CALL FOR ABSTRACTS

The International Conference on Metallurgical Coatings and Thin Films (ICMCTF) is recognized as the premier international conference on thin film deposition, characterization, and advanced surface engineering. It provides a forum and networking venue for scientists, engineers, and technologists from academia, government laboratories, and industry. Attendees from all over the world come to present their findings, exchange ideas, share insights, make new friends, renew old acquaintances, and establish collaborations. ICMCTF typically draws more than 700 attendees, covering some 35 oral technical sessions and a well-attended Thursday evening poster session.

ICMCTF 2025 will have seven technical symposia covering synthesis processes, materials (four symposia), advanced characterization, modeling, digitalization and industrial applications, and three topical sessions featuring materials, processes and applications that focus our attention on 'Surface Engineering for Sustainable Development', which is the overarching theme of ICMCTF 2025. The conference will open on Monday morning with Professor Shirley Meng from the University of Chicago, US, delivering a plenary lecture entitled "Past, Present and Future of All Solid-State Batteries – Challenges and Opportunities." Other special highlights of the meeting will be our Keynote Lectures, highlighting the importance of materials for sustainable industrial applications.

In addition to the technical program, the conference features a two-day industrial exhibition showcasing the latest equipment, materials, and services used for the deposition, monitoring, and characterization of coatings and thin films. The exhibition, which will be held Tuesday and Wednesday, May 13-14, will be open to the public, as well as a Career Center where organizations may post jobs, and candidates may interview for positions throughout the week. An educational program of Short Courses will be offered throughout the week.

Each year, the R.F. Bunshah and Bill Sproul Award Laureates and three outstanding Graduate Student Award winners are celebrated during a special convocation ceremony late Wednesday afternoon, May 14, followed by a festive reception in the evening. In addition, we hope to see many of the major leaders of the conference from previous years.

ICMCTF will again publish excellent scientific and technical work after peer-review in the Elsevier journals *Surface and Coatings Technology (IF = 5.3)* and *Vacuum (IF=3.8)*. We encourage authors to submit manuscripts by July 2025. The papers will be open access for 12 months after publication.

The Town and Country Resort Hotel and Convention Center, located in sunny San Diego of Southern California, will be the official conference venue, providing a relaxing atmosphere for discussion and networking among attendees.

We welcome your participation and look forward to receiving your abstract by submission deadline, November 15, 2024!

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PP5: Microfabrication Techniques with Lasers and Plasmas
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PP6: Greybox Models for Wear Prediction
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SYMPOSIUM MA (Materials A): PROTECTIVE AND HIGH-TEMPERATURE COATINGS
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MA1: Coatings to Resist High-temperature Oxidation, Corrosion, and Fouling
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MA3: Hard and Nanostructured Coatings
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MA4: High Entropy and Other Multi-principal-element Materials
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MA5: Boron-containing Coatings
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SYMPOSIUM MB (Materials B): FUNCTIONAL THIN FILMS AND SURFACES

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MB1: Thin Films and Surfaces for Optical Applications

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MB2: Thin Films for Electronic Devices

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MB3: Low-Dimensional Materials and Structures

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SYMPOSIUM MC (Materials C): TRIBOLOGY AND MECHANICS OF COATINGS AND SURFACES

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MC1: Friction, Wear, Lubrication Effects, and Modeling

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MC2: Mechanical Properties and Adhesion

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MC3: Tribology of Coatings and Surfaces for Industrial Applications

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SYMPOSIUM MD (Materials D): SURFACE ENGINEERING OF BIOMATERIALS, MEDICAL DEVICES, AND REGENERATIVE MATERIALS

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MD1: Development and Characterization of Bioactive Surfaces/Coatings

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MD2: Surface Response to Biological Environments, Biointerphases, and Regenerative Biomaterials

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SYMPOSIUM CM: ADVANCED CHARACTERIZATION, MODELLING AND DATA SCIENCE FOR COATINGS AND THIN FILMS

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Symposium Chair: Naureen Ghafoor, Linköping Univ., IFM, Thin Film Physics Div., Sweden, naureen.ghafoor@liu.se
Symposium Chair: Sebastian Siol, Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland, sebastian.siol@empa.ch

CM1: Spatially-resolved and In-Situ Characterization of Thin Films and Engineered Surfaces

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CM2: Advanced Mechanical Testing of Surfaces, Thin Films, Coatings and Small Volumes

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Matteo Ghidelli, Laboratoire des Sciences des Procédés et des Matériaux (LSPM) – CNRS, France, matteo.ghidelli@lspm.cnrs.fr

CM3: Accelerated Thin Film Development: High-throughput Synthesis, Automated Characterization, and Data Analysis

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CM4: Simulations, Machine Learning and Data Science for Materials Design and Discovery

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SYMPOSIUM IA: SURFACE ENGINEERING - APPLIED RESEARCH AND INDUSTRIAL APPLICATIONS

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Symposium Chair: Christoph Schiffers, CemeCon AG, Germany, christoph.schiffers@cemecon.de
Symposium Chair: Ta-Chin Wei, Chung Yuan Christian University, Taiwan , tcwei@cycu.edu.tw

IA1: Advances in Application Driven Research and Hybrid Systems, Processes and Coatings

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IA2: Surface Modification of Components in Automotive, Aerospace and Manufacturing Applications

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IA3: Innovative Surface Engineering for Advanced Cutting and Forming Applications

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SYMPOSIUM TS: TOPICAL SYMPOSIUM ON SUSTAINABLE SURFACE ENGINEERING

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Symposium Chair: Martin Welters, KCS Europe, Germany, welters@kcs-europe.com

TS1: Coatings for Batteries and Hydrogen Applications

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TS2: (Photo)electrocatalysis and Solar/Thermal Conversion

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TS3: Circular Strategies for Surface Engineering

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Nina Schalk, Montanuniversität Leoben, Austria, nina.schalk@unileoben.ac.at

Symposium PP: Plasma and Vapor Deposition Processes

Symposium PP focuses on plasma vapor deposition technologies, which are central to thin film synthesis and surface engineering. The symposium covers development and enhancement of established technologies, novel concepts, as well as advances in diagnostics and fundamental understanding of deposition processes.

PP1: PVD Coating Technologies

This session solicits contributions related to the development of new PVD methods and the advancement of industrially applied technologies. Sputtering, cathodic arc, anodic arc, laser, and electron beam-based methods and their combinations are considered in particular. The session welcomes contributions incorporating topics such as in-situ measurements, plasma transport in electromagnetic fields, plasma diagnostics, and computer-aided process development. Furthermore, the session will cover digital methods to understand and control thin film deposition processes, encompassing topics such as simulations, small and large-scale data analysis, in-situ process feedback control, and real-time optimization related to PVD technologies. Potential application areas include deposition technologies in use for wear-protective coatings for components and tools, low-friction thin films, high-temperature wear-, erosion-, and corrosion-resistant coatings, optical layers, biomaterials, decorative coatings, and materials for energy applications.

