Monday Morning, April 26, 2021

Live Session
Room Live - Session LI-MoM1
Coatings for Flexible Electronics and Bio Applications
Live Session
Moderators: Dr. Jean Geringer, Ecole Nationale Superieure des Mines, France, **Dr. Grzegorz (Greg) Greczynski**, Linköping University, Sweden, **Dr. Christopher Muratore**, University of Dayton, USA, **Dr. Barbara Putz**, Empa, Switzerland

10:00am	**LI-MoM1-1** ICMCTF Chairs' Welcome Address*, **G. Greczynski**,* Linköping University, Sweden*; C. Muratore,* University of Dayton, USA	
10:15am	**INVITED: LI-MoM1-2** Plenary Lecture: Organic Bioelectronics – Nature Connected*, **M. Berggren**,* Linköping University, Norrköping, Sweden	
10:30am		
10:45am		
11:00am	BREAK	
11:15am	**INVITED: LI-MoM1-6** Flexible Printed Sensors for Biomechanical Measurements*, **T. Ng**,* University of California San Diego, USA	
11:30am		
11:45am	**INVITED: LI-MoM1-8** Flexible Electronics: From Interactive Smart Skins to In vivo Applications*, **D. Makarov**,* Helmholtz-Zentrum Dresden-Rossendorf e. V. (HZDR), Institute of Ion Beam Physics and Materials Research, Germany	
12:00pm		
12:15pm	**INVITED: LI-MoM1-10** Biomimetic Extracellular Matrix Coating for Titanium Implant Surfaces to Improve Osteointegration*, **S. Ravindran**, P. Gajendrareddy, J. Hassan, C. Huang,* University of Illinois at Chicago, USA	
12:30pm		
12:45pm	**LI-MoM1-12** Closing Remarks & Thank You!*, **C. Muratore**,* University of Dayton, USA*; G. Greczynski,* Linköping University, Sweden, USA	

Live Session
Room Live - Session LI-MoM2
New Horizons in Boron-Containing Coatings Live Session
Moderators: Mr. Marcus Hans, RWTH Aachen University, Germany, **Dr. Helmut Riedl**, TU Wien, Institute of Materials Science and Technology, Austria

11:00am	**LI-MoM2-1** Welcome & Thank You to Sponsors, ***M. Hans,*** RWTH Aachen University, Germany*; H. Riedl,* TU Wien, Institute of Materials Science and Technology, Austria	
11:15am	**INVITED: LI-MoM2-2** Insights in the Structure, Defects and Stability of Mo_2BC Thin Films by Advanced Characterization Methods*, S. Gleich, R. Soler, B. Breitbach,* Max-Planck-Institut für Eisenforschung GmbH, Germany*; H. Bolvardi, J. Achenbach, J. Schneider,* RWTH Aachen University, Germany*; G. Scheu,* ***C. Scheu,*** Max-Planck-Institut für Eisenforschung GmbH, Germany	
11:30am		
11:45am	**INVITED: LI-MoM2-4** Metal Diborides Everywhere: Conformal Coating, Infilling, and Alloying by Low Temperature CVD, ***J. Abelson,*** University of Illinois at Urbana-Champaign, USA	
12:00pm		
12:15pm	**INVITED: LI-MoM2-6** A Progress Report on Bulk MAB Phases, ***M. Barsoum,*** Drexel University, USA*; S. Kota,* Drexel University, USA	
12:30pm		
12:45pm	**LI-MoM2-8** Closing Remarks and Sponsor Thank You!, ***H. Riedl,*** TU Wien, Institute of Materials Science and Technology, Austria*; M. Hans ,* RWTH Aachen University, Germany	

Live Session
Room Live - Session LI-TuM1
Surface Engineering - Applied Research and Industrial Applications Live Session
Moderators: Dr. Satish Dixit, Plasma Technology Inc., USA, **Dr. Christoph Schiffers**, CemeCon AG, Germany

10:00am	**LI-TuM1-1** Award Chair's Welcome Address, Introductions, & Thank You to Sponsors, ***I. Petrov,*** University of Illinois at Urbana-Champaign, USA	
10:15am	**LI-TuM1-2** Student Award Finalist Talk: Enhanced High-temperature Oxidation Resistance of Hard TiB_2-rich $Ti_{1-x}Al_xB_y$ Thin Films, ***B. Bakhit***[1], Linköping University, Sweden; *I. Petrov, J. Greene,* University of Illinois, USA, Linköping University, Sweden, USA; *L. Hultman, J. Rosen, G. Greczynski,* Linköping University, Sweden	
10:30am	**LI-TuM1-3** Student Award Finalist Talk: The Magneto-Plasmonic Properties of Ag-Co Composite Nanostructures, ***H. Luong***[1], *T. Nguyen, Y. Zhao,* University of Georgia, USA	
10:45am	**LI-TuM1-4** Student Award Finalist Talk: Nanoscale Stress and Microstructure Distributions across Scratch Track Cross-Sections in a Brittle-Ductile CrN-Cr Bilayer Film on Steel Revealed by X-ray Nanodiffraction, ***M. Meindlhumer***[1], Montanuniversität Leoben, Austria; *J. Todt, J. Zalesak,* Austrian Academy of Sciences, Austria; *M. Rosenthal,* ESRF, Grenoble, France; *H. Hruby,* eifeler-Vacotec GmbH, Germany; *C. Mitterer, R. Daniel, J. Keckes,* Montanuniversität Leoben, Austria	
11:00am	BREAK	
11:15am	**INVITED: LI-TuM1-6** Silicon in Cutting Tools, ***A. Layyous,*** Layyous Consulting, Israel; *L. Qiu,* Central South University, China	
11:30am		
11:45am	**INVITED: LI-TuM1-8** Stabilization of FCVAS Based Hybrid System for Deposition of Thick Tetrahedral Amorphous Carbon Films and its Applications, ***J. Kim***, *Y. Jang,* Korea Institute of Materials Science (KIMS), Korea, Republic of Korea; *D. Kim, Y. Kang,* Korea Institute of Materials Science (KIMS), Korea; *J. Kim,* Korea Institute of Materials Science (KIMS), Korea, Republic of Korea	
12:00pm		
12:15pm	**INVITED: LI-TuM1-10** Low Interfacial Toughness Materials for Effective Large-scale Deicing, ***K. Golovin,*** University of Britsh Columbia, Canada	
12:30pm		
12:45pm	**LI-TuM1-12** Closing Remarks & Sponsor Thank You's!, ***S. Dixit,*** Plasma Technology, Inc., USA; *C. Schiffers,* CemeCon AG, Germany	

[1] **Student Award Nominee**

Live Session
Room Live - Session LI-TuM2
Tribology and Mechanical Behavior of Coatings and Engineered Surfaces Live Session
Moderators: Dr. Michael Chandross, Sandia National Laboratories, USA, **Dr. Giovanni Ramirez**, Oxford Instruments , USA

11:00am	**LI-TuM2-1** Welcome, Announcements, & Thank You to Sponsors, ***G. Ramirez,*** Oxford Instruments , USA	
11:15am	**INVITED: LI-TuM2-2** PVD Coatings Interaction with the Environment and Influence of Substrate on Coating Performance, ***B. Podgornik,*** Institute of Metals and Technologies, Slovenia	
11:30am		
11:45am	**INVITED: LI-TuM2-4** Insights into Indentation-Induced Cracking via 3D-FIB Tomography and HR-EBSD, ***B. Li,*** University of Oxford, UK	
12:00pm		
12:15pm	**INVITED: LI-TuM2-6** Photon Beam and Plasma Cloud – Programmable Surfaces, ***A. Buling***, *J. Zerrer,* ELB Eloxalwerk Ludwigsburg GmbH, Germany	
12:30pm		
12:45pm	**LI-TuM2-8** Closing Remarks & Thank You's, ***M. Chandross,*** Sandia National Laboratories, USA	

Live Session
Room Live - Session LI-WeM1
In-Silico Design of Novel Materials by Quantum Mechanics and Classical Methods Live Session
Moderators: Dr. David Holec, Montanuniversität Leoben, Austria, **Dr. Davide G. Sangiovanni**, Linköping University, Sweden

10:00am	**LI-WeM1-1** Program Chair's Welcome and Introduction of our Special Interest Talk, ***G. Greczynski,*** Linköping University, Sweden	
10:15am	**INVITED: LI-WeM1-2** Special Interest Talk: Materials Discoveries at Extreme Conditions: A Path Towards New Advanced Materials, ***I. Abrikosov,*** Linköping Univ., IFM, Theoretical Physics Div., Sweden	
10:30am		
10:45am		
11:00am	BREAK	
11:15am	**INVITED: LI-WeM1-6** Are Protective Coatings Predictable?, ***J. Schneider***[1], RWTH Aachen University, Germany	
11:30am		
11:45am	**INVITED: LI-WeM1-8** Controlling Phase and Microstructure of Ti-Cr-Al-N System Deposited by Arc Ion Plating, ***K. Yamamoto,*** Kobe Steel Ltd., Japan	
12:00pm		
12:15pm	**INVITED: LI-WeM1-10** Theoretical Insights into Transition Metal Nitrides for Thermoelectric and Piezoelectric Applications, ***B. Alling,*** Linköping Univ., IFM, Theoretical Physics Div., Sweden	
12:30pm		
12:45pm	**LI-WeM1-12** Closing Remarks & Thank You's, ***D. Sangiovanni,*** Ruhr University Bochum, Germany	

[1] **2020 Bill Sproul Awardee**

Live Session
Room Live - Session LI-WeM2
Advanced Characterization Techniques Live Session
Moderators: Prof. Dr. Diederik Depla, Ghent University, Belgium, **Dr. Prabhakar Mohan**, Solar Turbines, USA

11:00am	**LI-WeM2-1** Welcome, Announcements & Sponsor Thank You's, ***P. Mohan,*** Solar Turbines, Inc. , USA	
11:15am	**INVITED: LI-WeM2-2** Influence of the Microstructural Evolution of YSZ TBCs on their Thermal Insulation Potential, ***G. Boissonnet****, G. Bonnet, F. Pedraza,* Université de La Rochelle, France	
11:30am		
11:45am	**INVITED: LI-WeM2-4** High-Entropy Ceramic Thin Films; A Case Study of Nitrides, Oxides and Diborides, ***P. Mayrhofer****, A. Kirnbauer, R. Hahn,* TU Wien, Institute of Materials Science and Technology, Austria*; P. Polcik,* Plansee Composite Materials GmbH, Germany	
12:00pm		
12:15pm	**INVITED: LI-WeM2-6** Characterization of Defects and their Dynamics using Transmission Scanning Electron Microscopy, ***D. Gianola****,* University of California Santa Barbara, USA	
12:30pm		
12:45pm	**LI-WeM2-8** Closing Remarks and Thank You's, ***D. Depla****,* Ghent University, USA	

Live Session
Room Live - Session LI-ThM1
Hard Coatings and Vapor Deposition Technologies Live Session
Moderators: Dr. Tiberiu Minea, Université Paris-Sud, France, **Dr. Farwah Nahif**, eifeler-Vacotec GmbH, Germany

10:00am	**LI-ThM1-1** General Chair's Welcome, ***C. Muratore,*** University of Dayton, USA*; F. Nahif,* voestalpine eifeler-Vacotec GmbH, Düsseldorf, Germany	
10:15am	**INVITED: LI-ThM1-2** Exhibition Keynote Lecture: Carbon based Coatings in Industrial Scale for Sustainable Surface Solutions, ***J. Vetter,*** Oerlikon Balzers Coating Germany GmbH, Bergisch Gladbach, Germany	
10:30am		
10:45am		
11:00am	BREAK	
11:15am	**INVITED: LI-ThM1-6** Impact of Nitrogen Deficiency on the Phase Transformation of (Ti,Al)N Thin Films at Elevated Temperatures, ***I. Schramm,*** Sandvik Coromant R&D, Sweden	
11:30am		
11:45am	**INVITED: LI-ThM1-8** Air-based Sputtering Deposition of Gradient Oxynitride Coatings, ***F. Lu,*** National Chung Hsing University, Taiwan*; Y. Liou, Y. Lee, M. Chan,* National Chung-Hsing University, Taiwan	
12:00pm		
12:15pm	**INVITED: LI-ThM1-10** Optimizing Ionization and Deposition Rate in High Power Impulse Magnetron Sputtering, ***D. Lundin,*** Linköping University, Sweden	
12:30pm		
12:45pm	**LI-ThM1-12** Closing Remarks & Thank You's, ***T. Minea,*** Université Paris-Saclay, France	

Live Session
Room Live - Session LI-ThM2
Thin Films for Energy Applications Live Session
Moderators: Dr. Peter Kelly, Manchester Metropolitan University, UK, **Dr. Glen West**, Manchester Metropolitan University, UK

