRAINA, *University of Messina* **Nanomedicine in the field of Ortopedic surgery**
10:30 - 11:00 Coffe Break	
11:00 - 12:30	**WS.V.2 - TT.IV.C**
New Materials and Nanotechnologies for Innovative therapeutic Approaches	
Chair: Rosalba PARENTI, *University of Catania* *In collaboration with:* Distretto Tecnologico Sicilia Micro e Nano Sistemi	
WS.V.2.1 TT.IV.C.1	Emanuela ESPOSITO, *University of Messina* **Laser-produced Au nanoparticles as X-ray contrast agents for diagnostic imaging**
WS.V.2.2 TT.IV.C.2	Gianfranco PASUT, *University of Padova* **Monoclonal antibody for drug delivery and targeting**
WS.V.2.3 TT.IV.C.3	Gennara CAVALLARO, *University of Palermo* **Nano into micro formulations based on functionalized polymers for pulmonary drug delivery**
WS.V.2.4 TT.IV.C.4	Francesco GIULIANO, *SIFI* **Nanostructured carriers for effective delivery of drugs to the back of the eye**
12:30 - 14:00 Light Lunch	

14:00 - 15:30	WS.V.3 - TT.V.D

Materials and Devices for implants and regenerative medicine

Chair: Salvo PETRALIA, *STMicroelectronics*
In collaboration with: Distretto Tecnologico Sicilia Micro e Nano Sistemi

WS.V.3.1 TT.V.D.1	Rodolfo QUARTO, *University of Genova* **Engineered bone-biomaterial interface**
WS.V.3.2 TT.V.D.2	Elisa FIGALLO, *Finceramica, Faenza* **Experimental design approach for engineering biomimetic osteochondral device**
WS.V.3.3 TT.V.D.3	Giovanna CALABRESE, *University of Catania* **Biomaterials and adipose-derived stem cells for osteo-chondral regeneration in vitro and in vivo**
WS.V.3.4 TT.V.D.4	Alberto RIMINUCCI, *CNR ISMN, Bologna* **Magnetic Assembling of 3D cellular architectures**

15:30 - 16:00 Coffe Break

16:00 - 17:30	WS.V.4 - TT.VI.C

Molecular Biosensors: the next generation devices

Chair: Filippo D'ARPA, *Distretto Tecnologico Sicilia Micro e Nano Sistemi*
In collaboration with: Distretto Tecnologico Sicilia Micro e Nano Sistemi

WS.V.4.1 TT.VI.C.1	Maria Jose LO FARO, *CNR IPCF, Messina* **Biosensors based on the innovative optical properties of silicon nanowires**
WS.V.4.2 TT.VI.C.2	Salvatore PERNAGALLO, *DestiNA Genomics* **Chem-NAT bead-based assays for quantifying microRNAs directly from biological sources**
WS.V.4.3 TT.VI.C.3	Salvatore PETRALIA, *STMicroelectronics* **Molecular Surface-cooperative-hybridization: an innovative approaches for Nucleic AcidsDetection**
WS.V.4.4 TT.VI.C.4	Roberta D'AGATA, *University of Catania* **Nanoparticle-enhanced surface plasmon resonance imaging for advanced clinical diagnostics**

February 2018
Photo edited by Prof. Francesco Marra

Materiali Nanofasici

Wednesday 12 - Friday 14 September

MATERIALI NANOFASICI is a bi-annual National Conference organized since 1994 under the patronage of CNR, ENEA, Università di Cagliari and Università di Bologna.

The national community interested in nanophase materials traditionally met at **MATERIALI NANOFASICI** to setup new contacts and to reinforce well established relationships, while discussing about the new scientific advancements at national and international levels. Several topics are traditionally treated with a multi-disciplinary approach. Recently a particular attention has been devoted to emerging issues related to metrology and toxicology. Scientific sessions generally include innovative synthesis techniques, structural, microstructural and morphological characterization by advanced techniques, and the study of chemical and physical properties.

A focus point has been traditionally dedicated at the application aspects of nanomaterials, accounting for the revealed amount of promising, and sometimes unpredictable properties, at the basis of many novel applications, in electronics, magnetism, photonics, energy and biology, to name just a few.

The Organizing Committee is pleased to announce a permanent agreement between **MATERIALI NANOFASICI** and NANOINNOVATION, Conference and Exhibition, on the basis of which, **MATERIALI NANOFASICI** becomes one of the organizing bodies of NANOINNOVATION.

Consequently, starting from this year edition, the **MATERIALI NANOFASICI** Conference will be organized in the frame of NANOINNOVATION, sharing the same venue and the same local organization.

The Organizing Committee of **MATERIALI NANOFASICI** remains fully in charge for the organization of the Congress Section in agreement with the traditional NANOINNOVATION organizing scheme. The Committee will organize, in agreement with NANOINNOVATION bodies, a three full days conference, dedicated to the traditional topics and will be also in charge also for the selection of Chairman who will manage the sessions according to the traditional format comprising scientific sessions with invited talks and oral/poster contributions.

The purpose of this agreement is to give a new impetus and a well defined organizing fame to the future of our Conference, making it an integral and significant part of the vibrant and active NANOINNOVATION initiative.

The synergies between the two events can widen, in fact, the participation, opening the doors of our communities to new adepts coming from the broad community interested in different aspects of nanotechnology. On the other hand, this approach will support our members in the important activities of technology transfer, bringing the traditional deep scientific knowledge of our community in the wider frame where industrial applications plays the main role.

Among the benefits for the **MATERIALI NANOFASICI** participants is the integration into a wider initiative, which attracts many active operators, including relevant industrial stakeholders interested in the nanoscience and in the related devices and applications.

In the tradition of NANOINNOVATION, a free access to all aspects of NANOINNOVATION Conference and Exhibition, thus including **MATERIALI NANOFASICI**, the technical sessions and the commercial exhibition, will be granted to all participants, upon on line registration before the event. A contribution will be requested only to speakers and poster exhibitors according to the general NANOINNOVATION rules.

We are convinced that this organization frame will ensure a solid and long lasting development of our Conference, contributing effectively to the national general effort required for a full and safe development of nanotechnology in all the relevant industrial fields.

Open innovation and Open Science

Friday 14 September,

In collaboration with: AIRI, Associazione NanoItaly and Sapienza

La capacità di identificare e sfruttare competenze e conoscenze di rete, e di gestire processi cooperativi rapidi e complessi, sono fattori determinanti per il successo della ricerca ed innovazione.
Sono richiesti nuovi e piu efficaci modelli per l'incontro tra domanda e offerta di tecnologia, che rispondano alle richieste di multi-disciplinarietà e multi-settorialità dell'innovazione, anche mediante piattaforme digitali innovative, in un'ottica di open science ed open innovation.
E' necessario un cambiamento culturale che coinvolga il management della R&I, oltre a figure professionali dedicate, per affrontare i processi sempre più rapidi e complessi connessi con lo sviluppo delle tecnologie abilitanti ed emergenti.
Durante il seminario, alcuni tra i principali Enti di ricerca, Università e Grandi imprese nazionali, PMI ed associazioni professionali nazionali si confronteranno su esigenze, linguaggi, buone pratiche e modelli per favorire lo scambio cooperativo tra ricerca industria e pubblica in un'ottica di innovazione di medio-breve periodo.

