

15th International Conference  Physics of
6th Autumn School  Advanced Materials

Programme Book ICPAM-15



November 19-26, 2023
Sharm-El-Sheikh, Egypt
www.icpams.com

ICPAM-15

**15th International Conference on Physics of
Advanced Materials**

**November 19-26, 2023, Sharm El Sheikh, Egypt
<https://icpams.com/>**

Daily Program

Cover: Dragos Dutu



Foreword

The 15th International Conference on Physics of Advanced Materials (ICPAM-15) continues the tradition of the previous conferences organized by the Faculty of Physics of Alexandru Ioan Cuza University of Iasi at every four years, since 1980, at every two years since 2012, and every year since 2021.

Beginning with 2012, the conference has as co-organizers prestigious institutions. Due to their contribution, the scientific quality of the conference increased, the conference papers being published in special issues in *Materials Science and Engineering: B; Applied Surface Science, Thin Solid Films, Material Today: Proceedings, Nanomaterials, Materials, Coatings*.

In 2014 the first autumn school on Physics of Advanced Materials, PAMS-1 was held in parallel with ICPAM-10. This event is focused on providing interdisciplinary expert training, involving both fundamental knowledge and current research topics. The fact that the school is organized in parallel with the conference assures a better interaction between the conference participants involved in different fields of physics of advanced materials and the participants attending the school. In the same year we began the collaboration with the 4th International Festival of NanoArt, promoting the art and science interaction.

Since 2016, beginning with ICPAM-11, the conference and the events hosted by the conference became itinerant.

For the first time, the 13th edition, the 4th Autumn School on Physics of Advanced Materials (PAMS-4), and the 5th

International Festival of NanoArt were organized in a hybrid form.

ICPAM-15 and PAMS-6 attracted 150 participants, of which 86 participate onsite.

We invite participants in ICPAM-15 and PAMS-6 to send their manuscripts for publication in the special issues of Coatings, Materials, Nanoexpress, Academia Materials Science and Nanomaterials journals. These journals are partners, sustaining the conference and the autumn school.

The special Issues are:

New trends in Functional Materials and Devices, published by Coatings.

Thin Films, Nanostructures and Devices for Optoelectronics Applications, published by Materials.

Nanostructures for Advanced Optoelectronic Applications, published by Academia Materials Science.

Focus on Physics of Advanced Materials published in the open access journal Nanoexpress.

Perspectives on Physics of Advanced Nanomaterials and Interfaces, published in Nanomaterials.

Manuscripts should follow the instructions and the deadlines given on <https://icpam.ro/papers-publication/>.

We would like to thank all participants for their important scientific contribution and the sponsors and partners for their support.

ICPAM-15, PAMS-6 General Chairs

Felicia IACOMI – Alexandru Ioan Cuza University of Iasi,
Romania

Hossam El NAZER – National Research Centre Dokki-Giza,
Egypt

Valentin CRACIUN – National Institute for Laser, Plasma &
Radiation Physics and Extreme Light Infrastructure for Nuclear
Physics, Magurele, Romania

Romulus TETEAN – Babeş-Bolyai University, Cluj-Napoca,
Romania

Isabelle BERBEZIER – Institute for Materials, Microelectronic
and Nanosciences of Provence, Marseille, France

Co-organizers:



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Yoshimasa KAWATA, Shizuoka University, Hamamatsu, Japan

Conference topics and topics chairpersons

T1: Thin Films and Nanostructures for Modern Electronics

Daniel MORARU, Research Institute of Electronics, Shizuoka University

T2: Fundamentals of Plasma and Laser-Material Interactions and Processing

Cristian FOCSA, University of Science and Technology of Lille, France

Ionut TOPALA, Alexandru Ioan Cuza University of Iasi, Romania

T3: Materials for Energy and Environment

Silviu COLIS, University of Strasbourg, France

Hoda HAFEZ, University of Sadat City, Egypt

T4: Magnetic Materials, Spintronics and Related Devices

Coriolan TIUSAN, Babes-Bolyai, Cluj-Napoca, Romania

Aurelian ROTARU, Stefan cel Mare University, Suceava, Romania

T5: Nanostructures and Low Dimensional Systems

Michele AMATO, Paris-Saclay University, Orsay, France

T6: Emerging Electronic Memory Materials and Devices

Shashi PAUL, De Montfort University, Leicester, United Kingdom

T7: Polymer Materials and Composites

Valeria HARABAGIU, Petru Poni Institute of Macromolecular Chemistry, Romania

T8: Biomaterials and Healthcare Applications

Adriana ZELENKOVA, Pavol Jozef Safarik University, Košice, Slovakia

T9: Functional Materials. Processing and Characterization

Abdullah YILDIZ, Ankara Yıldırım Beyazıt University, Turkey

Biomaterials and Healthcare Applications

T10: New Developments in Sensing Materials and Sensor Devices

Jan LANCOK, Institute of Physics of the Czech Academy of Sciences, Czech Republic

T11: Trends in Condensed Matter Theory

Liviu CHIONCEL, Augsburg University, Germany

T12: Self-assembled and nanopatterned materials and their ion beam modification

Jorg K. N. LINDNER, Paderborn University, Germany

T13: Advanced photonic materials and devices

Dana CRISTEA, National Institute for Research and Development in Microtechnologies, Bucharest

Mohamed SWILLAM, American University in Cairo, Egypt

T14: Waste materials and bioeconomy

Branko GLAMUZINA, University of Dubrovnik, Croatia

Simona PINZARU, Babes-Bolyai University Cluj-Napoca

T15: Materials in conservation-restoration of cultural heritage monuments and objects

