



ICMCTF 2027

53rd International Conference on Metallurgical Coatings and Thin Films

APRIL 25-30, 2027 | SAN DIEGO, CA



CALL FOR ABSTRACTS

The International Conference on Metallurgical Coatings and Thin Films (ICMCTF) is recognized as the premier international conference in thin film deposition, characterization, and advanced surface engineering. It provides a unique forum for scientists, engineers, and technologists from academia, government laboratories, and industry to present their latest findings, exchange ideas, share insights, establish collaborations, and strengthen long-standing connections within our international community.

The **53rd International Conference on Metallurgical Coatings and Thin Films (ICMCTF 2027)** will be held from **April 25-30, 2027**, at the Town and Country Resort in San Diego, California, USA. Under the overarching theme **“Surface Engineering Shaping Future Technologies,”** the conference will highlight the essential role of coatings, thin films, and engineered surfaces in enabling emerging technologies and supporting sustainable development. Particular emphasis will be placed on advanced energy systems, sustainable and circular surface solutions, materials performance in extreme environments, emerging thin films for computing technologies, and functional surfaces for healthcare, biotechnology, food, and agriculture.

The 2027 technical program will feature more than 100 high-profile invited speakers across 25+ sessions. It will span the full spectrum of surface engineering, from plasma and vapor deposition processes to protective and high-temperature coatings, functional thin films and surfaces, tribology and mechanics, and surface engineering for biomaterials, devices, and regenerative materials. Further symposia will address advanced characterization, modelling and data science, as well as applied research and industrial applications. A dedicated Sustainable Surface Engineering program will focus on coatings for batteries and hydrogen applications, as well as on coatings and surfaces for renewable energy technologies.

Several Topical Symposia and Special Sessions will complement the core technical program. “Promoting Women in Surface Engineering” will highlight scientific excellence, leadership, and diversity within our community. Memorial Sessions will celebrate the scientific legacies of Jindřich Musil and Steven Muhl, while Honorary Sessions will recognize the outstanding contributions of Christian Mitterer and Jia-Hong Huang. A dedicated session on “Thin Films in Microelectronics” will explore the rapidly growing importance of advanced thin-film materials and processes for future computing and electronic technologies.

One conference highlight will be the plenary lecture by Univ.-Prof. Ulrike Diebold, Vice President of the Austrian Academy of Sciences and Professor for Surface Science at TU Wien. The Exhibit Keynote Lecture will be delivered by Dr.-Ing. Tobias Brögelmann of Ionbond | IHI Group, providing an important industrial perspective on the role of surface engineering in future technologies. Together with additional keynote lectures, the plenary and exhibit keynote will be among the week's major scientific highlights.

In addition to the scientific program, ICMCTF 2027 will feature an industrial exhibition showcasing the latest equipment, materials, services, and emerging technologies for the deposition, monitoring, characterization, and application of coatings and thin films. The ICMCTF Academy will offer Short Courses throughout the week. At the same time, daily networking events will provide numerous opportunities to meet colleagues, establish new collaborations, reconnect with long-time friends, and welcome the next generation of surface engineering researchers.

A special convocation ceremony will honor the recipients of the R.F. Bunshah Award and the Bill Sproul Award, together with the outstanding Graduate Student Award winners. The accompanying festive reception remains one of the conference's most memorable occasions, bringing together established leaders, early-career researchers, students, and industry representatives from across the international surface engineering community.

High-quality scientific and technical contributions presented at ICMCTF 2027 will again be considered, following peer review, for publication in dedicated Special Issues of the leading Q1 journals *Surface and Coatings Technology* (IF 6.9) and *Vacuum* (IF 4.3). The Special Issues offer important benefits, including one year of open access, rapid online publication following acceptance, and the selection of outstanding contributions as Editor's Picks. Authors are strongly encouraged to submit manuscripts based on their conference presentations by June 30, 2027.

The Town and Country Resort, located in sunny San Diego, will once again provide a welcoming and inspiring setting for scientific discussions, networking, and the exchange of new ideas. As we celebrate new research, long-standing friendships, and many shared memories, **ICMCTF 2027 will also mark an exciting moment as our conference community prepares to set sail toward new destinations.**

We warmly invite you to join us in San Diego and help shape the future of surface engineering and thin film technologies. We look forward to receiving your abstract by October 30, 2026, and to welcoming you to ICMCTF 2027! Submit your abstract [HERE!](#)

Helmut Riedl
2027 Program Chair

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PROGRAM COMMITTEE

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

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

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

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CM3: Data-Driven Thin Film Design: High-Throughput Experimentation, Simulation, and Machine Learning

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SYMPOSIUM MB (Materials B): FUNCTIONAL THIN FILMS AND SURFACES

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MB1: Optical Materials and Thin Films

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MB2: Thin Films for Emerging Electronic and Quantum Photonic Devices

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SYMPOSIUM PP: PLASMA AND VAPOR DEPOSITION PROCESSES

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Symposium Chair: Yen-Hsun Su, National Cheng Kung University (NCKU), Taiwan, yhsu@mail.ncku.edu.tw
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PP1: PVD Coating Technologies

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PP2: HiPIMS, Pulsed Plasmas and Energetic Deposition

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PP3: CVD, ALD, and Laser-based Deposition & Microfabrication Technologies

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PP4: Greybox Models for Process and Film Performance Prediction

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SYMPOSIUM MA: PROTECTIVE AND HIGH-TEMPERATURE COATINGS

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Symposium Chair: Jyh-Wei Lee, Ming Chi University of Technology, Taiwan, jefflee@mail.mcut.edu.tw
Symposium Chair: Francisco Javier Pérez-Trujillo, Universidad Complutense de Madrid, Spain, fjperez@ucm.es

