

**The Sixth International Conference**  
*"Dynamics of Systems on the Nanoscale"*



**DySoN 2020**

Regina Elena Hotel  
Santa Margherita Ligure, Italy  
November 23-27, 2020



**SECOND ANNOUNCEMENT**

## Scope

The Sixth International Conference “Dynamics of Systems on the Nanoscale” (DySoN 2020) will take place on **November 23-27, 2020** in Santa Margherita Ligure, Italy. The Conference is co-organized by the [University of Ferrara](#) (Ferrara, Italy), [University of Kent](#) (Canterbury, United Kingdom) and [MBN Research Center](#) (Frankfurt am Main, Germany).

The DySoN conference has been built upon a series of International Symposia “Atomic Cluster Collisions: structure and dynamics from the nuclear to the biological scale” (ISACC 2003-2019, see [isacc-portal.org](#)). During these meetings it has become clear that there is a need for an interdisciplinary conference covering a broader range of topics than just atomic cluster collisions, related to the Dynamics of Systems on the Nanoscale. Therefore, a new conference series was launched in 2010 under the title “Dynamics of Systems on the Nanoscale”. The first DySoN conference took place in Rome, Italy in 2010. Since then, four further DySoN conferences were held in St. Petersburg, Russia (2012); Edinburgh, United Kingdom (2014); Bad Ems, Germany (2016); and Potsdam, Germany (2018). DySoN 2020 is the sixth conference in this series.

The DySoN 2020 Conference will promote the growth and exchange of interdisciplinary scientific information on the structure formation and dynamics of animate and inanimate matter on the nanometer scale. There are many examples of complex many-body systems of micro- and nanometer scale size exhibiting unique features, properties and functions. These systems may have very different nature and origin, e.g. atomic and molecular clusters, nanostructures, ensembles of nanoparticles, nanomaterials, biomolecules, biomolecular and mesoscopic systems. A detailed understanding of the structure and dynamics of these systems on the nanoscale is a difficult and fundamental task, the solution of which is necessary in numerous applications of nano- and biotechnology, materials science and medicine.

Although mesoscopic, nano- and biomolecular systems differ in their nature and origin, a number of fundamental problems are common to all of them: What are the underlying principles of self-organization and self-assembly of matter at the micro- and nanoscale? Are these principles classical or quantum? How does function emerge at the nano- and mesoscale in systems with different origins? What criteria govern the stability of these systems? How do their properties change as a function of size and composition? How are their properties altered by their environment? Seeking answers to these questions is at the core of a new interdisciplinary field that lies at the intersection of physics, chemistry and biology, a field now entitled Meso-Bio-Nano (MBN) Science.

Experimental, theoretical and applied aspects of these problems will be discussed at DySoN 2020. Particular attention will be devoted to dynamical phenomena and many-body effects taking place in various MBN systems on the nanoscale, which include problems of structure formation, fusion and fission, collision and fragmentation, surfaces and interfaces, collective electron excitations, reactivity, nanoscale phase and morphological transitions, irradiation driven transformations of complex molecular systems, irradiation-induced biodamage, channeling phenomena, construction of novel light sources, and many more. Links of the DySoN topics to novel and emerging technologies will be an important focus of DySoN 2020.

Finally, the conference will provide a platform to host discussions about current research, technological challenges and related initiatives within the Topical Areas of DySoN Conference Series.

### **Topical Areas of DySoN:**

- Structure and dynamics of molecules, clusters and nanoparticles
- Cluster and biomolecular ensembles, composite systems
- Nanostructured materials, surfaces and interfaces
- Reactivity and nanocatalysis
- Collision and radiation processes, fusion, fission, fragmentation
- Electron and spin transport in molecular systems
- Radiation-induced chemistry
- Clustering, self-organization, phase and morphological molecular transitions on the nanoscale, nanofabrication
- Irradiation-driven transformations, fabrication and damage of MesoBioNano systems
- Biomedical and technological applications of radiation
- Propagation of particles through media
- DySoN-based technologies: novel light sources, functionalized materials and many more