09:00 - 10:30	**JE.II.1 - HT.III.D**
Il rapporto tra Innovazione e Conoscenza in Italia Il sistema della ricerca privata	
Chair: Alberto CIGADA, *Polytechnic of Milan & President Comitato Scientifico Cluster Made in Italy*	
JE.II.1.1 HT.III.D.1	Teodoro VALENTE, *Pro-Rettore alla Ricerca, Innovazione e Trasferimento Tecnologico, Sapienza University of Rome* Sesto VITICOLI, *Vice Presidente AIRI* **OPENING**
JE.II.1.2 HT.III.D.2	Sergio D'ALBERTO, *LFoundry, General Affairs Senior Manager* **Innovation in a Semiconductor Industry and .... Opportunities**
JE.II.1.3 HT.III.D.3	Sergio JESI, *CEO Office Vice Presidente Institutional Relations Italy & Public Financing, ELETTRONICA* **La crescente importanza della collaborazione pubblico/privato sui temi strategici della ricerca e dell'innovazione**
JE.II.1.4 HT.III.D.4	Giuseppe CARUSO, *Capo Area Ricerca, FARMINDUSTRIA* **Ricerca, sviluppo e innovazione: l'impegno delle imprese del farmaco**
JE.II.1.5 HT.III.D.5	Francesca BRACA, *Research Project Manager, ARCHA* **Creare valore dalla ricerca responsabile e sostenibile**
JE.II.1.6 HT.III.D.6	Pier Francesco MORGANTI, *Direttore R&D Nanoscience Center MAVI* **Progetto EU PolyBioSkin: Polimeri naturali e tessuti biodegradabili a salvaguardia dell'ambiente**
JE.II.1.7 HT.III.D.7	Giuseppe SALONIA, *Responsabile Servizio Innovazione e Proprietà Industriale, UNIONCAMERE* **La politica di Unioncamere per l'innovazione**
JE.II.1.8 HT.III.D.8	Cesarina BONFANTI, *R&D Financing Manager, ENI* **L'innovazione collaborativa: ampliare l'accesso all'energia**
10:30 - 11:00 Coffe Break	

11:00 - 12:30	JE.II.2 - TT.VII.G

Il rapporto tra Innovazione e Conoscenza in Italia
Il sistema della ricerca pubblica

Chair: Alberto CIGADA, *Polytechnic of Milan & President Comitato Scientifico Cluster Made in Italy*

JE.II.2.1 TT.VII.G.1	Andrea CANESCHI, *Direttore Consorzio Interuniversitario INSTM* **Ricerca e innovazione in INSTM**
JE.II.2.2 TT.VII.G.2	Luigi MANCINI, *Sapienza University of Rome* **Università e Impresa 4.0: la sfida dei Competence Center**
JE.II.2.3 TT.VII.G.3	Marco RAUGI, *Prorettore per la ricerca applicata e il trasferimento tecnologico, University of Pisa* **Ricerca e innovazione all'Università di Pisa**
JE.II.2.4 TT.VII.G.4	Oscar AMERIGHI, *Industry and Business Associations Unit, ENEA* **ENEA Knowledge Exchange Strategy: moving towards an ecosystem approach to innovation and technology transfer**
JE.II.2.5 TT.VII.G.5	Massimo BONINI, *consorzio interuniversitario CSGI* **Colloidi, Nanoscienze e Formulazioni: Sfide ed Opportunità**
JE.II.2.6 TT.VII.G.6	Corrado SPINELLA, *Direttore DSFTM-CNR* **Ricerca e innovazione nel CNR**

12:30 - 14:00 Light Lunch

14:00 - 15:30	JE.II.3 - TT.VIII.B

Promozione e sviluppo del trasferimento tecnologico e dell'innovazione a livello territoriale

Chair: Lorenzo LO CASCIO, *Regione Lazio, Sviluppo economico*

JE.II.3.1 TT.VIII.B.1	Guido FABIANI, *Presidente del Comitato Direttivo del Centro Ricerche Economiche e Sociali Manlio Rossi-Doria* **Opening**
JE.II.3.2 TT.VIII.B.2	Alfonso MARRA, *Amministratore Delegato di Klopman International, Frosinone* **Internet of Textile**
JE.II.3.3 TT.VIII.B.3	Marina SILVERII, *Direttore ASTER, Bologna* **Strategie e strumenti per sistemi d'innovazione territoriali**
JE.II.3.4 TT.VIII.B.4	Roberto ZAMBONI, *Direttore di CNR-ISOF e Presidente Area della Ricerca CNR di Bologna* **Ricerca, Innovazione, Impresa: strategie e risultati dell'AdR del CNR di Bologna**
JE.II.3.5 TT.VIII.B.5	Roberto GIANNANTONIO, *Dhitech, Lecce* **Innovazione e Trasferimento Tecnologico in Regione Puglia: problemi e opportunità**

15:30 - 16:00 Coffe Break

16:00 - 17:30	JE.II.4 - TT.IX.E

Un approccio innovativo della Regione Lazio: Infrastrutture Aperte per la Ricerca

Chair: Marco ROSSI, *Sapienza University of Rome*

JE.II.4.1 TT.IX.E.1	Riccardo PANUNZIO, *Lazio Innova* **Strumenti regionali per l'Open Innovation**
JE.II.4.2 TT.IX.E.2	Guglielmo FORTUNATO, *CNR IMM & Leonardo* **NanoMicroFab - Infrastruttura aperta di ricerca per il supporto di aziende operanti nell'ambito della micro-nanoelettronica**
JE.II.4.3 TT.IX.E.3	Giuseppe BARBIERI, *ENEA* **MAIA – Materiali Avanzati in una Infrastruttura Aperta**
JE.II.4.4 TT.IX.E.4	Andrea GHIGO, *INFN, Frascati* **LATINO – Laboratory in Advanced Technologies for INnOvation**
JE.II.4.5 TT.IX.E.5	Luca LEUZZI, *Sapienza University of Rome & CNR Nanotec* **ATOM - Advanced Tomography and Microscopies**

New Zetasizer ULTRA featuring MADLS®: the ultimate technology for nanoparticle size and number concentration analysis

Wednesday 12 September, 09:00 - 12:30

ABSTRACT

Characterizing size and concentration is a key step in the study and development of dispersed nanosystems and for the control of the final product properties and quality.

Light scattering is a primary technique for this purpose, and Malvern Panalytical is the leader provider of light scattering instruments for nanoparticle characterization. The workshop will be dedicated to the brand new and revolutionary Adaptive correlation and multi-angle Dynamic Light scattering MADLS® techniques for more complete particle size distributions and calibration-free concentration analysis.

The brand new Zetasizer ULTRA from Malvern Panalytical featuring these 2 techniques will be officially presented for the first time in Italy during this worshop. The workshop will be dedicated both to measurement principle and applicative examples to illustrate the benefits of Adaptive correlation and MADLS® respect to classical DLS.

The new Zetasizer ULTRA will be presented on site during a live demonstration.

PROGRAMME: 2 replicate sessions at 9:15 and 11:00

09:00	Welcome
09:15	Reliable DLS size data quicker with Adaptive Correlation
09:30	See the whole nanoparticle sample with MADLS®: particle characterization you can trust and easy, calibration-free number concentration measurements
10:00	New Zetasizer ULTRA live demonstration
10:30	*Coffee Break*
11:00	Reliable DLS size data quicker with Adaptive Correlation (replicate)
11:15	See the whole nanoparticle sample with MADLS®: particle characterization you can trust and easy, calibration-free number concentration measurements (replicate)
11:45	New Zetasizer ULTRA live demonstration (replicate)
12:15	Open discussion until 13.00

SPEAKER INFORMATION:

Andrea Pigozzo - Alfatest srl – Distributore Malvern Panalytical per l'Italia

Dr. Andrea Pigozzo is graduated in Environmental Sciences at University Ca' Foscari of Venice. He works for Alfatest since 2015, focusing on the molecular interactions and nanoparticle/protein characterization instrumentation. He is Product Manager for Malvern Panalytical light scattering and micro-calorimetry platforms and Pall Fortébio product lines.