MA1: Coatings for High Temperatures and Harsh Environment Applications

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MA2: Hard & Nanostructured Coatings

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MA3: High Entropy and Other Multi-principal-element Materials

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MA4: Boron-containing Coatings
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SYMPOSIUM MC: TRIBOLOGY AND MECHANICS OF COATINGS AND SURFACES

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Symposium Chair: Carsten Gachot, Vienna University of Technology, Austria, carsten.gachot@tuwien.ac.at
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MC1: Friction, Wear, Lubrication Effects, and Modeling

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MC2: Tribology of Coatings and Surfaces for Industrial Applications

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SYMPOSIUM MD: SURFACE ENGINEERING OF BIOMATERIALS, MEDICAL DEVICES, AND BIOINTERFACES FOR HEALTHCARE, FOOD, AND AGRICULTURE

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Symposium Chair: Hamdy Ibrahim,
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Symposium Chair: Mathew T. Mathew,
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**MD1: Coatings and Surfaces for
Medical Devices: Mechanical,
Corrosion, Tribocorrosion and Surface
Processing**

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**MD2: Coatings and Sensors for
Healthcare, Food, Agriculture:
Antibacterial, Bioactive, and Flexible
Interfaces**

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**SYMPOSIUM IA: SURFACE
ENGINEERING - APPLIED
RESEARCH AND INDUSTRIAL
APPLICATIONS**

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Symposium Chair: Fan-Yi Ouyang, National
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**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
Tool Applications**

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**SYMPOSIUM SSE: SUSTAINABLE
SURFACE ENGINEERING**

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**SSE1: Coatings for Batteries and
Hydrogen Applications**

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**SSE2: Coatings and Surfaces for
Renewable Energy Technology**

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**SYMPOSIUM TS: TOPICAL AND
SPECIAL SESSIONS SYMPOSIUM**

Symposium Chair: Helmut Riedl, TU
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**TS1: Promoting Women in Surface
Engineering**

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TS2: Memorial Session for Jindřich Musil

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TS3: Memorial Session for Steven Muhl

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**TS4: Honorary Session for Christian
Mitterer**

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Michael Stüber, Karlsruhe Institute of Tech.,
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TS5: Honorary Session for Jia-Hong

**Huang: Mechanical Behavior of
Transition Metal Nitride Coatings**

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Ivan Petrov, University of Illinois at Urbana-
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**TS6: Thin Films in Semiconductor,
Optoelectronic, and Flexible Devices**

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TOPICS & SESSIONS

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 focuses on advanced spatially resolved methods for characterizing the structure, chemistry, composition, and microstructure of thin films, coatings, interfaces, and engineered surfaces. Particular emphasis is placed on approaches that deepen the understanding of film growth-structure relationships, local heterogeneity, interface formation, and microstructural evolution. Contributions on 2D- and 3D- characterization of small volumes are especially encouraged, including APT, analytical and high-resolution TEM, FIB/SEM and FIB/EBSD tomography, ToF-SIMS 3D mapping, correlative microscopy, and multimodal reconstruction methods. The session also welcomes in situ and operando studies of structural, chemical, and microstructural evolution during growth, processing, or post-deposition treatments. Relevant methods include ellipsometry, X-ray and neutron diffraction, scattering and reflectometry, micro-Raman spectroscopy, and other spatially, temporally, or depth-resolved techniques. Studies involving mechanical, thermal, electrical, chemical, or environmental stimuli are within scope when the primary objective is to reveal changes in structure, composition, phases, defects, interfaces, or morphology, rather than to measure mechanical or physical properties.

CM1 Invited Speakers:

Vivek Devulapalli, Empa, Switzerland

Lorenzo Rigutti, Université de Rouen Normandie, France

Peter Schweizer, MPI for Sustainable Materials, Germany, "In Situ TEM Characterization of Defects in Thin Films"

Matthijs Van Spronsen, Diamond Light Source, UK

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

Modern applications require advanced materials that combine properties often seen as mutually exclusive, such as high strength and ductility, while also resisting wear, fatigue, fracture, and extreme environments in combination with functional properties. In this context, this session focuses on cutting-edge mechanical and mechanical-physical characterization techniques for surfaces, interfaces, thin films, coatings, and small-scale materials. Emphasis is placed on the development and application of novel methods that probe mechanical properties as well as electrical, thermal, magnetic, and interfacial properties, and/or exploring their interconnection with the mechanical behavior. Contributions that introduce innovative nanoindentation and micro- and nano-mechanical approaches and advanced physical characterization – particularly on coatings, thin films, and near-surface regions, including those prepared by focused ion beam (FIB) or other lithographic techniques – are highly encouraged. Studies that provide quantitative determination of mechanical properties, residual stresses, interface adhesion, fatigue, and fracture toughness as well as studies that investigate relationships between microstructure and physical properties are particularly relevant. The coupling of mechanical/physical testing –such as in situ experiments within SEM, TEM, Raman, and X-ray beamlines – are also welcome. Moreover, we especially invite papers that explore characterization under non-ambient and extreme conditions, including high and cryogenic temperatures, radiation exposure, hydrogen environments, cyclic loading, and high strain rates. By integrating advanced experiments and characterization, the symposium aims to provide a comprehensive platform for understanding, predicting, and qualifying advanced materials from a truly multi-properties and multiscale scale perspective.