Josko BOGDANOVIC, University of Dubrovnik, Croatia

T16: Advanced photocatalysts for industrial and environmental applications

Yasser MAHMOUD, National Research Centre, Egypt

El-Zahraa EL GOHARY, National Research Centre, Egypt

T17: Art, Science and Technology

Cris ORFESCU, NanoArt 21, Los Angeles, California, US

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ICPAM-15 PROGRAMME

Sunday, November 19, 2023

Pyramisa Beach Resort

Foyer

- 11:00 Venue & Registration
- 12:00 Lunch Break
- 13:30 Excursion I- Glass Bottom Boat in Sharm el-Sheikh
and Coral Reef Viewing
- 19:00 Dinner break

Monday, November 20, 2023

Pyramisa Beach Resort

HALL 1

8:30 **Conference Opening**

Plenary Session

HALL 1

Chairs: V. Craciun, H. El Nazer

9:00 **T3-PL2:** Chalcogenide or oxysulfide perovskites, a
onsite new class of material for photovoltaics

Thomas Fix, 11cube Laboratory, CNRS And
Université De Strasbourg – Strasbourg, France

9:35 **T1-PL1:** Microcantilever-based Chemical Sensors
online using ZnO nanostructures

Ratno Nuryadi, *Research Center for Photonics,
Research Organization for Nanotechnology and
Materials, National Research and Innovation Agency
(BRIN), B.J. Habibie Science and Technology Park,
South Tangerang City, Indonesia*

10:10 Coffee Break

Plenary Session

HALL 1

Chairs: R. Tetean, J. Lindner

10:40 **T8-PL1:** Thermal and ultrasonic effects due to the
online interaction of electromagnetic radiation with

magnetic nanovectors

Ricardo Ibarra, *Institute of Nanoscience and Materials of Aragon, CSIC-University Zaragoza, Spain*

11:15 **T9-PL1:** Dominant factor limiting carrier transport
online of W-doped In_2O_3 polycrystalline films with
thicknesses of less than 10 nm

Tetsuya Yamamoto, *Materials Design Center, Kochi
University of Technology, Kochi, Japan*

11:50 **T8-PL1:** From nanoparticles to atomic nanoclusters
onsite by integrating plasmonic, luminescent and hybrid
nanoprobes in biomedical applications

Simion Astilean, *Department of Bimolecular Physics,
Faculty of Physics, Babes-Bolyai University, Cluj-
Napoca*

12:25 **T8-PL2:** Multifunctional mesoporous silica
online nanoparticles for biomedical applications

Vladimir Zelenak, *Department of Inorganic
Chemistry, Faculty of Science, Kosice, Slovakia*

13:00 Lunch Break

Invited and Oral Session

HALL 1

Chairs: V. Harabagiu, V. Zelenak, Heba El Kholy
T 8, T14, T16

- 15:00 **T8-I1:** Low-Temperature Plasma-Treated Liquids for
onsite Cancer Treatment
Camelia Miron, *Center for Low-temperature Plasma
Sciences, Nagoya University, Furo-cho, Chikusa-ku,
Nagoya 464-8601, Japan*
- 15:25 **T8-I2:** Cancer therapy by magnetic hyperthermia: focus
online on iron and cobalt ferrites nanoparticles
Adriana Zelenakova, *Pavol Jozef Safarik University,
Kosice, Slovakia*
- 15:50 **T8-I3:** Bioactive composite nanocoatings of
onsite antimicrobial peptides fabricated by advanced laser
processing with enhanced anti-superbug efficiency
Rodica Cristescu, *Lasers Department, National Institute
for Lasers, Plasma & Radiation Physics, Bucharest-
Magurele, Romania*
- 16:15 **T8-O1:** Implant coatings based on low-cost
onsite sustainable natural resources for infection prevention
Anita Ioana Visan, *1National Institute for Laser,
Plasma and Radiation Physics, 077125 Magurele, Ilfov,
Romania*
- 16:30 **T8-O2:** A versatile approach laser-based to
functionalizing PDMS with zwitterionic coatings in

- onsite various biological applications
Luminita Nicoleta Dumitrescu, *1NILPRP (Lasers), Magurele, Romania*
- 16: 45 **T8-O3**: Investigation of interactions between magnetic nanoparticles and model cell membranes
online **Pavol Hrubovcak**, *Department of condensed matter physics, P.J. Safárik University, Kosice, Slovakia*
- 17:00 **T8-O4**: Preliminary studies on zincpolycarboxilate/polyglass/gold nanoparticles composites
onsite **Felicia Iacomi**, *Faculty of Physics, Alexandru Ioan Cuza University of Iasi, Romania*
- 17:15 **T14-I1**: Exploring the impact of cobalt and nikel doping on structural, morphological and magnetic properties of manganese ferrite nanoparticles embedded in SiO₂ matrix
onsite **Iosif Grigore Deac**, *Faculty of Physics, Babes-Bolyai University, Cluj-Napoca, Romania*
- 17:40 **T14-O1**: From research to the market through The European Digital Innovation Hub in Transylvania
onsite **Oana Raita**, *National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania*
- 17:55 **T16-I1**: Recent advances in metal-doped ZnO-based nanostructures as photocatalysts for the removal of organic pollutants
online **Petronela Pascariu**, *Petru Poni Institute of Macromolecular Chemistry, Iasi, Romania*

Invited and Oral Sessions

HALL 2

Chairs: M. Ignat, H. Hafez, Irina Butnaru

T16, T3

- 15:00 **T16-I2:** Design and implementation of high performance photocatalysts in environmental and photocatalysis applications
onsite
Yasser Mahmoud, *Photochemistry Department, National Research Centre, Dokki, Giza,*
- 15:25 **T16-I3:** ZnO based photocatalytic materials for dyes removal from textile industry wastewaters
onsite
Andrea Laura Chibac-Scutaru, *Polyaddition and Photochemistry Department, Petru Poni Institute of Macromolecular Chemistry, Iasi, Romania,*
- 15:50 **T16-O1:** Activating oxygen vacancies in layered double hydroxides by memory effect toward tailoring novel photocatalysts to remove dangerous pollutants from water
online
Loredana Andrea Gavrilă *Petru Poni” Institute of Macromolecular Chemistry, Electroactive Polymers and Plasmochemistry Laboratory, Iasi, Romania*
- 16:05 **T3-I1:** Electrodes based on heterocyclic polymeric materials for smart energy storage systems
onsite
Mariana Dana Damaceanu, *Electroactive Polymers and Plasmochemistry Laboratory, Petru Poni Institute of Macromolecular Chemistry, Iasi, Romania*