11:00am	**LI-ThM2-1** Welcome and Thank You to our Sponsors!, ***P. Kelly,*** Manchester Metropolitan University, UK	
11:15am	**INVITED: LI-ThM2-2** Advanced Nanomaterials for Energy-Related Applications, ***E. Schubert****, C. Briley, U. Kilic, M. Hilfiker,* University of Nebraska-Lincoln, USA*; D. Sekora,* Honeywell Inc.*; M. Schubert,* University of Nebraska-Lincoln, USA	
11:30am		
11:45am	**INVITED: LI-ThM2-4** Photocatalytic Bismuth Oxide Coatings and their Potential for Water Treatment Applications, ***M. Ratova****, J. Redfern,* Manchester Metropolitan University, UK*; C. Amorim,* Universidade Federal de Minas Gerais, Brazil*; P. Kelly,* Manchester Metropolitan University, UK	
12:00pm		
12:15pm	**INVITED: LI-ThM2-6** High Entropy Materials for Energy Applications, ***J. Ting,*** National Cheng Kung University, Taiwan	
12:30pm		
12:45pm	**LI-ThM2-8** Closing Remarks & Thank You's!, ***G. West,*** Manchester Metropolitan University, UK	

Friday Morning, April 30, 2021

Live Session
Room Live - Session LI-FrM
Awards Session Live
Moderators: Dr. Ivan G. Petrov, University of Illinois at Urbana-Champaign, USA, **Dr. Andrey Voevodin**, University of North Texas, USA

10:00am		
10:15am	**INVITED: LI-FrM-2** Special Interest Talk: Design, Metallurgy and Manufacturing Technologies of Targets for Hard Coating and Tribological Applications, ***P. Polcik,*** Plansee Composite Materials GmbH, Germany	
10:30am		
10:45am		
11:00am	BREAK	
11:15am	**INVITED: LI-FrM-6** Bill Sproul Award and Honorary ICMCTF Lecture: Transition Metal Nitride Layers: New Phases and New Properties, ***D. Gall***[1], Rensselaer Polytechnic Institute, USA	
11:30am		
11:45am	BREAK	
12:00pm	**INVITED: LI-FrM-9** R.F. Bunshah Award and ICMCTF Honorary Lecture: From a Sparkling Brass Chain and Twitching Frog Legs: The Astonishing Path to Plasma-Based Advanced Coatings, ***A. Anders***[2], Leibniz Institute of Surface Engineering (IOM), Felix Bloch Institute, Leipzig University, Germany	
12:15pm		
12:30pm		
12:45pm	**LI-FrM-12** Closing Remarks and Thank You's, ***A. Voevodin,*** University of North Texas, USA	

[1] **2021 Bill Sproul Awardee**
[2] **R.F. Bunshah Awardee**

Coatings for Use at High Temperatures
Room On Demand - Session A1
Coatings to Resist High-temperature Oxidation, Corrosion, and Fouling
1:00pm

A1-1
PVD Cr Coatings to Mitigate Corrosion of SiC-SiC_f Composite for LWR Applications, ***K. Quillin,*** *H. Yeom, T. Dabney, J. Lacy, T. Kim,* University of Wisconsin - Madison, USA*; S. Chemerisov,* Argonne National Laboratory, USA*; A. Couet, K. Sridharan,* University of Wisconsin - Madison, USA

A1-2
High Temperature Molten Salt Corrosion Behavior of Nickel and Nickel-Molybdenum Coatings for Molten Salt Reactor (MSR), ***K. Sandhi,*** *J. Szpunar,* University of Saskatchewan, Canada

A1-3
Laser Cladding NiTi on the Magnesium Alloy Substrate With the Intermediated Aluminum Layer, *C. Zhang,* ***Y. Yang,*** *X. Cui, G. Jin, W. Zheng,* Harbin Engineering University , China

A1-4
Early Detection and in-situ Monitoring of the Oxidation of an MCrAlY Coating by Thermoreflectometry, ***M. Ecochard,*** *B. Javaudin, R. Gilblas, D. Texier, T. Sentenac,* ICA, France

A1-5
Intrinsic and Extrinsic Size Effects on the High Temperature Oxidation of APS and HVOF MCrAlY Coatings, ***D. Texier,*** *M. Ecochard,* ICA, France*; T. Gheno,* ONERA, France*; M. Salem, P. Lours,* ICA, France

A1-6
Effects of Temperature and the KCl + K_2SO_4 Load on the Behavior of Several Aluminide Coatings on Ferritic Steels Tested under a Biomass Combustion Atmosphere, *A. Agüero,* ***M. Gutiérrez,*** Instituto Nacional de Técnica Aeroespacial (INTA), Spain

INVITED: A1-7
INVITED TALK: PGM based Diffusion Coatings for Ni-based Superalloys by a Paste Method, ***H. Murakami,*** National Institute for Materials Science (NIMS), Japan*; D. Tue, A. Ishira, L. Honglien,* National Institute for Materials Science (NIMS), Japan

A1-9
Effect of Nickel Percentage on the Morphology, Wear and Corrosion Resistance of Zn-Ni Alloy Coating, ***A. Farooq,*** *S. Ahmad,* University of the Punjab, Pakistan*; K. Deen,* University of British Columbia, Canada

Coatings for Use at High Temperatures
Room On Demand - Session A2
Thermal and Environmental Barrier Coatings
1:00pm

A2-1
Improvement of TBC Coating Resistance to Simultaneous Attacksby Sulfur and Vanadium Compounds, ***J. He,*** Oerlikon Metco , USA*; T. Sharobem, G. Dwivedi,* Oerlikon Metco, USA

A2-2
High-Temperature Corrosion of Sintered $Er_2Si_2O_7$ With CMAS for Environmental Barrier Coatings, ***S. Kim,*** Kyushu University, Japan*; N. Nagashima, Y. Matsushita,* National Institute for Materials Science, Japan*; B. Jang,* Kyushu University, Japan

A2-3
Experimental and Modelling Analysis of the Driving Force for TBC Damage During Thermal Cycling With Consideration of Temperature Gradients, ***L. Mahfouz,*** *V. Maurel , V. Guipont, B. Marchand,* Mines ParisTech, PSL Research University, France*; F. Coudon,* Safran Tech, Safran SA, France

A2-4
Effect of Varying APS Flash Bond Coating Thickness on Furnace Cycle Lifetime, ***M. Lance,*** *K. Kane, J. Haynes, B. Pint,* Oak Ridge National Laboratory, USA*; E. Gildersleeve, S. Sampath,* Stony Brook University, USA

A2-5
Electrodeposited Thin La_2O_3 Based Chromium Barrier Coating for Interconnectors in Solid Oxide Electrolysis, ***V. Kolarik,*** *M. Juez Lorenzo, E. Walschburger,* Fraunhofer Institute for Chemical Technology ICT, Germany

A2-6
Effects of Mo Interlayer on the Oxidation Behaviour and Degradation Mechanism of Amorphous SiAlN Coating at 1000 °C in Steam Environment, ***Z. Gao,*** The University of Manchester, UK*; J. Malecka, P. Kelly,* Manchester Metropolitan University, UK*; P. Xiao,* The University of Manchester, UK

A2-7
Laser Processing of Freeze Casted Yttria Stabilized Zirconia / Gadolinia Thermal Barrier Coatings to Mitigate CMAS Attack, ***S. Bakkar,*** *E. Cairns, M. Vu, M. Young, D. Berman,* University of North Texas, USA*; T. Hossain,* Ceriumlabs, USA*; J. Moldenhauer, E. Steinmiller, W. Flanagan,* University of Dallas, USA*; S. Aouadi,* University of North Texas, USA

A2-8
Corrosion Resistance and Fatigue Behavior of Bare and Coated Ni-based Superalloys, ***S. Dryepondt,*** *R. Pillai, J. Kurley,* Oak Ridge National Laboratory, USA

Coatings for Use at High Temperatures
Room On Demand - Session A3
Materials and Coatings for Solar Power Concentration Plants
1:00pm

A3-1
Biodegradable Polyurethane Antifouling Coating, ***M. Rahman,*** King Fahd University of Petroleum and Minerals, Saudi Arabia

A3-2
Aluminide Coating for Inconel 625 Prepared by Additive Manufacturing: Investigation of the Surface Reactivity of the Substrate, *N. Ramenatte, L. Portebois, S. Mathieu, L. Aranda,* ***M. Vilasi,*** University of Lorraine, France

A3-3
High-Temperature Protective Coatings against Molten Nitrate Salts for CSP Technology, ***G. García Martín,*** REP-Energy Solutions, Spain*; V. Encinas Sánchez, M. Lasanta Carrasco, T. De Miguel Gamo, F. Pérez Trujillo,* Universidad Complutense de Madrid, Spain

Coatings for Use at High Temperatures
Room On Demand - Session AP
Coatings for Use at High Temperatures (Symposium A)
Poster Session
1:00pm

AP-3
Microstructural Growth and Oxidation Performance of Ti_xSi_y on ɣ -TiAl, ***J. Crespo Villegas,*** *S. Brown, E. Bousser,* Polytechnique Montreal, Canada*; M. Cavarroc,* Safran Tech, France*; S. Knittel,* Safran Aircraft Engines, France*; L. Martinu, J. Klemberg-Sapieha,* Polytechnique Montreal, Canada

AP-4
Lowering Costs by Improving Efficiencies in Biomass Fueled Boilers: New Materials and Coatings to Reduce Corrosion (BELENUS), *A. Illana, V. Encinas-Sánchez, M. de Miguel, M. Lasanta, G. García-Martín,* ***F. Pérez Trujillo,*** Universidad Complutense de Madrid, Spain

Hard Coatings and Vapor Deposition Technologies
Room On Demand - Session B1
PVD Coatings and Technologies
1:00pm

B1-1
On Electron Heating and Ion Recycling in the High Power Impulse Magnetron Sputtering Discharge, ***J. Gudmundsson,*** University of Iceland*; D. Lundin,* Linköping University, Sweden*; M. Raadu,* KTH Royal Institute of Technology, Sweden*; T. Petty, T. Minea,* LPGP, Universite Paris-Sud, France*; N. Brenning,* KTH Royal Institute of Technology, Sweden

B1-2
Tailoring the Chemical Composition and Microstructure of Cr_xN Deposited by HiPIMS through Duty-cycle Modifications, ***M. Cedeño-Vente,*** *G. Mondragón-Rodríguez, N. Camacho, A. Gómez-Ovalle, J. González-Carmona, J. Alvarado-Orozco, D. Espinosa-Arbeláez ,* Centro de Ingeniería y Desarrollo Industrial (CIDESI), Mexico

B1-3

New Approaches for AlCrN-Based Coatings for High Speed Applications, ***M. Schenkel,*** voestalpine Eifeler Vacotec GmbH, Düsseldorf, Germany*; S. Spor,* voestalpine Eifeler Vacotec GmbH, Düsseldorf, Germany, Austria*; N. Gerhards, U. Zimmermann, F. Nahif,* voestalpine Eifeler Vacotec GmbH, Düsseldorf, Germany

B1-4

Investigation of the Influence of the Thickness of Nanolayers in Wear-resistant Layers of Ti-TiN-(Ti,Cr,Al)N Coating on Destruction in the Cutting and Wear of Carbide Cutting Tools, ***A. Vereschaka****, S. Grigoriev,* MSTU Stankin, Russian Federation*; N. Sitnikov,* National Research Nuclear University MEPhI, Russian Federation*; J. Bublikov,* Ikti Ran, Russian Federation

INVITED: B1-5

INVITED TALK: Industrial Scale ta-C Coating Using Laser Arc Technology, ***W. Fukarek****, B. Gebhardt,* VTD Vakuumtechnik Dresden GmbH, Germany*; V. Weihnacht, F. Kaulfuss,* Fraunhofer IWS, Germany

B1-7

Key Importance of the Controlled Reactive HiPIMS for Low-temperature Preparation of Tunable Oxynitrides and Thermochromic Oxides, ***J. Vlček****, J. Houška,* University of West Bohemia, Czech Republic

B1-8

Monitoring Tantalum Nitride Thin Films Structure by Reactive HiPIMS Magnetron Sputtering: From Microstructure to Properties, ***A. Poulon-Quintin****, A. Achille,* ICMCB-CNRS, France*; D. Michau,* Univ. Bordeaux, ICMCB, France*; M. Cavarroc,* Safran Tech, France

INVITED: B1-9

INVITED TALK: Multilayer nano-composite Oxidation-resistant Coatings for Accident-tolerant Nuclear Fuel Cladding using Reactive HiPIMS with Positive Kick and Precision Ion Energy Control, ***B. Jurczyk****, R. Stubbers, I. Shchelkanov, T. Houlahan,* Starfire Industries LLC, USA

B1-12

Multifunctional Coatings with Antifouling Properties, ***J. Castro****, I. Carvalho, M. Henriques, S. Carvalho,* University of Minho, Portugal

B1-13

How to Deposit a Porous Thin Film by Magnetron Sputtering ?, ***D. Depla****, R. De Doncker,* Ghent University, Belgium