CM2 Invited Speakers:

Anwasha Kanjilal, Max Planck Institute for Sustainable Materials, Germany

Eugen Rabkin, Technion Israel Institute of Technology, Israel

Eric Hintsala, Bruker Hysitron, Inc., USA

Jutta Luskch, University of Saarland, Germany, "Micromechanical Fatigue of Nanostructured Metal Thin Films"

CM3: Data-Driven Thin Film Design: High-Throughput Experimentation, Simulation, and Machine Learning

This session explores the synergistic integration of high-throughput experimentation, advanced computational methods, and data-driven approaches for accelerated thin film and coatings development. On the one hand the

session will cover the full spectrum of accelerated materials development from rapid materials synthesis—such as combinatorial or autonomous thin film deposition—to automated characterization techniques and the efficient management and analysis of large experimental datasets. Contributions are invited on recent advances in high-throughput research methods, including the application of data science, machine learning, and artificial intelligence to experimental workflows. On the other hand, the session covers computational and simulation tools as well as data science approaches for knowledge-based materials design and discovery. Here, topics of interest include the use of simulations and machine learning to understand material structures and properties across scales, rapid screening of compositional landscapes, and the generation, curation, and exploration of big materials data from both experiments and computations. By bridging experimental high-throughput synthesis, characterization, and computational modeling, this session aims to showcase the latest developments and foster interdisciplinary collaboration in data-driven thin film design.

CM3 Invited Speakers:

Taylor Sparks, University of Utah

CM4: Advanced Characterization, Modelling and Data Science for Coatings and Thin Films Poster Session

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

This symposium addresses functional thin films and surfaces for applications in optics and photonics, electronics, quantum technologies, sensors, flexible and bio-integrated devices, and other emerging technologies. It focuses on the design, synthesis, characterization, and integration of thin films, coatings, nanostructures, heterostructures, and free-standing architectures whose functionalities arise from tailored composition, electronic structure, interfaces, or dimensionality. Particular emphasis is placed on fundamental processing-structure-property relationships, emerging deposition and manufacturing approaches, advanced characterization and modelling, and the translation of novel materials into products and devices.

MB1. Optical Materials and Thin Films

Modern optical and photonic technologies place increasingly demanding requirements on material synthesis, architecture, and performance. This session focuses on the design, synthesis, characterization, and application of optical thin films, coatings, and low-dimensional materials and structures, including 2D and 1D materials, nanoclusters, nanoparticles, heterostructures, and nanostructured surfaces. Contributions addressing the control of light-matter interactions, processing-structure-property relationships, and emerging concepts for optical, photonic, optoelectronic, sensing, imaging, and light-harvesting applications are particularly encouraged. Relevant characterization approaches include spectrophotometry, ellipsometry, scatterometry, interferometry, vibrational spectroscopy, near-field microscopy, and time-resolved optical techniques. Experimental, theoretical, and computational contributions are welcome.

MB1 Invited Speakers:

Péter Dombi, HUN-REN Wigner Research Centre for Physics, Hungary

Mateusz Rebarz, ELI Beamlines, ELI ERIC, Czechia

MB2. Thin Films for Emerging Electronic and Quantum Photonic Devices

This session explores functional thin films, low-dimensional materials, interfaces, and heterostructures for emerging electronic and quantum photonic devices. Contributions are invited on 2D, 1D, and 0D material systems, nanostructures, nanoclusters, nanoparticles, organic and polymeric materials, and other functional materials exhibiting tailored electronic, optical, piezoelectric, magnetic, superconducting, or electromechanical properties. Particular emphasis is placed on thin-film growth and interface engineering to control electrical and thermal transport, optical response, mechanical and thermal stability, and device functionality. Application areas include beyond-CMOS electronics, quantum light sources and photonic circuits for communication, sensing, and computing, advanced sensors, low-power and IoT devices, solid-state lighting, flexible electronics and displays, MEMS, bioelectronics, biosensors, and emerging AI hardware. The session also welcomes advances in scalable, cost-effective, and sustainable deposition and manufacturing methods - including vacuum-based, solution-based, and printing technologies - together with innovative approaches to materials and device characterization, reliability, and performance assessment.

MB2 Invited Speakers:

Jiří Olejníček, Institute of Physics of the Czech Academy of Sciences Division of Optics, Czechia

MB3: Functional Thin Films and Surfaces Poster Session

Symposium PP: Plasma and Vapor Deposition Processes

Symposium PP covers cutting-edge developments in plasma and vapor deposition technologies for advanced thin film synthesis and surface engineering. Topics include innovations in PVD, CVD, and plasma-assisted methods, along with in-situ diagnostics, plasma-surface interactions, and simulation-driven process control. The symposium also highlights emerging approaches such as data-enabled process optimization and greybox modeling, which combine physical and machine learning models to improve predictions of coating performance and wear behavior. Applications span protective coatings, electronics, energy, and biomedical devices, bridging fundamental research with industrial impact.

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, carbon-based coatings, high-temperature wear, erosion-, and corrosion-resistant coatings, optical layers, biomaterials, decorative coatings, and materials for energy applications.

PP1 Invited Speakers:

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, 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:

PP3. CVD, ALD, and Laser-based Deposition & Microfabrication Technologies

This session explores thin film deposition and microscale fabrication techniques based on chemical vapor deposition (CVD), atomic layer deposition (ALD), and laser/plasma-assisted methods. The processes covered include LPCVD, MOCVD, PECVD, PEALD, and laser/plasma-based structuring, enabling functional coatings, selective area processing, and nanostructured interfaces. Topics include novel precursors, in situ diagnostics, surface engineering, and multiscale modeling. Contributions addressing the theoretical modeling of the role of lasers and plasmas in chemical reactions that govern the film growth are also encouraged. The session highlights interdisciplinary strategies for structuring and engineering surfaces at micro- and nanoscales, enabling applications in electronics, energy, catalysis, and biomaterials.