- 16:30 **T3-I2:** Engineering Heterostructures of Zn-Based Layered Double Hydroxides and Gold Nanoparticles for Plasmon-Enhanced Catalysis
online
Gabriela Carja, *Department of Chemical Engineering, Faculty of Chemical Engineering and Environmental Protection Technical University "Gh. Asachi" of Iasi Romania*
- 16:55 **T3-I3:** On the rational combination of electrochemical and chemical methods in the recycling of spent lithium-ion batteries
onsite
Viacheslav Barsukov, *Institute for Sorption and Problems of Endoecology of National Academy of Science of Ukraine, Kyiv, Ukraine*
- 17:20 **T3-O1:** A homogenisation technique describing the radiofrequency behavior of rare-earth doped ZnO/graphene nanocomposites
online
Titus Sandu, *National Institute for Research and Development in Microtechnologies - IMT Bucharest, Romania*
- 17:35 **T3-O2:** Nanocomposite RE:ZnO/Graphene with enhanced electrical and dielectric properties
onsite
Cristina Pachiu, *National Institute for Research and Development in Microtechnologies - IMT Bucharest, Romania*
- 17:50 **T3-O3:** Hyperbranched thiophene-based polymers with integrated electrochromic and energy storage functions
online
Ioana Alexandra Trofin, *Petru Poni Institute of*

*Macromolecular Chemistry, Electroactive Polymers and
Plasmochemistry Department, Iasi, Romania*

18:05 **T3-O4:** Challenges and Prospects in the Development
online of Bismuth Chalcogenide for Next Generation, Earth
Abundant Photovoltaics

Mykhailo Koltsov, *Department of Materials and
Environmental Technology, Tallinn University of
Technology, Tallinn, Estonia*

18:20 Coffee break

Invited and Oral Session

HALL 1

Chairs: F. Iacomi, M. Suchea

T17

18:50 **T17-I1:** Who is the artist in an AI world?
online **Joe Nalven**, *San Diego, California, USA*

19:15 **T17-O1:** Nano-Visualization in Science and Art
online **Jean Constant**, *Visual Communication department,
Hermani NM, Santa Fe, USA*

19:30 **The International Festival of NanoArt, 7th edition -
online 3D Gallery curated by**
Cris Orfescu, *NanoArt 21, Los Angeles, California, USA*

20:20 Dinner Break

Tuesday, November 21, 2023

Pyramisa Beach Resort

Plenary Session

HALL 1

Chairs: D. Moraru, A. Rotaru

- 9:00 **T5-PL1:** Differential Phase Contrast STEM
online Investigation of Interatomic Electric Fields in Pristine
and Defective 2D-WSe₂ Multi- and Monolayers
Jorg Lindner, *Nanopatterning - Nanoanalysis -
Photonic Materials, Department of Physics, Paderborn
University, Germany*
- 9:35 **T3-PL2:** Oxygen vacancies effects in ferroelectric
onsite Bi₂FeCrO₆ thin films
Silviu Colis, *Institut de Physique et Chimie des
Matériaux de Strasbourg (IPCMS), CNRS and University of
Strasbourg, France*
- 10:10 Coffee break

Plenary Session

HALL 1

Chairs: D. Zahn, D. Peddis

- 10:40 **T10-PL1:** Quantum dots/graphene nanohybrids: a platform to play quantum physics
onsite **Judy Wu**, *Department of Physics and Astronomy, University of Kansas, Lawrence, KS 66045, USA*
- 11:15 **T1-PL2:** Dopant activation and charge transport in ultrathin Si nanofilms
online **Michele Perego**, *Institute for Microelectronics and Microsystems-Narional Research Council of Italy, Unit of Agrate Brianza, Agrate Brianza, Italy.*
- 11:50 **T6-PL1:** Doping and interface effects on polarization of ferroelectric HfO₂
online **Florencio Sanchez**, *Institute of Materials Science of Barcelona (ICMAB-CSIC), Spain*
- 12:25 **T6-PL2:** Role of both internal and external electric field in realising emerging electronic memory devices
online **Shashi Paul**, *Emerging Technologies Research Centre, De Montfort Univeristy, UK*
- 13:00 Lunch break

Invited and Oral Session

HALL 1

Chairs: J. Wu, A. Di Bartolomeo, A. Rotaru

T10, T11, T5

- 15:00 **T10-I1:** Representation of Pseudo-colored Multi-energy X-ray CT Imaging Using Mixed Reality
online **Hiroki Kase**, *Research Institute of Electronics, Shizuoka University, Hamamatsu, Japan*
- 15:25 **T10-I2:** Direct growth of superconducting nanodevices by Focused Ion Beam Induced Deposition
online **Jose Maria De Teresa**, *Institute of Nanoscience and Materials of Aragon (INMA), University of Zaragoza-CSIC, Zaragoza, Spain,*
- 15:50 **T10-I3:** "The Good ol' Silicon', from energy applications to biosensing
onsite **Pericle Varasteanu**, *National Institute for Research and Development in Microtechnologies-IMT Bucharest, Bucharest, Romania*
- 16:15 **T10-O1:** Investigation of a silver-SERS based biosensor decorated with zeolite for E. coli detection
onsite **Mohamed Swillam**, *Physics Department, School of Science and Engineering, American University in Cairo (AUC) New Cairo, Egypt*
- 16:30 **T10-O2:** A highly sensitive silver Nanostructure platform based on surface-enhanced Raman scattering for Escherichia coli biosensing
onsite **Mohamed Swillam**, *Physics Department, School of*