B1-14

Evolution of the Microstructure of Sputter Deposited TaAlON Thin Films with Increasing Oxygen Partial Pressure, ***N. Schalk****, C. Saringer,* Montanuniversitat Leoben, Austria*; A. Fian,* Joanneum Research Forschungsgesellschaft mbH, Austria*; V. Terziyska, M. Tkadletz,* Montanuniversitat Leoben, Austria

B1-15

Towards Knowledge-based Design of Multi-element Target Materials, ***M. Golizadeh****,* Montanuniversität Leoben, Austria*; A. Anders,* Leibniz Institute of Surface Engineering (IOM), and Felix Bloch Institute, Leipzig University, Germany*; C. Mitterer, R. Franz,* Montanuniversität Leoben, Austria

INVITED: B1-16

INVITED TALK: Coating Design and Mechanical Properties of Multicomponrnt AlTi(X)N Hard Coatings, ***Y. Chang****,* National Formosa University, Taiwan

Hard Coatings and Vapor Deposition Technologies
Room On Demand - Session B2
CVD Coatings and Technologies
1:00pm

B2-1

In-situ Investigation of the Oxidation Behaviour of Chemical Vapour Deposited Zr(C,N) Hard Coatings Using Synchrotron X-ray Diffraction, ***F. Frank****, M. Tkadletz, C. Saringer,* Montanuniversität Leoben, Austria*; A. Stark, N. Schell,* Helmholtz-Zentrum Geesthacht, Germany*; C. Czettl,* CERATIZIT Austria GmbH, Austria*; N. Schalk,* Montanuniversität Leoben, Austria

B2-3

Ti-Si-B-C-N PECVD Nanocomposite Coatings for Tribological Applications at Elevated Temperatures, ***A. Nienhaus****,* TU Braunschweig, Institute for Surface Technology, Germany

INVITED: B2-4

INVITED TALK: Atomic Layer Deposition for Complex-Shape and Temperature Sensitive Objects: Towards New Functions and Products, ***F. Mercier****,* Univ. Grenoble Alpes, CNRS, France

INVITED: B2-6

INVITED TALK: Plasma-assisted Deposition using Microdroplets, ***T. Ito****, K. Nitta, K. Terashima,* The University of Tokyo, Japan

B2-8

High Throughput Deposition of Hydrogenated Amorphous Carbon Films using High-Pressure Ar+CH_4 Plasmas, ***K. Koga****, S. Hwang, K. Kamataki, N. Itagaki, M. Shiratani,* Kyushu University, Japan

B2-9

Influence of Co-enriched Surface Zones in WC-Co Cemented Carbides on the Microstructure and Mechanical Properties of $TiC_{0.6}N_{0.4}$/α-Al_2O_3 Coatings, ***F. Konstantiniuk****, M. Tkadletz,* Montanuniversität Leoben, Austria*; C. Czettl,* CERATIZIT Austria GmbH, Austria*; N. Schalk,* Montanuniversität Leoben, Austria

B2-10

CVD Alumina-based Nanocomposite Coatings, ***Z. Liu****,* Kennametal Inc., USA

B2-11

Compatibility of a CoCrFeNi Multi-principal Element Alloy Substrate with Halide-based Thermal CVD Processes for TiN Deposition, ***K. Böör****,* Uppsala University, Sweden*; R. Qiu,* Chalmers University of Technology, Sweden*; A. Forslund,* KTH Royal Institute of Technology, Sweden*; O. Bäcke,* Chalmers University of Technology, Sweden*; H. Larsson,* KTH Royal Institute of Technology, Sweden*; E. Lindahl,* Sandvik Coromant R&D, Sweden*; M. Halvarsson,* Chalmers University of Technology, Sweden*; M. Boman,* Uppsala University, Sweden*; L. von Fieandt,* Sandvik Coromant R&D, Sweden

B2-12

Silicon Carbide Coatings for High Temperature Receiver of Concentrated Solar Power Plants, ***M. Pons****, D. Chen,* University of Grenoble Alpes, France*; J. Colas,* PROMES-CNRS, France*; F. Mercier,* University Grenoble-Alpes, France*; L. Charpentier, M. Balat-Michelin,* PROMES-CNRS, France

B2-13

Hot Filament CVD Diamond Coatings for Hard-to-machine Materials, ***M. Woda****, W. Puetz, M. Frank, W. Koelker, C. Schiffers, O. Lemmer,* CemeCon AG, Germany

B2-14

Ald-Pvd Multilayers: Deposition, Thermal Stability And Mechanical Properties, ***T. Edwards****, T. Xie, L. Petho, S. Büchel, X. Maeder, B. Putz, J. Michler,* Empa, Swiss Federal Laboratories for Materials Science and Technology, Thun, Switzerland

B2-15

Investigation of Diamond Coating Characteristics on Chrome-Plated AISI 4140 Steel by Hot-Filament Chemical Vapour Deposition Process, *R. Vignesh,* ***S. Boominatha Sellarajan****, J. Rajaguru, N. Arunachalam , M. Ramachandra Rao,* Indian Institute of Technology Madras , India

B2-16

The Challenge and Strategy of a-Si CVD Coating on Aluminum Alloys, ***M. Yuan****,* SilcoTek Corporation, USA

Hard Coatings and Vapor Deposition Technologies
Room On Demand - Session B3
Deposition Technologies and Applications for Diamond-like Coatings
1:00pm

B3-1

'Hydrogenated Amorphous Carbon from Magnetized Hollow Cathode Discharges, ***J. Miller****, A. Ceballos-Sanchexz, S. Elhadj, S. Kucheyev, B. Bayu Aji, S. Falabella,* Lawrence Livermore National Laboratory, USA

B3-2

Effect of Mechanical and Thermochemical Tool Steel Substrate Pre-treatment on DLC Coating Durability, ***D. Tobola****,* Łukasiewicz Research Network - Krakow Institute of Technology, Poland*; T. Liskiewicz,* Manchester Metropolitan University, UK*; L. Yang,* Leeds University, UK*; T. Khan,* Manchester Metropolitan University, UK*; Ł. Boron,* Łukasiewicz Research Network - Krakow Institute of Technology, Poland

B3-3

Stress Free ta-C Coatings by means of Up-Scaled Pulsed Laser Deposition for Industrial Applications, ***H. Gruettner****, D. Haldan, J. Maus,* Hochschule Mittweida - University of Applied Sciences, Germany*; M. Nieher,* Hochschule Mittweida - University of Applied Sciences , Germany*; S. Weissmantel,* Hochschule Mittweida - University of Applied Sciences, Germany

B3-4

DLC Coatings Deposited by Novel Doping Strategies with HiPIMS, ***J. Santiago Varela,*** *I. Fernández-Martínez, A. Wennberg,* Nano4Energy SL, Spain*; M. Monclús, J. Molina-Aldareguia,* IMDEA Materials Institute, Spain*; V. Bellido-Gonzalez,* Gencoa Ltd, UK*; M. Panizo-Laiz,* Universidad Politecnica de Madrid, Spain*; J. Sánchez-Lopez, T. Rojas,* CSIC, Spain*; S. Goel,* Cranfield University, UK*; J. Endrino,* IKERBASQUE, Spain

B3-5

Preparation of Hybrid ta-C/MoS_2-Films by using Laser Arc Technology, ***F. Kaulfuss,*** *F. Hofmann, Y. Han, F. Schaller,* Fraunhofer IWS, Germany*; T. Kruelle,* Fraunhofer IWS,Germany*; S. Makowski, V. Weihnacht, A. Leson, L. Lorenz, M. Zawischa,* Fraunhofer IWS, Germany

B3-6

Effects of Target Poisoning Ratios on the Microstructure, Mechanical Properties and Corrosion Resistance of WC_x Coatings Fabricated by Superimposed HiPIMS and MF System, ***I. Moirangthem,*** Ming Chi University of Technology, Taiwan*; S. Chen,* National Taiwan University, Taiwan*; J. Lee,* Ming Chi University of Technology, Taiwan

B3-7

The Influence of Different Power Supply Systems on the Microstructure, Mechanical and Corrosion Properties of Titanium Carbide Coatings, *H. Yu - Tung,* Ming Chi University of Technology, Taiwan, Republic of China*; C. Li-Chun,* Ming Chi University of Technology, Taiwan*; L. Bih-Show,* Chang Gung University, Taiwan*;* ***L. Jyh-Wei,*** Ming Chi University of Technology, Taiwan

Hard Coatings and Vapor Deposition Technologies
Room On Demand - Session B4
Properties and Characterization of Hard Coatings and Surfaces
1:00pm

B4-1

Investigating the Influence of Nanocomposite Structure on the Thermal Stability of Ag in VSiCN-Ag Coatings, ***F. Thompson,*** South Dakota School of Mines and Technology, USA*; F. Kustas,* NanoCoatings, Inc., USA*; G. Crawford,* South Dakota School of Mines and Technology, USA

B4-2

Spinodal Decomposition of Reactively Sputtered VAlN Thin Films, ***M. Hans,*** *H. Rueß,* RWTH Aachen University, Germany*; Z. Czigány,* Centre for Energy Research, Hungary*; J. Krause, P. Ondračka, D. Music, S. Evertz, D. Holzapfel,* RWTH Aachen University, Germany*; D. Primetzhofer,* Uppsala University, Sweden*; J. Schneider,* RWTH Aachen University, Germany

B4-3

Effect of Functionally Graded Layers on Tribological Behavior of TiZrN Coatings on AISI D2 Steel, ***J. Huang,*** *B. Tsai,* National Tsing Hua University, Taiwan

B4-4

Thin Film Characterization by Picosecond Ultrasonics on High Curvature Surfaces, ***F. Faese,*** *J. Michelon, X. Tridon,* Neta, France

B4-5

Fatigue Behaviour of Thin Coating and the Influences of Plastic Deformation of Harden-case using Irreversible Cohesive Zone Model, ***J. Feng,*** Manchester Metropolitan University, UK*; Y. Qin,* University of Strathclyde, UK*; T. Liskiewicz,* Manchester Metropolitan University, UK*; B. Beake,* Micro Materials Ltd, UK

B4-6

Microstructure and Oxidation Behaviour of Arc Evaporated TiSiN Coatings Investigated by *in-situ* Synchrotron X-ray Diffraction, ***Y. Moritz,*** *C. Saringer, M. Tkadletz,* Montanuniversität Leoben, Austria*; A. Stark, N. Schell,* Helmholtz-Zentrum Geesthacht, Germany*; M. Pohler,* CERATIZIT Austria GmbH, Austria*; N. Schalk,* Montanuniversität Leoben, Austria

B4-7

High Temperature Tribology of Hf Doped c-$Al_{0.67}Ti_{0.33}N$ Cathodic Arc PVD Coatings Deposited on M2 Tool Steel, *G. Mondragón Rodríguez,* ***A. Gómez Ovalle,*** *J. Alvarado Orozco, J. González Carmona, C. Ortega Portilla, J. Hernández Mendoza,* CIDESI, Mexico

B4-8

Cross-sectional X-ray Nanodiffraction Characterization of Radiation Damage, Stresses, and Microstructure in Tungsten Coatings, ***K. Hlushko,*** Montanuniversität Leoben, Austria*; A. Mackova,* Nuclear Physics Institute of the Czech Academy of Sciences*; J. Todt,* Erich Schmid Institute for Material Science, Austrian Academy of Sciences, Austria*; R. Daniel,* Christian Doppler Laboratory for Advanced Synthesis of Novel Multifunctional Coatings at the Department of Materials Science, Montanuniversität Leoben, Leoben, Austria*; J. Keckes,* Montanuniversität Leoben, Austria

B4-9

Combinatorial Approach for the Synthesis of Thermally Stable High Si-containing Nanocomposite AlCrSiN Coatings, ***M. Zítek,*** *N. Jäger, M. Meindlhumer,* Montanuniversität Leoben, Austria*; F. Nahif,* voestalpine eifeler-Vacotec GmbH, Düsseldorf, Germany*; C. Mitterer, R. Daniel,* Montanuniversität Leoben, Austria

B4-10

In-plane Texturing of Silver Thin Films, ***F. Corbella,*** Saint-Gobain Recherche/CNRS, France

INVITED: B4-12

INVITED TALK: Modern Analytical Methods for Characterizing the Tribological Material Properties of Coatings, ***D. Schorr,*** Cooperate State University in Karlsruhe, Germany

INVITED: B4-14

INVITED TALK: Metal Oxynitride Thin Films: A Review on Synthesis Developments, Performance, and Applications, ***S. Ali,*** Linnaeus University, Sweden

B4-16

Influence of the Period of the Substrate Oscillation on Thin CrN Films Obtained by RF Physical Vapor Dynamic Glancing Angle Deposition Technique, *M. Jimenez, F. Cemin, A. Riul, L. Zagonel,* UNICAMP, Brazil*; C. Figueroa,* Universidade de Caxias do Sul, Brazil*; D. Wisnivesky,* UNICAMP, Brazil*;* ***F. Alvarez,*** Instituo de Física-UNICAMP, Brazil

