XIX International Conference on Surfaces, Materials and Vacuum

Sunday, June 21, 2026 - Thursday, June 25, 2026

Merida, México

Scientific Program

Advanced and Quantitative Materials Characterization

Vacuum science and plasma based technologies have historically been at the core of surface science and thin film growth. Controlled vacuum environments enable precise manipulation of matter, while plasmas and energetic species provide highly reactive and non-equilibrium conditions that drive atomic scale processing, advanced materials synthesis and surface modification.
Modern materials research increasingly demands atomic level precision, controlled energy delivery and engineered interfaces. Techniques such as Pulsed Laser Deposition (PLD), Atomic Layer Deposition (ALD), plasma-enhanced processes and other vapor phase methods rely on vacuum and reactive environments to achieve control over thickness, stoichiometry, microstructure and functional properties. These approaches span equilibrium and non-equilibrium growth regimes, enabling the fabrication of complex thin films, heterostructures, functional surfaces and nanoparticles.
This symposium aims to provide a forum for discussion of current research and technological developments in vacuum and plasma based materials processing, from fundamental principles to advanced technological applications.

- Fundamentals of vacuum science and plasma physics
- Pulsed Laser Deposition and laser–matter interactions
- Atomic Layer Deposition and sequential surface chemistry
- Plasma-enhanced and plasma-assisted growth techniques
- Vapor phase deposition methods (PVD, CVD and related processes)
- Growth mechanisms, nucleation and kinetic control
- Atomic scale, ultra thin film and nanoparticles engineering
- Plasma-surface interactions and energetic species dynamics
- Surface functionalization, interface control and nanoparticles synthesis
- In situ diagnostics and process monitoring under vacuum
- Modeling and simulation of vacuum and plasma based processes
- Emerging applications in advanced materials and devices

Biomaterials and Polymers

Conference will be organized on themes related with: ‘Emerging Technologies and Scientific Advancements in polymers and Biomaterials Engineering.

The scientific event offers a best platform with its well organized scientific program to the audience which includes interactive panel discussions, plenary talks, short presentations, short courses, invited sessions and poster sessions on the topics that cover areas of:

Polymer science, Engineering and technologies from the latest innovations in synthesis
Processing and modeling to the advanced applications of polymers in health
Advanced Biomaterials
Biomaterials and Nanotechnology Applications in Biomedicine
Use in Therapeutic and Investigative Delivery
Biomaterials in Biological Engineering
Biodegradable Biomaterials,
Utility Based Biomaterials
Energy and sustainability
Future materials and devices

Characterization and Metrology

Optic and electronic spectroscopy and microscopy are very important and relevant fields of knowledge when it comes to fundamental and applied research in materials science. Materials and surfaces have been widely studied and characterized by using linear optics through reflectance, transmittance, absorbance, and scattering properties. By contrast, nonlinear optics are closely related to the understanding of materials and surfaces, since such phenomena for example, second harmonic generation, wave mixing, parametric up and down conversion to mention only a few are directly related to material features, such as, crystallinity, centrosymmetry, anisotropy and quantum properties.

This symposium is dedicated to the presentation and discussion of characterization and metrology within the following topics:
Materials
Surfaces
Linear and nonlinear optical properties
Raman characterization
Nonlinear optical microscopy
Ultrafast light-matter interaction
Laser processing of materials: micro and nanostructures
Laser-tissue interactions
Laser-induced cavitation
Photonics
Biophotonics
Opticaltrapping

Luminescence Phenomena: Materials and Applications

This symposium centers on the science and technology of luminescence, in its broader sense, including photo-, thermo-, electro- and mechano-luminescence. The aim is to gather international experts as well as students to discuss the recent progresses in this highly inter- and multi-disciplinary area, with particular attention to the synthesis characterization, and applications of materials exhibiting advanced luminescence properties.