PP3 Invited Speakers:

PP4. Greybox Models for Process and Film Performance 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 the 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 into "Greybox" models. This offers great potential to improve the prediction accuracy of wear and remaining service life. The session welcomes contributions that address

the 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.

PP4 Invited Speakers:

Jan Trieschmann, UNI Kiel, Germany, "Machine Learning Enhanced Plasma Simulations: From Plasma Processing to Thin Film Properties"

PP5: Plasma and Vapor Deposition Processes Poster Session

Symposium MA: 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, which obtain unique chemical and physical properties, are of interest. The application areas span the energy generation, the aviation sector as well as the machining industry, highlighting new developments towards zero GHG emission and sustainability.

MA1. Coatings for High Temperatures and Harsh Environment Applications

This session focuses on the design, development, synthesis, and performance of coatings intended to resist high-temperature oxidation, corrosion, and fouling. This includes protective coatings as well as thermal and environmental barrier coatings, which are crucial components in advanced technologies such as steam, gas and hydrogen turbines, jet engines, concentrated solar power plants (CSP), advanced nuclear reactors, petrochemical and gasification plants, waste incinerators, metal-forming, recycling industries and solid oxide fuel cells (SOFC) and electrolyzers (SOEC) for hydrogen production. The demand for effective solutions is heightened in harsh environments characterized by exposure to steam, supercritical carbon dioxide (SCO₂), molten salts, liquid metals, hydrogen, ammonia, biofuels, and similar substances. The research challenges involve coating development, process optimization, and the exploration of innovative processing techniques. Key areas of focus include the characterization of coatings and reaction products, understanding degradation mechanisms, modelling fabrication and degradation processes, and assessing the lifetime and performance under operationally relevant conditions (including atmosphere, stress, cycling, erosion, abrasion, and CMAS attack).

MA1 Invited Speakers:

Christopher Berndt, Swinburne University, Australia

Tanvir Hussain, University of Nottingham, UK

Uwe Schulz, German Aerospace Center (DLR), Germany

Bobby Sethi, Cranfield University, UK

Mike Tucker, Lawrence Berkeley Laboratory, USA

MA2. 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 modelling, and applications, as well as the development and use of novel characterization techniques, bridging both theoretical and practical aspects of hard and smart coatings.

MA2 Invited Speakers:

Daniel Kiener, Technical University of Leoben, Austria

MA3. 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, modelling, thin film processing, and characterizations of HEAs and other multi-principal-element materials.

MA3 Invited Speakers:

Leonardus Bimo Bayu Aji, Lawrence Livermore National Laboratory, USA, "High Entropy Alloy Coatings for Inertial Confinement Fusion Hohlraums"

Pascal Briois, Université de Technologie de Belfort-Montbéliard, France, "Application of PVD Technology to Enhance the Lifetime of Solid Oxide Fuel Cells"

Yin-Yu Chang, National Formosa University, Taiwan, "Effects of Periodic Nanomultilayer Architecture on the Thermal Stability and High-Temperature Oxidation Resistance of Al-Cr-Ti-Nb-Si Nitride Coatings"

Jean-Francois Pierson, Université de Lorraine, France, "Tuning the Physical Properties of Cantor Thin Films by the Chemical Composition and the Structure"

MA4. Boron-containing Coatings

Boride-based and boron-containing thin films are at the forefront of materials science due to their exceptional combination of properties. Renowned for their high hardness and superior resistance to wear, oxidation, and corrosion, these coatings provide critical protection in demanding operational environments. Furthermore, their unique optical, electronic, and thermal properties make them highly promising for a wide range of functional applications.

This session will bring together researchers, engineers, and industry professionals to share and discuss the latest developments in boride-based coatings and materials. The goal is to create a collaborative platform to explore and understand these materials, from initial concepts to practical implementation, by addressing key challenges and opportunities in the field, aiming to accelerate the development and application of advanced boride-based coatings. We welcome contributions on topics including, but not limited to: Synthesis and deposition, Advanced characterization, Applications, and Computational design.

MA4 Invited Speakers:

Naureen Ghafoor, Linköping University, Sweden

Kateryna Smyrnova, CENAM FMPI, Comenius University in Bratislava, Slovakia, "Exploring Structure-Property Relationships in HiPIMS-Deposited Boride Coatings"

MA5: Protective and High-Temperature Coatings Poster Session

Symposium MC: 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.

MC1 Invited Speakers:

Martin Dienwiebel, Karlsruhe Institute of Technology (KIT), Germany, "Numerical and Experimental Tribological Evaluation of Next-Generation Materials for Extreme Environments"

Dileep Singh, Argonne National Laboratory, USA, "Synchrotron X-Ray Characterizations for Materials and Coatings"

Emanuel Tack, Oerlikon Balzers Coating, Liechtenstein, "Digital Twin Approaches and Their Application to Gear and DLC-Related Tribology"

MC2. 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, production technology. Thin film coatings, diffusion treatments as well as 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.