## **Important Dates**

Distribution of the first announcement	November 01, 2019
Distribution of the second announcement	April 30, 2020
Deadline for early-bird registration	August 01, 2020
Deadline for hotel reservation	September 15, 2020
Deadline for abstract submission	October 01, 2020

## **Scientific Program**

The scientific program for DySoN 2020 will consist of interdisciplinary sessions which will include plenary lectures, review talks and progress reports. PhD students and young researchers are encouraged to submit their contributions and participate in the conference. A number of hot topic reports will be chosen by the DySoN International Advisory Committee from the submitted abstracts. Other contributions will be presented in a poster session.

## **DySoN 2020 Program**

*Monday, November 23, 2020*

12 <sup>00</sup> – 16 <sup>00</sup>	Participants registration
14 <sup>30</sup> – 14 <sup>45</sup>	<b>DySoN 2020 Opening</b>
14 <sup>45</sup> – 16 <sup>15</sup>	<b>Afternoon session I</b>
16 <sup>15</sup> – 16 <sup>45</sup>	Coffee break
16 <sup>45</sup> – 18 <sup>15</sup>	<b>Afternoon session II</b>
19 <sup>00</sup> – 22 <sup>00</sup>	<b>Welcome reception</b>

*Tuesday, November 24, 2020*

9 <sup>30</sup> – 11 <sup>00</sup>	<b>Morning session I</b>
11 <sup>00</sup> – 11 <sup>30</sup>	Coffee break
11 <sup>30</sup> – 13 <sup>00</sup>	<b>Morning session II</b>
13 <sup>00</sup> – 14 <sup>30</sup>	Lunch
14 <sup>30</sup> – 16 <sup>00</sup>	<b>Afternoon session I</b>
16 <sup>00</sup> – 16 <sup>30</sup>	Coffee break
16 <sup>30</sup> – 18 <sup>00</sup>	<b>Poster session</b>

*Wednesday, November 25, 2020*

9 <sup>30</sup> – 11 <sup>00</sup>	<b>Morning session I</b>
11 <sup>00</sup> – 11 <sup>30</sup>	Coffee break
11 <sup>30</sup> – 13 <sup>00</sup>	<b>Morning session II</b>
13 <sup>00</sup> – 14 <sup>30</sup>	Lunch
14 <sup>30</sup> – 16 <sup>00</sup>	<b>Afternoon session I</b>
16 <sup>00</sup> – 18 <sup>00</sup>	<b>Conference tour</b>

*Thursday, November 26, 2020*

9 <sup>30</sup> – 11 <sup>00</sup>	<b>Morning session I</b>
11 <sup>00</sup> – 11 <sup>30</sup>	Coffee break
11 <sup>30</sup> – 13 <sup>00</sup>	<b>Morning session II</b>
13 <sup>00</sup> – 13 <sup>15</sup>	Conference photo
13 <sup>15</sup> – 14 <sup>30</sup>	Lunch

14 <sup>30</sup> – 16 <sup>00</sup>	<b>Afternoon session I</b>
16 <sup>00</sup> – 16 <sup>30</sup>	Coffee break
16 <sup>30</sup> – 18 <sup>00</sup>	<b>Afternoon session II</b>
19 <sup>00</sup> - 22 <sup>30</sup>	<b>Conference dinner</b>

*Friday, November 27, 2020*

9 <sup>30</sup> – 11 <sup>00</sup>	<b>Morning session I</b>
11 <sup>00</sup> – 11 <sup>30</sup>	Coffee break
11 <sup>30</sup> – 13 <sup>00</sup>	<b>Morning session II</b>
13 <sup>00</sup> – 13 <sup>15</sup>	<b>Final Discussion and DySoN 2020 Closing</b>
13 <sup>15</sup> – 14 <sup>30</sup>	Lunch and departure

### **Confirmed Speakers**

**Hassan Abdoul-Carime**, University of Lyon, France

*Selective chemistry triggered by slow electrons*

**Rodolphe Antoine**, Université de Lyon1, France

*Gold catenane nanoclusters: from silver doping to self-assembled nanostructures*