PP1 Invited Speakers:

Thomas Schütte, PLASUS GmbH, Mering, Germany, "Developing and Securing Coating Processes by Cutting-Edge Spectroscopic Plasma Monitoring and Process Control"

PP2: HiPIMS, Pulsed Plasmas and Energetic Deposition

The energy carried to the thin film during deposition is crucial in reducing the growth temperature and improving the properties of thin film materials. Higher plasma density leads to enhanced ionization of the film precursors and offers better deposition process control. This results in improved coating characteristics, valuable for e.g., optical, wear-resistant, or photovoltaic applications. This session solicits contributions from academia as well as industry and covers both the physics and the applications of energetic deposition. Topics of interest include plasma generation and discharge physics, plasma surface interaction and diagnostics, modeling and data-driven process understanding and simulations, reactive processes and process control, mechanisms of film growth, surface and interface engineering, industrial applications and production, upscaling and associated equipment.

PP2 Invited Speakers:

Daniel Lundin, Linköping University, Sweden, "Investigating Plasma and Surface Physics in Nitrogen-Based Reactive High-Power Impulse Magnetron Sputtering Discharges"

PP3: ALD, CVD Coating Technologies

This session solicits experts in thin films deposition techniques, involving chemical vapor deposition, for the growth of protective coatings and multifunctional, smart, or hard materials. This session will address (1) various techniques including Atmospheric Pressure CVD, LPCVD, MOCVD, ALD, HVPE, Pulsed CVD, and their plasma-assisted counterparts, PECVD and PEALD; (2) novel molecular CVD precursors or original delivery systems for low vapor pressure/difficult precursors (DLI, pressure pulse, direct halogenation) ; (3) properties of materials and structures grown by these deposition techniques; and (4) CVD modeling techniques from molecular to equipment scale.

PP3 Invited Speakers:

David Horwat, Institut Jean Lamour, University of Lorraine-CNRS, France, "Self-Assembly Monolayers (SAMs)-Free Area-Selective Atomic Layer Deposition, from Principles to Photoconversion Devices"

Kazunori Koga, Kyushu University, Japan, "Selective Generation of Particles in Plasma-Enhanced CVD and Site-Selective Deposition of Carbon Films"

PP4: Deposition Technologies for Carbon-based Coatings

This session solicits contributions that address applications of the carbon-based coatings industry. We want to span the whole range from applications for DLC or ta-C on engineering components as well as coatings employed in devices and displays or electrochemical applications like fuel cells and electrolytic applications. Deposition technologies include plasma-based methods CVD, PVD, and their combination, arc, ion-beam, and laser-assisted deposition and HIPIMS as well as dip coating, sol-gel, and other transfer techniques. This session includes fundamentals and development of interfaces between substrate and DLC to improve adhesion, supporting layers, and hybrids with hard coatings, industrial practices, scalability, and cost estimates.

PP4 Invited Speakers:

Julien Fontaine, Laboratoire de Tribologie et Dynamique des Systèmes LTD, France, "Insights into Solid Lubrication Processes of DLC Films Thanks to Analytical Tribology"

Martin Kopte, VON ARDENNE GmbH, Dresden, Germany, "With Carbon Coatings towards CO_2 Neutrality - Industrialization in Electrochemical and Tribological Applications"

PP5: Microfabrication Techniques with Lasers and Plasmas

Laser and plasma sources provide tunable fluxes of photons, electrons, ions, and radicals available for microscale-controlled or selected-area film deposition, surface etching/texturing, and functionalization. The scope of this session encompasses laser, plasma, and electron/ion beam processes aimed at chemical modification for catalytic substrates and surface engineering to fabricate biomaterials and microelectronic devices. Here, strategies to synthesize nanostructured interfaces enabling few-atom catalysts, organic tissues, and electronic heterostructures, like large-area laser microtexturing and plasma-enhanced atomic layer deposition, will be discussed. This session thereby welcomes contributions on laser, plasma, and particle beam techniques to generate functional interfaces in the domains of atoms, polymer chains, nanoparticles, cells, microchips, and entire tissues, with experimental and modeling approaches. Such a multiscale perspective will enable design of green, sustainable processes for tailoring of surface properties, like microlithography and plasma polymerization, thereby appealing to scientists interested in energy, packaging, and semiconductor applications.

PP5 Invited Speakers:

Ageeth Bol, University of Michigan, USA, "Synthesis of 2D Transition Metal Dichalcogenides Using Advanced ALD Cycle Schemes"

Thomas Lippert, Paul Scherrer Institute, Switzerland, "Pulsed Laser Deposition for Energy Materials"

PP6: Greybox Models for Wear Prediction

The prognosis of the wear behavior of coated tools and components is still unsolved and sufficiently accurate models to predict the wear behavior do not yet exist. Methods of machine learning in combination with conventional simulation approaches offer high potential to tackle this issue. By using these methods, the understanding of the wear mechanisms and the forecast of wear development and lifetime can benefit. Consequently, tool and component development as well as machining processes and applications can be improved by an adjustment of the process parameters or by an adjustment of the coatings deposited on the tools or components in order to achieve a higher productivity and a longer lifetime. Regarding wear prognosis, “Whitebox” models, based on physical laws and analytical correlations, represent the state of the art to determine the behavior of, for example, tools during the cutting process. Nevertheless, for a very complex and non-linear system behavior like wear progress of tools, whitebox models are limited. One possibility to predict non-linear behavior is offered by data driven “Blackbox” models, mostly based on machine learning algorithms. To utilize the benefits of whitebox and blackbox models and to overcome the limitations of both, they can be combined to “Greybox” models. This offers great potential to improve prediction accuracy of wear and remaining service life.

The session welcomes contributions that address wear prognosis of coated tools or components by conventional simulation approaches in combination with data-driven models. Emphasis can be directly on greybox approaches or on particular analytical or data-driven models. Of particular relevance will be whitebox models that combine coating properties and behavior in processes and contribute to an increased prediction accuracy of established models. Also welcome are contributions to blackbox models for high-performance applications with coated tools or components. In particular, the need for blackbox models should be described and how these models can be combined with whitebox models to form greybox models. Moreover, the greybox modelling approach can be extended to other applications of the coating industry in the future. Contributions to this topic from scientists and from industry in the fields of coating technology, production, mathematics and information technology are very welcome to contribute to the session and present their work.