B4-17

Fabrication and Microstructure Evolution of Sputtering Single Element Transition Metal Nitride Multilayers, *K. Liu, Y. Yang, J. Xiang, Z. Lin,* ***F. Wu,*** National United University, Taiwan

B4-18

Numerical Evaluation of the Contact Fatigue Resistance of AlCrN, N and AlCrN/N Coatings on AISI 4140 Steel, ***A. Ballesteros-Arguello,*** *F. Ramírez-Reyna, A. Meneses-Amador, G. Rodríguez-Castro, D. Fernández-Valdés, O. Reyes-Carcaño,* National Polytechnic Institute, Mexico

B4-19

Low Temperature Deposition of TiB-based Hard Coating Films by Pulsed DC Plasma CVD, ***T. Saito,*** *H. Matsushima, K. Fuji, D. Kiyokawa, N. Okamoto,* Osaka Prefecture University, Japan

Hard Coatings and Vapor Deposition Technologies
Room On Demand - Session B5
Hard and Multifunctional Nanostructured Coatings
1:00pm

INVITED: B5-1

INVITED TALK: PVD of Hard Nanocomposite Coatings Using Multiphase SHS Cathodes - Evolution and New Horizons, ***P. Kiryukhantsev-Korneev,*** *E. Levashov,* National University of Science and Technology "MISiS", Russian Federation

B5-3

On the Structure and Mechanical Properties of X_2BC Coatings Prepared by High Power Impulse Magnetron Sputtering at Different Temperatures, ***P. Soucek,*** *M. Polacek, L. Zabransky, M. Stupavska, P. Vasina,* Masaryk University, Brno, Czech Republic

B5-4

Ammonium Thiosulfate Precursor for Coating Molybdenum Disulfide onto the Surface of Porous Metal for High Anti-Wearing Application in the Machinery Industry, ***L. Hu,*** National Sun Yat-Sen University, Taiwan*; P. Chen,* Southern Taiwan University of Science and Technology, Taiwan

B5-5

Optimization of TiSiCN Coating Properties Obtained by RF Magnetron Sputtering and High Power Impulse Magnetron Sputtering, ***J. Matthey,*** Haute Ecole Arc Ingenierie HES-SO, Switzerland Ecole Arc Ingenierie, Switzerland*; O. Banakh, R. Constantin, F. Bisoffi, M. Erard,* Haute Ecole Arc Ingenierie HES-SO, Switzerland

B5-6

Characteristics of Hf(*M*)SiBCN (*M* = Y, Ho, Ta, Mo) Coatings: Role of the *M* Choice, ***M. Matas,*** *M. Prochazka, J. Vlcek, J. Houska,* University of West Bohemia, Czech Republic

B5-7

Thermal Stability of Nanostructured TiAl(Si,B)N Coatings Deposited by HiPIMS with Positive Pulses, ***Á. Méndez Fernández,*** *J. Santiago, I. Fernández-Martínez, A. Wennberg,* Nano4Energy SL, Spain*; M. Panizo-Laiz,* Universidad Politecnica de Madrid, Spain*; M. Monclús, J. Molina-Aldareguia,* IMDEA Materials Institute, Spain

B5-8

Tuning Fracture Characteristics of Superhard Tm Carbide Coatings by Nitrogen Alloying, ***T. Glechner***, *R. Hahn,* TU Wien, CDL-SEC, Austria; *D. Primetzhofer,* Uppsala University, Sweden; *H. Zaid, S. Kodambaka,* University of California Los Angeles, USA; *D. Holec,* Montanuniversität Leoben, Austria; *P. Mayrhofer,* TU Wien, Austria; *S. Kolozsvári,* Plansee Composite Materials GmbH, Germany; *J. Ramm,* Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein; *H. Riedl,* TU Wien, CDL-SEC, Austria

B5-9

Improved Ti–Al–Ta–N Coatings by Doping with LaB_6 and $CeSi_2$, ***A. Kirnbauer***, *S. Kagerer,* TU Wien, Institute of Materials Science and Technology, Austria; *P. Polcik,* Plansee Composite Materials GmbH, Germany; *P. Mayrhofer,* TU Wien, Institute of Materials Science and Technology, Austria

B5-10

Dislocation Confinement in Core-Shell Nanostructures: A Molecular Dynamics Study, ***D. Fleming***, Arkansas State University, USA

B5-11

Tribocorrosion Behaviors in Seawater of TiSiCN Coatings Deposited by High Power Impulse Magnetron Sputtering: In-situ Electrochemical Response, ***Y. Ou***, Beijing Radiation Center, China; *H. Wang,* Beijing Normal University, China; *J. Luo,* Beijing Radiation Center, China; *B. Liao, X. Zhang,* Beijing Normal University, China; *W. Wang,* Beijing Radiation Center, China; *X. Ouyang,* Northwest Nuclear Technology Institute

Hard Coatings and Vapor Deposition Technologies
Room On Demand - Session B6
Interplay Between Computational and Experimental Design of Coatings and Processes I
1:00pm

B6-1

Data-driven Assessment of Chemical Vapor Deposition of MoS2: a Meta-Study Based on Published Growth Experiments, *A. Costine,* University of Virginia, USA; *P. Delsa,* Lousiana School for Math, Science, and the Arts, USA; *T. Li,* ***P. Reinke***, *P. Balachandran,* University of Virginia, USA

B6-2

Kinetic Monte Carlo Simulations of Residual Stress Evolution, ***E. Chason***, *A. Bower,* Brown University, USA

B6-3

Maximum N Content in a-CN_x and other Amorphous Nitrides, ***J. Houska***, University of West Bohemia, Czech Republic

B6-4

Transition Metal Carbonitride based Thin Films: A Critical Review on Thermal and Elastic Properties of Group IV to VI $TMC_{1-x}N_x$, *T. Glechner,* TU Wien, CDL-SEC, Austria; *P. Mayrhofer,* TU Wien, Austria; *S. Kodambaka,* University of California Los Angeles, USA; *R. Hahn,* TU Wien, CDL-SEC, Austria; *D. Holec,* Montanuniversität Leoben, Austria; *T. Wojcik,* TU Wien, Institute of Materials Science and Technology, Austria; *M. Arndt,* Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein; *S. Kolozsvári,* Plansee Composite Materials GmbH, Germany; ***H. Riedl***, TU Wien, CDL-SEC, Austria

INVITED: **B6-5**

INVITED TALK: Weakest Links in Superlattices: Insights from Ab Initio Modelling, ***D. Holec***, Montanuniversität Leoben, Austria; *N. Koutná,* TU Wien, Austria; *L. Löfler, L. Hantzenbichler,* Montanuniversität Leoben, Austria; *P. Řehák,* Central European Institute of Technology (CEITEC), Brno University of Technology, Czech Republic; *M. Bartosik,* TU Wien, Austria; *M. Friák,* Institute of Physics, Academy of Sciences of the Czech Republic, Czech Republic; *M. Černý,* Central European Institute of Technology (CEITEC), Brno University of Technology, Czech Republic; *P. Mayrhofer,* TU Wien, Institute of Materials Science and Technology, Austria

B6-7

Superlattice Design for Superior Thin Films, ***N. Koutná***[1], *R. Hahn, J. Buchinger,* TU Wien, Institute of Materials Science and Technology, Austria; *D. Sangiovanni,* Linköping University, Sweden; *M. Bartosik,* TU Wien, Institute of Materials Science and Technology, Austria; *D. Holec,* Montanuniversität Leoben, Austria; *P. Mayrhofer,* TU Wien, Institute of Materials Science and Technology, Austria

Hard Coatings and Vapor Deposition Technologies
Room On Demand - Session B7
Plasma Surface Interactions, Diagnostics and Growth Processes
1:00pm

INVITED: **B7-1**

INVITED TALK: Energy and Momentum Fluxes at Plasma Processing of Materials, ***H. Kersten***, *T. Trottenberg, M. Klette, L. Hansen, A. Spethmann, F. Schlichting,* IEAP, U Kiel, Germany

B7-3

A Force Probe as a Tool to obtain Directionally Resolved Momentum Characteristics during Sputter Processes, ***M. Klette***, *T. Trottenberg, M. Maas, H. Kersten,* Kiel University, Kiel, Germany

B7-4

Erosion and Cathodic Arc Plasma of Nb–Al Cathodes: Composite vs. Intermetallic, *S. Zöhrer, M. Golizadeh,* Montanuniversität Leoben, Austria; *N. Koutná,* TU Wien, Austria; *D. Holec,* Montanuniversität Leoben, Austria; *A. Anders,* Leibniz Institute of Surface Engineering (IOM), Germany; ***R. Franz***, Montanuniversität Leoben, Austria

B7-5

Oxygen Diffusion Barrier On Interfacial Layer Formed With Remote Nh3 Plasma Treatment, ***F. Chu***, *K. Chang-Liao, D. Ruan, H. Yeh, S. Yi, Y. Chien,* National Tsing Hua University, Taiwan

Hard Coatings and Vapor Deposition Technologies
Room On Demand - Session B8
HiPIMS, Pulsed Plasmas and Energetic Deposition
1:00pm

INVITED: **B8-1**

INVITED TALK: Evolution of Ionization Fraction of Sputtered Species in Standard, Multi-pulse and Reactive HiPIMS, *M. Fekete, K. Bernatova, P. Klein, J. Hnilica,* ***P. Vasina***, Masaryk University, Brno, Czech Republic

B8-3

Dynamics of the Titanium Ground State Atoms and Ions in HiPIMS Discharge, ***J. Hnilica***, *P. Klein, P. Vasina,* Masaryk University, Brno, Czech Republic; *R. Snyders, N. Britun,* University of Mons, Belgium

B8-4

The Single-Shot Spatial-Resolved OES of the Spoke in Non-Reactive HiPIMS, ***M. Šlapanská***, *M. Kroker, J. Hnilica, P. Klein, P. Vašina,* Masaryk University, Czechia

B8-5

Understanding and Influencing the Energy Delivered to the Film in Bipolar HiPIMS, ***T. Kozak***, *A. Pajdarova, J. Capek,* University of West Bohemia, Czech Republic; *M. Cada, Z. Hubicka,* Institute of Physics, Academy of Sciences of the Czech Republic; *P. Mares,* HVM Plasma, s.r.o., Czech Republic

B8-6

The Use of HiPIMS with Positive Pulses to Tailor Film Ion Assistance and the Resulting Microstructural Properties, ***I. Fernandez***, *J. Santiago, A. Wennberg, A. Mendez,* Nano4Energy SL, Spain; *F. Papa,* GP Plasma, USA

B8-7

Measurements and Modeling of Residual Stress in Sputtered Nitride Films: Dependence on Growth Rate and Gas Pressure, ***Z. Rao***, *E. Chason,* Brown University, USA

B8-9

Wafer-scale Metallic Nanotube Arrays (MeNTAs): Fabrication and Application, ***A. Altama***, *J. Chu,* National Taiwan University of Science and Technology, Taiwan; *A. Purniawan, S. Wicaksono,* Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia

B8-10

Plasma Chemistry, Crystal Growth and Mechanical Properties of CrAlYN / CrN Nanoscale Multilayer Coatings Deposited by High Power Impulse Magnetron Sputtering, ***A. Ehiasarian***, *A. Sugumaran, P. Hovsepian,* Sheffield Hallam University, UK

B8-12

On the Influence of the Micropulse on Nb Thin Films Deposited by MPPMS and DOMS: A Comparative Study, ***Y. Li***, *Z. Jiang, H. Yuan, N. Pan, M. Lei,* Dalian University of Technology, China

[1] **2020 Student Award Finalist**

B8-13
The Effect of Metal Transition Dopents on Mechanical Properties TiBCN Based Coatings Deposited by CFUBMS-HiPIMS, ***I. Efeoglu,*** Ataturk University, Turkey*; N. Aksakalli,* Atatürk University, Turkey*; B. Gumus, E. Tan,* Aselsan Inc., Turkey

Hard Coatings and Vapor Deposition Technologies
Room On Demand - Session BP
Hard Coatings and Vapor Deposition Technologies (Symposium B) Poster Session
1:00pm

BP-1
Investigation of Ionized Density Fraction in Reactive Hipims, ***K. Bernátová,*** Masaryk University, Czechia

BP-2
Increasing Oxidation Resistance of Reactive Magnetron Sputtered ($Al_vCr_wNb_xTa_yTi_z$)N Thin Films by Si-alloying, ***A. Kretschmer,*** TU Wien, Institute of Materials Science and Technology, Austria*; K. Yalamanchili, H. Rudigier,* Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein*; P. Mayrhofer,* TU Wien, Institute of Materials Science and Technology, Austria

BP-3
Properties of Boron Carbide Thin Films Deposited by Pulsed Laser Deposition, ***F. Jahn,*** *S. Weissmantel,* Laserinstitut Hochschule Mittweida, Germany

BP-4
In-situ Analysis of B-doped Diamond Synthesis using Hot Filament CVD, ***R. Tanaka,*** *M. Takuya,* Chiba Institute of Technology Graduate School, Japan*; Y. Sakamoto,* Chiba Institute of Technology, Japan