MC2 Invited Speakers:

Stephen Brown, Polytechnique Montréal, Canada, "What Erodes, Why, and How to Stop It: Solid Particle Erosion in Aerospace Alloys and Protective Coatings"

Eli Ross, Pratt & Whitney, USA

MC3: Tribology and Mechanics of Coatings and Surfaces Poster Session

Symposium MD: Surface Engineering of Biomaterials, Medical Devices, and Biointerfaces for Healthcare, Food, and Agriculture

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, including health, food and agriculture. 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. Coatings and Surfaces for Medical Devices: Mechanical, Corrosion, Tribocorrosion and Surface Processing

This session focuses on coatings and surface engineering strategies for biomedical applications, including implants, medical devices, and surgical instruments. Contributions addressing surface modifications that enhance mechanical performance, corrosion, wear and tribocorrosion resistance, biocompatibility, osseointegration, cell proliferation, and tissue regeneration are particularly encouraged. The session also welcomes research on biofunctional surfaces that regulate biological responses, including thrombosis prevention, restenosis reduction, controlled ion release, smart drug delivery, implantable sensors, and diagnostic platforms. Both experimental and computational studies investigating the underlying mechanisms governing biomaterial-tissue interactions, as well as the in vitro and in vivo performance of coated biomaterials, are within the scope of the session. Clinical relevance, physiological responses, and the translation of advanced surface engineering concepts into biomedical applications are particularly encouraged.

Keywords: Coatings and Surface modifications of biomaterials, Corrosion, Tribology, Tribocorrosion, 3D printing/additive manufacturing, Implants, Retrieval studies, recent advancements in surface characterization techniques

MD1 Invited Speakers:

Shekhar Bhansali, Vanderbilt University, USA

Jose Daniel De Mello, Universidade Federal de Uberlândia, Brazil, "Tribology: Looking Back and Looking Ahead"

Amandine Impergre, Clemson University, USA, "Corrosion of Implants"

Zou Min, University of Arkansas, USA, "Coatings"

Johnson V. Johnson, Terasaki, USA, "Regenerative Engineering"

MD2. Coatings and Sensors for Healthcare, Food and Agriculture: Antibacterial, Bioactive and Flexible Interfaces

This session focuses on bioactive coatings, functional surfaces, biointerfaces, and biosensors that control and exploit interactions between biological systems and engineered materials for applications in healthcare, food, and agriculture. Surface properties - including chemistry, topography, mechanical properties, wettability, and electrochemical characteristics - play a fundamental role in regulating cell, protein, and bacterial responses, enabling the development of multifunctional surfaces with tailored biological performance. Contributions addressing antibacterial and antifouling coatings, bioinspired and biomimetic surfaces, regenerative biomaterials, tissue engineering, smart diagnostic platforms, implantable and wearable sensors, flexible bioelectronics, and controlled biological interfaces are particularly encouraged. The session also welcomes research on advanced manufacturing approaches, including additive manufacturing and 3D bioprinting, functionally graded biomaterials, computational modeling, artificial intelligence, and data-driven design of biomaterials and biointerfaces. Both fundamental studies of cell-material interactions and application-driven developments for healthcare, food safety, agriculture, and environmental biotechnology are within the scope of the session.

Keywords: Biocompatibility, Antibacterial properties, Biointerfaces, Cell-Material interaction pathways and Mechanisms, Regenerative materials and surfaces, Tissue engineering, 3D Bioprinting, Computational model and AI-driven biomaterials, Biosensors and diagnostic devices.

MD2 Invited Speakers:

Nicola Cioffi, University of Bari, Italy

Yuan-Pang Hsien, National Taiwan University of Science and Technology, Taiwan

Huinan H. Liu, University of California, Riverside, USA

Shalini Prasad, University of Texas at Dallas, USA

Renu Vyas, MIT ADT University, India

MD3: Surface Engineering of Biomaterials, Medical Devices and Biointerfaces for Healthcare, Food and Agriculture 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, Processes, and Coatings

The scope of this session is on industry sponsored research work performed by academia, applied research work performed by research laboratories, and academia. One focus is on companies that can present current status and achievements, as well as to address future development trends. Academic institutions are highly encouraged to present results of background research or contributions aimed at the development of the 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:

Frank Papa, GP Plasma, USA, "An Evolution of Plasma Based Technologies for Surface Engineering Challenges"

Gustaf Sjoblom, Alleima Materials Technology AB, Sweden, "On the Performance of PVD Coated Metal Coils for Fuel Cell Applications"

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

This session will cover industrial 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 along with their performance. 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:

Yip-Wah Chung, Northwestern University, USA, "Unconventional Strategies for Wear-Protective Coatings in Lubricated Sliding"

Markus Esselbach, Oerlikon, Germany, "New Surface Treatment Solutions for High Performance Applications"

Herbert Gabriel, PVT, Germany, "High Volume Production of PVD Coatings for the Hydrogen economy - Applications, Testing and Production"

Shrikant Joshi, University West, Sweden, "Single-step, Powder-Free, and Scalable: Solution Precursor Plasma Spraying for Next-Generation Oxide Coatings"

Suneel Kodambaka, Virginia Tech, USA, "Crystalline Thin Film Growth on Molten Surfaces: In Situ Scanning Electron Microscopy Study"

Joerg Vetter, S3 Consulting, Germany, "Magnetron Sputtering for Friction and Wear Reduction: The Evolution to High Power Density Pulsed Dc Magnetron Sputtering (HiPIMS) Solutions in Industrial Scale"

IA3: Innovative Surface Engineering for Advanced Cutting and Forming Tool 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 Arc PVD, Sputtering, HIPIMS, hybrid processes, 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 benefitted 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:

Christian Dipolt, RÜBIG Anlagentechnik, Germany

Julia Janowitz, IHI Hauzer Techno Coating B.V., Netherlands, "From Arc to HiPIMS: Shaping Industrial Tool Coatings at Hauzer"

IA4: Surface Engineering – Applied Research and Industrial Applications Poster Session

SYMPOSIUM SSE: SUSTAINABLE SURFACE ENGINEERING

This symposium highlights the growing importance of integrating state-of-the-art surface engineering with sustainability. The sessions on batteries, hydrogen technologies, catalysis, and energy conversion contribute to the development of sustainable energy systems and directly support the United Nations Sustainable Development Goals (SDGs), particularly SDG 7 (Affordable and Clean Energy), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action).

