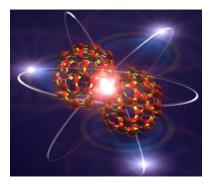
The Sixth International Conference "Dynamics of Systems on the Nanoscale" and

The Tenth International Symposium "Atomic Cluster Collisions"





DySoN-ISACC 2021

Regina Elena Hotel Santa Margherita Ligure, Italy October 18-22, 2021



THIRD ANNOUNCEMENT

Scope

The Sixth International Conference <u>"Dynamics of Systems on the Nanoscale"</u> (DySoN) and the tenth International Symposium <u>"Atomic Cluster Collisions"</u> (ISACC) are organized jointly under the title **"DySoN-ISACC 2021 Conference"**.

The DySoN-ISACC 2021 Conference will take place on **October 18-22, 2021** in Santa Margherita Ligure, Italy. It is co-organized by the <u>University of Ferrara</u> (Ferrara, Italy), <u>University of Kent</u> (Canterbury, United Kingdom) and <u>MBN Research Center</u> (Frankfurt am Main, Germany).

A series of International Symposia "Atomic Cluster Collisions: structure and dynamics from the nuclear to the biological scale" started in 2003, and nine ISACC conferences have been <u>held so far</u>. The ISACC series promotes the growth and exchange of scientific information on the structure, properties and dynamics of complex nuclear, atomic, molecular, cluster, nanoscopic and biological systems studied primarily by means of photonic, electronic and atomic collisions. Most ISACC conferences were satellites of the International Conferences on Photonic Electronic and Atomic Collisions (ICPEAC). In light of the Covid-19 pandemic the <u>XXXIII ICPEAC Conference</u> has been postponed to 2023. Despite this, the ISACC International Advisory Committee decided to organize the Tenth ISACC Symposium in 2021 as a joint meeting with the DySoN 2021 conference.

The "Dynamics of Systems on the Nanoscale" conference has been built upon the ISACC series reflecting 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. The DySoN conference series was launched in 2010 and five DySoN conferences have been <u>held so far</u>.

The DySoN conferences 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 nano- and biotechnologies, 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 of different origin? 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 entitled Meso-Bio-Nano (MBN) Science.

The joint DySoN-ISACC 2021 Conference will cover experimental, theoretical and applied aspects of all the aforementioned topics. 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. The utilization of advanced computational techniques and high-performance computing for studying the aforementioned phenomena and effects will also be discussed. Links of the DySoN and ISACC topics to novel and emerging technologies will be an important focus of the DySoN-ISACC 2021 Conference.

Finally, DySoN-ISACC 2021 will provide a platform to host discussions about current research, technological challenges and related initiatives within the Topical Areas of DySoN and ISACC Conference Series.

Topical Areas of DySoN and ISACC:

- Structure and dynamics of molecules, clusters and nanoparticles
- Cluster and biomolecular ensembles, composite systems
- Clustering, self-organization, phase and morphological transitions on the nanoscale
- Clustering in systems of various degrees of complexity
- Nanostructured materials, surfaces and interfaces
- Cluster structure and dynamics on a surface
- Reactivity and nanocatalysis
- Electron and spin transport in molecular systems
- Collision and radiation processes, fusion, fission, fragmentation
- Electron-, photon- and ion-cluster collisions
- Collision processes with biomolecules
- Radiation-induced chemistry
- Irradiation-driven transformations, damage and fabrication of MesoBioNano systems
- Propagation of particles through media
- Clusters and biomolecules in external fields: electric, magnetic, laser etc.
- Cluster and biomolecular research with Free Electron Lasers
- Biomedical and technological applications of radiation
- Related technologies: novel light sources, controlled nanofabrication, functionalized materials, etc.