BP-5
Behavior of Partially Oxidized Metal Targets, ***J. Houska,*** *T. Kozak,* University of West Bohemia, Czech Republic

BP-6
Phase Formation, Thermal Stability and Mechanical Properties of Nb-B-C Thin Films Prepared by Magnetron Sputtering Using a Combinatorial Approach, ***S. Debnarova,*** *P. Soucek, V. Bursikova,* Masaryk University, Czechia*; S. Mraz, M. Hans, J. Schneider, D. Holzapfel,* RWTH Aachen University, Germany*; P. Vasina,* Masaryk University, Czechia

BP-7
Mechanical and Tribological Performance of V-C-N Coatings Deposited by RF Magnetron Sputtering, ***A. Alhussein,*** Universite de Technologie de Troyes (UTT), France*; L. Aissani,* Khenchela University, Larbi Ben M'Hidi University, Algeria*; C. Nouveau,* CER Arts et Metiers Paris Tech, France

BP-8
Radiation Stability of nc- ZrN/a-ZrCu Multilayered Films after He Implantation, ***G. Abadias,*** Institut Pprime - CNRS - ENSMA - Université de Poitiers, France*; V. Uglov, S. Zlotski, I. Saladukhin,* Belarusian State University, Belarus

BP-9
Physical and Mechanical Properties of Cr-Al-N and Cr-v-N Ternary Systems, ***A. Belgroune,*** University of Technology of Troyes, France*; L. Aissani,* University of Abbes Laghrour, Algeria*; A. Alhussein,* University of Technology of Troyes, France

BP-10
Understanding Residual Stress in Thin Films: Analyzing the Stress Evolution Using a Kinetic Model for Ag, Cu, Ni, Fe, Ti, and Cr, ***Z. Rao,*** *S. Berman,* Brown University, USA*; D. Depla ,* Ghent University, Belgium*; E. Chason ,* Brown University, USA

BP-11
Effect of Target Poisoning Ratios on the Fabrication of TiO_X Coatings Using Superimposed HiPIMS and MF System, *W. Chen,* Ming Chi University of Technology, Taiwan*; B. Lou,* Chang Gung University, Taiwan*; .* ***Lee,*** Ming Chi University of Technology, Taiwan

BP-12
The Role of Oxygen Flow Rate on the Structure and Stoichiometry of Cobalt Oxide Films Deposited by DC Reactive Sputtering, ***N. Francelosi Azevedo Neto,*** *L. Affonco,* São Paulo State University, Brazil*; C. Stegemann, D. Marcel Gonçalves Leite ,* Aeronautics Institute of Technology, Brazil*; J. Humberto Dias da Silva ,* São Paulo State University, Brazil

BP-13
e-Poster Presentation: Bipolar HiPIMS for Tailoring Ion Energies in Thin Film Deposition, ***D. Lundin,*** *R. Viloan,* Linköping University, Sweden*; M. Zanáška,* Linköping University*; H. Du,* Guizhou University, China*; R. Boyd,* Linköping University, Sweden*; T. Shimizu,* Tokyo Metropolitan University, Japan*; U. Helmersson,* Linköping University, Sweden

BP-14
Nb-C Thin Films Prepared by DC-MS and HiPIMS: Synthesis, Structure and Tribo-mechanical Properties, ***N. Sala,*** *M. Abad,* Institut Químic de Sarrià, Universitat Ramon Llull, Spain*; J. Sánchez-López,* Instituto de Ciencia de Materiales de Sevilla, CSIC-Universidad de Sevilla, Spain*; J. Caro,* Eurecat, Centre Tecnològic de Catalunya, Spain*; C. Colominas,* Institut Químic de Sarrià, Universitat Ramon Llull, Flubetech S.L. , Spain

BP-15
Impact of Stacking Sequence with InWZnOx/InWZnOy Bilayer Conductive Bridge Random Access Memory, ***C. Hsu,*** *P. Liu, K. Gan, D. Ruan, Y. Chiu,* National Chiao Tung University, Taiwan*; S. Sze,* Naitonal Chiao Tung University, Taiwan

Fundamentals and Technology of Multifunctional Materials and Devices
Room On Demand - Session C1
Optical Materials: Design, Synthesis, Characterization, and Applications
1:00pm

INVITED: C1-1
INVITED TALK: Measurement of Feature Dimension and Shape for Nanowire Test Structures Using Mueller Matrix Spectroscopic Ellipsometry based Scatterometry and Small Angle X-Ray Scattering, ***A. Diebold,*** SUNY Polytechnic Institute Albany, USA

C1-3
Optical Probing of Vanadium Oxide Thin Film Composition and Phase, *M. Junda,* ***N. Podraza,*** University of Toledo, USA

INVITED: C1-4
INVITED TALK: Metrology for Emerging Semiconductor Devices and Processes, ***N. Orji,*** National Institute of Standards and Technology (NIST), USA

C1-6
Chemical Bath Deposition of ZnO Nanorods on Ion-plated ZnO:Ga Seed Layers and Their Structural, Photoluminescence and UV Light Detecting Properties, ***T. Terasako,*** *S. Obara, N. Hashikuni, S. Namba,* Ehime University, Japan*; M. Yagi,* National Institute of Technology (KOSEN), Kagawa College, Japan*; Y. Furubayashi, T. Yamamoto,* Research Institute, Kochi University of Technology, Japan

C1-7
IR Mirror Coating for Evacuated Thermal Collectors: Design and Optical Characterization, ***D. De Luca,*** UniNa and CNR-ISASI, Italy*; E. Di Gennaro,* UniNa Università degli studi di Napoli "Federico II", Italy*; C. D'Alessandro, A. Caldarelli, D. De Maio, E. Gaudino,* UniNa and CNR-ISASI, Italy*; M. Musto,* UniNa Università degli studi di Napoli "Federico II", Italy*; R. Russo,* CNR-ISASI, Italy

Fundamentals and Technology of Multifunctional Materials and Devices
Room On Demand - Session C2
Functional Coatings and Thin Films for Electronic Devices
1:00pm

C2-1
Interference Signal Induced by Ultra-Thin Amorphous Carbon Films Over Flexible Copper Foils Demonstrated by Electromagnetic Boundaries Calculations, ***Â. Crespi,*** *C. Ballage, M. Hugon, J. Robert,* Université Paris Saclay, France*; D. Lundin,* Linköping University, Sweden*; T. Minea,* Université Paris Saclay, France

INVITED: C2-2
INVITED TALK: High k Dielectrics for MIM Architecture: From Capacitors to Non-volatile Memories Applications, ***C. Vallee,*** SUNY POLY, Albany, USA*; P. Gonon, M. Bonvalot, A. Bsiesy,* UGA-LTM, France

C2-4

Study of Polycrystalline BiMnO3 Thin Films Grown by Radio-Frequency Magnetron Sputtering, ***G. Umoh,*** *J. Holguín-Momaca , R. Talamantes,* Centro de Investigación en Materiales Avanzados, S.C. (CIMAV), Mexico*; G. Herrera-Pérez,* Centro de Investigación en Materiales Avanzados, S.C. (CIMAV), USA*; S. Olive-Méndez, A. Hurtado-Macias,* Centro de Investigación en Materiales Avanzados, S.C. (CIMAV), Mexico

C2-5

Nanostructured Multifunctional Architectural Glass Glazing for Future Green Cities*, S. Woodward-Gagne, R. Beaini, B. Baloukas, O. Zabeida,* ***L. Martinu,*** Polytechnique Montreal, Canada

C2-6

Effect of Substrate Bias on Properties and Microstructure of Nanotwinned Copper Thin Films Deposited by Magnetron Sputtering System, ***T. Lin,*** NTHU, Taiwan*; S. Chang,* +886-3-5715131 ext 34321, Taiwan*; F. Ouyang,* NTHU, Taiwan

C2-7

Nanostructured CuO/WO_3 Thin Films for Hydrogen Gas Sensing Prepared by Advanced Magnetron Sputtering Techniques, ***N. Kumar,*** *S. Haviar, J. Čapek, Š. Batková, P. Zeman, P. Baroch,* University of West Bohemia, Czech Republic

C2-8

Study of Thermal Stability of Highly (111)-Oriented Nanotwinned Ag Films by Using Unbalanced Magnetron Sputtering, ***P. Wu,*** *Y. Hao, L. Chang, F. Ouyang,* National Tsing Hua University, Taiwan

C2-9

Enhanced Reliability and Uniformity for Ge pMOSFET with Low Temperature Supercritical Fluid Treatment, ***B. Kuo,*** *K. Chang-Liao,* National Tsing Hua University, Taiwan*; D. Ruan,* National Tsing Hua University, China*; J. Li,* National Tsing Hua University, Taiwan

C2-11

Printed Polymer Heat Sinks for High-Power, Flexible Electronics, ***K. Burzynski***[1], University of Dayton and Air Force Research Laboratory, USA*; N. Glavin,* Air Force Research Laboratory, Materials and Manufacturing Directorate, USA*; E. Heckman,* Air Force Research Laboratory, Sensors Directorate, USA*; C. Muratore,* University of Dayton, USA

C2-12

High-performance Thermochromic VO_2-based Coatings Prepared on Glass by a Low-temperature Scalable Deposition, ***T. Bárta,*** *J. Vlček, D. Kolenatý, J. Rezek, J. Houška, S. Haviar,* University of West Bohemia, Czech Republic

C2-13

Investigation of Resistive Switching in TAOs-Based Memristor With Ultraviolet Irradiation, ***Y. Li,*** *P. Liu, C. Hsu, K. Gan, D. Ruan, Y. Chiu,* National Chiao Tung University, Taiwan

Fundamentals and Technology of Multifunctional Materials and Devices
Room On Demand - Session C3
Thin Films for Energy Applications: Solar, Thermal, and Photochemical
1:00pm

C3-1

Au and Ag Nanoparticle Effects on the Electrical Properties of Pulsed Laser Deposited Cdte/Cds Photovoltaic Thin Films, ***M. Sahiner,*** *J. Emerson, F. Akinlade, M. Herington, V. Castillon,* Seton Hall University, USA

C3-2

Transparent Thermoelectric TiO_2:Nb Thin Films*, J. Ribeiro, F. Correia,* ***C. Tavares,*** University of Minho, Portugal

C3-3

Multilayers for Efficient Thermal Energy Conversion in High Vacuum Flat Solar Thermal Panels*, D. De Maio,* Unina and CNR-ISASI, Italy*; C. D'Alessandro, A. Caldarelli, E. Gaudino,* UniNa and CNR-ISASI, Italy*; M. Musto,* UniNa - Università degli studi di Napoli "Federico II", Italy*; D. De Luca,* UniNa and CNR-ISASI, Italy*; E. Di Gennaro,* UniNa - Università degli studi di Napoli "Federico II", Italy*;* ***R. Russo,*** CNR - ISASI, Italy

C3-4

Development of Efficient Perovskite Solar Cells Under Ambient Conditions via Fine Tuning of Compact TiO_2 Layer, ***N. Bhagat,*** Guru Nanak Dev University, India*; V. Saxena,* Bhabha Atomic Research Centre, India*; A. Mahajan,* Guru Nanak Dev University, India

[1] **2020 Student Award Finalist**

Fundamentals and Technology of Multifunctional Materials and Devices
Room On Demand - Session CP
Fundamentals and Technology of Multifunctional Materials and Devices (Symposium C) Poster Session
1:00pm

CP-1

Freestanding ZnO Nanowire For Multifunctional Application in RRAM Memory and Gas Sensing, ***P. Singh,*** National Taiwan University of Science and Technology, Taiwan*; T. Tseng ,* National Chiao Tung university , Taiwan*; J. Chu,* National Taiwan University of Science and Technology, Taiwan

CP-2

Introducing Thin HfO_2 Layer to Inhibit the Power Consumption of InWZnO CBRAM, ***Y. Li,*** *P. Liu, C. Hsu, K. Gan, D. Ruan, Y. Chiu,* National Chiao Tung University, Taiwan

CP-3

Improved Electrical Performance for Indium Tungsten Oxide Thin-Film Transistor with Asymmetric Source and Drain ElectrodeMaterial, ***C. Lin,*** *P. Liu,* National Chiao Tung University, Taiwan*; D. Ruan,* National Chiao Tung University, China*; K. Gan, Y. Chiu, C. Hsu,* National Chiao Tung University, Taiwan*; S. Sze,* National Chiao Tung University, USA

Coatings for Biomedical and Healthcare Applications
Room On Demand - Session D1
Surface Coating and Surface Modification in Biological Environments
1:00pm

D1-1

Physical Vapor Deposition for Growth of Large Area Molecular Sensor Arrays*, N. Glavin, D. Austin, D. Moore, M. Motala,* Air Force Research Laboratory, Materials and Manufacturing Directorate, USA*;* ***C. Muratore,*** University of Dayton, USA