SSE1. Coatings for Batteries and Hydrogen Applications

The transition towards sustainable energy systems relies on advanced electrochemical technologies for energy storage and hydrogen production. Surface engineering and advanced coatings play a crucial role in improving the performance, durability, efficiency, and safety of these systems by tailoring interfaces and functional surfaces. This

session focuses on coatings, thin films, and surface functionalization for batteries and hydrogen technologies, including electrode coatings, catalyst layers, membrane and separator functionalization, current collectors, diffusion barriers, protective coatings, and interface engineering. Contributions addressing coating synthesis, surface modification, degradation mechanisms, corrosion protection, operando characterization, and computational approaches for electrochemical energy devices are particularly encouraged.

SSE1 Invited Speakers:

Lukas Gröner, Fraunhofer-Institut für Werkstoffmechanik IWM, Germany

Vincenc Nemanič, Jožef Stefan Institute, Slovenia

Krishnakant Tiwari, Ming Chi University of Technology, Taiwan , "Development of Functional High-Entropy Alloy Thin Films for Sustainable Energy Storage Applications"

SSE2. Coatings and Surfaces for Renewable Energy Technology

Renewable energy production, industrial decarbonization, and pollution reduction are gaining attention as essential to address contemporary challenges for a sustainable future. This session seeks to establish a collaborative environment for researchers to present and share recent advancements in energy harvesting technologies and their applications for fostering a more sustainable tomorrow. It is specifically devoted to discussing materials and devices developed for various forms of energy conversion, including thermoelectric, (photo)electrochemical, and mechanical energy conversion and further to self-generating sensors or wearable technology. It includes the direct conversion from natural energy sources to electricity or the conversion from natural energy sources to fuels later used in other technology (e-/solar fuel generation). It encompasses both theoretical and experimental research pertaining to the design and processing of these systems.

We welcome contributions for the following topics: Thermoelectric power generation, Solar-driven chemical energy conversion, photo(electro)catalysis, or solar fuel generation Triboelectric/Piezoelectric nanogenerators, Self-generating sensors and Self-generating wearable technology.

SSE2 Invited Speakers:

Adriana Creatore, Eindhoven University of Technology, Netherlands, "How Next-Generation Energy Storage Technologies Challenge Atomic Layer Deposition"

André Luis de Jesus Pereira, Instituto Tecnológico de Aeronáutica (ITA), Brazil, "Engineering WO_x Thin Films for Enhanced Photoelectrochemical Hydrogen Production: The Role of Nanoarchitecture and Defect Control"

Venkatasubramanian Rama, Johns Hopkins University, USA, "Nano-engineered Thin-film Thermoelectric Materials and Devices - Applications from Practical Refrigeration to Electronics Cooling to Prosthetics"

Mohammed Jassim Uddin, SUNY Polytechnic Institute, USA, "The Chemical Design of Functional Surface Using Advanced Oxides for Green Energy Generation"

SSE3: Sustainable Surface Engineering Poster Session

Symposium TS: Topical and Special Sessions Symposium

The Topical and Special Sessions Symposium reflects both the future and the strong community tradition of ICMCTF. In 2027, it features one timely technical focus on thin films in microelectronics and semiconductors, complemented by a session promoting women in surface engineering and several honorary and memorial sessions celebrating outstanding contributions to the field and remembering distinguished members of our community. Together, these sessions pay tribute to the many years of scientific exchange, personal connections, and shared memories at the Town & Country Resort in San Diego, while looking ahead toward new and exciting destinations for ICMCTF.

TS1. Promoting Women in Surface Engineering

This session highlights the excellence of women in research and development in surface engineering through a cross-disciplinary format, encompassing all topics covered at ICMCTF, including plasma and vapor deposition processes, protective coatings and high temperature materials, functional thin films and surfaces, tribology and coating mechanics, biomaterials, medical devices and regenerative materials, advanced characterization, modelling and data science, as well as applied research and industrial applications such as batteries and hydrogen technologies, and surfaces for renewable energy. The aim is to provide high visibility to women in surface engineering, who are underrepresented among previous ASED chairs, ICMCTF program chairs and Bunshah and Bill Sproul awards, and to promote the next generation of women leaders in this field.