Gambetti
Vacuum Technology
and Related Solutions

Park
SYSTEMS

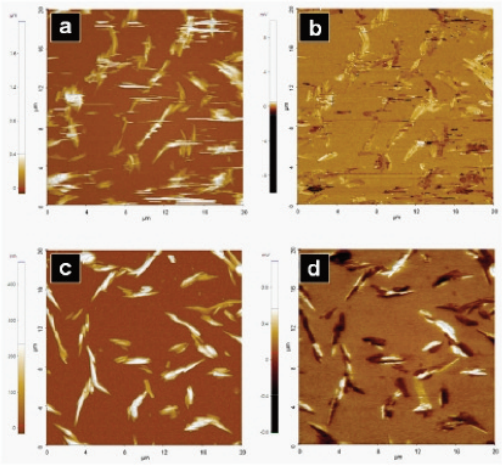
Advances in Atomic Force Microscopy
PinPoint Piezo Force Microscope – frictionless imaging technique (Seminar and Life Demo)

Wednesday 12 -Thursday 13 September, 14:30 – 16:00

ABSTRACT

Electromechanical coupling in materials is a key property that provides functionality to a variety of applications including: sensors, actuators, IR detectors, energy harvesting, and biology. Most materials exhibit electromechanical coupling in nanometer-sized domains. Therefore, to understand the relationships between structure and function of these materials, characterization on the nanoscale is required. This electromechanical coupling property can be directly measured in a non-destructive manner using piezoelectric force microscopy (PFM), a well – established method in atomic force microscopy (AFM).

The conventional PFM is usually performed in contact mode. Contact mode, however, has challenges for a great variety of samples, e.g. the characterization of an annealed phenanthrene thin film on top of an ITO surface. The main difficulty in imaging these samples is due to the phenanthrene thin film forming rod-shaped nanostructures that are very susceptible to displacement by a scanning AFM probe. This is the reason for the newly developed **PinPoint™ PFM mode by Park Systems**. As opposed to standard contact mode, in PinPointTM mode the AFM probe monitors its feedback signal, approaches towards the sample surface until a predefined force threshold is reached, and measures the Z scanner's height. The AFM probe is then rapidly retracted away from the surface to a user-defined height. During the data acquisition the XY scanner stops movement completely and therefore no AFM probe movement takes place on the sample surface at any time. This allows for a more accurate representation of the surface as the nanorods are not moved from their original position.



Join the seminar and live demo to learn more about advantages of PinPointTM PFM over a conventional PFM mode.

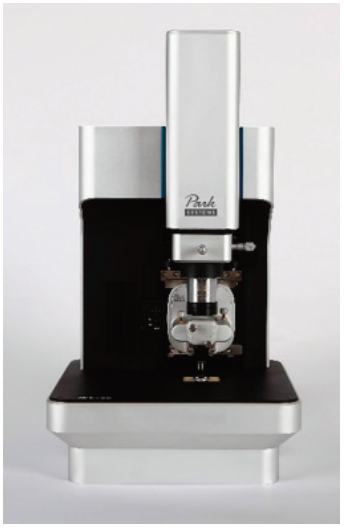
PROGRAMME:

14:30 Welcome and Introduction

14:40 Talk: **"PinPoint Piezo Force Microscope – frictionless imaging technique"**

15:30 Instrument Demonstration on Park NX10 AFM

16:00 Discussion und Summary

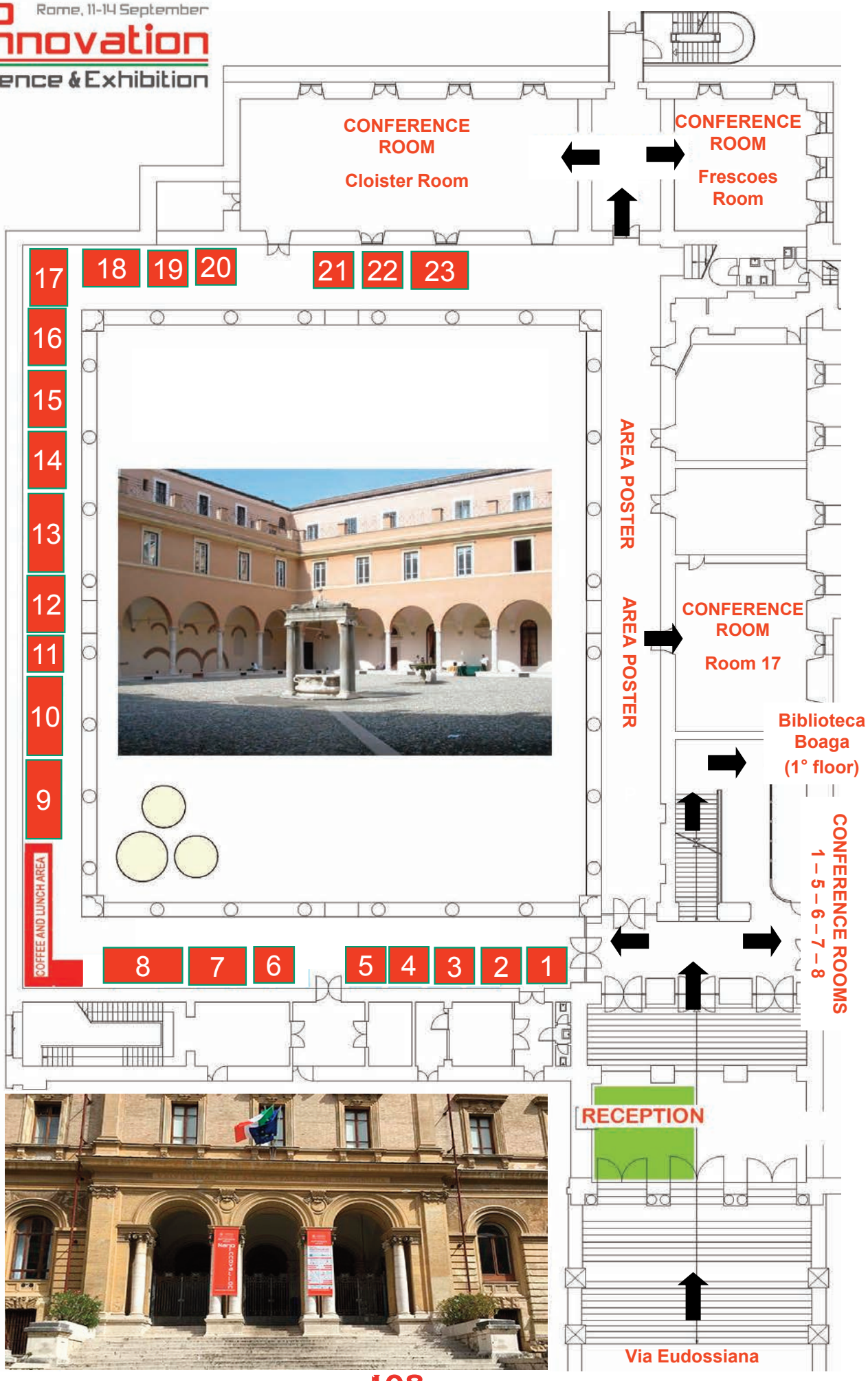


SPEAKER INFORMATION:

Victor Bergmann – *Application Scientist at Park Systems*

pse@parksystems.com | www.parksystems.com

Nano Innovation 2018
Rome, 11-14 September
Conference & Exhibition



ALPHABETICAL ORDER	
6	**2M STRUMENTI**
19	**AIRI**
8	**ALFATEST** MALVERN PANALYTICAL
12	**ASSING** BRUKER SURFACE ANALYSIS CRESTEC CORPORATION IMINA TECHNOLOGIES PHYSICAL ELECTRONICS PLASMA-THERM PVA TEPLA ANALYTICAL SYSTEMS RIGAKU TESCAN
7	**BRUKER**
2	**DISTRETTO TECNOLOGICO SICILIA MICRO E NANO SISTEMI**
14	**FONDAZIONE BRUNO KESSLER**
10	**GAMBETTI KENOLOGIA** KLA-TENCOR OXFORD INSTRUMENTS PARK SYSTEMS THERMO FISHER SCIENTIFIC
22	**GRAPHENE FACTORY**
18	**ITALIAN TRADE AGENCY**
13	**LABOZETA**
16	**LFOUNDRY**
4	**LOT QUANTUMDESIGN**
17	**NANO TECH 2019**
20	**NANOSHARE**
3	**PLATINUM**
21	**PROGETTO Fit4RRI**
11	**PROXIMA**
1	**RENISHAW**
15	**SCUOLA NORMALE SUPERIORE** CENTRO DI COMPETENZE SULLE NANOTECNOLOGIE – CCNEST LABORATORIO SMART
5	**STREM CHEMICALS**
23	**WARRANT GROUP**
9	**ZEISS**

BOOTHS ORDER	
1	**RENISHAW**
2	**DISTRETTO TECNOLOGICO SICILIA MICRO E NANO SISTEMI**
3	**PLATINUM**
4	**LOT-QUANTUMDESIGN**
5	**STREM CHEMICALS**
6	**2M STRUMENTI**
7	**BRUKER**
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22	**GRAPHENE FACTORY**
23	**WARRANT GROUP**

BOOTH 6

2M STRUMENTI SRL

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2M STRUMENTI is active in the materials science, biophysics and nanotechnology fields, representing and producing scientific instruments and high quality components for the creation and characterization of inorganic, organic and biological, from micro to nano structure. The main activities of 2M STRUMENTI are the commercialization, installation and technical support of scientific instrumentation, exclusively on the national territory. The core areas of the company are:

Nanoscopy: AFM, STM, probes and several accessories.