PP6 Invited Speakers:

Kirsten Bobzin, RWTH Aachen University, Germany, “Greybox Models for the Qualification of Coated Tools for High-Performance Cutting”

Wolfgang Tillman, Dortmund University, Germany

PP7: Plasma and Vapor Deposition Processes (Symposium PP) Poster Session

Symposium MA (Materials A): Protective and High-temperature Coatings

Symposium MA focuses on surface engineering and materials science of protective and high-temperature coatings. The interaction of coating materials with harsh environmental conditions is addressed, including high-temperatures, thermochemical environments as well as mechanical loads. The environmental impacts include phenomena such as thermomechanical wear (e.g., abrasion, erosion, or mechanical stress), high-temperature aging, corrosion (e.g., oxidation, sulfidation, carburization, and water-accelerated degradation), or catalytic and physical fouling (e.g., coking, ash fouling, and slagging). The symposium also addresses coating deposition processes, architectural designs, and process-structure-property relationships of protective coatings. The protective coating materials range from metallic alloys to ceramics such as nitrides, borides, oxides, or carbides. Furthermore, specific alloying strategies such as high entropy alloys (HEAs) and other multi-principal-element materials obtaining unique chemical and physical properties are of interest. The application areas span the aviation sector, energy generation, as well as the machining industry, highlighting new developments towards zero GHG emission and sustainability.

MA1: Coatings to Resist High-temperature Oxidation, Corrosion, and Fouling

This session spans all aspects of design, processing, and performance of coatings to resist high-temperature oxidation, corrosion, and fouling. Topics include composition and process optimization, characterization of coatings and reaction products, development of advanced processing methods such as additive manufacturing, modeling of fabrication processes and degradation mechanisms, lifetime prediction and performance assessment in realistic conditions (atmosphere, stress, cycling, erosion, etc.). Environments of interest include, steam, SCO2, molten salts, liquid metal, hydrogen, ammonia, biofuels, etc. for applications such as turbomachinery, fuel cell and electrolyzers for green hydrogen production, concentrating solar power plants, advanced nuclear reactors, petrochemical and gasification plants, waste incinerators and metal-forming and recycling industries. Contributions addressing research as well as solutions are encouraged, with focus on coatings and surface modification.

MA1 Invited Speakers:

Pauline Audige, INTA, Spain, "High-Temperature Corrosion Resistant Coatings: Recent Aluminide Developments for Renewable Energy Applications"

Tomasz Dudziak, Cracow Institute of Technology, Poland, "The Role of Circular Economy in Materials Science: Thermal Spray and Laser Coatings Originated from Abandoned Scrap for Protectiveness of Metallic Alloys at High Temperatures"

MA2: Thermal and Environmental Barrier Coatings

This session focuses on the design, development, synthesis, and applications of thermal and environmental barrier coatings for gas and high volume H2 turbines and other high and ultra- high temperature applications. Topics include process understanding and novel processing methods, characterization of coating microstructure, properties (thermal, optical, mechanical, and chemical), testing methods (destructive and nondestructive), structure-property relationships, residual stresses, aging phenomena, substrate/coating system effects, and failure mechanisms, including CMAS attack, erosion, abrasion, and impact. These topics can be addressed for experimental research and/or modeling development.

MA2 Invited Speakers:

MA3: Hard and Nanostructured Coatings

This session welcomes contributions related to the characterization, simulation, development, and application of hard coatings and surfaces, including the relationships among composition, microstructure, chemical and mechanical properties, and the influence of deposition conditions on those parameters. The session also covers multifunctional nanostructured coatings, including nanocomposite, multi-component, and layered films with designs adapting the microstructure down to the nanoscale level. The session emphasizes the design, synthesis, and characterization of novel coating concepts, their modeling, and applications, as well as the development and use of novel characterization techniques, bridging both theoretical and practical aspects of hard and smart coatings.

MA3 Invited Speakers:

Emile Haye, University of Namur, Belgium

Daniel Rostislav, Montanuniversität Leoben, Austria

MA4: High Entropy and Other Multi-principal-element Materials

High entropy alloys (HEAs) and other multi-principal-element materials are multi-component systems in which high entropy of mixing, or kinetic effects, stabilize a solid solution. They exhibit unique chemical and physical properties and have therefore recently attracted a growing interest in the materials science community. This session will be a

platform for thin film-related research on high entropy and multi-principal-element materials including metal alloys, carbides, nitrides, and oxides as well as other multi-component systems in which high entropy affects phase stability. Topics of interest include but are not limited to, modeling, thin film processing, and characterizations of HEAs and other multi-principal-element materials.

MA4 Invited Speakers:

Shih-Hsun Chen, National Yang Ming Chiao Tung University (NYCU), Taiwan , "Phase-Adjustable High-Entropy Alloy Coatings Prepared via Thermal Spray Process"

Frederic Sanchette, Université de Technologie de Troyes, France, "Oxidation Resistance of High Entropy Nitride Thin Films Deposited by Magnetron Sputtering"

MA5: Boron-containing Coatings

Borides and boron-containing thin film materials are emerging as the next generation of hard, wear-, oxidation-, and corrosion-resistant coatings. Furthermore, various boron-based materials exhibit unique properties obtaining high potential for functional and architectural designs. The aim of this session is to provide a platform for first-principles design, synthesis, characterization of properties and defect structure as well as applications of different types of boron-containing protective and functional thin films.

MA5 Invited Speakers:

Annop Ektarawong, Chulalongkorn University, Thailand, "First-Principles Demonstration of Electronic Band Filling-Induced Improvement in Thermodynamic Stability and Mechanical Properties of Tantalum Diboride"

MA6: Protective and High-temperature Coatings (Symposium MA) Poster Session

Symposium MB (Materials B): Functional Thin Films and Surfaces

This Symposium focuses on thin films, coatings, and free-standing architectures with specific functionalities, in particular those based on electronic structure or nanodimensions. The content encompasses design and synthesis of novel materials; processing and integration into products and devices; fundamentals of operation; and characterization of advanced functionality for a range of applications divided into the following sessions:

MB1: Optical Materials and Thin Films

Current applications of optical materials, thin films, and advanced structured materials impose extreme demands on their synthesis and performance. The optimization of these devices, from design to applications, can be facilitated by optical characterization methods such as spectrophotometry, ellipsometry, scatterometry, interferometry, vibrational spectroscopies, near-field microscopies and other light-matter interactions. We welcome contributions in the design, synthesis, characterization, and applications of thin films and nanostructures for optical applications.