Important Dates

Distribution of the first announcement Distribution of the second announcement Distribution of the third announcement Deadline for early-bird registration Deadline for hotel reservation Deadline for abstract submission

February 01, 2021 July 30, 2021 October 01, 2021 August 15, 2021 September 01, 2021 September 15, 2021

DySoN-ISACC 2021 Program

Monday, October 18 (DySoN-related sessions)

$10^{00} - 14^{00}$	Participants registration	
$14^{00} - 14^{15}$	DySoN-ISACC 2021 Opening Vincenzo Guidi, Nigel J. Mason and Andrey V. Solov'yov	
$14^{15} - 15^{45}$	Afternoon session I: Dynamics of systems on the nanoscale	
	Andrey Solov'yov , MBN Research Center, Frankfurt am Main, Germany Advances and challenges in computational multiscale modelling of MesoBioNano systems	
Eleanor Campbell , University of Edinburgh, Edinburgh, Scotland Shake, Rattle and Roll: STM studies of Fullerenes		
	Beata Ziaja-Motyka , Center for Free-Electron Laser Science, DESY, Hamburg, Germany <i>Transitions in matter induced by intense X-ray radiation and their diagnostics</i>	
$15^{45} - 16^{15}$	Coffee break	
$16^{15} - 17^{45}$	Afternoon session II: Structure and dynamics of molecules, clusters and nanoparticles	
	Riccardo Ferrando , University of Genoa, Italy Symmetry breaking and symmetry recovery in the growth of metal nanoparticles	
	Rodolphe Antoine , Institut Lumière Matière, Université Claude Bernard Lyon1, France <i>Tailoring the optical properties of gold catenane nanoclusters. Surface ligand, silver doping, and self-assembly</i>	
	Stefan Bromley , University of Barcelona, Spain Understanding cosmic nanodust using molecular dynamics	
1900 -2200	Welcome reception	

Tuesday, October 19 (DySoN-related sessions)

$9^{30} - 11^{00}$	Morning session I: Cluster and biomolecular ensembles, composite systems	
	Ilko Bald , University of Potsdam, Potsdam, Germany	
	Novel nanoarchitectures for the monitoring of single molecules and plasmon induced chemical	
	reactions by surface-enhanced Raman scattering (SERS)	
	Michael Mertig, Kurt-Schwabe-Institut für Mess- und Sensortechnik Meinsberg e.V. and	
	Technische Universität Dresden, Germany	
	Putting DNA origami-based nanostructures in stable motion	
	Ilia Solov'yov, Carl von Ossietzky University of Oldenburg, Oldenburg, Germany	
	Structure and dynamics of cryptochrome photoreceptors	
$11^{00} - 11^{30}$	Coffee break	
11 ³⁰ - 13 ⁰⁰	Morning session II: Irradiation-driven processes and technologies involving Meso-Bio- Nano systems	
	Nigel Mason / Perry Hailey , University of Kent, Canterbury, United Kingdom <i>Irradiation-driven transformations of ice deposits under astrochemical conditions</i>	
	Marco Beleggia, Technical University of Denmark, Lyngby, Denmark Organic ice resist lithography	
	Harald Plank, Graz University of Technology, Graz, Austria	
	3D nanoprinting via focused electron beams: principles and applications	
$13^{00} - 14^{30}$	Lunch	
$14^{30} - 16^{00}$	16 ⁰⁰ Afternoon session I: Radiation-induced chemistry	
	Pablo de Vera, European Centre for Theoretical Studies in Nuclear Physics and Related	
	Areas (ECT*), Trento, Italy	
	Irradiation driven molecular dynamics interfaced with Monte Carlo for detailed simulations of focused electron beam induced deposition	
	Alexey Prosvetov, MBN Research Center, Frankfurt am Main, Germany Atomistic insights into metal nanostructure growth under focused electron beam irradiation	
	Duncan Mifsud, University of Kent, Canterbury, United Kingdom	
	Sulphur astrochemistry in the laboratory: techniques to understand the formation of interstellar	
	and planetary Sulphur-bearing molecules	
$16^{00} - 16^{30}$	Coffee break	
$16^{30} - 18^{00}$	Afternoon session II: Structure and dynamics of molecules, clusters and nanoparticles	
	Filipe Ferreira da Silva, Universidade Nova de Lisboa, Caparica, Portugal <i>Electron interactions with HFC (R134a) refrigerant gas</i>	
	Short presentations:	
	Cesare Roncaglia, University of Genoa, Genoa, Italy	
	Structural transitions in metal nanoparticles: equilibrium-driven processes in Au and AuPd	
	Iva Falková, Institute of Biophysics of CAS, Brno, Czech Republic	
	Novel software based on artificial neural networks and deep learning for automatic analysis of	
	ionizing radiation-induced foci (IRIFs) and advanced analysis of their micro-morphological and additional parameter	
	Anders Frederiksen, Carl von Ossietzky University of Oldenburg, Oldenburg, Germany Structural and dynamic traits of avian cryptochromes	
	Gesa Grüning , Carl von Ossietzky University of Oldenburg, Oldenburg, Germany The influence of dynamics degrees of freedom on spin relaxation in the European Robin	
	cryptochrome	