**Ilko Bald**, University of Potsdam, Germany

*Plasmon chemistry revealed by surface-enhanced Raman scattering*

**Gérard Baldacchino**, Université Paris-Saclay, Gif-sur-Yvette, France

*Exposition to extreme ionizing radiations and consequences on the nanoparticles effects for therapy*

**Laura Bandiera**, Istituto Nazionale di Fisica Nucleare, Ferrara, Italy

*Recent experimental results on high energy electromagnetic processes in strong crystalline fields*

**Sadia Bari**, Deutsches Elektronen-Synchrotron (DESY), Hamburg, Germany

*TBA*

**Kit Bowen**, Johns Hopkins University, Baltimore, USA

*Adventures in negative ion photoelectron spectroscopy*

**Stefan Bromley**, University of Barcelona, Spain

*Understanding size-dependent structure and dynamics of nanoscale oxides: from water splitting to cosmic dust*

**Maurizio Dapor**, University of Trento, Italy

*Simulation of low energy electron transport in condensed matter for technological and medical applications*

**Davide De Salvador**, University of Padova, Italy

*Pulsed laser processes for nanoscale doping and strain control*

**Wolfgang Ernst**, Graz University of Technology, Graz, Austria

*Nanomaterials synthesized in helium droplets*

**Ilya Fabrikant**, University of Nebraska-Lincoln, Nebraska, USA

*Positronium collisions with molecules*

**Martin Falk**, Institute of Biophysics of the CAS, Brno, Czech Republic

*DNA damage and repair in normal and tumour cells - the micro-scale and nano-scale views*

**Juraj Fedor**, J. Heyrovský Institute of Physical Chemistry, Czech Republic

*Statistical vs. non-statistical emission of electrons from hot anions*

**Riccardo Ferrando**, University of Genoa, Italy

*TBA*

**Franco Gianturco**, The University of Innsbruck, Austria

*Quantum behaviour of cold anions in ion traps: selective photodetachment of interstellar molecules*

**Vincenzo Guidi**, University of Ferrara, Italy

*Two dimensional materials and their application to gas sensing*

**Michael Huth**, Goethe University, Frankfurt am Main, Germany  
*Simulation-guided 3D direct-write nanofabrication with focused electron beams*

**Vadim Ivanov**, Peter the Great St. Petersburg Polytechnical University, Russia  
*Channeling of electrons and positrons in straight and periodically bent diamond crystals*

**Julius Jellinek**, Argonne National Laboratory, Argonne, Illinois, USA  
*Universality in size-driven evolution towards bulk polarizability of metals*

**Shiv Khanna**, Virginia Commonwealth University, Richmond, USA  
*Bridged superatomic molecules: Unusual nano p- n- junction with tunable band gaps, adjustable band alignment, and effective electron hole separation*

**Ken Knappenberger**, Dept. of Chemistry, Penn State University, USA  
*Electronic relaxation dynamics in quantum metals*

**Andrei Korol**, MBN Research Center, Frankfurt am Main, Germany  
*Crystal based gamma-ray light sources*

**Werner Lauth**, Institute of Nuclear Physics, University of Mainz, Germany  
*Characterization of crystalline undulators at the Mainz Microtron MAMI*

**Nigel Mason**, University of Kent, Canterbury, United Kingdom  
*Are nanoparticles a panacea for radiotherapy or a chimera?*

**Andrea Mazzolari**, Istituto Nazionale di Fisica Nucleare, Ferrara, Italy  
*Manufacturing of crystals for coherent interactions with high-energy particle beams*

**Nektarios Papadogiannis**, Hellenic Mediterranean University, Heraklion, Greece  
*Laser-plasma secondary X-ray sources with high coherence: An important tool for spatiotemporal nanoscopy of structural changes in matter*

**Silvia Ramos**, University of Kent, Canterbury, United Kingdom  
*Nanostructure probed by X-ray absorption spectroscopy*