MB1 Invited Speakers:

MB2: Thin Films for Electronic Devices

This session explores advancements in functional thin films for electronic devices, focusing on their material characteristics such as electronic, optical, piezoelectric, magnetic, superconducting and MEMS device properties. These properties are crucial for optimizing device functionality. The session emphasizes the importance of leveraging thin film growth to tailor specific properties like electrical and thermal conductivity, optical properties, thermal and mechanical stability, and magnetic characteristics to meet diverse device requirements. Furthermore, the session covers emerging trends in the electronics industry and their implications for thin film applications. It includes advancements in CMOS and beyond CMOS nanoelectronics, advanced sensors, low-power IoT devices, solid-state lighting, flexible displays, bioelectronics and biosensors. These developments highlight the role of functional thin films in enabling cutting-edge technologies. Scalable, cost-effective, sustainable, and environmentally friendly thin film deposition processes are discussed, considering various substrates including flexible ones. The session also examines innovative thin film deposition manufacturing techniques such as vacuum-based technologies, and printing technologies, along with advancements in testing and characterization methods for thin films. Join this session to gain insights into the latest research and advancements in functional thin films for electronic devices. Discover how contemporary thin films enhance device performance, adapt to industry trends, interface with biological systems and contribute to breakthroughs in sensing, connectivity, AI, and quantum computing.

MB2 Invited Speakers:

MB3: Low-dimensional Materials and Structures

This session focuses on harnessing nanoscale phenomena and innovative deposition strategies for low-dimensional materials and structures with application-oriented functionalities. Advances in the synthesis and applications of various classes of low-dimensional materials will be addressed that cover synthesis, processing, characterization and applications of mono- and multi-component 2D and 1D materials, nanocrystals, nanoparticles, nanofluids, heterostructures and thin films composed of 2D, 1D and 0D structures. The areas of interest include experimental, theoretical and computational research in low-dimensional materials with controlled properties, cutting-edge investigation of processing-structure-property relationships, and novel application concepts or prototypes based on such materials. The session will provide a unique platform for connecting researchers with diverse academic and industrial backgrounds, including materials science, physics, and chemistry, and a forum for the discussion of fundamental issues and recent developments in the synthesis of low-dimensional materials as well as the ways to apply them in the next generation applications.

MB3 Invited Speakers:

Angel Barranco, Institute of Materials Science, CSIC, Spain
Paolo Milani, University of Milano, Italy

MB4: Functional Thin Films and Surfaces (Symposium MB) Poster Session

Symposium MC (Materials C): Tribology and Mechanics of Coatings and Surfaces

This symposium covers all aspects of tribology, mechanical properties, and adhesion of coatings and engineered surfaces. The scope includes both experimental investigations and modeling of static (e.g., indentation and adhesion) and dynamic (e.g., oscillating, scratching, sliding, and rolling) contacts, and contact/fracture mechanics from atomistic to macroscopic length scales. We welcome contributions that improve scientific and mechanistic understanding of tribo-mechanical responses, characterization and performance of engineered surfaces and coatings, processing-structure-property-performance relationships, design of coatings for specific applications, and size effects. Additional emphasis is given to multifunctional (hard and lubricious) and nanocomposite coatings for extreme environments, nanostructured coatings, diamond and diamond-like carbon, and coatings for advanced aerospace, automotive, and machining applications, along with advances in instrumentation and measurement techniques.

MC1: Friction, Wear, Lubrication Effects, & Modeling

This session covers all phenomena related to friction, wear, lubrication, and modeling. We solicit contributions on the development, characterization and modeling of materials, coatings or innovative structures to control friction and wear, including liquid and solid lubrication. We are interested in studies providing new understanding of tribological mechanisms of coatings and thin films. Emphasis will be given to contributions on understanding the role of coating composition and structure in friction and wear reduction. Incorporation of additional coating functionalities (thermal cycling resistance, fracture toughness, oxidation resistance, etc.) is also an important issue. Contributions on theoretical and computational modeling of tribological interactions at the atomic or molecular level are also welcome.

MC2: Mechanical Properties and Adhesion

This session is devoted to the measurement and modeling of the mechanical properties of surface, near-surface, and interface regions of thin films, coatings, and surface-engineered bulk materials. We are interested in measurement methods and models for the quantitative determination of mechanical properties, residual stresses, interface adhesion, fatigue, and fracture toughness. Emphasis will be given to contributions on novel test methods, such as *in situ* testing using SEM, TEM, or XRD as well as multi-axial contact mechanics, MEMS testbeds, and new approaches for the extraction of mechanical and constitutive properties by modeling of indentation load-displacement curves. Finally, special consideration will be given to contributions that address processing-structure-mechanical property relationships across multiple length scales.

MC2 Invited Speakers:

Barbara Putz, EMPA, Switzerland
Sanjay Sampath, Stony Brook University, USA

MC3: Tribology of Coatings and Surfaces for Industrial Applications

Surface engineering and advanced coatings contribute to improved tribological properties and performance in many industrial applications. This session welcomes contributions on the development, characterization, and mechanical as well as tribological evaluation of coating solutions and surface functionalization in industrial applications, e.g.

transportation, or production technology. Thin film coatings, diffusion treatments as well other types of coatings and surface treatments are welcome. Special consideration will be given to contributions that address overarching investigations to link fundamental insights with application results.

MC4: Tribology and Mechanics of Coatings and Surfaces Poster Session

Symposium MD (Materials D): Surface Engineering of Biomaterials, Medical Devices and Regenerative Materials

This Symposium focuses on the practical applications of the synthesis, characterization, and performance (both *in vitro* and *in vivo*) of coatings and modified surfaces designed for biomedical applications. The symposium is devoted to creating a friendly hub platform to promote research discussions between material scientists, engineers, coating experts, nanotechnologists, and clinicians. Papers are solicited in areas related to bioactive and biocompatible coatings for implants (e.g., orthopedic, dental, spinal, etc.), cardio-vascular stents, drug delivery, and biosensing. Examples of research topics sought are hydroxyapatite coatings, biomimetic and bio-inspired coatings, antimicrobial, anti-biofouling, drug-eluting coatings, blood-compatible coatings, electrospun coatings, biofunctionalization of materials surfaces such as tissue engineering scaffolds by wet chemical and plasma methods, cell-surface interactions, bio-lubrication and bio-tribology, and processing and characterization of biomaterial surfaces. Studies of the interactions between coatings and the biological environment, including tribocorrosion and other degradation mechanisms, are also welcome. Moreover, research on the effect of biomaterial coatings on biological behavior, such as cell growth, adhesion, and gene expression, is sought. Contributions in retrieval implant analysis, releasing metal ions/particles, smart/intelligent surfaces, and potential clinical concerns will also be considered. A new key interest is the applications of coatings in additive manufacturing, as many novel 3D-printed implants benefit from surface coatings to promote osseointegration and, more generally, biocompatibility.