Science and Engineering, American University in Cairo (AUC) New Cairo, Egypt

16:45
online **T11-I1:** The predictive power of the Embedded Dynamical Mean Field Theory (eDMFT) for the electronic-structural interplay in Correlated Materials

Gheorghe Lucian Pascut, *MANSiD Research Center and Faculty of Forestry, Stefan Cel Mare University (USV), Suceava, Romania*

17:10
onsite **T11-O1:** Majorana fingerprints in an asymmetrically connected quantum dot nanodevice under electron-phonon effects

Levente Mathe, *National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania*

17:25
online **T5-I1:** Hexagonal Si and Ge polytypes for silicon photonics

Emilio Scalise, *Department of Materials Science, University of Milano-Bicocca, Milano, Italy*

17:50
online **T5-O1:** Ab initio modeling of n-type and p-type doping in hexagonal-diamond silicon

Marc Tunica I Rosich, *Laboratory of Solid State Physics, Paris-Saclay University, CNRS, Orsay, France*

18:05
online **T5-O2:** Small-angle scattering investigation of ferrofluids with anisometric nanoparticles

Maria Balasoiu, *Frank Laboratory of Neutron Physics, Joint Institute of Nuclear Research, Dubna, Russia*

Invited and Oral Session

HALL 2

Chairs: V. Craciun, I. Berbezier, V. Harabagiu

T1, T7

- 15:00 **T1-I1:** The Use of Ion Beams for Quantum Applications
onsite **Ella Schneider**, *Surrey Ion Beam Centre, University of Surrey, Guildford, UK*
- 15:25 **T1-I2:** Nitrogen Deep Dopant in Silicon for Room Temperature Quantum Sensing Applications
online **Arup Samanta**, *Quantum/Nano-Science and Technology Lab, Department of Physics, Indian Institute of Technology, Roorkee, India*
- 15:50 **T1-I3:** Effect of nanostructuring on the properties of organic heterostructures with single stacked bi and mixed layer
online **Anca Stanculescu**, *National Institute of Materials Physics, Magurele, Romania*
- 16:15 **T1-O1:** A Proposal for Silicon-based Ultra-sensitive THz Detector
online **Pooja Sudha**, *Department of Physics, Indian Institute of Technology, Roorkee, India*
- 16:30 **T1-O2:** New pyrotechnic devices based on multilayer thermite materials CuO/Al for modern microelectronics
online **Egor Lebedev**, *National Research University of*

Electronic Technology – MIET, Zelenograd, Russia

- 16:45 onsite **T7-01:** Tailoring polyimide-based nanocomposites towards efficient electronic applications
Irina Butnaru, *Electroactive Polymers and Plasmochemistry Laboratory, Petru Poni Institute of Macromolecular Chemistry, Iasi, Romania*
- 17:00 onsite **T7-02:** Elaboration and characterization of In-situ CrC/γ-Ni composites elaborated from Ni and Cr₂AlC precursors
Chiker Nabil, *Laboratory of Studies and Research in Industrial Technology, University of Blida 1, Algeria*
- 17:15 onsite **T7-03:** Materials with variable shielding effectiveness for X-Ray
Daniel Timpu, *Physical-Chemistry of Polymers, Petru Poni Institute of Macromolecular Chemistry of the Romanian Academy, Iasi, Romania*
- 17:30 onsite **T7-04:** Differently shaped CeO₂ nanomaterials for applications in hemostasis
Zsejke-Reka Toth, *Doctoral School of Physics, Babes-Bolyai University, Cluj-Napoca, Romania*
- 17:45 onsite **T7-I1:** Bistable magnetic, electrical and optical behaviour in polymer-SCO electrospun nanocomposites
Aurelian Rotaru, *Stefan cel Mare University of Suceava, Romania*
- 18:10 online **T7-05:** Comparative study on semicrystalline and amorphous polymer structures modified by plasma
Roxana Ciobanu, *IPARC, Faculty of Physics, Alexandru*

Ioan Cuza University, Iasi, Romania

18:25 Coffee break

Short Oral Session I

HALL 1

Chairs: P. Varasteanu, M.D. Damaceanu, M. Suchea

18:55 **T1-SO1:** Isotopically Enriched ^{28}Si Layers for Quantum Computers Using Ion Implantation and Layer Exchange
onsite

Ella Schneider, *Surrey Ion Beam Centre, University of Surrey, Guildford, UK*

19:03 **T1-SO2:** Single Ion Multispecies Positioning at Low Energy for Fabrication of Quantum Technologies
onsite

Ella Schneider, *Surrey Ion Beam Centre, University of Surrey, Guildford, UK*

19:11 **T1-SO3:** IPIDS – Isotopically Pure Ion Deposition System for Quantum Grade Substrates
onsite

Luke Antwis, *1Surrey Ion Beam Centre, University of Surrey, Guildford, UK*

19:19 **T1-SO4:** Facilities at the UK National Ion Beam Centre
onsite

Luke Antwis, *1Surrey Ion Beam Centre, University of Surrey, Guildford, UK*

19:27 **T1-SO5:** Generating pyroelectric current with patterned ferroelectric hafnium oxide thin films
onsite

Livia Dinu, *National Institute for Research and Development in Microtechnologies-IMT Bucharest*,