**Thomas Schlathölder**, Zernike Institute for Advanced Materials, University of Groningen, The Netherlands  
*Structural dynamics in DNA nanostructures observed in a free-electron-laser pump-probe experiment*

**Sascha Schäfer**, Carl von Ossietzky University, Oldenburg, Germany  
*Spatio-temporal mapping of ultrafast nanoscale dynamics by femtosecond electron pulses*

**Jefferson Shinpaugh**, East Carolina University, Greenville, USA  
*Radiosensitization properties for metals and nanostructures materials for ion radiation*

**Malgorzata Smialek-Telega**, Gdansk University of Technology, Poland  
*What happens if phenol meets toluene?*

**Andrey Solov'yov**, MBN Research Center, Frankfurt am Main, Germany  
*Advances and challenges in computational multiscale modelling of MesoBioNano systems*

**Iia Solov'yov**, Carl von Ossietzky University, Oldenburg, Germany  
*Structure and dynamics of cryptochrome photoreceptors*

**Béla Sulik**, Institute for Nuclear Research (Atomki), Debrecen, Hungary  
*Ion impact ionization in gases and ices*

**Eugene Surdutovich**, Oakland University, USA  
*Multiscale approach to ion-beam therapy as an idea and as an accomplishment*

**Thu Nhi Tran Caliste**, European Synchrotron Radiation Facility, Grenoble, France  
*Defect / distortion characterisation of crystals and deposited layers: new capabilities using quantitative X-ray Bragg diffraction imaging*

**Hidetsugu Tsuchida**, Kyoto University, Japan  
*Dissociation of biomolecules in liquid water by various excitation methods*

**Pablo de Vera**, University of Murcia, Spain  
*Detailed simulations of focused electron beam induced deposition by interfacing Monte Carlo and Molecular Dynamics techniques*

**Alexey Verkhovtsev**, MBN Research Center, Frankfurt am Main, Germany  
*Computational modeling of radiosensitising nanoparticles with MBN Explorer*

**Andrew Wheatley**, University of Cambridge, United Kingdom

*Engineering surface properties for new energy sector materials*

**Beata Ziaja-Motyka**, Center for Free-Electron Laser Science, DESY, Hamburg, Germany

*Transitions in matter induced by intense X-ray radiation and their diagnostics*

### **Financial support**

A limited number of bursaries (300 Euros each) will be available from [the Sir John Mason Academic Trust](#) for Early Career Researchers defined as Masters students doing research projects, PhD students and early postdocs (up to 3 years after PhD). Recipients of bursaries must have an abstract accepted either as oral or poster presentation. Applications should be sent to [dyson.conference@gmail.com](mailto:dyson.conference@gmail.com) with copy of submitted abstract(s) before October 01, 2020.

Reduced registration fee (**350 €** (early-bird) / **400 €** (late)) will be offered to the members of [the Virtual Institute of Nano Films \(VINF\)](#).

### **Best poster prize for Early Career Researchers**

Thanks to one of our sponsors, Springer Verlag, we are organizing a competition for the best poster prize for Early Career Researchers. The prize will consist on both a certificate and an economic reward.

### **Topical Issue of the European Physical Journal D**

We have the pleasure to announce that a Topical Issue “**Dynamics of Systems on the Nanoscale (2020)**” will be launched in the [European Physical Journal D: Atomic, Molecular, Optical and Plasma Physics](#). The main scope of this topical issue will be to present recent advances and perspectives in this highly interdisciplinary field of modern research. It will include regular articles, as well as review and colloquium papers.

**Submission to this Topical Issue will be opened to the entire research community** working in the DySoN topical areas and is not restricted to the participants of the DySoN 2020 Conference. All conference participants are encouraged to submit their novel results to this Topical Issue.

The deadline for submission is March 31, 2021.