MD1: Development and Characterization of Bioactive Surfaces/Coatings

This session addresses coatings and surface modifications utilized in biomedical applications. These modifications aim to enhance the performance characteristics or provide additional functionalities to implants, medical devices, or surgical instruments. The coatings and surface modifications serve various functions, including improving biocompatibility, promoting cell proliferation and viability, reducing restenosis, preventing thrombus formation, regulating metallic ion release, and resisting corrosion, wear and fatigue tribocorrosion, and wear. These functionalities are evaluated in both laboratory settings (*in vitro*) and within living organisms (*in vivo*). In addition, the regulated biological responses to the surfaces can be utilized for diagnostic and monitoring purposes, such as early prediction of diseases such as cancer or neurological disorders, through readily available body fluids, urine, or saliva. This session seeks to explore clinical applications and physiological responses to material systems used for tissue regeneration, implantable sensors, and smart drug delivery, among other things. The scope extends to computational, analytical, and experimental studies investigating coated biomaterials' underlying mechanisms and diverse behaviors. Your research, with its potential to directly contribute to these practical applications, holds immense value for the advancement of the field. We encourage you to share your findings and insights with our community of researchers and practitioners.

Keywords: Coatings and Surface modifications of biomaterials, Corrosion, Tribology, Tribocorrsion, 3D printing/additive manufacturing, Implants, Retrieval studies, Biosensors and diagnostic devices.

MD1 Invited Speakers:

Ren-Jei Chung, National Taipei University of Technology, Taiwan
Chi-Hsien Huang, Ming Chi University of Technology, Taiwan
Ying-Chih Liao, National Taiwan University, Taiwan
Ting-Yu Liu, Ming Chi University of Technology, Taiwan, “Noble Nanoparticles Arrays Coating for Electrochemical (EC) and Surface-Enhanced Raman Spectroscopy (SERS) Biosensors”
Diego Mantovani, University of Laval, Canada
Mike McNallan, University of Illinois - Chicago, USA
V. Ram Gopal Rao, Birla Institute of Technology and Science, Pilani, India, "Biosensor Developments"

MD2: Surface Response to Biological Environments, Biointerphases, and Regenerative Biomaterials

The communication interactions between cells/bacteria and biomaterials occur through the surface of the biomaterials. The surface characteristics encompass its topography, chemistry, mechanical properties, surface energy, and redox potentials. These interactions initiate either desirable or undesirable processes. For instance, they can activate signaling pathways that regulate cell adhesion, migration, proliferation, and differentiation into specific desired cell types for various applications. However, they can also facilitate excessive adhesion of microorganisms, leading to the formation of biofilms that pose significant health risks. Gaining a comprehensive understanding of

these interaction processes and their relationship with surface properties is crucial knowledge that enables us to create new surfaces or coatings capable of promoting specific biological responses, thereby designing bioactive surfaces. The session welcomes abstracts on the new generation of biomaterials based on regenerative medicine and tissue engineering, potentially competing to replace man's synthetic materials. Recent developments such as 3D bioprinted bones and tissues, functionally graded materials, nature-mimetic biomaterials, and computational models/AI-driven technology in biomaterials will be strongly recommended for submission.
Keywords: Biocompatibility, Antibacterial properties, Biointerphases, Cell-Material interaction pathways and Mechanisms, Regenerative materials and surfaces, Tissue engineering, 3D Bioprinting, Computational model and AI-driven biomaterials

MD2 Invited Speakers:

Madhu S. Dhar, University of Tennessee, USA, "Integrating Materials Science with Biology to Advance Tissue Engineering and Regenerative Medicine"
Samir Iqbal, University of Texas at Rio Grand Valley, USA, "Biomedical Engineering and Diagnostics"
Huinan Liu, University of California, Riverside, USA
Murali Sastry, Monash University, Australia, "Bioapplications Using Novel Synthesis Strategies"

MD3: Surface Engineering of Biomaterials, Medical Devices and Regenerative Materials Poster Session

Symposium CM: Advanced Characterization, Modelling and Data Science for Coatings and Thin Films

This Symposium focuses on recent advances in microstructural, chemical, electrical, optical, and mechanical characterization of coatings and thin films, as well as advanced modelling and computation techniques, which enhance our understanding of the fundamental structure-property-processing relationships. In addition, the symposium will cover topics related to high-throughput thin film development including combinatorial synthesis, automated characterization and data science approaches such as machine learning or artificial intelligence for large data processing. Of interest are contributions that either highlight the application of recent advances in analytical methods, characterization techniques and nano-mechanical testing methods for coating evaluation, or present advanced and innovative modelling techniques to understand coating properties.

CM1: Spatially-resolved and in situ Characterization of Thin Films, Coating and Engineered Surfaces

This session deals with novel spatially-resolved structural/chemical and microstructural characterization techniques, especially those that advance the in-depth understanding of the relationship between processing, structure and properties of thin films and engineered surfaces. Particular attention will be given to cutting-edge experiments providing *in situ* information on structure or microstructural evolution during growth or during post-growth stimuli (mechanical, thermal,..). Especially, the session will focus on the emerging area of three-dimensional microstructural characterization in small volumes, such as atom probe tomography, TEM characterization, FIB/SEM/EBSD tomography and ToF-SIMS 3D mapping, dynamic characterization of thin film growth, ellipsometry, wide- and small-angle X-ray/neutron scattering, reflectometry, micro-Raman spectroscopy, etc.

CM1 Invited Speakers:

Ryota Gemma, Tokai University, Japan
Alice Lassnig, Austrian Academy of Sciences, Austria
Remi Lazzari, CNRS, Sorbonne Université, Institut des NanoSciences de Paris, France, "Real-Time Monitoring of Sputter Deposition Process: Application in the Context of Ag-Based Low-Emissive Coatings"
Pierre-Olivier Renault, Institut Pprime, CNRS-Université de Poitiers, France, "Exploring Mechanical Properties of Thin Films Through Synchrotron X-Ray Diffraction, Digital Image Correlation and Electrical Resistivity"

CM2: Advanced Mechanical Testing of Surfaces, Thin Films, Coatings and Small Volumes

This session covers advanced mechanical characterization techniques for surfaces, thin films, and coatings with a focus on the development of novel methods. This includes novel methods for performing nanoindentation and advanced micro-scale testing on coatings, thin films, and nanostructures produced by FIB or other lithography techniques, emphasizing multi-techniques nanomechanical testing: performed in situ in the SEM, TEM, Raman, X-ray beamline, etc. Particular attention will be given to papers providing characterization in non-ambient and extreme conditions (high or cryogenic temperatures, radiation, hydrogen - characterization and its effect on the deformation mechanism and embrittlement of coatings and thin films), and challenging loading (cyclic and high strain rates).