Wednesday, October 20 (DySoN-related sessions)

$9^{30} - 11^{00}$	Morning session I: Interaction of radiation with biomolecular systems: mechanisms and applications	
	Simone Taioli , European Centre for Theoretical Studies in Nuclear Physics and Related Areas (ECT*), Trento, Italy	
	Ab initio informed Monte Carlo simulations of biologically relevant materials excitation spectra	
	Marc Benjamin Hahn , Bundesanstalt für Materialforschung und -prüfung, Berlin, Germany The change of DNA radiation damage upon hydration: In-situ observations by near-ambient- pressure XPS	
	Thomas Schlathölter, Zernike Institute for Advanced Materials, University of Groningen,	
	The Netherlands	
	<i>Multiple valence electron detachment following Auger decay of inner-shell vacancies in gas-phase DNA</i>	
$11^{00} - 11^{30}$	Coffee break	
$11^{30} - 13^{00}$	Morning session II: Interaction of radiation with bio-systems: mechanisms and applications	
	Martin Falk, Institute of Biophysics of the CAS, Brno, Czech Republic Repair focus micro- and nano architecture in DSB repair efficiency and pathway selection	
	Alexey Verkhovtsev, MBN Research Center, Frankfurt am Main, Germany Lethal DNA damage caused by heavy ion-induced shock waves in cells	
	Kate Ricketts, University College London, United Kingdom <i>Realising the potential of particle therapy and nanoparticle enhanced radiotherapy</i>	
$13^{00} - 13^{15}$	Conference photo	
$13^{15} - 14^{30}$	Lunch	
$14^{30} - 16^{00}$	Afternoon session I: Propagation of particles through media	
	Andrei Korol, MBN Research Center, Frankfurt am Main, Germany Crystal based gamma-ray light sources	
	Hartmut Backe , Institute of Nuclear Physics, University of Mainz, Germany Considerations on Channeling of charged particles in diamond, based on experiments, simulations, and the Fokker-Planck equation	
	Werner Lauth, Institute of Nuclear Physics, University of Mainz, Germany Characterization of crystalline undulators at the Mainz Microtron MAMI	
$16^{00} - 16^{30}$	Coffee break	
$16^{30} - 18^{00}$	Afternoon session II: Design and practical realization of novel gamma-ray crystal-based light sources	
	Marco Romagnoni, Università degli Studi di Milano, Milan, Italy Advancement of bent crystals technology in high-energy particle accelerators	
	Davide De Salvador, University of Padova, Italy Pulsed laser melting processes for nanoscale doping and strain control	
	Thu Nhi Tran Thi , European Synchrotron Radiation Facility, Grenoble, France <i>Revealing single crystal quality by insight Diffraction Imaging technique</i>	

Thursday, October 21 (ISACC-related sessions)