The scope of the conference will cover the following areas:
Photoluminescence
Cathodoluminescence
Ionoluminescence
Bioluminescence
Thermoluminescence
Electroluminescence
Mechano-, Sono- and Chemi-Luminescence
Theoretical aspects of luminescence
Nanophosphors: Physics and materials
Crystalline, amorphous and glass-ceramic materials
Polymeric and hybrid materials
Novel Synthesis
Materials Characterization

Quantum cutting and up-conversion
Combination of luminescent and plasmonic effects
Light emitting devices
Displays
Solar cells

Microelectronics and MEMS

Nanostructures

We take pleasure to invite you to participate in the Nanostructures symposium of the XV international conference on surfaces, materials and vacuum. Participants interested in presenting an oral or poster contribution are invited to submit an abstract to the following link until June 30th:

The symposium scientific program will cover a wide spectrum of topics including physical phenomena, materials sciences, and applications of nanostructures. The diversity of topics provides an opportunity to broaden the knowledge on latest developments and future perspectives in nanostructures research. Current development in the nanostructured materials includes: (i) Synthesis, functionalization, processing and self-assembly of nanoparticles, (ii) Nanotubes, nanowires, quantum dots and other low dimensional structures, (iii) Bio-active nanomaterials and nanostructured materials for bio-medical applications, (iv) Carbon nanostructured materials, Nano-structured membranes, nano-porous materials, functional coatings, (v) Nanomaterials for photo-catalysis, solar hydrogen and thermoelectric, (vi) Nano-fabrication, characterization and manipulation techniques for nanostructures, (vii) Magnetic and nano-semiconductor materials, (ix) Industrial development and application of nanomaterials and (x) Theoretical studies of nanostructured materials.

We look forward to welcoming you.

Renewable Energy: Materials and Devices

The symposium Renewable Energy: Materials and Devices, has the aim to provide a forum to present and discuss the research relating to the science and technology of energy generation, storage, and managements. An important theme is the research concerning to first generation solar cells, based on mono and poly-crystalline silicon; second generation cells, including CdTe, CIGS, CZTS, amorphous silicon, micro-crystalline and polymorphous silicon; third generation cells, based on the use of quantum dots, nanowires, carbon nanotubes, photo-electrochemical cells, polymer solar cells, nano-crystalline cells, dye-sensitized cells, perovskite solar cells, etc.

Semiconductors

Research on semiconductors has been an extremely important research field for most of the past century and will continue to have a central role worldwide during the twenty first century. Current technology would not exist if silicon-based electronics had not been developed. This impressive progress has been extended to other semiconductors such as gallium arsenide, group-three nitrides and related materials. The pace at which technology advances is a direct consequence of

the research efforts in growth, characterization, control of properties, development of novel devices, performance improvement, new materials such as alloys and solid solutions, theoretical approaches to predict and understand semiconductor properties, and so on. The Mexican Society for Science and Technology of Surfaces and Materials (SMCTSM) has had, since its beginnings, an important tradition among its members in pursuing research in the important field of semiconductors.This Symposium has been an important forum,for many years,for the generation, discussion and exchange of ideas where stimulating and fruitful collaborationshas arisen among the participants.

Tribology, Surfaces and Interfaces

Tribology studies the friction and wear behavior of surfaces that are in contact and in relative motion. Materials, Lubricants and Coatings are commonly used to increase the durability and life of components in mechanical systems, as well to reduce the energy consumption through reducing friction.

Theory and Simulation of Materials

The aim of this symposium is to bring together experts in the field of surfaces and interfaces to discuss recent developments in electronic and transport properties of bulk materials, surfaces, optical properties, physical properties of clusters, and 2D materials, Density Functional Theory and Time Dependent DFT.

Thin Films

The purpose of this symposium is to provide an international forum for discussion and exchange of ideas on the up-to-date research and developments of processing and characterization of advanced thin films. The physical properties of thin films are critically dependent on the deposition conditions and post-treatment details therefore discern the correlations between the experimental conditions and film properties are of great interest for the field.The participants from various universities, industries and research laboratories are welcome to submit contributions for both oral and posters presentations to discuss recent advances, developments, field applications, and future challenges for the thin film technologies.

Science Outreach

Una labor completa en investigación científica se cumple cuando se complementa con actividades de divulgación de la ciencia. La divulgación de la ciencia tiene como finalidad proporcionar un panorama general a toda la sociedad sobre los diferentes desarrollos científicos y tecnológicos que se realizan en el país. Para los investigadores, es una herramienta útil para promover sus investigaciones y alentar, principalmente a los jóvenes, a interesarse por el quehacer científico. A partir del 2005, la SMCTSM se propuso fomentar estas actividades a través del Simposio de Divulgación de la Ciencia y Tecnología que -cada año- tiene lugar dentro del marco del Congreso anual de esta sociedad científica.