Electron Microscopy: Complete line of SEM and TEM Specimen Preparation Equipments. SEM and TEM Imaging. SEM and TEM Ancillary Equipments: CL, Cryo, Heating and Cooling Stages, Tensile Stages. Consumables for Electron Microscopy and Labs. Diamond and Glass Knives for Microtome and Ultramicrotome.

Deposition: Deposition systems by Metallorganic MO-CVD / LPE / PVD / VPE. Deposition systems Plasma and Reactive Etching Assisted PE-CVD / ICP-RIE. Sputter and evaporators; CVD, PVD.
Graphene growing systems uo to 300 mm diameters Nanoimprinting thermal and UV. Inkjet printing and microdispensing.

Surface Physics: Laser and Spectroscopic Ellipsometers. Analysis for chemical surface characterizations (PTIR). Solar simulator. IQE/EQE PV cells characterization. Surface plasma treatment.

High Vacuum and Ultra High Vacuum Components: Flanges (CF, KF, ISO), Windows, Gaskets, Seals, Valves, Feedthroughs, Materials, Deposition Equipment, Sample, Manipulation.

The company can also provide the "design, construction, distribution, repair, transformation of scientific equipment." Some instruments have been made both in the industrial (process control) and science.

BOOTH 19

Airi

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website: www.airi.it, www.nanotec.it
contact person: **Andrea Porcari**
email: info@airi.it

Airi is a private, not-for profit Association, funded in 1974 to promote industrial Research and Innovation in Italy and to enhance co-operation between the private and public sector. Airi is the focal point for about 100 members, representing private industrial enterprises, large and SMEs and public research organizations. Airi/Nanotec IT is a division dedicated to promote nanotechnologies and their integration with the other Key Enabling Technologies. Researchers of Airi members constitute about the 45% of the researchers in the Country. Airi monitors scientific R&D trends and their applications, disseminates information, facilitates technology transfer and promotes Responsible Research and Innovation (RRI), and has a long experience in participation in co-operative European projects, often as co-ordinator.
Information on activities of Airi will be available at the stand, including the following publications and projects:

- **Verso un manifatturiero italiano 4.0. Ricerca, tecnologia e non solo, dic 2017, Airi**
- **Le innovazioni del prossimo futuro: tecnologie prioritarie per l'industria, mag 2016, Airi**
- **NanoRestArt project: Nanomaterials for the Restoration of works of Art**
- **Prisma project: Piloting Responsible Research and Innovation in Industry**
- **GoNano: Governing Nanotechnologies through societal engagement**
- **CaLIBRAte: Risk Governance Framework for nanomaterials**
- **NanoLab: risk management of nanomaterials in R&D labs**
- **RinnovareNano: National platform on the safety of nanomaterials**

BOOTH 8

ALFATEST SRL

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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 the exclusive distributor in Italy for: Phenom-world, Formulaction, Postnova Analytics, Haver & Boecker, Microfluidics, Freeman Technologies, Pall ForteBio, Alpha-MOS, Armfield, Applied Photophysics, and ONI.

BOOTH 8

PANALYTICAL SRL

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Fax +39 039 2434520
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contact person: **Vincenzo Di Marzio**
email: vincenzo.di-marzio@panalytical.com

PANalytical provides solutions for highly reliable and robust chemical and structural analysis of a wide variety of materials. The combination of our software and instrumentation, based on X-ray diffraction (XRD), X-ray scattering, X-ray fluorescence (XRF), near-infrared (NIR) and pulsed fast thermal neutron activation (PFTNA), provides our customers with elemental and structural information on their materials.

With our global presence, expertise and unmatched support organization we help customers characterize materials in every industry segment, applications and materials research areas.

Our systems range from laboratory instruments and on-line analyzers to completely automated laboratories for the metals and mining industries.Currently we are the only analytical X-ray equipment supplier with own in-house development and manufacture of the X-ray tubes, basis of the best performance.

We have over 1000 dedicated employees, are present in all countries of the world, hold more than 250 patents and have research centers in Almelo and Eindhoven, the Netherlands and on the campus of the University of Sussex (UK).

Our fully equipped application laboratories are established also in Japan, China, the United States, Brazil. Since 1 January 2017 PANalytical has merged its activities with Malvern Instruments. We continue to be coitted to leadership and innovation, customer satisfaction, safety, environmental health, ethical standards, integrity, fairness, trust and mutual respect.

BOOTH 12

ASSING SPA

Via Edoardo Amaldi, 14
00015 Monterotondo (RM), ITALIA
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Fax +39 06 90670200
website: www.assing.it
email: 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**), systems from **Plasma Therm** (RIE, PECVD, ICP), , Electronic lithography systems (**Crestec**), atomic force microscopies, optical and stylus profilometers (**BRUKER Nano Surfaces**), XPS, TOF SIMS, AUGER (**PHi**), 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 12

BRUKER SURFACE & DIMENSIONAL ANALYSIS

7 rue de la Croix Martre
91120 Palaiseau, France
website: www.bruker.com/products/surface-and-dimensional-analysis.html
email: 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 12

CRESTEC CORPORATION

9-2, Owada-machi, Hachioji-shi,
Tokyo 192-0045, JAPAN
website: www.crestec8.co.jp
email: sales@crestec8.co.jp

Crestec Corporation provides Dedicated electron beam lithography systems, tailored to deliver extremely high currents in a minimal diameter beam spot.

BOOTH 12

IMINA TECHNOLOGIES SA

EPFL Innovation Park, Bâtiment E
CH-1015 Lausanne, SWITZERLAND
Sito Web: www.imina.ch
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 12

PHYSICAL ELECTRONICS INC. (PHI)

18725 Lake Drive East
Chanhassen, MN 55317
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Sito web www.phi.com
Email 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 12

PLASMA-THERM

10050 16th St. North
Saint Petersburg, FL 33716, UNITED STATES
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E-mail: sales@assing.it

Plasma-Therm is, since 1974, an innovator in plasma-processing technologies and manufactures plasma etch, deposition, and advanced packaging equipment for specialty semiconductor and nanotechnology markets.

BOOTH 12

PVA TEPLA ANALYTICAL SYSTEMS GMBH

Deutschordenstrasse, 38
D-73463 Westhausen, GERMANY
website: www.pva-analyticalsystems.com
email: sales@assing.it

PVA TePla Analytical Systems develops, produces and delivers scanning acoustic microscopes (whose unique characteristic is the ability to non-destructively examine the interior of opaque materials with resolution comparable to optical light microscopy) providing innovative, advanced solutions for non-destructive imaging.

BOOTH 12

RIGAKU CORPORATION

4-14-4, Sendagaya, Shibuya-ku
Tokyo 151-0051, JAPAN
website: www.rigaku.com/en
email: sales@assing.it

Rigaku Corporation is an international leader in manufacturing and distribution of analytical instruments for X-ray diffraction (XRD), X-ray crystallography (SC-XRD) and X-ray fluorescence (XRF) for research and industrial applications.