Romania

- 19:35 **T1-SO6:** Sol-Gel semiconducting thin films in V_2O_5 - B_2O_3 - P_2O_5 system
online **Ana Filip**, *National Institute for Laser, Plasma and Radiation Physics, Lasers department, Magurele, Romania*
- 19:43 **T3-SO1:** Development of electrode and electrolyte materials for solid-state batteries based on $Li_{1.3}Al_{0.3}Ti_{1.7}(PO_4)_3$
onsite **Viacheslav Barsukov**, *V. I. Vernadsky Institute of General and Inorganic Chemistry NAS Ukraine, Kyiv, Ukraine*
- 19:51 **T3-SO2:** Novel inorganic materials for arsenic removal from aqueous environment
onsite **Viacheslav Barsukov**, *V. I. Vernadsky Institute of General and Inorganic Chemistry NAS Ukraine, Kyiv, Ukraine*
- 19:59 **T3-SO3:** Insights on the use cellulose-based materials as proton exchange membranes in fuel cells
onsite **Sergiu Coseri**, *Polyaddition and Photochemistry Department, Petru Poni Institute of Macromolecular Chemistry Iasi, Romania*
- 20:07 **T9-SO1:** Investigation of the properties of some binary and ternary layers obtained by MAPLE for optoelectronic applications
online **Carmen Breazu**, *National Institute of Materials Physics, Magurele, Romania*

- 20:15 **T9-SO2:** Fabrication of nanopatterned surfaces as ultrasensitive SERS detection platforms
onsite **Alia Colnita**, *Molecular and Biomolecular Physics Department, National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania*
- 20:23 **T9- SO3:** Extraction of silica from natural deposits for the production of silicon in photovoltaic applications
online **Asmaa Zeboudj**, *Physics Department, LMESM Laboratory, University of Science and Technology Mohamed Boudiaf (USTO-MB), Oran, Algeria*
- 20:31 Dinner Break

Wednesday, November 22, 2023

Pyramisa Beach Resort

Plenary & Invited Session

HALL 1

Chairs: R. Tetaan, M. Swillam

- 8:35 **T10-PL2:** Single Crystal Diamond grown by MOCVD for
radiation imaging device
online **Toru Aoki**, *Research Institute of Electronics, Shizuoka
University, Japan*
- 9:10 **T1-PL3:** From silicon nanodevices to silicon/carbon-
nanotube hybrid nanodevices: a comparative analysis
online **Daniel Moraru**, *Research Institute of Electronics,
Shizuoka University, Hamamatsu, Japan*
- 9:45 **T5-I2:** The Role of Contact Area, Surface Roughness
and Contact Force in Triboelectric Nanogenerator
online Performance
Daniel M. Mulvihill, *University of Glasgow, United
Kingdom*
- 10:10 Coffee Break

Plenary Session

HALL 1

Chairs: H. El Nazer, V. Barsukov

- 10:40 **T3-PL3:** Pd nanoparticles as a plasmonic material:
Recent progress and challenges
onsite **Hoda Hafez**, *Environmental Studies and Research
Institute(ESRI), University od Sadat City (USC)., Sadat city,
Egypt*
- 11:15 **T7-PL1:** Silicon- and carbon-based materials:
yesterday, today, tomorrow
onsite **Valeria Harabagiu**, *Laboratory of Inorganic Polymers,
Petru Poni Institute of Macromolecular Chemistry,
Romanian Academy, Iasi, Romania*
- 11:50 **T16-PL1:** Effective strategies to modify ferrite
nanoparticles toward improving (photo)catalytic
onsite properties
Maria Ignat, *Laboratory of Materials Chemistry,
Department of Chemistry, Alexandru Ioan Cuza
University of Iasi, Romania*
- 12:25 **T13-PL1:** Manipulating Light at the Nanoscale
onsite **Mohamed Swillam**, *Department of Physics, School of
Sciences and Engineering, American University in
Cairo (AUC), New Cairo, Egypt*
- 13:00 Lunch Break

Short Oral Session II

Hall 1

Chairs: Y. Mahmoud, I.G. Deac, C. Miron

T8, T10, T16, T14

- 15:00 **T8-SO1:** Fabrication and characterization of polycaprolactone films for applications in biliary stents
onsite
Luminita Nicoleta Dumitrescu, *National Institute for Laser, Plasma, and Radiation Physics, Magurele, Romania*
- 15:08 **T8-SO2:** Curcumin and whey protein concentrate binding: Molecular docking investigation
onsite
Calin Floare, *National Institute for Research and Development of Isotopic and Molecular Technologies, Department of Molecular and Biomolecular Physics, Cluj-Napoca, Romania*
- 15:16 **T8-SO3:** Experimental study of magnetic nanoparticles for magnetic separation DNA/RNA
online
Michael Barutiak, Department of Condensed Matter Physics, Pavol Jozef Safarik University, Kosice, Slovakia
- 15:24 **T8-SO4:** Preparation and characterization of collagen-alginate sponge composite and their application in wound healing
onsite
Oana Brincoveanu, National Institute for R&D in Microtechnology - IMT Bucharest, Romania
- 15:32 **T8-SO5:** Supramolecular complex CHT - β

- onsite cyclodextrin: A calorimetric, spectroscopic and molecular docking approach
Mihaela Mic, *National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania*
- 15:40 **T8-SO6:** Characterization of β - cyclodextrin inclusion complex with Ferulic acid
onsite **Adrian Pirnau**, *National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania*
- 15:48 **T8-SO7:** Design, Synthesis and Evaluation of the Binding Affinity a new compound with strong antioxidant activity to macromolecules
onsite **Adrian Pirnau**, *National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania*
- 15:56 **T8-SO8:** Characterization of high entropy alloy thin films grown by pulsed laser deposition
onsite **Valentin Craciun**, *National Institute for Laser, Plasma & Radiation Physics, Măgurele, Romania*
- 16:04 **T8-SO9:** Investigations of pulsed laser micro marked dental bio-implants
onsite **Valentin Craciun**, *National Institute for Laser, Plasma & Radiation Physics, Măgurele, Romania*
- 16:12 **T8-SO10:** Integrating Bioglasses and Statins into Specialised Coatings for Enhancing the Osseointegration of Stainless-Steel Implants
onsite