CM2 Invited Speakers:

Hanna Bishara, Tel Aviv University, Israel, "The Local Electrical Fingerprint of Deformation-Induced Defects in Alloys"

Christoph Gammer, The Erich Schmid Institute of Materials Science (ESI) of the Austrian Academy of Sciences, Austria, "Mechanical Properties of Thin Films Studied using 4D-STEM"
Dong Liu, University of Oxford, UK, "Micromechanical Testing of Ceramic Coatings for Nuclear Applications"
Takahito Ohmura, Kyushu University/NIMS, Japan, "Nano-Mechanical Characterization and Modeling of Plasticity in Metallic Materials"

CM3: Accelerated Thin Film Development: High-throughput Synthesis, Automated Characterization and Data Analysis

This session covers all topics related to accelerated, high-throughput thin films and coatings development. This includes studies on rapid thin film materials development and coatings optimization but also recent advances and developments in high-throughput research methods. Of particular interest are advanced approaches for synthesis, such as combinatorial or autonomous thin film deposition, but also automated characterization techniques. An emphasis is put on the role of data, the efficient handling of large data sets as well as the application of data science techniques and machine learning to high-throughput experimental workflows. This session complements CM4 which focusses on advanced theoretical approaches for materials discovery and design.

CM3 Invited Speakers:

Hannah-Noa Barad, Bar Ilan University, Israel
Sage Bauers, National Renewable Energy Laboratory, USA, "Applying Combinatorial Research Methods to Accelerate Energy Materials Discovery"
Ian Sharp, Technical University Munich, Germany
Helge Stein, Technical University Munich, Germany

CM4: Simulations, Machine Learning and Data Science for Materials Design and Discovery

This session presents computational and simulation methods, machine learning, artificial intelligence, visualization algorithms, as well as best practices of their applications for knowledge-based materials design and discovery. It welcomes contributions devoted to (1) aid understanding of material structures and properties based on computations and simulations spanning from the atomic level to macroscale, (2) use of machine-learning algorithms for describing material properties or rapidly screen compositional landscapes, (3) generation, curation, and exploration of big materials data from a wide range of sources, including computations and experiments. Additionally, (4) predictive process modeling and simulations will be discussed as a tool which provides irreplaceable insight into process conditions and quantities which cannot be measured. Process modeling provides an additional layer of physics-based metadata that can be leveraged by machine learning and AI methods. This session complements CM3 focusing on experimental high throughput synthesis, characterization and data analysis.

CM4 Invited Speakers:

Kevin Kauffman, University of California San Diego, USA, "Crystal Symmetry Determination in Electron Diffraction Using Machine Learning"
Chao-Cheng Kaun, Research Center for Applied Sciences, Academia Sinica, Taiwan , "Computational Modeling of Nanoelectronics and Emerging Materials"
Vladyslav Turlo, EMPA (Swiss Federal Laboratories for Materials Science and Technology), Switzerland, "Computational Approach to Probing Hydrogen in Atomic Layer-Deposited Barrier Coatings"

CM5: Advanced Characterization, Modelling and Data Science for Coatings and Thin Films (Symposium CM) Poster Session

Symposium IA: Surface Engineering - Applied Research and Industrial Applications

This symposium will focus on applied research related to industrial manufacturing and application aspects of various surface engineering and coating technologies. Topics include recent advancements in surface engineering equipment and the application of PVD/CVD/ALD and allied deposition technologies for coatings and thin films in automotive, aerospace, medical, semiconductors, dies, molds, components and tooling/cutting applications. Also of particular interest are surface treatments before and after the coating processes to enhance the performance of engineered surfaces, hybrid/duplex coating techniques, innovations in manufacturing practices, computational & Artificial Intelligence manufacturing techniques and cooperation between industry, research organizations, and academia to advance surface engineering applications.

IA1: Advances in Application Driven Research and Hybrid Systems, Process and Coatings

The scope of this session is on the research results produced in cooperation between industry, research laboratories, and academia. One focus should be on companies that can present current status and achievements, as well as address future development trends. Academic institutions are highly encouraged to present results of background

research or contributions aimed at the development of tailored solutions to meet the industrial demands of thin film and hard coatings applications. Applications of machine learning, artificial intelligence and its adaptation to surface engineering will be of great interest.

IA1 Invited Speakers:

Ing. Herbert M. Gabriel, PVT Plasma and Vakuum Technik GmbH, Germany, "Coatings for Hydrogen Technology"

IA2: Surface Modification of Components in Automotive, Aerospace and Manufacturing Applications

This session will cover manufacturing advances and application-oriented research and development on surface engineered products and technologies. Topics include surface modified or coated products/components in tribology, corrosion, high temperature, optical, magnetic, and allied technologies. Also, the new thrust in surface engineering in additive manufacturing and implementation of Artificial Intelligence in Smart Manufacturing. The focus is also on novel substrate preparation and pretreatment methods: nitriding, carburizing, boriding, or oxidation pre-treatments; intermediate etching treatment and interlayer design during the coating processes. The innovative technologies such as coating post-treatments, including laser, electron beam, annealing, ion implantation or mechanical/chemical/optical techniques, and integrated and/or novel treatments and process combinations are also of interest. The main criteria are that the surface engineering/coatings should be applied to semi/end products to enable/improve desired physical/chemical properties. The components used in automotive, aerospace, manufacturing, land-based and aero turbines, lasers, mining, oil drilling and fracking, construction machinery, sporting goods and farming equipment are of primary interest in this session. Papers dealing with aspects relating to properties, processes, performance, equipment, and industrial applications for such treatments are all welcome.

IA2 Invited Speakers:

Ewa Rennebro, Pacific Northwest National Laboratory, "Ultra-High Vacuum Test for Quantitative Determination of Hydrogen Permeability of Various Ceramic Coatings on Stainless Steel"

Diana Berman, University of North Texas, USA

Shrikant Joshi, University West, Sweden, “Solution Precursor Thermal Spraying for Advanced Functional Coatings: Is the Jury Still Out?”