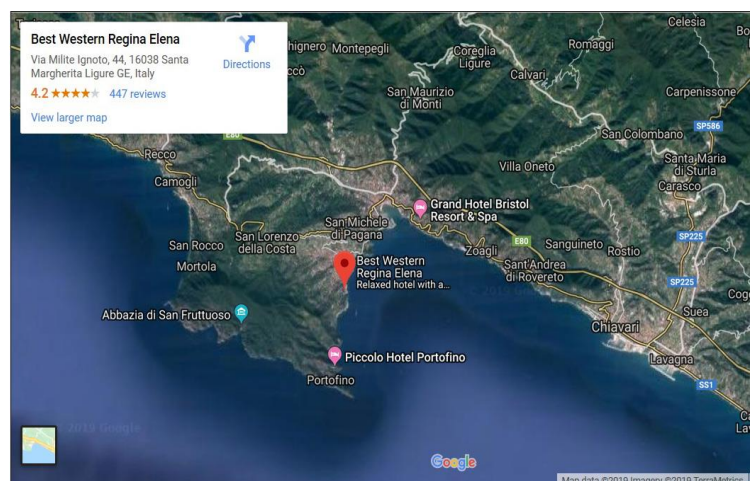
Further information will be available on the conference website soon.

The previous Topical Issue “Dynamics of Systems on the Nanoscale (2018)” has been published in EPJD. All the articles of this topical issue [are freely accessible](#) until June 15, 2020.

### **Conference Venue and Travel Information**

The Conference will be hosted by [Best Western Hotel Regina Elena](#), Lungomare Milite Ignoto 44, 40128 Santa Margherita Ligure, Italy. The hotel is located on the seafront that connects **Santa Margherita Ligure** to **Portofino**, among the **Regional Natural Park** and the **Tigullio Gulf** and the **Marine Protected Area** of Portofino.

Santa Margherita Ligure is a municipality in the Italian region Liguria, located about 35 kilometers southeast of Genoa, in the area traditionally known as Tigullio. The town is known for Castello di Santa Margherita Ligure, built by the Republic of Genoa in 1550 as a defense against the increasing attacks of North African pirates, as well as for Villa Durazzo - a complex that includes two patrician villas, a 16<sup>th</sup>-century castle and a 17<sup>th</sup>-century park.



The information on how to reach the conference venue can be found [here](#). The hotel is located about 35 km away from the Genoa Airport, 150 km from the Pisa Airport and about 220 km from Milan-Malpensa and Milan-Bergamo airports. Santa Margherita Ligure train station is operated by Trenitalia, see [here](#) for prices and schedule. The venue can also be reached by car from A12 highway (exit Rapallo).

Detailed information on how to reach the conference venue will be circulated in the final announcement.

### **Registration**

The number of rooms reserved at the hotel for conference participants is limited. We advise the participants to register for the conference and the hotel at the earliest convenience.

- Regular conference fee: **450 €** (early-bird) / **500 €** (late)
- Undergraduate and PhD students: **350 €** (early-bird) / **400 €** (late)
- Accompanying persons: **120 €** (+optional 3-lunch pack for 105 €)

The conference fee will cover the book of abstracts, coffee breaks, lunches, the conference reception, a sightseeing tour and the conference dinner. The fee for accompanying persons includes the conference reception, a sightseeing tour and the conference dinner. Optionally, accompanying persons can also book a 3-lunch package for 105 € (35€ per lunch).

The payment to the order of “DySoN 2020” can be made **by bank transfer** to

Bank Account Name: MBN Research Center gGmbH  
Bank name: Deutsche Bank  
Branch Address: Hauptstr. 561462 Koenigstein Germany  
IBAN: DE15500700240137588000  
BIC: DEUTDEDBFRA

Please quote your **NAME** and **DYSON** on the transfer. Please ensure there are **NO** charges to us.

If you need an invoice for the payment or want to pay with a credit card, please send a short email to [dyson.conference@gmail.com](mailto:dyson.conference@gmail.com).

### **Accommodation**

Please book accommodation directly with the [Best Western Hotel Regina Elena](#) and quote “DYSON” to book either (i) a single room for 55€ per night, or (ii) a double room for single use for 69€ per night, or (iii) a double/twin room for 40€ per night per person. There is also a supplement of 30€ per room per night for a double/twin room with balcony and sea view. The rooms will be reserved before September 15, 2020, and will then be released so please book early.