Valentina Grumezescu, *National Institute for Lasers, Plasma and Radiation Physics, Magurele, Romania*

16:20
onsite **T8-SO11:** Preclinical in vitro and in vivo evaluation of tyrosine kinase inhibitor-gold nanoparticles for Acute Myeloid Leukemia

Sanda Boca, *Medfuture Research Center for Advanced Medicine, Iuliu Hatieganu University of Medicine and Pharmacy, Cluj Napoca, Romania*

16:28
online **T10-SO1:** Surface Acoustic Wave sensors based on molecularly imprinted biopolymer for herbicide detection

Angela Baracu, *National Institute for Research and Development in Microtechnologies -IMT Bucharest, Voluntari, Romania*

16:36
onsite **T10-SO2:** Exploring Carbon Nanohybrid Materials for Chemoresistive Sensor Sensing Films through Raman Studies

Cristina Pachiu, *National Institute for Research and Development in Microtechnologies – IMT Bucharest, Romania*

16:44
onsite **T10-SO3:** Bentonite filtered blueberry extracts allowed lowering the SERS detection limit of thiabendazole in frozen fruits

Csila Muller Molnar, *National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania*

16:52
onsite **T10-SO4:** Flexible and Tunable SERS Platforms Based on Hybrid ZnO@Ag Thin Films

Ioana Brezestean, *Department of Molecular and*

Biomolecular Physics, National Institute of R&D of Isotopic and Molecular Technologies, Cluj-Napoca, Romania

- 17:00 **T10-S05:** Aerosol heavy metals photodetection techniques using novel gold nanoparticles systems coated with chitosan and lipids
onsite
Silvia Garofalide, *Alexandru Ioan Cuza University of Iasi, Faculty of Physics, Atmosphere Optics, Spectroscopy and Laser Laboratory (LOASL), Iasi, Romania*
- 17:08 **T10-S06:** Lamellar gallium chalcogenides – native oxide nanocomposites for gas sensors
online
Aurelian Carlescu, *Integrated Center for Studies in Environmental Science for the North-East Region (CERNESIM), Department of Exact Sciences, Institute of Interdisciplinary Research, Alexandru Ioan Cuza University of Iasi, Romania*
- 17:16 **T16-S01:** Exploiting the reconstruction by the structural memory for engineering layered double hydroxides as active environmental cleaners of water polluted with diclofenac
online
Denis Cutkovski, *Faculty of Chemical Engineering and Environmental Protection, Technical University of Iasi, Iasi, Romania*
- 17:24 **T16-S02:** Insight into the synthesis of templated mesoporous titania nanoparticles employing various sol-gel approaches
onsite
Maria Ignat, *Laboratory of Materials Chemistry, Department of Chemistry, Alexandru Ioan Cuza University of Iasi, Romania*
- 17:32 **T16-S03:** Tailoring catalytic properties of Cr/Gd-substituted zinc ferrite nanoparticles via porous

- onsite media engineering
Maria Ignat, Laboratory of Materials Chemistry,
 Department of Chemistry, Alexandru Ioan Cuza
 University of Iasi, Romania
- 17:40 **T16-SO4:** Germicide action using nanostructured
 photocatalysts
- online **Mirela Suche**a, *National Institute for Research and
 Development in Microtechnologies- IMT-Bucharest,
 Bucharest, Romania*
- 17:48 **T14-SO1:** Multi-functional core-shell pomegranate
 peel amended alginate beads for treatment of
 onsite industrial wastewaters contaminated with methylene
 blue, lead and phenol: Synthesis, characterization,
 and kinetics investigation
Heba El-kholly, *Water Pollution Research Department,
 National Research Centre, Dokki, Giza*
- 17:56 **T14-SO2:** Computational Fluid Dynamics for
 Digitalization in the Energy Sector
- onsite **Vasile Rednic**, *National Institute for Research and
 Development of Isotopic and Molecular Technologies,
 Cluj-Napoca, Romania*
- 18:04 Coffee break

Short Oral Session III

Hall 1

Chairs: H. El Nazer, D. Timpu, O. Raita

T8, T10, T16, T14

- 18:34 **T7-SO1:** The influence of gum arabic on physical and
 biological properties of alginate-based biocomposites
 onsite **Alexandra Feraru**, *Nanostructured Materials and Bio-*

Nano-Interfaces Center, Interdisciplinary Research Institute on Bio-Nano-Sciences, Babes-Bolyai University, Cluj-Napoca, Romania

18:42 **T7-SO2:** A 3D Monte Carlo simulation of percolation in composite materials

online **Douniazad Mezdour,** *Electronic department, Mohammed Seddik Benyahia University Jijel, Algeria*

18:50 **T7-SO3:** Design of magnetic nanoparticles for significantly enhanced thermal conductivity of polyfluoromandelic acid composites

onsite **George Ispas,** *National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania*

18:58 **T7-SO4:** Influence of amine moieties in polydopamine analogues

onsite **Claudia Lar,** *Physics and Technology of Isotopes, National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania*

19:06 **T7-SO5:** Polyurethane elastomers with both fluorescent sequences and metal oxide nanoparticles

onsite **Violeta Melinte,** *Polyaddition and Photochemistry Department, Petru Poni Institute of Macromolecular Chemistry, Iasi, Romania*

19:14 **T7-SO6:** Optical behaviour of new polydopamine analogues

onsite **Natalia Terenti,** *National Institute for Research and*

*Development of Isotopic and Molecular Technologies,
Cluj-Napoca, Romania*

19:22 **T7-SO7:** Dynamic SERS monitoring of dopamine's
oxidative polymerization

onsite

Nicoleta Elena Dina, *National Institute for Research
and Development of Isotopic and Molecular
Technologies, Cluj-Napoca, Romania*