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$9^{30} - 11^{00}$	Morning session I: Collision and radiation-induced processes	
	Ilya Fabrikant, University of Nebraska-Lincoln, Nebraska, USA	
	Positronium collisions with molecules: Free-electron-gas model	
	Nektarios Papadogiannis, Hellenic Mediterranean University, Heraklion, Greece	
	Laser-generated ultrafast and coherent X-ray sources and their application in nanoscopy	
	Eric Suraud, Université Paul Sabatier, Toulouse, France	
	Towards the analysis of attosecond dynamics in complex systems	
$11^{00} - 11^{30}$	Coffee break	
$11^{30} - 13^{00}$	Morning session II: Electron and photon cluster collisions	
	Juraj Fedor, J. Heyrovský Institute of Physical Chemistry, Czech Republic	
	Statistical vs. non-statistical emission of electrons from hot anions	
	Himadri Chakraborty, Northwest Missouri State University, Maryville, USA	
	Ultrafast relaxation of photoexcited "hot" electrons in fullerene materials	
	Hassan Abdoul-Carime, University of Lyon, France	
	Reaction in selected molecular films induced by low energy electrons	
$13^{00} - 14^{30}$	Lunch	
$14^{30} - 16^{00}$	Free time / Conference walk through the town (optional)	
$16^{00} - 16^{30}$	Coffee break	
$16^{30} - 18^{00}$	Afternoon session I: Cluster-molecule interactions, reactivity and nanocatalysis	
	Vincenzo Guidi, University of Ferrara, Italy	
	An operando FTIR to monitor the reaction mechanism of adsorbed molecular species in chemoresistive devices	
	Andrew Wheatley, University of Cambridge, United Kingdom	
	On the potential of immobilizing active species for energy and sensing applications	
	Shiv Khanna, Virginia Commonwealth University, Richmond, USA	
	Metal-chalcogenide superatoms for nano p- n- junction with tunable band gaps, adjustable band alignment, and light harvesting	

Friday, October 22 (ISACC-related sessions)

9 ³⁰ - 11 ⁰⁰	Morning session I: Structure and dynamics of molecules, clusters and nanoparticles	
Sascha Schäfer , Carl von Ossietzky University, Oldenburg, Germany <i>Probing ultrafast nanoscale dynamics by femtosecond electron imaging</i>		
	Sadia Bari , Deutsches Elektronen-Synchrotron (DESY), Hamburg, Germany Soft X-ray spectroscopy of peptides and porphyrins	
	Malgorzata Smialek-Telega, Gdansk University of Technology, Poland What happens if phenol meets toluene?	
$11^{00} - 11^{30}$	Coffee break	
$11^{30} - 13^{15}$	Morning session II: Structure and dynamics of nanosystems (short presentations)	
	Jonathan Hungerland , Carl von Ossietzky University of Oldenburg, Oldenburg, Germany <i>Phase transition of alanine polypeptides in water</i>	
	Maja Hanić, Carl von Ossietzky University of Oldenburg, Oldenburg, Germany Structural and dynamic characterization of avian cryptochrome 4	
	Diana Nelli , University of Genoa, Genoa, Italy From kinetic trapping to equilibration in the coalescence of elemental and bimetallic nanoparticles	
	Georg Manthey , Carl von Ossietzky University of Oldenburg, Oldenburg, Germany <i>On structure prediction of proteins with alphafold and traditional methods</i>	

	El Yakout El Koraychy, University of Genoa, Genoa, Italy Microscopic formation mechanisms of multiply twinned gold nanoparticles from tetrahedral seed Fabian Schuhmann, Carl von Ossietzky University of Oldenburg, Oldenburg, Germany Computational approach for 3D reconstruction of missing protein fragments
	Siu Ying Wong , Carl von Ossietzky University of Oldenburg, Oldenburg, Germany <i>Cryptochrome magnetoreception: Four tryptophans could be better than three</i>
1315-1330	Final Discussion and DySoN-ISACC 2021 Closing

Topical Issue of the European Physical Journal D

A Topical Issue **"Dynamics of Systems on the Nanoscale (2021)"** will be launched in the <u>European Physical</u> <u>Journal D</u>: 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.

This Topical Issue will be opened to the entire research community working in the DySoN and ISACC topical areas and will not restricted to the participants of the DySoN-ISACC 2021 Conference. All conference participants are encouraged to submit their novel results to this Topical Issue.