### **Official Invitation and Visa**

Conference participants are advised to check the passport and visa requirements for travel to Italy well in advance. For invitation requests please contact Professor Vincenzo Guidi (University of Ferrara), see the contact information below.

### **Conference Language**

The language of the conference is English.

### **International Advisory Committee**

- Andrey V. Solov'yov (MBN Research Center, Frankfurt am Main, Germany) - **IAC Chair**
- Ilko Bald (University of Potsdam, Germany)
- Catherine Bréchnignac (Laboratoire Aime Cotton, CNRS, Orsay, France)
- Michel Broyer (University of Lyon, France)
- Jean-Patrick Connerade (Imperial College London, London, UK)
- Franco Gianturco (The University of Innsbruck, Austria)
- Vincenzo Guidi (University of Ferrara, Italy)
- Julius Jellinek (Argonne National Laboratory, Argonne, Illinois, USA)
- Shiv Khanna (Virginia Commonwealth University, Richmond, USA)
- Nigel Mason (University of Kent, Canterbury, UK)
- Ilia Solov'yov (Carl von Ossietzky University, Oldenburg, Germany)
- Eugene Surdutovich (Oakland University, Rochester, Michigan, USA)

## **Organizing Committee**

- Vincenzo Guidi (University of Ferrara, Italy) - **Co-Chair**
- Nigel Mason (University of Kent, United Kingdom) - **Co-Chair**
- Andrey Solov'yov (MBN Research Center, Germany) - **Co-Chair**
- Laura Bandiera (INFN, Ferrara, Italy)
- Andrei Korol (MBN Research Center, Germany)
- Andrea Mazzolari (INFN, Ferrara, Italy)
- Ilia Solov'yov (Carl von Ossietzky University, Oldenburg, Germany)
- Irina Solovyeva (MBN Research Center, Germany)
- Alexey Verkhovtsev (MBN Research Center, Germany)

## **Sponsors**

The conference will be held under the auspices of the following sponsors:

- MBN Research Center, Frankfurt am Main, Germany
- University of Ferrara, Ferrara, Italy
- University of Kent, Canterbury, United Kingdom
- Sir John Mason Academic Trust
- Virtual Institute of Thin Films
- Springer Verlag
- H2020-MSCA-RISE N-Light
- H2020-MSCA-RISE RADON

## **Contact Information**

**Professor Vincenzo Guidi**  
DySoN 2020 Co-Chair

Dept. of Physics and Earth  
Sciences, University of Ferrara  
Via Saragat 1  
44122 Ferrara, Italy  
Phone: +39 0532 974284  
E-mail: [vincenzo.guidi@unife.it](mailto:vincenzo.guidi@unife.it)  
Website:  
[docente.unife.it/vincenzo.guidi-en](http://docente.unife.it/vincenzo.guidi-en)

**Professor Nigel J. Mason, OBE**  
DySoN 2020 Co-Chair

School of Physical Sciences  
University of Kent  
Canterbury, CT2 7NH  
United Kingdom  
Phone: +44 (0)1227 823321  
E-mail: [N.J.Mason@kent.ac.uk](mailto:N.J.Mason@kent.ac.uk)  
Website:  
[kent.ac.uk/physical-sciences](http://kent.ac.uk/physical-sciences)

**Prof. Dr. Andrey V. Solov'yov**  
DySoN 2020 Co-Chair

MBN Research Center gGmbH  
Altenhöferallee 3  
60438 Frankfurt am Main, Germany  
Phone: +49 (0)69 34875600  
E-mail: [solovyov@mbnresearch.com](mailto:solovyov@mbnresearch.com)  
Website:  
[www.mbnresearch.com](http://www.mbnresearch.com)

## **DySoN Conference Web Page**

Updated information on the conference series is available at [www.dyson-conference.org](http://www.dyson-conference.org)

## **Conference e-mail**

[dyson.conference@gmail.com](mailto:dyson.conference@gmail.com)