D1-2

Mesenchymal Stem Cells Response to Metal Oxide Thin Films, ***P. Silva-Bermudez,*** Instituto Nacional de Rehabilitación Luis Guillermo Ibarra Ibarra, Mexico*; M. Fernández-Lizárraga,* Escuela Nacional de Ciencias Biológicas, Instituto Politécnico Nacional, Mexico*; S. Rodil,* Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, Mexico*; J. Garcia-Lopez, R. Sanchez-Sanchez,* Instituto Nacional de Rehabilitación Luis Guillermo Ibarra Ibarra, Mexico

D1-3

Behavior of a-C:H with Different fs-laser Micro-Patterns against Diamond Tip in Hyaluronic Acid, ***A. Dorner-Reisel,*** Schmalkalden Universtity of Applied Sciences, Germany*; S. Svoboda,* Schmalkalden University of Applied Sciences, Germany*; A. Engel,* University of Applied Sciences Mittweida*; C. Schürer,* Consultant Chemnitz*; S. Weißmantel,* University of Applied Sciences Mittweida, Germany

D1-4

Analysis of a Drug Coated Polymer Stent with XPS and Argon Cluster Depth Profiling, ***D. Surman,*** Kratos Analytical Inc., USA*; J. Counsell,* Kratos Analytical Ltd., UK*; M. Alexander,* University of Nottingham, UK

D1-5

Flexible Plasma Jet Source for Biomedical Applications, ***C. Corbella,*** *S. Portal, L. Lin, M. Keidar,* George Washington University, USA

INVITED: D1-6

INVITED TALK: Embroidery of Conductive E-Threads: Opportunities and Challenges in Healthcare*, Z. Dalisky, S. Alharbi, V. Mishra,* ***A. Kiourti,*** *K. Guido,* The Ohio State University, USA

Coatings for Biomedical and Healthcare Applications
Room On Demand - Session D2
Bio-corrosion, Bio-tribology and Bio-Tribocorrosion-Additive Manufacturing Impact
1:00pm

INVITED: **D2-1**

INVITED TALK: Behavior Of Additively Manufactured 316L Stainless Steel Fabricated By Selective Laser Melting In Comparison To Wrought 316L And 317 L Stainless Steels, ***M. Salasi,*** *K. Wang, E. Hornus,* Curtin University, Australia*; M. Pabbruwe,* Curtin University, Royal Perth Hospital, Australia , Australia*; T. Pojtanabuntoeng,* Curtin University, Australia , Australia*; M. Iannuzzi, Z. Quadir, W. Rickard,* Curtin University, Australia*; M. Salem, P. Lours,* Ecole de Mines Albi, France*; J. Bougoure,* Curtin University, Australia , Australia*; P. Guagliardo,* Curtin University, Australia

D2-3

Sputtered Thin Film Systems As Anode Materials for Biodegradable Battery, ***W. Haider,*** Central Michigan University, USA

D2-4

In Vitro Degradation of ZrO_2 Coated Magnesium Alloys, ***B. Millan,*** Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México*; O. Depablos-Rivera,* Universidad Nacional Autónoma de México, México*; P. Silva-Bermudez,* Instituto Nacional de Rehabilitación Luis Guillermo Ibarra, Mexico*; S. Rodil,* Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, Mexico

D2-5

In Solution, A New Representation to Link the Corrosion Degradation Consistent with Wear: Smooth and Hard Coatings are Well Discriminated.*,* ***J. Geringer,*** *A. Boyer,* Mines Saint-Etienne, France*; H. Ding, V. Fridrici, P. Kapsa,* Ecole Centrale de Lyon, Ecully, France*; T. Tayler, L. Semetse, P. Olubambi,* University of Johannesburg, South Africa

Coatings for Biomedical and Healthcare Applications
Room On Demand - Session D3
Biointerfaces: Improving the Cell Adhesion and Avoiding Bacteria. What Kinds of Coatings/Surfaces Should be Used?
1:00pm

D3-1

Very Thin Gold Films Deposited Collagen to Improve Skin Wound Healing in Animal Study, ***S. Huang,*** Feng Chia University, Taichung Veterans General Hospital, Taiwan*; P. Hsieh, R. Chang,* Feng Chia University, Taiwan*; C. Chou,* Taichung Veterans General Hospital, National Yang-Ming University, Taiwan*; C. Chung,* Central Taiwan University of Science and Technology, Taiwan*; J. He,* Feng Chia University, Taiwan

D3-2

New Cytocompatible and Antibacterial Porous Ta_2O_5 Surface: Dental Implant Prototype, ***L. Fialho,*** University of Minho, Portugal*; L. Grenho,* university of Porto, Portugal*; M. Fernandes,* University of Porto, Portugal*; L. Forte Martins,* Private dental practice - Dental Verde clinic, Portugal*; S. Carvalho,* University of Minho, Portugal

Coatings for Biomedical and Healthcare Applications
Room On Demand - Session DP
Coatings for Biomedical and Healthcare Applications (Symposium D) Poster Session
1:00pm

DP-1

Optimisation of Electrolytic Plasma Oxidation (PEO) Coatings Formed on Magnesium for Biological Applications, ***Y. Guo,*** *A. Rogov, B. Mingo, A. Matthews, A. Yerokhin,* The University of Manchester, UK

DP-2

The Property of Adhesion and Biocompatibility of Silicon and Fluorine Doped Amorphous Carbon Films, ***M. Toyonaga,*** Keio University, Japan*; T. Hasebe,* Keio University, Tokai University Hachioji Hospital, Japan*; S. Maegawa,* Tokai University Hachioji Hospital, Japan*; T. Matsumoto,* Keio University, Tokai University Hachioji Hospital, Japan*; A. Hotta, T. Suzuki,* Keio University, Japan

DP-3

In Vitro Study of Very Thin Gold Film Deposited Collagen Fabric, ***S. Huang,*** *. Hsieh,* Feng Chia University, Taichung Veterans General Hospital, Taiwan*; R. Chang,* Feng Chia University, Taiwan*; C. Chou,* Taichung Veterans General Hospital, National Yang-Ming University, Taiwan*; C. Chung,* Central Taiwan University of Science and Technology, Taiwan*; J. He,* Feng Chia University, Taiwan

DP-4

e-Poster Presentation: Metallization of Polymers for Medical Applications using HiPIMS, ***A. Chacko,*** *K. Thorwarth, R. Crockett, U. Müller, H. Hug,* Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland

DP-5

TiZrSiN Coatings, Structural Characterization, and Corrosion Resistance in Ringer's Lactate, ***C. Mejía Villagrán,*** Universidad Nacional de Colombia*; M. Chellali,* Karlsruhe Institute of Technology (KIT), Libya*; C. Garzón Ospina,* Universidad Nacional de Colombia*; H. Hahn,* Karlsruhe Institute of Technology (KIT), Germany*; J. Olaya Flórez,* Universidad Nacional de Colombia*; L. Velasco Estrada,* Karlsruhe Institute of Technology (KIT), Germany

DP-6

A Novel Synthesis Method of Carbide Derived Carbon (CDC) Surface Modification for Hip Implants, ***Y. Sun,*** University of Illinois at Chicago, USA*; K. Cheng, M. Mathew,* UIC College of Medicine at Rockford, USA*; M. McNallan,* University of Illinois at Chicago, USA

DP-7

Enhancing Osseoointegration on PEEK Spinal Implant by Using Laser Surface Roughening and HIPIMS Titanium Coating, ***P. Hsieh,*** Feng Chia University, Taiwan*; H. Tsou,* Taichung Veterans General Hospital, Taiwan*; C. Chung,* Central Taiwan University of Science and Technology, Taiwan*; J. He,* Feng Chia University, Taiwan

DP-8

Superamphiphobic Stainless Steel Surface Prepared by Femtosecond Laser Patterning and Pulsed Plasma-Polymerization, *C. Lin,* Central Taiwan University of Science and Technology, Taiwan*; C. Chou,* Taichung Veterans General Hospital; National Yang-Ming University, Taiwan*;* ***C. Chung,*** Central Taiwan University of Science and Technology, Taiwan*; J. He,* Feng Chia University, Taiwan

DP-9

Light-activated High Efficiency Antimicrobial and Antiviral Coatings, ***V. Bellido-Gonzalez,*** *P. Killen, T. Sgrilli, D. Monaghan,* Gencoa Ltd, UK*; O. Hernandez-Rodriguez,* IK4-TEKNIKER, Spain

Tribology and Mechanical Behavior of Coatings and Engineered Surfaces
Room On Demand - Session E1
Friction, Wear, Lubrication Effects, and Modeling
1:00pm

E1-1

Multi-sensing Nano-wear with Electrical Contact Resistance and Friction Measurement, ***B. Beake,*** Micro Materials Ltd, UK*; T. Liskiewicz,* Manchester Metropolitan University, UK*; A. Harris,* Micro Materials Ltd.*; S. McMaster, A. Neville,* University of Leeds, UK

E1-2

Interlayer Design to Increase Adhesion of a-C Coatings onto C17200 Copper-Beryllium Alloy Surface, ***M. dos Santos,*** *N. Fukumasu,* Polytechnic School of the University of Sao Paulo, Brazil*; A. Tschiptschin,* Metallurgical and Materials Engineering Department, University of Sao Paulo, Sao Paulo, Brazil*; R. de Souza, I. Machado,* Polytechnic School of the University of Sao Paulo, Brazil

E1-3

Tribologically Enhanced Self-healing of Niobium Oxide Surfaces, ***S. Aouadi,*** *A. Shirani, J. Gu, B. Wei, D. Berman,* University of North Texas, USA

E1-4

Computer Simulations of FCC Alloys Subjected to Dry Sliding as Basis for a Near-Surface Deformation Mechanism Map, ***S. Eder,*** *M. Rodríguez Ripoll, U. Cihak-Bayr,* AC2T Research GmbH, Austria*; D. Dini,* Imperial College London, UK*; C. Gachot,* TU Wien, Austria

E1-5

From Surface to Sub-surface Contributions to Friction at the Nanoscale, *C. Menezes,* UFSC, Brazil*; V. Pavinato, L. Leidens,* UCS - Caxias do Sul University, Brazil*; F. Echeverrigaray, F. Alvarez,* UNICAMP, Brazil*; A. Michels,* ***C. Figueroa,*** UCS - Caxias do Sul University, Brazil

E1-6

Ni-based Self-Lubricating Laser Claddings for Hot Forming and High Temperature Vacuum Applications, *H. Torres,* AC2T Research GmbH, Austria*; B. Prakash,* Lulea University of Technology, Sweden*;* ***M. Rodriguez Ripoll,*** AC2T Research GmbH, Austria

INVITED: **E1-7**

INVITED TALK: The Thinnest of The Thin: Friction and Adhesion Behavior of Graphene and other Two-Dimensional Materials, ***R. Carpick,*** University of Pennsylvania, USA

E1-9

Tribological Properties of Vanadium-doped Coatings via Reactive Molecular Dynamic Simulations, ***I. Ponomarev,*** *T. Polcar, P. Nicolini,* Czech Technical University in Prague, Czech Republic

E1-11

Tribological Properties of Duplex PEO/Chameleon Coating on Aluminum Alloys, ***A. Voevodin,*** *J. Shittu, A. Shirani,* University of North Texas, USA*; A. Yerokhin,* University of Manchester*; A. Korenyi-Both,* Colorado School of Mines, USA*; J. Mogonye,* Army Research Laboratories, USA*; D. Berman, S. Aouadi,* University of North Texas, USA

E1-13

Analysis of Coating Layers and Defects Using Atomic Force Microscopy, ***S. Kaemmer,*** *G. Mendoza,* Park Systems Corporation, USA

Tribology and Mechanical Behavior of Coatings and Engineered Surfaces
Room On Demand - Session E2
Mechanical Properties and Adhesion
1:00pm

E2-1

Structural, Nanomechanical and Tribological Properties of Manganese Phosphate Coatings, ***E. Broitman,*** *I. Nedelcu,* SKF Research & Technology Development Center, Netherlands*; T. von Schleinitz,* SKF Research & Technology Development Center, Germany

INVITED: E2-2

INVITED TALK: Controlled Spalling of Microscale, Single-Crystal Films of High-Quality, High-Value Semiconductors, ***C. Packard,*** Colorado School of Mines, USA

E2-4

Industrial Applied Measurement Method of Localized Coating Property and Stress Profiles Within a Calotte Wear Crater via Nano-Indentation, ***T. vom Braucke,*** GP Plasma, Canada*; F. Papa,* GP Plasma, USA*; A. Harris, B. Beake,* Micro Materials Ltd, UK*; J. Gutiérrez, I. Martinez, A. Wennberg,* Nano4Energy, Spain*; C. Shin, J. Yun,* DONGWOO HST CO., Korea (Democratic People's Republic of)*; N. Bierwisch, N. Schwarzer,* Saxonian Institute of Surface Mechanics SIO, Germany

E2-5

Nanostructured CVD W/WC Coating with Enhanced Resistance to Water Droplet Erosion and Cavitation, ***Y. Zhuk,*** Hardide Plc, UK