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 Kingdoom, Germany, Czech Republic and Poland.

Rigaku products are worldwide well known for the top.level design, the high performance and the unequaled reliability.

BOOTH 12

TESCAN

Libušina tř. 21
623 00 Brno – Kohoutovice,
ČESKÁ REPUBLIKA
Tel. +420 530 353 411
Fax +420 530 353 415
website: www.tescan.com
email: 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
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Fax +39 02 2361294
Sito Web: www.bruker.com
Contact person: **Cristian Vailati**
E-mail: bruker.italy@bruker.com

Bruker enables scientists to make breakthrough discoveries and develop new applications that improve the quality of human life. Bruker's high-performance scientific instruments and high-value analytical and diagnostic solutions enable scientists to explore life and materials at molecular, cellular and microscopic levels. In close cooperation with our customers, Bruker is enabling innovation, productivity and customer success in life science molecular research, in applied and pharma applications, and in microscopy, nano-analysis and industrial applications. In recent years, Bruker has also become a provider of high-performance systems for cell biology, preclinical imaging, clinical phenomics and proteomics research, clinical microbiology, and for molecular pathology research.

Today, worldwide more than 6,000 employees are working on this permanent challenge at over 90 locations on all continents. Bruker continues to build upon its extensive range of products and solutions, its broad base of installed systems and a strong reputation among its customers. Being one of the world's leading analytical instrumentation companies, Bruker is strongly committed to further fully meet its customers' needs as well as to continue to develop state-of-the-art technologies and innovative solutions for today's analytical questions.

Bruker's unique range of analytical tools for SEM includes EDS, WDS, EBSD and Micro-XRF.

BOOTH 2

DISTRETTO TECNOLOGICO SICILIA MICRO E NANO SISTEMI

Ottava Strada, 5 – Zona Industriale
95121 Catania (CT), ITALIA
Tel. +39 095 5968261
Sito Web: www.distrettomicronano.it
Contact person: **Rosanna Pane**
E-mail: rosanna.pane@distretttomicronano.it

The "Distretto Tecnologico Sicilia Micro e Nano Sistemi" is a cluster founded in August the 1st 2008 in form of limited liability consortium, based on a National agreement between the Italian Government and the Sicily Region. The "Distretto" counts on the aggregation of 22 different research and development enterprises (both private firms and public companies) that work on micro-nano technologies in the fields of Life Science, Energy, Mobility, Agricultural & Food, Environment and Security. The "Distretto" is also part of several National Technological Cluster named by the MIUR, the Italian Ministry of Education & Research. In particular, Cluster"Alisei" focused on Life Science, Cluster "Smile" on Ambient Assisted Living, Cluster Energy, and Cluster Smart Communities. The Consortium owns really strong competencies due to the fact that among its parties it includes several national and "global" firms dedicated to research, development and experimentation of micro-nano industrial systems. Just to mention some of these private firms:

- STMicrolectronics, IBM Italia, SIFI, ISMETT (Istituto Mediterraneo per i Trapianti e Terapie ad Alta Specializzazione), ITALTEL, Corvallis, and Engeneering.
- Furthermore, referring to the National public system of research as parties of the Consortium, is important to mention: CNR, that - with about 8.000 employees - is a public organization with the duty to carry out, promote, spread, transfer and improve research activities in the main sectors of knowledge and scientific technological development and the 3 Sicilian Universities (Palermo, Catania and Messina) and its branches and departments that provides specific technical and scientific support.
- Starting from 2012, and till the 2015, the District Consortium is involved in several ambitious research projects (partially funded for about 50M€ by the Italian Ministry of Education & Research) in the fields of Health & Biotechnology, Energy Efficiency, and Electronic & New Materials.

BOOTH 14

FONDAZIONE BRUNO KESSLER

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38122 Trento (TN), ITALIA
Tel. +39 0461 314200
Sito Web: www.fbk.eu
Contact person: **Massimo Bersani**
E-mail: bersani@fbk.eu

Fondazione Bruno Kessler was created on 1 March 2007. FBK inherits the activities of the Istituto Trentino di Cultura, which was based on the ideas of Bruno Kessler, a long-time member of the local government and founder of the University of Trento. Established by a law of the Autonomous Province of Trento, FBK operates as private entity. The Foundation is charged with keeping the province of Trento in the mainstream of European and international research. It does so by attracting women, men and resources at the forefront of technological development and humanities studies. The Foundation is also involved in bringing together natural and human sciences, a sign of recognition of the challenges faced by the knowledge society.
Fondazione Bruno Kessler promotes: •cultural activities, scientific research, technological development, with the aim of both the advancement of knowledge and service to the local community •the exploration of innovative frontiers of knowledge with particular emphasis on interdisciplinary approaches and on the applications area •the opening of the Trentino Region to the international scene, through collaborations and exchange activities with national and international research organizations •a widespread innovation ability, involving the community and the local economy •the transfer of research results: support for new entrepreneurship, for the growth of brand-new professional skills and for the improvement of public administration structures. The main FBK research fields are in the areas of Information Technology, Materials and microsystems. Centre Materials and Microsystems (CMM) is focused on key areas of Materials, Microdevices and Microsystems, employing more than 120 people. CMM combines scientific excellence with the ability to exploit research outcomes and results within national and international network, aiming at optimizing experience through open innovation.

BOOTH 10

GAMBETTI KENOLOGIA SRL

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Tel. +39 02 90093082
Fax +39 02 952778
Sito Web: www.gambetti.it
Contact person: **Stefania Fabbri**
Email sales@gambetti.it

Gambetti Kenologia has chosen NanoInnovation to promote together with Park Systems the most innovative solutions in atomic force microscopy.

Park Systems is a world-leading manufacturer of atomic force microscopy (AFM) systems with a complete range of products for researchers and industry engineers in chemistry, materials, physics, life sciences, and semiconductor and data storage industries. Park's products are used by over a thousand of institutions and corporations worldwide. Our comprehensive line of AFMs, with revolutionary features like **True Non-Contact™** mode **or Park SmartScan OS**, offers users unparalleled accuracy and ease of use. With AFMs designed specifically to be used in materials and life science, electronics, nanotechnology, and other areas of research and industry, our tools are trusted to deliver ultra-high resolution with extremely precise measurements quickly and easily.

An NX10 will be available at our booth, and during satellite events with real demos.

Gambetti Kenologia since 1974 provides solutions for R&D and industrial companies in the following fields of activities:

Surface Characterization, Process Systems for Plasma Thin Films, Process control for Vacuum, UHV, Gas Analysis.

Our brand includes also bench top plasma systems fully developed and produced at GK

For more info: www.gambetti.it www.plasmi.eu

BOOTH 10

KLA TENCOR

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Milpitas, California 95035, U.S.A.
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Sito Web: www.kla-tencor.com

Extending the boundary of Process control

KLA-Tencor is among the largest semiconductor equipment companies in the world. We are an industry leader with the financial strength to support growth and development, the technical innovation needed in a fast-paced industry environment, and the critical mass to serve a global customer base.

KLA-Tencor has been a leader in process control for the semiconductor and related industries for 40 years, developing and manufacturing inspection, metrology and data analysis systems that rely on innovative optics, sensors and high performance computing technologies.

BOOTH 10

OXFORD INSTRUMENTS PLASMA TECHNOLOGY

66.8 mi
Yatton, Bristol, UK
Tel: +44 (0)1934 837000
Sito Web: https://plasma.oxinst.com/

Oxford Instruments Plasma Technology

Oxford Instruments Plasma Technology (OIPT) provide etch and deposition process solutions for nanometre sized features, nanolayers and the controlled growth of nanostructures.

These solutions are based on core technologies in plasma, ion beam and atomic layer deposition and etch. Products range from clustered cassette-to-cassette platforms for high-throughput production processing to compact stand-alone systems for R&D.

BOOTH 10

PARK SYSTEMS

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Fax: +82-31-546-6805
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Email psc@parkAFM.com

Gambetti Kenologia has chosen NanoInnovation to promote together with Park Systems the most innovative solutions in atomic force microscopy.