TS1 Invited Speakers:

Caroline Adam, Kiel University, Germany, "Hybrid HiPIMS/RF Discharges for Energetic Thin Film Growth"

Katherine Burzynski, Air Force Research Laboratory, USA, "From Lab to Fab: Manufacturing Challenges in GaN Thin Film van der Waals Transfer"

Emmanuelle Göthelid, AB Sandvik Coromant, Sweden, "Leading Innovation in Surface Engineering: Industrial Perspectives on Advanced CVD Coatings for Machining Applications"

Ray-Hua Horng, National Yang Ming Chiao Tung University (NYCU), Taiwan, "AlScN Grown by HiPIMS and Relative Device Applications"

Shuyao Lin, TU Wien, Austria, "Bridging Atomistic Insights and Structural Design: Phase-Dependent Mechanics of Transition Metal Diborides"

Juliane Ribeiro da Cruz Alves, University of São Paulo, Brazil, "Corrosion Resistance of Thermally Sprayed Cermet Coatings"

Johanna Rosén, Linköping University, Sweden, "From Thin Films to 2D Materials – Scalable and Sustainable Materials Synthesis from Theoretical and Experimental Perspectives"

Alice Todeschini, Politecnico di Milano, Italy, "Mapping MEMS Thin Film Stress: Wafer-Level Analysis of Micro-Mechanical Structures"

Wan-Yu Wu, National United University, Taiwan, "Engineering Functional Thin Films by HiPIMS: Bridging Plasma Science and Applications"

TS2. Memorial Session for Jindřich Musil

This session is dedicated to the memory of Professor Jindřich Musil, who significantly advanced our understanding of plasma physics and plasma technologies. His distinguished career yielded pioneering contributions which have had a profound and lasting impact on the field. By bringing together researchers working on related topics, the session both honors his remarkable contributions and highlights the continuing relevance of the ideas he helped to shape.

TS2 Invited Speakers:

André Anders, Plasma Engineering LLC, USA, "How Do Ions Actually Gain Their Intrinsic Energy in Cathodic Arcs?"

Ali Erdemir, Texas A&M University, USA, "The Promise of Multi-Functional Nanocomposite Coatings in Overcoming Tribological Challenges Under Extreme Conditions"

Jyh-Wei Lee, Ming Chi University of Technology, Taiwan, "Toward the Development of Nanocomposite Coatings through Alloy Selection and Design"

David McKenzie, University of Sydney, Australia, "The Role of Ab Initio Simulation of the Thermal Spike Event in Ion Assisted Deposition of Thin Films"

Christian Mitterer, Montanuniversität Leoben, Austria, "Engineering Surfaces: From Hard Coatings to Smart Functionality for Emerging Applications"

Sven Ulrich, Karlsruhe Institute of Technology, Germany, "Coating System Independent Process Parameters for the Successful Development of PVD Coatings"

Andrey A. Voevodin, University of North Texas, USA, "Wear Resistant and Environmentally Adaptive Nanocomposite Coatings"

Jiří Vyskočil, HVM Plasma, Czechia, "45 Years of Sputtering: From First DC Magnetron of Jindřich Musil to Reactive Dual HiPIMS in Industrial Equipment"

TS3. Memorial Session for Steven Muhl

It is with a mix of deep respect and fond remembrance that we invite you to participate in a special commemorative symposium celebrating the life, academic achievements, and enduring legacy of our dear colleague, mentor, and friend, Dr. Steven Muhl. For over four decades, Steve was a pioneering force in materials science, particularly in the fields of thin films, magnetron sputtering, plasma studies, and tribology. From his innovative paradigm for the Hollow Cathode Effect to the development of highly original deposition systems, his technical ingenuity and rigorous experimental approach left a profound mark on our field. Furthermore, his tireless dedication to building scientific infrastructure and forming generations of researchers made him a foundational pillar of materials science at the UNAM and throughout Mexico. Beyond his remarkable intellect and his publications and patents, we remember Steve for his unparalleled generosity. He was a collaborative spirit who always had time to dissect a baffling experimental anomaly, a dedicated mentor to countless students, and a steadfast friend to so many of us in the ICMCTF community. We invite you to join us in honoring his memory at this year's conference. We welcome scientific presentations that build upon his areas of research or stem from past collaborations, as well as personal anecdotes and reflections on the many ways he enriched our scientific community.

TS3 Invited Speakers:

Diederik Depla, Ghent University, Belgium, "Statistical View on Hardness Measurements"

Ali Erdemir, Texas A&M University, USA, "Innovative Surface Technologies for Extreme Tribological Applications"
Martin Flores, University of Guadalajara, Mexico, "Corrosion and Tribocorrosion Behaviour of Amorphous/Crystalline Multilayers Deposited by GHIPIMS on Biomedical Alloy CoCrMo and Bearing Steels 52100 and 4317"

Christopher Muratore, University of Dayton, USA, "Rethinking the Tools of Discovery: Advanced Thin Film Metrology from Obsolete Electronics"

Phaedra Silva-Bermudez, Instituto Nacional de Rehabilitación, Mexico, "Magnetron-Sputtered Metal Oxide Thin Films as Functional Coatings for Tailoring Surface Properties and Modulating Biological Response"

TS4. Honorary Session for Christian Mitterer

This honorary session recognizes the pioneering fundamental and seminal interdisciplinary contributions and lifetime achievements of Professor Christian Mitterer to the design, synthesis and atomistic-level understanding of the correlation of microstructure and properties of functional materials, surfaces and thin films and coatings for multiple breakthrough industrial applications.