E2-6

Toughening Magnetron Sputtered S-phase Stainless Steel Coatings by Cycling the N_2 Gas Flow Rate, ***C. Garzon,*** Universidad Nacional de Colombia - Bogotá, Colombia*; A. Recco,* Universidade do Estado de Santa Catarina, Brazil

E2-7

Thin-film Adhesion: A Comparative Study Between Colored Picosecond Acoustics and the Stressed Overlayer technique, ***A. Devos,*** Iemn, Umr Cnrs, France*; M. Cordill,* Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Leoben, Austria

E2-8

Comparing the Residual Stress Gradient Measurement of ZrN using FIB-DIC and Xray Diffraction, *W. Lin, Y. Chou,* National Chung Hsing University, Taiwan*; J. Huang,* National Tsing Hua University, Taiwan*;* ***M. Lin,*** National Chung Hsing University, Taiwan

E2-9

Investigation of Deformation Behavior Under Different Loading Directions in Transition Metal Thin Films, ***M. Schoof,*** RWTH Aachen University, Germany

E2-10

Study of Corrosion-Resistance Behavior and Tribological Properties of Electrophoretically Deposited Graphene Coatings on Titanium Substrate for Marine Applications, ***M. Mallick,*** *A. N,* IIT Madras, India

E2-12

Effect of Residual Stress on the Mechanical Properties of Nitride-Based Protective Coatings Deposited by Pulsed-Plasma Sputtering Techniques, ***E. Bousser,*** *E. Herrera-Jimenez, L. Martinu, J. Klemberg-Sapieha,* Polytechnique Montreal, Canada

E2-13

Hyperelasticity and Viscoelasticity in Thin Organic Semiconductor Coatings, ***S. Bull,*** Newcastle University, UK*; A. Yadav, H. Gonabadi,* Newcastle University

E2-14

Abrasion Wear Resistance of Low Temperature Plasma Nitrided Inconel 625 Superalloy, *L. Varela, M. Ordoñez,* University of São Paulo, Brazil*;* ***C. Pinedo,*** Heat Tech & University of Mogi das Cruzes, Brazil*; A. Tschiptschin,* University of São Paulo, Brazil

Tribology and Mechanical Behavior of Coatings and Engineered Surfaces
Room On Demand - Session E3
Tribology of Coatings for Automotive and Aerospace Applications
1:00pm

E3-1

Coating Properties and Wear Resistance of ta-C Deposited by Arc Ion Plating (AIP) Technique, ***Y. Isomura,*** *T. Takahashi, J. Fujita,* Kobe Steel, Ltd., Japan*; S. Kujime,* Kobe Steel Ltd., Japan

E3-2

Numerical Study of Cracking in Thin Hard Coating Layers Using a Cohesive Phase-Field Model and Experimental Validation, ***A. Rajaei Harandi,*** RWTH Aachen, Germany*; S. Rezaei,* Technical University of Darmstadt, Germany*; S. Karimi Aghda, T. Brepols, J. Schneider, S. Reese,* RWTH Aachen University, Germany

E3-3

Duplex TiN and TiAlN Coatings on Ti-6Al-4V Alloy Formed by a Combination of Plasma Nitriding and Cathodic Arc Evaporation, *V. Pankov,* ***Q. Yang,*** National Research Council of Canada

E3-4

Determination of Method for Tribological Experiment on Ultra-Hard Coatings in Low-Viscosity Fuels, ***K. Jacques,*** University of North Texas, USA*; S. Berkebile, N. Murthy, J. Mogonye,* Army Research Laboratories, USA*; S. Dixit,* Plasma Technology Inc., USA*; D. Berman, T. Scharf,* University of North Texas, USA

Tribology and Mechanical Behavior of Coatings and Engineered Surfaces
Room On Demand - Session EP
Tribology and Mechanical Behavior of Coatings and Engineered Surfaces (Symposium E) Poster Session
1:00pm

EP-1

About the Impossibility of a Mathematical Relationship between Hardness Values Measured by Vickers and Instrumented Nanoindentation Techniques, ***E. Broitman,*** SKF Research & Technology Development Center, Netherlands

EP-2

Substrate Influence on the Adhesion of Metallic Films, ***M. Cordill,*** Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Austria*; P. Kreiml,* Erich Schmid Institute for Material Science, Austrian Academy of Sciences, Austria

EP-3

Effects of Sputtering Gas Systems on the Preparation of a-BN Films using RF Sputtering, ***Y. Yamada,*** *T. Markuko,* Chiba Institute of Technology Graduate School, Japan*; M. Imamiya,* Hana Saidan, Japan*; Y. Sakamoto,* Chiba Institute of Technology, Japan

EP-4

Tribological Properties of Sputter-deposited Mo Films on Polyimide, ***E. Kobierska,*** *S. Hirn,* Montanuniversität Leoben, Austria*; M. Cordill,* Erich Schmid Institute for Material Science, Austrian Academy of Sciences, Austria*; R. Franz, M. Rebelo de Figueiredo,* Montanuniversität Leoben, Austria

EP-5

Tribocorrosion Behavior of Boride Coating on Cocrmo Alloy Produced by Thermochemical Process in 0.35% NaCl Solution, *A. Rentería,* Universidad de Guadalajara, México*;* ***M. Doñu-Ruiz,*** Universidad Politecnica del Valle de Mexico, México*; M. Flores-Martinez,* Universidad de Guadalajara, México*; S. Muhl,* Universidad Nacional Autónoma de México, México*; N. Lopez-Perrusquia,* Universidad Politecnica del Valle de México, México*; E. García,* CONACYT - Universidad de Guadalajara, México

EP-6

Composite Coating on Cu Prepared by Plasma Electrolytic Aluminating, *C. Zhao, J. Sun, R. Cai,* ***X. Nie,*** University of Windsor, Canada*; J. Tjong,* Ford Motor Company, Canada*; D. Matthews,* University of Twente, Netherlands

EP-7

A Numerical-Experimental Study of Borided AISI 316L Steel Under Cyclic Contact Loading, ***D. FERNÁNDEZ***, *O. DE LA ROSA, G. Rodríguez-Castro, A. Meneses-Amador,* National Polytechnic Institute, Mexico*; A. LÓPEZ-LIÉVANO, A. Ocampo-Ramírez,* Instituto Sanmiguelense, Mexico

EP-9

Novel Micromechanical Approaches to Understand the Influence of Hydrogen on Materials Behavior, ***J. Duarte Correa***, *J. Rao,* Max-Planck-Institut für Eisenforschung GmbH, Germany*; X. Fang,* Technische Universität Darmstadt, Germany*; G. Dehm,* Max-Planck-Institut für Eisenforschung, Düsseldorf, Germany

EP-10

Enhancement in Dry Cutting Performance and Tribological Characteristics of Amorphous Carbon and Bimetal Nitride Coatings Deposited by HiPIMS Technology With Positive Pulses, ***D. Matthews,*** University of Twente, Netherlands*; R. Ganesan,* University of Sydney, Australia*; I. Fernandez-Martinez,* Nano4Energy, Spain*; M. Stueber, S. Ulrich,* Karlsruhe Institute of Technology (KIT), Germany*; D. Mckenzie, M. Bilek,* University of Sydney, Australia

New Horizons in Coatings and Thin Films
Room On Demand - Session F1
Nanomaterials and Nanofabrication
1:00pm

F1-1

Theory and Applications of Inverted Fireballs, ***G. Eichenhofer,*** 4A-PLASMA, Germany*; J. Gruenwald,* G-Labs, Austria

F1-2

Pulsed Aerosol Assisted Plasma Deposition: Influence of the Injection Parameters on ZnO/DLC Nanocomposite Thin Films, ***A. Girardeau,*** LAPLACE, LCC, France*; G. Carnide,* LAPLACE, LCC, IMRCP, France*; A. Mingotaud,* IMRCP, France*; M. CAVARROC,* Safran Tech, France*; M. Kahn,* LCC, France*; R. Clergereaux,* LAPLACE, France

F1-3

Design of Functional Nanoporous Ceramic Coatings via Infiltration of Polymer Templates, ***D. Berman,*** University of North Texas, USA

F1-4

Improvement of Adhesion between NiTi Alloy and Diamond-like Carbon Filmby Bayesian Optimization, ***M. Toyonaga,*** Keio University, Japan*; T. Hasebe,* Keio University, Tokai University Hachioji Hospital, Japan*; S. Maegawa,* Tokai University Hachioji Hospital, Japan*; T. Matsumoto,* Keio University, Tokai University Hachioji Hospital, Japan*; A. Hotta, T. Suzuki,* Keio University, Japan

F1-5

Novel Type of Bent-Lattice Nanostructure in Crystallizing Amorphous Films Revealed by TEM: From Transrotational Microcrystals to Strain Nanoengineering and Novel Amorphous Models, ***V. Kolosov,*** Ural Federal University, Russian Federation

F1-6

Deposition of Cu and Pt Metallic Clusters onto Titanium Dioxide Nanoparticles by DC Magnetron Sputtering for Hydrogen Production, ***G. West,*** Manchester Metropolitan University, UK*; M. Bernareggi, G. Chiarello, E. Selli,* University of Milan, Italy*; A. Ferretti,* ISTM-CNR Lab Nanotechnology, Italy*; M. Ratova, P. Kelly,* Manchester Metropolitan University, UK

F1-7

Manipulation of Thin Films and Nanostructures on Weakly-interacting Substrates by Selective Surfactant Deployment, *A. Jamnig,* Linköping University, IFM, Nanoscale Engineering Division, Sweden*; N. Pliatsikas, M. Konpan,* Linköping University, IFM, Nanoscale Engineering Division*; J. Lu,* Linköping University, IFM, Thin Film Physics Division, Sweden*; J. Kovac,* Josef Stefan Institute*; G. Abadias,* University of Poitiers, PPRIME Institute, CNRS, France*; I. Petrov,* University of Illinois, USA, Linköping University, Sweden, USA*; J. Greene,* University of Illinois, USA, Linköping University, Sweden, National Taiwan Univ. Science & Technology, Taiwan, USA*;* ***K. Sarakinos,*** Linköping University, Sweden

New Horizons in Coatings and Thin Films
Room On Demand - Session F2
High Entropy and Other Multi-principal-element Materials
1:00pm

F2-1

Combinatorial Design of High Entropy Alloys: A Rational Approach in Thin Film, ***E. Garel,*** *H. Van Landeghem, R. Boichot,* SIMAP, Grenoble-INP, CNRS, France

F2-2

Systematic Investigation of the Impact of Pure Metal Addition on AlCuMgZn Multi Principal Element Alloys, ***J. Kirschner,*** *R. Gaschl,* Vienna University of Technology, Austria*; J. Bernardi,* USTEM, Vienna Technical University, Austria*; C. Eisenmenger-Sittner,* Vienna University of Technology, Austria*; C. Simson,* LKR Leichtmetallkompetenzzentrum Ranshofen, Austria

F2-3

Improving Phase Stability, Hardness and Oxidation Resistance of Reactive Magnetron Sputtered ($Al_vCr_wNb_xTa_yTi_z$)N Thin Films by Si-alloying, ***A. Kretschmer,*** Institute of Materials Science and Technology, TU Wien, Austria*; K. Yalamanchili,* Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein*; H. Rudigier,* OC Oerlikon Management AG, Switzerland, Liechtenstein*; P. Mayrhofer,* TU Wien, Institute of Materials Science and Technology, Austria

F2-4

Carbon Containing Multicomponent Alloys with High Hardness, Ductility and Corrosion Resistance, ***L. Zendejas Medina,*** Uppsala University, Sverige*; G. Lindwall,* KTH - Royal Institute of Technology, Sweden*; E. Pascalidou,* Uppsala University, Sweden*; L. Riekehr,* Uppsala University, Angstrom Laboratory, Sweden*; M. Tavares da Costa,* Uppsala University, Sweden*; S. Fritze,* Uppsala University, Angstrom Laboratory, Sweden*; K. Gamstedt,* Uppsala University, Sweden*; L. Nyholm, U. Jansson,* Uppsala University, Angstrom Laboratory, Sweden

F2-5

Structural and Mechanical Properties of AlTiTaZr(-N) Medium Entropy Films (MEF) Obtained by DC Magnetron Sputtering in Dynamic Mode, ***M. El Garah,*** *S. Achache,* LASMIS, CNRS- Université Technologique de Troyes, France*; A. Michau, F. Schuster,* CEA, Université Paris-Saclay, France*; F. Sanchette,* LASMIS, CNRS- Université Technologique de Troyes, France

F2-6

Mechanical Properties of Multilayered NbMoTaW Alloy Films with Cyclic Gradient Concentration, *Y. Chen,* ***C. Chen,*** National Taiwan Ocean University, Taiwan

F2-7

Unveiling Microplasticity Mechanisms in Metallic Glasses with the Help of Polymer-supported Thin Films, ***O. Glushko,*** Montanuniversität Leoben, Leoben, Austria*; C. Mitterer, J. Eckert,* Montanuniversität Leoben, Austria