Park Systems is a world-leading manufacturer of atomic force microscopy (AFM) systems with a complete range of products for researchers and industry engineers in chemistry, materials, physics, life sciences, and semiconductor and data storage industries. Park's products are used by over a thousand of institutions and corporations worldwide. Our comprehensive line of AFMs, with revolutionary features like **True Non-Contact™** mode or **Park SmartScan OS**, offers users unparalleled accuracy and ease of use. With AFMs designed specifically to be used in materials and life science, electronics, nanotechnology, and other areas of research and industry, our tools are trusted to deliver ultra-high resolution with extremely precise measurements quickly and easily.

An NX10 will be available at our booth, and during satellite events with real demos.

Gambetti Kenologia since 1974 provides solutions for R&D and industrial companies in the following fields of activities:

Surface Characterization, Process Systems for Plasma Thin Films, Process control for Vacuum, UHV, Gas Analysis.

Our brand includes also bench top plasma systems fully developed and produced at **GK**

For more info: www.gambetti.it www.plasmi.eu

BOOTH 10

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Tel. 800-678-5599
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Thermo Scientific – a commitment to analytical precision

Thermo Scientific instruments, equipment, software, services and consumables empower scientists to solve for complex analytical challenges in pharmaceutical, biotechnology, academic, government, environmental and industrial research, as well as the clinical laboratory. Our products address a range of needs from sample, material characterization and chemical analysis to clinical diagnoses and biological-based therapeutics manufacturing.

Arrive at a confident answer

Tackle the most challenging surface, thin film and interface questions with Thermo Scientific™ XPS spectrometers. Our analytical innovations allow scientists on the forefront of materials science to drive bold progress in the fields of ultra thin film and nanotechnology development. Unparalleled ease-of-use, best-in-class software and high sample throughput provide superior results for production and analytical laboratories. Whenever new questions rise to the surface, our comprehensive offering of XPS spectrometers deliver the performance and flexibility to arrive at a confident answer.

BOOTH 22

GRAPHENE FACTORY

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GRAPHENE FACTORY is the CNR web portal born with the aim to show and promote the research on graphene and bi-dimensional materials performed within the CNR network. It also offers contents and information about "graphene" to the scientific community, to the media, to SMEs, Industry and general public.

The National Research Council (CNR) is the largest public Research Institution in Italy. CNR is strongly involved in the research activities on graphene and two-dimensional materials beyond graphene, both on the fundamental research, and on future applications and technological innovation.

On a national basis, is the institution with the largest number of researcher involved on these topics and the largest scientific production.

BOOTH 18

ITA
ITALIAN TRADE AGENCY
ICE - Agenzia per la promozione all'estero e l'internazionalizzazione delle imprese italiane

ITALIAN TRADE AGENCY

Via Liszt, 21
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website: www.ice.gov.it
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Ufficio Tecnologia Industriale, Energia e Ambiente
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The Italian Trade Agency - ICE is the government organization which promotes the internationalisation of Italian companies. ICE provides information, support and advice to Italian and foreign companies.

ICE operates worldwide through a network of Trade Promotion Offices linked to Italian embassies and consulates and working closely with local authorities and businesses.

ICE provides tailored services to help Italian businesses expand overseas and connect with prospective partners: one-on-one business meetings, targeted partner searches, trade delegations to Italy, official participation in international trade events, forums and seminars with Italian experts.

www.ice.gov.it | www.italtrade.com | tecnologia.industriale@ice.it

BOOTH 13

labozeta
la sicurezza nel laboratorio ®

LABOZETA

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Labozeta operates in the field of design and construction of scientific laboratories and is partner and distributor of Kottermann.
EN ISO 9001:2008 (Vision 2000) certified, Labozeta is a specialized company with certification awarded by the Society of Certification Bodies (SOA).
Operating on an international level, it is constantly involved in the study of technological innovations and advanced production processes to ensure the maximum level of prevention and protection of the personnel of scientific laboratories, pursuant to international quality standards.
Labozeta combines variable geometries for personalized services from planning, definition and management of a project to implementation, testing and delivery of the work in sectors as Industry, Health, Forensics, Research, Control and Education.

Educational workshops for Universities, Technical and Professional Schools, Education and Training Institutions.
The interaction of professionals from different fields reflects the multidisciplinary aspect of innovative projects that mix appearance, ergonomics, communication, psychology, usability and functionality for the management and simplification of complexity with competence and reliability.
The philosophy of Labozeta is expressed in its attention to detail and to the quality of its products with the aim of creating sensitivity, developing original, concrete and innovative ideas, mixing different concepts and skills to be used in a complementary manner.

Since 1983, Labozeta has been cooperating with qualified companies building a strong experience by carrying out several projects for the most prestigious institutions and private clients. Nowadays, Labozeta represents an original multidisciplinary reality that uses an international language to explore strategic and coherent forms, to develop new concepts, to carry out projects that inspire a new way of living the laboratory.
Great attention to people, the enhancement of highly potential resources and the development of a culture of knowledge represent for Labozeta the privilege of participating in life.

BOOTH 16

LFOUNDRY

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Contact person: **Sergio D'Alberto**
Email: sergio.dalberto@lfoundry.com

From the heart of ancient Europe, LFoundry, a SMIC majority-owned company, provides innovative solutions that reach all around the world, breathing life into our customers' visions. Fully committed to finding the best solutions to satisfy every specific necessity, LFoundry creates innovation to bring our partners' projects to life. When it comes to transforming innovation into reality, this is what makes LFoundry a world-class player. Our leading and highly specialised foundry has an advanced 200mm manufacturing fab and proprietary technologies at 150 and 110 nm nodes, with MPW and MLM services available. We provide special capabilities and know-how for CMOS Image Sensors through CIS optimised processes down to 90nm, as well as Back Side Illumination technology. We also provide excellent technology support for Optoelectronics such as SiPM, SPAD, X-Ray, as well as for DBI Bonding (3D-Stacking) and Smart Power and a vast range of applications for the automotive, industrial, medical, security, science and space imaging industries. As a SMIC Company, LFoundry can leverage skills and capabilities of one of the leading semiconductor foundries in the world and the largest and most advanced foundry in mainland China.

OUR PLACE

In Avezzano (AQ - Italy), LFoundry is enabling innovation worldwide. We have a continuous commitment to guaranteeing a secure environment in which our customers can realise their ideas to the highest standard, relying on LFoundry as an indispensable partner to unleash their full potential.

DEDICATED FOUNDRY AT AVEZZANO

Since 2006, Avezzano site (former Micron Technology) has been manufacturing customer imaging process technologies and products using 180nm to 90nm technologies at the 200mm, including a volume copper Back End of Line (BEOL), Back Side Illumination processes (BSI) and extensive testing capabilities. The Company provides automotive ISO-TS16949, telecom TL9000 and ISO9001 quality management system certifications as well as OHSAS 18001 certification for health and safety management system and ISO 14001 certification for environmental management system.

BOOTH 4

LOT-QUANTUMDESIGN SRL

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For over 45 years, we have been one of the leading European distributors of high-tech instrumentation and consumables for scientific, academic and industrial research.

Our product range comprises optics, components and systems for the life sciences, material characterization, cryotechnology, spectroscopy, imaging and electron microscopy.

We employ more than highly-qualified 140 staff across Europe. The headquarters are located in Darmstadt, Germany, further offices are in France, England, Italy, Scandinavia, Poland, Czech Republic, Hungary, Romania, Spain, Russia, Turkey, Switzerland and the BeNeLux. Together with our parent company Quantum Design International, Inc. and affiliated companies in the U.S., Asia and South America, we form the only world-wide distribution network for high-technology instrumentation.

BOOTH 17

nano tech 2019

Celestine Shiba Mitsui Building, 3-23-1,
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Sito Web: www.nanotechexpo.jp
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nano tech Japan is the world's largest and one of the most comprehensive event for nanotechnologies. It will be held in Tokyo for the 18th time from **Jan. 30 - Feb. 1, 2019.**
In the industry focused exhibition, 600 companies, research institutes and universities show the latest Materials, Fabrication and Measurement Technologies at the nano level.
The attendee list of more than 50,000 people reads like the Who-is-who of the Japanese and Asian Industry and includes Electronics manufacturers, as well as Chemical, Pharmaceutical, Automotive and Construction companies.