Hamidreza Mohseni, Pratt & Whitney, USA, "Thermal Spray Coatings Aerospacee Applications: State-of-Art and Path Forward"

IA3: Innovative Surface Engineering for Advanced Cutting and Forming Applications

The requirements of manufacturing industries and recent innovative developments in coatings and surface engineering processes for advanced tooling applications are the focus of this session. Such applications include but are not limited to high-demanding sheet or bulk metal forming, plastics processing, die-casting as well as cutting operations of steel, cast iron and difficult-to-cut materials like high-temperature alloys or CFRP. Novelties related to the use of coating technologies like PVD arc, sputtering, HIPIMS, hybrid, electron beam as well as PECVD and CVD for application-oriented design of different coating materials, architectures and properties are welcome. Insights into the combined effect of tool geometry and adapted coatings are also in the focus of the present session. Furthermore, contributions highlighting the interaction of the coatings designed for cutting and forming applications with the ambient atmosphere and/or the counterpart materials including metallic alloys and polymers are within the focus of this session. Recent advances in additive manufacturing have benefited mold and die industries. Papers which have a synergy between additive manufacturing and surface engineering of cutting and forming tool applications are also of interest.

IA3 Invited Speakers:

IA4: Surface Engineering - Applied Research and Industrial Applications (Symposium IA) Poster Session

Symposium TS: Topical Symposium on Sustainable Surface Engineering

The United Nations (UN) has defined 17 Sustainable Development Goals (SDG) to pave the way for a future, which is worth living for everyone. This mindset is emphasized at ICMCTF with the overarching theme ‘Surface Engineering for Sustainable Development.’ While sustainability aspects are more than welcome in all contributions from academic progress to industrial processes, the focused Topical Symposium on Sustainable Surface Engineering manifests the fact that state-of-the-art research and development in surface engineering must also account for sustainability. Individual topical sessions on batteries and hydrogen applications, catalysis and energy conversion as well as circular strategies for surface engineering are in line with SDG 7 'Affordable and Clean Energy', SDG 12 'Responsible Consumption and Production' as well as SDG 13 'Climate Action.'

TS1. Coatings for Batteries and Hydrogen Applications

The future of energy is driven by the overall goal to provide green and sustainable energy for all industrial sectors. All mobile and stationary applications will be affected by these changes. The achievement of these goals relies on green and sustainable energy generation, but also on the ability to store this energy. Once electricity is generated with regenerative technologies it can be stored in batteries or transported using hydrogen as a carrier to its final destination and transferred to electricity again, when needed. Electrochemical cells are key elements in hydrogen production and storage of generated electricity in batteries. Surface coatings and surface functionalization in these cells provide key properties to enable and drive necessary reactions. Electrode surfaces must provide high electric conductivities and withstand harsh electrochemically corrosive environments. On the other hand, membrane assemblies must be functionalized and act as carriers for catalysts. In solid-state batteries coatings are needed for interface design between electrodes and electrolytes. Moreover, coating processes are needed for the application of active materials. Future technical and economic success in hydrogen generation and electricity storage is mainly driven by the developments related to these electrochemical cells. This topical session focuses on coatings and surface functionalization in electrochemical cells used in hydrogen applications, e.g. electrolysis, fuel cells, and in electricity storage, e.g. Li-batteries, solid state batteries, flow batteries.

TS1 Invited Speakers:

Sheng-Wei Lee, National Central University, Taiwan, "Intermediate-Temperature Proton-Conducting Solid Oxide Fuel Cells and Electrolyzers for Clean Energy"

Wei-Ren Liu, Chung Yuan Christian University, Taiwan

Mehmet Öte, Schaeffler Technologies AG & Co. KG, Germany, "Coating Innovations for Green Energy: Enabling Hydrogen Technologies"

TS2. (Photo)electrocatalysis and Solar/Thermal Conversion

Energy conversion constitutes a fundamental challenge of today's society. As thermal energy and CO_2 are continuously lost and produced, respectively, developing materials, devices, and methods to reuse them is essential for a more sustainable future. This session is particularly dedicated to the materials and devices developed for solar thermal conversion, thermoelectrical and (photo)electrochemical energy conversion, covering both theoretical and experimental work on the design, processing, characterization, and performance of these technologies. By combining efforts in thermoelectrical, (photo)electrochemical, and solar thermal conversion technologies, this session aims to highlight the latest advancements and research, contributing to the development of more efficient and sustainable energy conversion solutions. We welcome contributions on the following:

- Inorganic and organic-based thin film thermoelectrics
- Thin films that can absorb and convert sunlight into heat
- Characterization of thermal properties in thin films
- Development and testing of thermoelectric and solar thermal devices and technologies
- Material replacement of critical elements in thermoelectrics and spectrally selective absorbers, thermal emitters, solar thermophotovoltaics
- Integration of photothermal and radiative cooling processes to enhance energy efficiency for residential heating and cooling and industrial process heat
- Solar thermal technology in water desalination, purification, and wastewater treatment
- Design and synthesis of novel catalysts (CO2RR; HER, OER, NH3)
- Vapor-based synthesis of catalytic 2D materials and nano-objects
- Material replacement of critical elements in catalysts
- Approaches of nanoscale design, synthesis, and functionalization
- Characterization of (photo) electrochemical activity (including in operando)
- Theoretical approaches for modeling catalytic processes
- Mechanisms of photo/electrocatalysis

TS2 Invited Speakers:

André Pereira, University of Porto, Portugal, "Flexible Thermoelectrics: Transforming Wearables, Space Exploration, and IoT"

TS3. Circular Strategies for Surface Engineering

The concept of a circular economy is a key element towards reaching the sustainable development goals (SDG) from the United Nations (UN) and comprises incentives to reuse existing products, instead of disposal and relying on the continuous global production for replacement. 'The goods of today are the resources of tomorrow at yesterday's resource prices'. Thus, natural resources can be used more efficiently, and also new markets will evolve in a circular economy. In the last decades, the research and development within surface engineering has been focused mainly on the enhancement of surface properties by design of multifunctional coatings and surfaces, while the sustainability of

such processes and products is usually neglected. However, the approach of a circular economy for surface engineering requires innovative rethinking along the lines of 'reduce, reuse, repair and recycle'. These strategies exhibit both ecologic as well as economic incentives, which means that the significant lowering of greenhouse gas emissions during production is closely connected to business models for the future. Sustainability measures have been widely implemented and exploited for immediate actions to enhance the longevity of products and materials within industrial surface engineering in the last years. On the other hand, insights and knowledge from basic academic research offer additional opportunities to enhance the sustainability of surface engineering products. Hence, this topical session provides a bridging platform for exchange on circular economy strategies for surface engineering between industry and academia. This exchange will benefit from innovative contributions on e.g. approaches for life cycle analyses, reduction of energy and material input, reusage of biproducts as well as repair and recycling of materials.