The deadline for manuscript submission is March 31, 2022. Guest Editors are Prof. Vincenzo Guidi, Prof. Nigel Mason, Dr. Alexey Verkhovtsev and Prof. Andrey Solov'yov.

Conference Venue and Travel Information

The Conference will be hosted by <u>Best</u> <u>Western Hotel Regina Elena</u>, 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 16th-century castle and a 17th-century park.

The information on how to reach the conference venue can be found <u>here</u>. 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 <u>here</u> for prices and schedule. The venue can also be reached by car from A12 highway (exit Rapallo).

Financial support

A limited number of bursaries (300 Euros each) will be provided by the Sir John and Lady 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.

Reduced registration fee of **550 €** for the whole DySoN-ISACC conference will be offered to the members of the Virtual Institute of Nano Films (VINF).

Best presentation prize for Early Career Researchers

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

Registration

Late registration is still possible under the following conditions:

	Conference fee (regular/students)
DySoN-related sessions only (October 18-20)	450 € / 350 €
ISACC-related sessions only (October 21-22)	400 € / 300 €
Whole conference (October 18-22)	600 € / 450 €

The fee covers the book of abstracts, coffee breaks, lunches, the conference reception, and the conference dinner.

The fee for accompanying persons is $100 \in$, which includes the conference reception and the conference dinner. Optionally, accompanying persons can also book lunches for the price of $35 \in$ per lunch.

The payment to the order of "DySoN-ISACC 2021" can be made by bank transfer to

Bank Account Name:	MBN Research Center gGmbH
Bank Name:	Deutsche Bank
Branch Address:	Hauptstr. 5, 61462 Koenigstein, Germany
IBAN:	DE15500700240137588000
BIC:	DEUTDEDBFRA

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

If you need an invoice for the payment or you want to pay with a **credit card**, please send a short email to <u>dyson.conference@gmail.com</u>.

Accommodation

Please book accommodation directly with the Best Western Hotel Regina Elena.

Travel Rules

Please consult <u>the webpage of the Italian Ministry of Health</u> regarding the actual travel rules to Italy (English version is available).

DySoN-ISACC International Advisory Committee

- Andrey V. Solov'yov (MBN Research Center, Frankfurt am Main, Germany) IAC Chair
- Ilko Bald (University of Potsdam, Germany)
- Catherine Bréchignac (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)
- Bernd Huber (Centre Interdisciplinaire de Recherche Ions Lasers, CIRIL GANIL, Caen, France)
- Julius Jellinek (Argonne National Laboratory, Argonne, Illinois, USA)
- Shiv Khanna (Virginia Commonwealth University, Richmond, USA)
- Nigel Mason (University of Kent, Canterbury, UK)
- Thomas Möller (Institut für Optik und Atomare Physik, TU, Berlin, Germany)
- Jefferson Shinpaugh (East Carolina University, Greenville, USA)
- Ilia Solov'yov (Carl von Ossietzky University, Oldenburg, Germany)
- Eric Suraud (Université Paul Sabatier, Toulouse, France)
- 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
- Andrei Korol (MBN Research Center, Germany)
- 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 gGmbH, Frankfurt am Main, Germany
- University of Ferrara, Ferrara, Italy
- University of Kent, Canterbury, United Kingdom
- Sir John and Lady Mason Academic Trust
- Virtual Institute of Thin Films
- Springer Verlag
- H2020-MSCA-RISE project "N-Light"
- H2020-MSCA-RISE project "RADON"

Contact Information

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Prof. Dr. Andrey V. Solov'yov DySoN-ISACC 2021 Co-Chair

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DySoN-ISACC Conference Web Page

Updated information on the DySoN-ISACC 2021 conference is available at <u>www.dyson-conference.org</u>. General information on the DySoN conference series can also be found there.

Relevant information on the ISACC series is available at <u>www.isacc-portal.org</u>.

DySoN-ISACC 2021 Conference e-mail

dyson.conference@gmail.com