Together with other high-tech events such as Printable Electronics, 3D Printing, or Smart Energy Japan, nanotech creates a huge marketplace for next generation technologies.
A joint Business Matching, which is shared by all co-located events, provides the opportunity for one-to-one business meetings with more than 1200 registered innovators and technology users and creates synergies between different fields.

An accompanying seminar and conference program covers a variety of nanotechnology related topics and provides information about latest research results and developments.

More information about nanotech is available at www.nanotechexpo.jp/index.html

BOOTH 20

NANOSHARE

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NanoShare Srl is a SME company legally based on the Polo Tecnologico Tiburtino (Rome. NanoShare is an academic spin-off of Tor Vergata University: our laboratories, facilities, professors and researchers are spread out the Tor Vergata University, Sapienza University and in the Polo Tecnologico Tiburtino Invent plant. NanoShare mission is to create job & opportunities through innovation and technological transfer in the field of nanotechnology.
The starting date of our activity was in 2011, when MIUR, (through the Art 11 D.M. 08.08.2000) financially supported the implementation of the "STORAGE" project, devoted to the development innovative nanocomposites for Hydrogen storage at RT and at low pressure. Our revenue model is in the framework of the general category of the commerce. We prepare customized physical goods based on nanotechnology (nanomaterials, nanodevices, nanosensors and other nanosystems) and we offer R&D services on the large field of nanotechnology and nanocharacterizations.

For what concerns the manufacturing of nanoparticles, nanostructures and nanocomposites, contracts and R&D projects are mainly related to the following applications:
- Thermal management;
- Sensing (gas/vapour, stress/strain, electrochemical, bio-);
- Energy storage (H-storage, supercapacitors, electrodes for cells);
- Coatings (mechanical, conductive, antistatic, fluorescent) on rigid and flexible substrates (including textiles);
- Electron sources (cold cathodes, micro-propulsion systems, miniaturized X-sources);
- Biomedical applications (drug delivery, imaging, biocide, antifungal, bio-adhesives layers).

BOOTH 3

PLATINUM "Aziende&Protagonisti"

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PLATINUM "Aziende&Protagonisti" è la rivista a colori diretta da "Gruppo 24 ORE" che illustra il panorama economico italiano attraverso i suoi principali interlocutori.
Una comunicazione autorevole e qualificata ad un target di nominativi nel panorama imprenditoriale (grandi imprese e PMI), istituzionale ed economico-finanziario nonché dei liberi professionisti.
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BOOTH 21

PROGETTO Fit4RRI

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FIT4RRI - Fostering improved training tools for RRI- is intended to help mainstream role of Responsible Research and innovation (RRI) and Open Science (OS) in Research Funding and Performing Organisations (RFPOs).
FIT4RRI moves from the assumption that there is a serious gap between the potential role RRI and OS could play in helping RFPOs to manage the rapid transformation processes affecting science (especially the science-in-society aspects) and the actual impact RRI and OS are currently having on RFPOs. FIT4RRI act on two key factors: • Enhancing competences and skills related to RRI and OS• Institutionally embedding RRI/OS practices in RFPOs
The FIT4RRI overall methodology is based on three main steps: • Analysing RRI and OS practices: trends, barriers and drivers, interests and values, experiences • Testing RRI/OS practices in 4 co-creation experiments with RFPOs, with a focus on Energy Efficiency, Photonics (optical monitoring), Material Science, Text & Data Mining • Developing easy-accessible training tools and evidence-based guidelines for RRI and OS.
At the FIT4RRI stand delegates will get insights on training tools and testing activities and explore opportunities to contribute and benefit from project activities.
Project funded by the EU's Horizon 2020 R&I Programme under Grant Agreement No 741477.
To learn more about FIT4RRI and to sign-up for the project's newsletter, visit www.fit4rri.eu/

BOOTH 11

PROXIMA SRL

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PROXIMA was born in 2010 with the goal of offering a new vision of global service in Vacuum Technologies.

Thanks to years of experience Proxima has become a solid rock for the maintenance of vacuum pumps, laboratory and industrial vacuum installations.

With time we started increasing our offer to customers with a wide product range both new and reconditioned items and customizing deposition plants according to customer needs.

PRODUCTS & SERVICES

1. Corrective and Preventive Maintenance of vacuum pumps and accessories.
   All Vacuum pumps: Turbomolecular, Cryogenic, rotary vane, Dry, Diffusion
   Special equipment like: Pumping Station, Leak-Detector, RGA, Valves, RF & DC Generator

2. Engineering and Automation solution to improve your productivity
   Design, manufacturing, installation and tests of production and laboratory vacuum equipment. Design of customized vacuum chambers, vacuum pumping station, special tools and specific sub-assemblies, UHV manipulators and spare-parts.
   We can supply a service that, from the initial design and 3D simulation of vacuum chambers, centralised vacuum systems and thin films under vacuum equipment, arrives at delivery of the product, keys in hand with training of the operator.

More information about PROXIMA is available at www.proxima3.com

BOOTH 1

RENISHAW

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Renishaw is one of the world's leading engineering and scientific technology companies, with expertise in precision measurement and healthcare. The company supplies products and services used in applications as diverse as jet engine and wind turbine manufacture, through to dentistry and brain surgery.

It is also a world leader in the field of additive manufacturing (also referred to as metal 3D printing), where it is the only UK business that designs and makes industrial machines which 'print' parts from metal powder.

The Renishaw Group currently has more than 70 offices in 35 countries, with around 4,000 employees worldwide. Around 2,600 people are employed within the UK where the company carries out the majority of its research and development and its manufacturing.

BOOTH 15

SCUOLA NORMALE SUPERIORE

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The Scuola Normale Superiore (SNS) is a public institute for higher education that in its two centuries of life has earned itself a special place, both in Italy and abroad, a place characterized by merit, talent and scientific rigour.

Within the SNS there are two laboratories involved in nanoscience, computational chemistry and augmented reality, Laboratorio NEST and Laboratorio SMART respectively, where the institutional scientific activity is also exploited for technology transfer.

These two labs of the SNS will be present at NanoInnovation 2018 in order to show their research activity and to offer collaboration on projects related to technology transfer for small and medium enterprises (SME) and research institutes.

BOOTH 15

CENTRO DI COMPETENZE SULLE NANOTECNOLOGIE

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The NEST Competence Centre on nanotechnologies (CCNEST) was funded in 2010 by the local government of the Tuscan region on a Scuola Normale Superiore proposal, as a service centre for local small and medium enterprises (SME).

It uses state-of-the-art instrumentation within a class ISO 6 clean room and it is located within the NEST laboratory of the Scuola Normale Superiore.

The NEST laboratory, the National Enterprise for nanoscience and Nanotechnology, is an interdisciplinary research and training centre for nanoscience where physicists, chemists and biologists (about 150 people) investigate scientific issues at the nanoscale.

This knowledge is exploited to develop innovative nanobiotechnological tools, nanoelectronic and photonic devices and architectures.

The NEST initiative comprises four distinct institutions: Scuola Normale Superiore, Istituto Italiano di Tecnologia, Consiglio Nazionale delle Ricerche and Scuola Superiore Sant'Anna. Although each institution has its own staff and administration (Laboratorio NEST of SNS, Centre for Nanotechnology Innovation of IIT, the Istituto Nanoscienze of CNR, and Nanoplant of SSSA) facilities and activities are closely coordinated and scientists team up for specific scientific objectives regardless of their affiliation.

Collaboration with SME at the NEST Competence Centre (CCNEST) is obtained through research contracts on nanoscience and nanotechnology topics. The synergy of the CCNEST with the NEST laboratory allows for the exploitation of both the skills of their technical-scientific staff and the equipment and tools available, and to put them at the service of the enterprise that wants to innovate.