TS3 Invited Speakers:

Albano Cavaleiro, University of Coimbra, Portugal, "Low Friction Sputtering Coatings, A Sustainable Option to Reduce Energy Consumption and Harmful Lubricant Usage"

Tim Fisher, University of California Los Angeles, USA, "Scalable Direct Solar Synthesis of High-Yield Flake Graphite and Hydrogen"

Christian Koller, Pankl Racing Systems, "Green Speed: The Race for Sustainability in the High-Performance/Motor-sports Sector"

TS1P: Coatings for Batteries and Hydrogen Applications - TS1 Poster Session
TS2P: (Photo)electrocatalysis and Solar/Thermal Conversion – TS2 Poster Session
TS3P: Circular Strategies for Surface Engineering – TS3 Poster Session

SPECIAL SESSIONS & EVENTS

Plenary Lecture (PL)

Y. SHIRLEY MENG, Chief Scientist, ACCESS, Argonne National Lab, Professor, Pritzker School of Molecular Engineering, The University of Chicago

"Past, Present and Future of All Solid State Batteries – Challenges and Opportunities"
Monday, May 12, 2025, 8:00 a.m.

Compared with their liquid-electrolyte analogues, Solid state electrolytes SSEs have drawn increased attention as they promote battery safety, exhibit a wide operational temperature window, and improve energy density by enabling Li metal as anode materials for next-generation lithium-ion batteries. Despite suitable mechanical properties to prevent Li dendrite penetration, relatively wide electrochemical stability windows, comparable ionic conductivities, and intrinsic safety, most SSEs are found to be thermodynamically unstable against Li metal, where SSE decomposition produces a complex interphase, analogous to the SEI formed in liquid electrolyte systems. An ideal passivation layer should consist of ionically conductive but electronically insulating components to prevent the SSE from being further reduced. The past four decades have witnessed intensive research efforts on the chemistry, structure, and morphology of the solid electrolyte interphase (SEI) in Li-metal and Li-ion batteries (LIBs) using liquid or polymer electrolytes, since the SEI is considered to predominantly influence the performance, safety and cycle life of batteries. All-solid-state batteries (ASSBs) have been promoted as a highly promising energy storage technology due to the prospects of improved safety and a wider operating temperature range compared to their conventional liquid electrolyte-based counterparts. While solid electrolytes with ionic conductivities comparable to liquid electrolytes have been discovered, fabricating solid-state full cells with high areal capacities that can cycle at reasonable current densities remains a principal challenge. Silicon anode offers a possibility to overcome the challenges that lithium metal anode faces. In this talk, we will highlight solutions to these existing challenges and several directions for future work are proposed.

Exhibitors Keynote Lecture (EX)

JUAN FLORES PRECIADO, Principal Engineer, SpaceX

"Surface Engineering & Rocket Science"
Tuesday, May 13, 2025, 11:00 a.m.

Keynote Lectures (KYL)

A special feature of highlighted presentations offers added value to the technical program. Lectures are dedicated to topics of fundamental interest for scientists and engineers in surface engineering. Presentations are individual and not "classic" day-to-day R&D business. Discussion of new developments and trends of relevance to ICMCTF, both in materials science and in methodology, in a pioneering state, with long-term impact. Selected critical reviews in a field of relevance to ICMCTF. Recognition of colleagues with pioneering and lasting impact on ICMCTF.

KYL1: Keynote Lecture I
KYL2: Keynote Lecture II

'FIRST TIMERS' SPECIAL

We want to welcome new participants in 2025 with a special `First Timers` offer of ***free student registration*** for one student accompanying their adviser/supervisor registering for ICMCTF 2023 for the first time. Both the mentor and student must be first time attendees, and both are required to stay in the conference hotel to be eligible for the offer. Please contact the ICMCTF 2025 General Chair, Johanna Rosen (johanna.rosen@liu.se) if you have any questions regarding this opportunity.

ICMCTF VENDOR EXHIBIT

Visit the exhibit hall on Tuesday, May 13, from 12:00-7:00 p.m. and Wednesday, May 14, from 10:00 am – 2:00 p.m. to learn about new products, services and application techniques that will help improve all facets of R&D, Engineering, Manufacturing, Quality Control and general laboratory operations. This is a great opportunity for attendees to interface with vendors who are eager to introduce their products that will satisfy your laboratory requirements and your specific research criteria. The exhibit hall is also a great place for networking. Join us each day for lunch and the exhibit hall reception on Tuesday at 5:30 pm. For questions regarding the exhibits, please contact Bob Jonas/Ryan Foley at **exhibits@avs.org**

Call for ICMCTF Awards

1. ***Graduate Student Awards:*** The ICMCTF Graduate Student Awards are intended to honor and encourage outstanding graduate students in fields of interest to the Advanced Surface Engineering Division (ASED) of the AVS. ASED seeks to recognize students of exceptional ability who show promise for significant future achievement in ASED-related fields. The nominee must be a graduate student in science or engineering who is in good standing at a university with a recognized graduate degree program and the presenting author of an oral presentation at the annual ICMCTF conference. Nominees who receive their final research degree after the ICMCTF Abstract Submission deadline are still eligible for that year. However, previous Graduate Student Award winners are ineligible. Submission Deadline: November 15, 2024. Click here for **Nomination Procedures**.

2. ***Bunshah Award:*** R.F. Bunshah Award and Honorary ICMCTF lectureship is intended to recognize outstanding research or technological innovation in the areas of interest to the Advanced Surface Engineering Division (ASED) of the AVS, with an emphasis in the fields of surface engineering, thin films, and related topics. The nominee shall have made pioneering contributions to the science or technology of surface engineering, thin films, or related fields of interest to ASED. Submission Deadline: November 15, 2024. Click here for **Nomination Procedures.**

3. ***Bill Sproul Award:*** The Bill Sproul Award and Honorary ICMCTF lectureship is intended to recognize the achievements of a mid-career researcher who has made outstanding scientific and/or technological contributions in areas of interest to the Advanced Surface Engineering Division (ASED) of the AVS, with an emphasis in the fields of surface engineering, thin films, and related topics. Submission Deadline: November 15, 2024. Click here for **Nomination Procedures**.

***ONLINE ABSTRACT SUBMISSION ONLY:* https://icmctf2025.avs.org/**
Deadline: 11:59 pm ET, FRIDAY, November 15, 2024

Supplemental data (1-2 pages, 1MB) will also be accepted via the submission site.
Instructions may be found at the website above.

****Please Note: A presenter may present one (1) ORAL AND one (1) POSTER) presentation at ICMCTF****

ORAL Sessions: Rooms will be set up with projectors, screens, microphones, and laptops (PCs).

POSTER Sessions: Each poster presenter will be allotted space that is 4 feet wide by 4 feet high. Please make your poster no larger than 46 inches wide by 46 inches high to ensure it fits nicely into the allotted space.

Any Questions? Please email **icmctf@icmctf.org**