TS4 Invited Speakers:

Mark Baker, University of Surrey, UK, "Femtosecond Laser Ablation XPS (fs-LA XPS) Depth Profiling: A Novel Chemical Characterization Method for Surface Engineering Applications"

Lars Hultman, Linköping University, Sweden, "Nanostructure Design of Functional Ceramic Films"

Ludvik Martinu, Polytechnique Montréal, Canada, "High-Performance Multifunctional Coatings Through Interface and Residual Stress Management"

Paul Mayrhofer, Technical University of Vienna, Austria, "From Structure-Property Relationships to Defect Engineering: A Three-Decade Journey in Protective Coatings Inspired by Christian Mitterer"

Nina Schalk, Montanuniversität Leoben, Austria, "Refractory Metal-Based Coatings for Hydrogen Barrier Applications"

Jochen Schneider, RWTH Aachen University, Germany, "Designing Coating Materials for Stability in Harsh Environments"

Andrey A. Voevodin, University of North Texas, USA, "In-Situ Raman Spectroscopy of Tribological Interfaces"

TS5. Honorary Session for Jia-Hong Huang: Mechanical Behavior of Transition Metal Nitride Coatings

Professor Jia-Hong Huang has dedicated his career to teaching, research, and social service. His research spans from hydrogen embrittlement in metals to thin film technology for transition metal-nitride (TMN) hard coatings. This includes film deposition processes, structural characterization, and tribological behavior, as well as the evaluation of mechanical properties such as residual stress and fracture toughness. Specifically, he has proposed several innovative methods for evaluating the mechanical behavior of TMN coatings. These include accurate stress measurement via the $\cos^2\alpha\sin^2\psi$ X-ray diffraction (XRD) and average X-ray strain (AXS) methods, fracture toughness measurement via the internal energy-induced cracking (IEIC) method, and the assessment of energy relief efficiency in metal interlayers using an energy-balance model. These methodologies have significantly advanced the understanding of hard coating mechanics and improved precision control in coating manufacturing. Furthermore, he pioneered a methodology combining the design of experiments (DOE) with single-variable methods to optimize coating deposition processes. His contributions to thin film technology have earned him international recognition and continue to significantly influence his peers in the field.

TS5 Invited Speakers:

Matteo Ghidelli, LSPM/CNRS, University Sorbonne, France, "Novel Nanoengineering Concept in Thin Film to Overcome the Strength-Plasticity-Thermal Stability Trade Off"

Bo-Shiuan Li, National Sun Yat-sen University, Taiwan, "Investigation of Fracture Behaviour in Highly-Stressed Coatings Using Nanomechanical Approaches"

Ming-Tzer Lin, National Chung Hsing University, Taiwan, "Residual Stress Profiling in Thin-Film Architectures: Advancing Ring-Core FIB-DIC Analysis"

Fan-Yi Ouyang, National Tsing Hua University, Taiwan

Zaoli Zhang, Erich Schmid Institute, Austrian Academy of Sciences, Austria

TS6. Thin Films in Semiconductor, Optoelectronic, and Flexible Devices

This session focuses on the design, deposition, characterization, modeling, and integration of thin films for semiconductor, optoelectronic, and flexible electronic devices. Topics include functional materials for transistors, integrated circuits, memory devices, sensors, photonic and optoelectronic components, flexible and wearable

electronics, as well as advanced semiconductor manufacturing and packaging technologies. The session covers the relationships among deposition processes, composition, microstructure, defects, interfaces, and the resulting electrical, optical, mechanical, and thermal properties of thin films. The session also highlights novel characterization techniques, in situ and operando diagnostics, multiscale modeling, reliability and performance assessment, and industrial perspectives on thin-film technologies for next-generation semiconductor and electronic devices, bridging fundamental materials science with practical device applications.

TS6 Invited Speakers:

Ying-Hao Chu, National Tsing Hua University, Taiwan, "van der Waals Epitaxy of Bi₂O₂Se for Advanced Semiconductor Devices"

Shih-Nan Hsiao, Nagoya University, Japan

Dong-Sing Wu, National Chi Nan University, Taiwan

Radek Žemlička, EVATEC AG, Switzerland, "HiPIMS with Synchronized RF Bias Combined with Complementary Directional Sputtering Strategies for Patterned Semiconductor Features"

TS1P: Promoting Women in Surface Engineering Poster Session

TS2P: Memorial Session for Jindřich Musil Poster Session

TS3P: Memorial Session for Steven Muhl Poster Session

TS4P: Honorary Session for Christian Mitterer Poster Session

TS5P: Honorary Session for Jia-Hong Huang Poster Session

TS6P: Thin Films in Semiconductor, Optoelectronic, and Flexible Devices Poster Session

SPECIAL SESSIONS & EVENTS

Plenary Lecture (PL)

***ULRIKE DIEBOLD, Univ.-Prof. Dr. techn. Dr. h.c. Vice President, Austrian Academy of Sciences
Professor of Surface Science, TU Wien***

Monday, April 26, 2027, 8:00 a.m.

Exhibitors Keynote Lecture (EX)

TOBIAS BRÖGELMANN, Dr.-Ing.

Global Product Manager Medical & Innovation Lead Engineer, Ionbond | IHI Group

"50+ Years of Enabling Performance Through Thin Film Expertise"

Tuesday, April 27, 2027, 11:00 a.m.

'FIRST TIMERS' SPECIAL

We want to welcome new participants in 2027 with a special 'First Timers' offer of **free student registration** for one student accompanying their adviser/supervisor registering for ICMCTF 2027 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 2027 General Chair, Sandra Rodil (srodil@unam.mx) if you have any questions regarding this opportunity.

ICMCTF VENDOR EXHIBIT

Visit the exhibit hall on Tuesday, April 27, from 12:00-7:00 p.m. and Wednesday, April 28, 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

- **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: October 30, 2026. Click here for [Nomination Procedures](#).

- **Bunshah Award:** The 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: October 30, 2026. Click here for [Nomination Procedures](#).
- **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: October 30, 2026. Click here for [Nomination Procedures](#).

ONLINE ABSTRACT SUBMISSION ONLY: <https://icmctf2027.avs.org/>

Deadline: 11:59 pm ET, Friday, October 30, 2026

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