BOOTH 15

LABORATORIO SMART - SNS

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The SMART (Space-time Multiscale Applications for Research and Technology) Laboratory at Scuola Normale Superiore was established in 2016. SMART focuses on the development of simulation and number crunching methods. The models developed at SMART are used by many researchers around the world, both in academia and in industry. In 2017 the Competence Centre in Simulation and Virtual Methods for Science and Technology was established within SMART as a service centre for local small and medium enterprises (SME).

The nexus of scientific research at SMART is the development, validation and application of algorithms and software to model molecular systems and forecast their properties under different environmental conditions, with particular emphasis on spectroscopic properties across the entire electromagnetic spectrum. Theoretical developments are implemented in widely available software for use by other researchers. This is of great scientific and technological impact, for example, in the development of Smart Materials, substances whose properties can be controlled or changed with accuracy by means of external stimuli (e. g. temperature, light).

Modern numerical simulations are able to generate huge amounts of complex, non-structured data, which can change in nature and whose size can grow rather quickly, which forces one to resort to Big Data technologies to handle them. Therefore, the development and application of algorithms for the automatic analysis of data and application of Machine Learning methods to pre- and post- processing steps are important lines of research.

SMART is also highly involved in the development of Immersive Virtual Reality to Scientific Visualization. The possibility of natural interaction with the visualized objects and the use of proprioception for a quick and intuitive grasp of complex structures should allow for a further evolution in interactive data visualization. This is particularly true when dealing with complex objects far from our usual perception scale.

The SMART staff is formed of about 30 people including senior staff (professors and researchers), post Docs, Ph. D. and undergraduate students and technical staff.

BOOTH 5

STREM CHEMICALS INC.

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Strem Chemicals, Inc., established in 1964, is a privately held manufacturer and marketer of specialty chemicals of high purity. Strem's key products include catalysts, ligands, organometallics, metal carbonyls, CVD/ALD precursors and nanomaterials.

We also offer many graphene related items such as powders, monolayers, nanoplatelets, quantum dots, fullerenes and more.

Our products are used for research & development and commercial scale applications, especially in the pharmaceutical, microelectronics, chemicals and petrochemicals industries.

Strem Chemicals also provides custom synthesis, process development and cGMP manufacturing services. Strem is an ISO 9001 certified company.

For more information, please visit www.strem.com or contact us at info.europe@strem.com

BOOTH 23

WARRANT GROUP

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Warrant Group S.r.l. is a privately held consultancy services company that provides integrated and specialized consulting at all stages of business development.

Warrant Group has been active since 1995, growing over the years to become a leader in its sector today. Its mission is to assist companies in defining strategies and essential condition for growth through management consulting and search for added-value solutions.

In particular, the European Funding Division (EFD) of Warrant Group offers methodological and strategic consultancy for approach and participation in European Research and Innovation Funding Opportunities, as well as in the preparation, negotiation and management of European Proposal, particularly on the calls launched by HORIZON 2020.

BOOTH 9

ZEISS GROUP

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ZEISS is an internationally leading technology enterprise operating in the optics and optoelectronics industries. The ZEISS Group develops, produces and distributes measuring technology, microscopes, medical technology, eyeglass lenses, camera and cine lenses, binoculars and semiconductor manufacturing equipment. With its solutions, the company constantly advances the world of optics and helps shape technological progress.

ZEISS is divided up into the four segments Research & Quality Technology, Medical Technology, Vision Care/Consumer Products and Semiconductor Manufacturing Technology. The ZEISS Group is represented in over 40 countries and has more than 50 sales and service locations, upwards of 30 manufacturing sites and about 25 research and development facilities around the globe.

In fiscal year 2016/17, the company generated revenue approximating 5.3 billion euros with around 27,000 employees. Founded in 1846 in Jena, the company is headquartered in Oberkochen, Germany. Carl Zeiss AG is the strategic management holding company that manages the ZEISS Group. The company is wholly owned by the Carl Zeiss Stiftung (Carl Zeiss Foundation).

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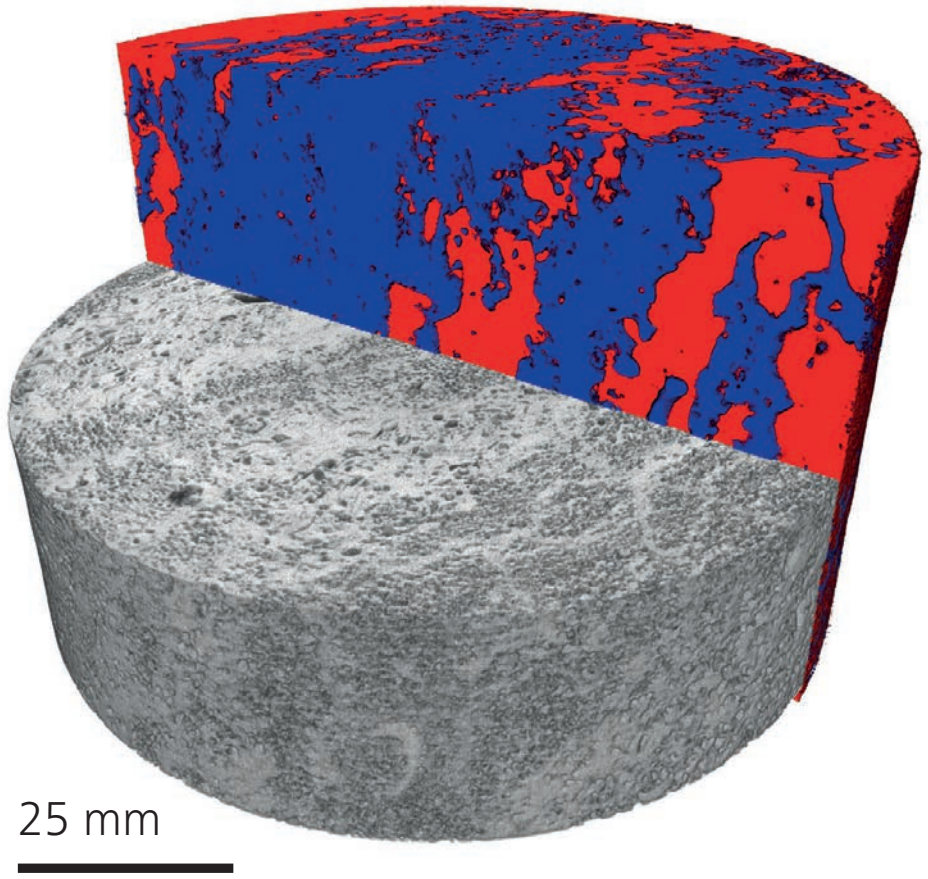

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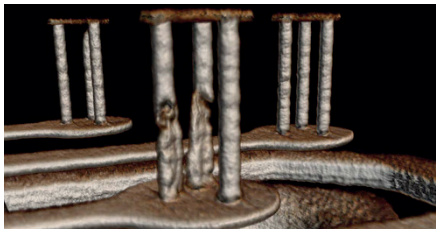

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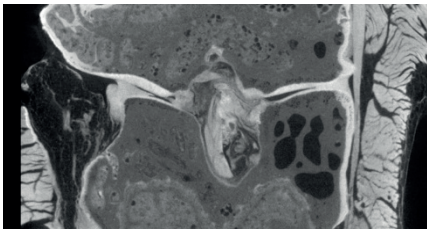
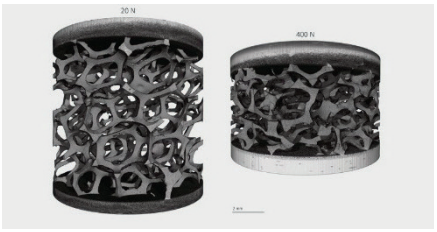
Experience Resolution Beyond Micro-CT



A virtual cross section through a mouse knee data set

Enhance Your Images with Advanced Contrast Techniques



In situ compression of a metal foam

Characterize Materials in situ and in 4D

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