19:30 **T7-SO8:** Ageing of silicone rubber insulator caused by
inclined plane test

online

Nikolaos Mavrikakis, *High Voltage Laboratory, School
of Electrical and Computer Engineering, Hellenic
Mediterranean University, Greece*

19:38 **T7-SO9:** Contact surfaces made from Poly(lactic acid)
enriched with Poly-L-Lysine, exhibiting antimicrobial
activity against food pathogens

online

Spyros Konteles, *Department of Food Science and
Technology, University of West Attica*

19:46 **T7-SO10:** Pure and La doped ZnO-graphene
nanocomposite materials for EM shielding
applications

online

Mirela Suche, *National Institute for Research and
Development in Microtechnologies- IMT Bucharest,
Romania*

19:54 **T7-SO11:** Morphostructural monitoring of thermal
induced changes in innovative bio-based polyamides

onsite

Ioana Brezestean, *Department of Molecular and
Biomolecular Physics, National Institute of Research and*

*Development of Isotopic and Molecular Technologies,
Cluj-Napoca, Romania*

- 20:02 **T13-SO1:** Fabrication of large diameter optical
elements generating optical vortices
online **Roxana Tomescu,** *National Institute for Research and
Development in Microtechnology – IMT Bucharest,
Romania*
- 20:10 **T13-SO2:** Developing of smart tags for anti-
counterfeiting applications
onsite **Catalin Corneliu Parvulescu,** *National Institute for
Research and Development in Microtechnology – IMT
Bucharest, Romania*
- 20:18 **T13-SO3:** Realisation of security metallic particles for
transparent holographic label development
online **Veronica Anastasoae,** *National Institute for Research
and Development in Microtechnology – IMT Bucharest,
Romania*
- 20:26 Dinner break

Thursday, November 23, 2023

- 6:00 **Excursion II: - Cairo-Pyramids of Giza and the Great Sphinx**
- 20:00 Dinner break

Friday, November 24, 2023

Pyramisa Beach Resort

Plenary Session

HALL 1

Chairs: D. Zahn, H. Hafez

- 9:00 **T11-PL1:** Mathematical Methods in Machine Learning
Applied to Materials Research
online **Douglas Chrysei**, *Department of Physics and
Engineering Physics, Tulane University, New Orleans, LA
70118, USA*
- 9:35 **T13-PL1:** The role of adsorbates on the electric
transport and the photoresponse of 2D materials
online **Antonio Di Bartolomeo**, *Department of Physics "E.R.
Caianiello", University of Salerno, and CNR-SPIN, Fisciano,
Italy*
- 10:10 Coffee Break

Plenary Session

HALL 1

Chairs: J. Lidner, J.M. De Teresa, V. Craciun

- 10:40 **T1-PL4:** Physical Properties of Silicon-Germanium
Nanostructures: Theory and Simulations
online **Michele Amato**, *Paris-Saclay University, Orsay,
France*

11:15 **T5-PL2:** Optical spectroscopy of twisted bilayers of
online two-dimensional transition metal dichalcogenide
semiconductors

Dietrich Zahn, *Semiconductor Physics, Chemnitz
University of Technology, Chemnitz, Germany*

11:50 **T5-PL3:** Description of crystallization/amorphization
online switching in PCMs using ultra-fast laser annealing of
Ge rich-Ge₂Sb₂Te₅

Isabelle Berbezier, *Institute for Materials,
Microelectronic and Nanosciences of Provence, Marseille,
France*

12:25 **T5-PL4:** Anomalous growth of epitaxial Si
onsite **Jean-Noel Aqua**, Institute of NanoSciences of Paris-
INSP, Sorbonne University, Paris, France

13:00 Lunch break

Invited and Oral Session

HALL 1

Chairs: T. Fix, S. Colis, E. Scalise

15:00 **T9-I1:** Crystallographic transformations and physical
online basis of reversibility in shape memory alloys

Osman Adiguzel, *Firat University, Department of
Physics, Elazig, Turkey*

15:25 **T9-I2:** Design of magnetic nanoarchitecture for
online theranostic

Davide Peddis, Department of Chemistry and

Industrial Chemistry, University of Genova, Italy

15:50 **T9-O1:** Designing electrospun polymer fiber mat as
on-site templates for developing hierarchical inorganic
architectures

Alex Evanghelidis, *National Institute of Materials
Physics, Bucharest-Magurele, Romania*

16:05 **T9-O2:** Development of a heteroaromatic smart
on-site material with electrochromic function

Radu Dan Rusu, *Petru Poni Institute of
Macromolecular Chemistry, Electroactive Polymers
and Plasmochimistry Department, Iasi, Romania*

16:20 **T9-O3:** Esterification of microcrystalline cellulose
on-site using deep eutectic solvents

Daniel Timpu, *Physical-Chemistry of Polymers, Petru
Poni Institute of Macromolecular Chemistry of the
Romanian Academy, Iasi, Romania*

16:35 **T9-O1:** Enhancing magnetoelectronic properties
online through As substitution in the new Heusler alloy
 $Ru_2VSb_{0.5}As_{0.5}$

Ikram Medjadji, *Department of Materials & Sustainable
Development, Exact Science faculty, University of Sidi Bel
Abbes-Djillali Liabes, Algeria.*

16:45 **T2-I1:** Real-time plasma diagnostics: towards
on-site controlling gas phase chemistry during pulsed laser
deposition

Stefan Irimiciuc, *National Institute for Laser, Plasma
and Tadiation Physics, Magurele, Romania*

- 17:10 **T2-I2:** He and Ar plasma exposure of polymers used
online for 3D printing: from plasma parameters to material
properties
Andrei Vasile Nastuta, *Physics and Biophysics
Education Research Laboratory, Biomedical Science
Department, Faculty of Medical Bioengineering, Grigore T.
Popa University of Medicine and Pharmacy Iasi, Iasi,
Romania*
- 17:35 **T2-O1:** Nanomaterials produced by laser techniques
online for TDD applications
Georgiana Cocean, *Alexandru Ioan Cuza University of
Iasi, Faculty of Physics, Atmosphere Optics, Spectroscopy
and Laser Laboratory (LOASL), Iasi, Romania*
- 17:50 **T6-I1:** Emerging Non-volatile Two-terminal Electronic
online Memory Devices
Iulia Salaoru, *Emerging Technologies Research Centre,
De Montfort University, Leicester, UK*

Invited and Oral Session

HALL 2

Chairs: R. Tetean, I. Berbezier, S. Astilean

- 15:00 **T12-I1:** Efficient processing methods to self-assemble
onsite and pattern polymers for optoelectronics and bio-
applications
Ioan Botiz, *Faculty of Physics, Babes-Bolyai University,
Cluj-Napoca, Romania*

- 15:25 **T12-O1:** Ion Beam Modification of Polystyrene Nanostructures
onsite **Jorg Lindner**, *Nanopatterning - Nanoanalysis - Photonic Materials, Department of Physics, Paderborn University, Germany*
- 15:40 **T4-I1:** Magnetic spin textures in ferrimagnetic Gd/Fe multilayer systems
onsite **Manfred Albrecht**, *Institute of Physics, University of Augsburg, Augsburg, Germany*
- 16:05 **T4-I2:** Ferrimagnetic materials based on Rare Earths as platforms for quantum spintronics
onsite **Coriolan Tiusan**, *Department of Solid-State Physics and Advanced Technologies, Faculty of Physics, Babeş-Bolyai University Cluj-Napoca, Romania*
- 16:30 **T4-I3:** Soft magnetic composite cores produced by spark plasma sintering from Permalloy (Supermalloy)@MeFe₂O₄ pseudo core-shell powders
onsite **Ionel Chicinas**, *Department of Materials Science and Engineering, Technical University of Cluj-Napoca, Cluj-Napoca, Romania*
- 16:55 **T4-I4:** Surface magnetism investigated by spin-resolved photoelectron spectroscopy
online **Cristian Teodorescu**, *National Institute of Materials Physics, Măgurele-Ilfov, Romania*
- 17:20 **T13-I1:** Hybrid colloidal plasmonic-photonic crystals as versatile platforms for enhanced optical spectroscopy
online **Cosmin Farcau**, *National Institute for Research and*

*Development of Isotopic and Molecular Technologies
INCDTIM, Cluj-Napoca, Romania*

17:45 **T13-O1:** Advanced process for the fabrication of defect-free Ge-rich SGOI layers

online **Anne-Flore Mallet**, STMicroelectronics and IM2NP, Crolles, France

18:00 **T13-O2:** SiGe strain engineering by epitaxy and condensation towards the fabrication of Ge photodetector

online **Adam Arette-Hourquet**, CNRS, IM2NP, Aix-Marseille University, Faculté des Sciences de Saint-Jérôme, Marseille, France

18:15 Coffee break

Short Oral Session IV

Hall 1

**Chairs: C. Tiusan, C. Parvulescu, H. El Kholly
T8, T10, T16, T14**

18:45 **T5-SO1:** Bio-mediated synthesis approach for designing inorganic 3D structures based on zinc oxide and gold nanoparticles

onsite **Irina Zgura**, National Institute of Materials Physics, Bucharest-Magurele, Romania

18:53 **T5-SO2:** Preparation and characterization of new zinc oxide particles for applications in photocatalysis

onsite **Viorica Elena Podasca**, Polyaddition and Photochemistry Department, Petru Poni Institute of

Macromolecular Chemistry, Iasi, Romania

19:01
onsite **T5-SO3:** Characterization of oxide and metallic nanocrystals synthesized by microwaves vaporization of metallic wires.

Valentin Craciun, *National Institute for Laser, Plasma and Radiation Physics, Magurele, Romania*

19:09
onsite **T6-SO1:** IMT achievements in the NANOMAT-Horizon Europe Project and its national support action (Premiere NANOMAT)

Alina Cismaru, *National Institute for Research and Development in Microtechnology – IMT Bucharest, Romania*

19:17
onsite **T6-SO2:** Horizon Europe SPIDER (grant nr. 101070417) – Romanian participation in the development of beyond CMOS computing systems (PN-IU-CEI-OE-Premiere OE-2023; PRE-HE-ORG-2023-0042)

Alina Cismaru, *National Institute for Research and Development in Microtechnology – IMT Bucharest, Romania*

19:25
onsite **T12-SO1:** Microphase Separation in Thin Films of a Sphere Forming PS-b-PDMS Block-Copolymer

Jorg Lindner, *Nanopatterning – Nanoanalysis – Photonic Materials, Department of Physics, Paderborn University, Germany*

19:33
onsite **T12-SO2:** Dewetting of Thin Gold Films on Planar and Nanopatterned Polystyrene Surfaces

Jorg Lindner, *Nanopatterning – Nanoanalysis –*

Photonic Materials, Department of Physics, Paderborn University, Germany

19:41 **T15-SO1:** Photogrammetric method of preserving the
remains of archaeological monuments

onsite

Zoreslava Zakhzhai, Department of Philosophy and History, V.I. Vernadsky Taurida National University, Kyiv, Ukraine

19:49 **T15-SO2:** Studies of some composite layers for
artworks restoration

onsite

Andrei Hrib, Faculty of Physics, Alexandru Ioan Cuza University of Iasi, Romania

19:49 **Closing Ceremony**

20:30 Dinner break

Saturday, November 25, 2023

4:00 **Excursion III - Luxor- Kings Valley, Karnak and
Hatshepsut Temples**

or

7:00 **Excursion IV - Colored Canyon & Snorkeling at Blue
Hole Safari by Jeep**

20:00 Dinner Break



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