F2-8

Phase Formation and Structural Properties of AlSiTaTiZr Multicomponent Thin Film Alloys, ***F. Cemin,*** *M. Jimenez,* UNICAMP, Brazil*; L. Leidens,* Universidade de Caxias do Sul, Brazil*; R. Merlo,* UNICAMP, Brazil*; C. Figueroa,* Universidade de Caxias do Sul, Brazil*; F. Alvarez,* UNICAMP, Brazil

F2-9

XPS Core-Level Shifts, Local Lattice Distortions and Charge Transfer in HfNbTiVZr Refractory High Entropy Alloy, ***L. Casillas-Trujillo,*** Linköping University, IFM, Sweden*; B. Osinger, R. Lindblad, D. Karlsson, S. Fritze, K. von Fieandt,* Uppsala University, Angstrom Laboratory, Sweden*; B. Alling,* Linköping University, IFM, Sweden*; U. Jansson,* Uppsala University, Angstrom Laboratory, Sweden*; I. Abrikosov,* Linköping University, IFM, Sweden*; E. Lewin,* Uppsala University, Angstrom Laboratory, Sweden

New Horizons in Coatings and Thin Films
Room On Demand - Session F3
2D Materials: Synthesis, Characterization, and Applications
1:00pm

F3-1

Low-Temperature Synthesis of Vertically Standing Graphene by Microwave-Chemical Vapour Deposition, *I. Vasconcelos Joviano dos Santos,* ***J. Kulczyk-Malecka,*** *S. Rowley-Neale, C. Banks, P. Kelly,* Manchester Metropolitan University, UK

F3-2

Better than Homoepitaxy? van der Waals Layer Assisted Growth of Thin Films, ***K. Tanaka,*** University of California Los Angeles, USA*; K. Hojo,* Nagoya University, Japan*; A. Deshpande, P. Arias, M. Liao, Y. Wang, H. Zaid, A. Aleman, M. Goorsky, S. Kodambaka,* University of California Los Angeles, USA

F3-3

Graphene Deposition on Copper Using Concentrated Solar-Thermal Heating, ***A. Alghfeli,*** *M. Abuseada, T. Fisher,* University of California at Los Angeles, USA

New Horizons in Coatings and Thin Films
Room On Demand - Session FP
New Horizons in Coatings and Thin Films (Symposium F)
Poster Session
1:00pm

FP-1
Optical, Structural and Morphological Properties of NiO_X Thin Films Obtained by E-Beam, ***J. Castillo,*** Universidad Autónoma de Baja California, Colombia; *N. Nedev,* Universidad Autónoma de Baja California, Bulgaria; *B. Valdez,* Universidad Autónoma de Baja California, Mexico; *M. Bernechea,* University of Zaragoza, Spain; *M. Mendivil,* Centro de Investigación en Materiales Avanzados (CIMAV, Mexico; *M. Curiel,* Universidad Autónoma de Baja California, Mexico

FP-2
Characterization and Photoluminescence of Al- and Ga-doped V_2O_5 Nanostructures Synthesized by Thermally Activated Process, ***C. Wang,*** National Chung Hsing University, Taiwan; *C. Lu,* Chinese Culture University, Taiwan; *F. Shieu,* National Chung Hsing University, Taiwan; *H. Shih,* Chinese Culture University, Taiwan

FP-3
On the Grain Size Dependence on Film Thickness, ***D. Altangerel,*** *R. Dedoncker, F. Cougnon, D. Depla,* Ghent University, Belgium

FP-4
Structural and Photoluminescence Properties of ZnO Nanorods Grown on Various TCO Seed Layers by Chemical Bath Deposition, ***T. Terasako,*** *K. Hamamoto,* Ehime University, Japan; *M. Yagi,* National Institute of Technology (KOSEN), Kagawa College, Japan; *Y. Furubayashi, T. Yamamoto,* Research Institute, Kochi University of Technology, Japan

FP-5
Superior Hydrophilicity in a Magnetron Sputtered Fe-Cr-Ni Thin Film With Nano-Pyramid Surface Structure, ***P. Yiu,*** *J. You, S. Wang, J. Chu,* National Taiwan University of Science and Technology, Taiwan

FP-6
Synergistic Effect of Ultra-thin Ag Film Coupled ITO Sandwich Structures, ***Y. Gao,*** *H. Song, W. Wu,* Da-Yeh University, Taiwan

FP-7
Development of Hydrogen Barrier Coatings based on Tungsten-doped Alloys, ***I. Lakdhar,*** *A. Alhussein,* Université de Technologie de Troyes (UTT), France; *J. Creus,* LASIE, CNRS-Université de La Rochelle, France

FP-8
Structure and Mechanical Properties of ZrB_{2+x} and $ZrAlB_{2+x}$ Hard Coatings, ***T. Fiantok,*** *T. Roch, M. Truchlý,* Comenius University in Bratislava, Slovakia; *P. Švec,* Slovak Academy of Sciences, Slovakia; *M. Zahoran, M. Mikula,* Comenius University in Bratislava, Slovakia

FP-10
Fabrication of Nanocomposite Thin Films of Metallic Nano Particles in Amorphous Carbon, ***S. Muhl,*** *F. Maya,* Universidad Nacional Autónoma de México, México; *S. Rodil,* Universidad Nacional Autónoma de México, México; *R. Calderon,* Universidad Nacional Autónoma de México, México; *A. Perez,* Unidad de Investigación y Desarrollo Tecnológico (UIDT-CCADET), Hospital General de México, México

FP-11
Growth and Characterization of Ga_2O_3/Ag-Cu /Ga_2O_3 Multilayers by High Power Impulse Magnetron Sputtering, ***S. Lin,*** *W. Wu, D. Wuu, J. Chiang, H. Sung,* Da-Yeh University, Taiwan

Surface Engineering - Applied Research and Industrial Applications
Room On Demand - Session G1
Advances in Industrial PVD, CVD and PCVD Processes and Equipment
1:00pm

INVITED: G1-1
INVITED TALK: Deposition of Functional Nano-Coatings Using Atmospheric Pressure Plasmas, ***D. Pappas,*** *A. Aref, A. Sy,* Plasmatreat USA, Inc., USA

G1-3
Parametric Analysis of the Selective GTAW Remelting Process for WC-10Co-4Cr Coating by HVOF, ***H. Santos,*** Universidade Federal do Pampa, Brazil; *N. Mayhassen,* Instituto Tecnológico de Aeronáutica, Brazil; *A. Miranda, H. SVOBODA,* Universidad de Buenos Aires, Argentina; *A. Oliveira,* Universidade Federal do Pampa, Brazil

G1-4
HIPIMS –Ready on Industrial Scale for Modern Production, ***P. Immich,*** *G. Negrea, D. Doerwald, R. Jacobs, M. Eerden, R. Ganesan, L. Tegelaers,* IHI Hauzer Techno Coating B.V., Netherlands

G1-5
Carbon coating on Three-dimensional Anodically Oxidized Titanium Foam with Hierarchical Nanostructure for Capacitive Deionization Electrode, *J. Huang,* ***P. Hsieh,*** *J. He,* Feng Chia University, Taiwan

G1-6
Digital Twin PVD Coater Matsight - State-of-the-Art and Future Outlook, ***A. Obrusnik,*** *P. Zikan, M. Kubecka,* PlasmaSolve s.r.o., Czechia

G1-7
Oxygen-Controlled Crystal Structures and Properties of SnO_2 Infrared Transparent Conducting Films, ***L. Xu,*** *L. Yang,* Harbin Institute of Technology, China; *J. Zhu,* Key Laboratory of Micro-systems and Micro-structures Manufacturing, China

INVITED: G1-8
INVITED TALK: New Developments in Magnetron Sputtering Devices, *D. Monaghan,* ***V. Bellido-Gonzalez,*** *T. Sgrilli, R. Brown, J. Brindley, B. Daniel,* Gencoa Ltd, UK

Surface Engineering - Applied Research and Industrial Applications
Room On Demand - Session G2
Surface Modification of Components in Automotive, Aerospace and Manufacturing Applications
1:00pm

INVITED: G2-1
INVITED TALK: Enhancing TiAl Oxidation Resistance at High Temperature: A Challenge for the Aerospace Industry, ***M. Cavarroc,*** Safran Tech, France

G2-3
Electrolytic Plasma Polishing as Post-Treatment for Additively Manufactured Stainless Steel, ***N. Laugel,*** *A. Matthews, A. Yerokhin,* The University of Manchester, UK

G2-4
PEO Coatings for Adhesive Bonded AA6060 Components, ***D. Shore,*** The University of Manchester, UK; *J. Avelar-Batista Wilson,* BCW Manufacturing Group Ltd, UK; *A. Matthews, A. Yerokhin,* The University of Manchester, UK

G2-5
Cobalt-based Thin Films as Electrocatalysts for Water Recombination Applications, ***C. Linder,*** Linköping University, IFM, Nanostructured Materials, Sweden; *S. Gangaprasad Rao, A. Le Febvrier,* Linköping Univ., IFM, Thin Film Physics Div., Sweden; *S. Munktell,* Swerim AB, Sweden; *P. Eklund,* Linköping Univ., IFM, Thin Film Physics Div., Sweden; *E. Björk,* Linköping University, IFM, Nanostructured Materials, Sweden

Surface Engineering - Applied Research and Industrial Applications
Room On Demand - Session G3
Innovative Surface Engineering for Advanced Cutting and Forming Tool Applications
1:00pm

G3-1
Enhancing the Performance of Rake and Flank Surface Textured Ceramic Tool Filled With Solid Lubricants, ***S. Nagarajan,*** *S. Venkata Sai Prabhu, S. G, A. G, S. N,* Sastra Deemed University, India

G3-2
Characterization of Different AlCrN PVD Coatings Deposited into H13 Steel for Lube-free Aluminum Die Casting Application, ***N. Delfino de Campos Neto,*** *A. Korenyi-Both, S. Midson, M. Kaufman,* Colorado School of Mines, USA

G3-3
12 µm in PVD with HiPIMS, ***C. Schiffers,*** *T. Leyendecker, W. Kölker,* CemeCon AG, Germany

G3-4
Cross-sectional Characterization of Microstructural, Phase and Elemental Changes during High-Temperature Oxidation of AlCrSiN Coatings, ***N. Jäger,*** Christian Doppler Laboratory for Advanced Synthesis of Novel Multifunctional Coatings at the Department of Materials Science, Montanuniversität Leoben, Leoben, Austria*; S. Spor,* voestalpine eifeler-Vacotec GmbH, Düsseldorf, Germany*; M. Meindlhumer,* Christian Doppler Laboratory for Advanced Synthesis of Novel Multifunctional Coatings at the Department of Materials Science, Montanuniversität Leoben, Austria*; H. Hruby, F. Nahif,* voestalpine eifeler-Vacotec GmbH, Düsseldorf, Germany*; C. Mitterer,* Montanuniversität Leoben, Austria*; J. Keckes,* Erich Schmid Institute for Materials Science, Austrian Academy of Sciences, Leoben, Austria*; R. Daniel,* Christian Doppler Laboratory for Advanced Synthesis of Novel Multifunctional Coatings at the Department of Materials Science, Montanuniversität Leoben, Austria

Surface Engineering - Applied Research and Industrial Applications
Room On Demand - Session G4
Pre-/Post-Treatment and Duplex Technology
1:00pm

INVITED: **G4-1**
INVITED TALK: Comprehensive Characterization of Surface Modification Mechanisms in Boron Nitride Films Prepared by a Reactive Plasma-assisted Coating Technique, ***K. Eriguchi,*** Kyoto University, Japan*; M. Noma,* SHINKO SEIKI CO., LTD, Japan*; M. Yamashita,* Hyogo Prefectural Institute of Technology, Japan*; K. Urabe,* Kyoto University, Japan*; S. Hasegawa,* Osaka University, Japan

G4-3
Notable Difference between Rapid-Thermal and Microwave Annealing on Ge pMOSFETs, ***F. Chu,*** *K. Chang-Liao,* National Tsing Hua University, Taiwan*; D. Ruan,* National Tsing Hua University, China*; S. Yi,* National Tsing Hua University, Taiwan

G4-4
Characterization of Tungsten-doped InZnO Thin Films with Plasma Treatment for Conductive-bridge RAM Applications, ***C. Hsu,*** National Chiao Tung Universiy, Taiwan*; P. Liu, K. Gan, D. Ruan, Y. Chiu, S. Sze,* National Chiao Tung University, Taiwan

Surface Engineering - Applied Research and Industrial Applications
Room On Demand - Session G5
Hybrid Systems, Processes and Coatings
1:00pm

INVITED: **G5-1**
INVITED TALK: Frontiers of Surface Engineering for Ultra-low Friction and Wear, ***A. Erdemir,*** Texas A&M University, USA

G5-3
From *On-line* Sensor Validation to *in-situ* Monitoring of Layer Growth: Coatings around Fiber-Bragg-Gratings, ***U. Beck,*** *A. Mitzkus, M. Sahre, T. Lange, M. Weise, M. Bartholmai, V. Schukar, F. Basedau, D. Hofmann, E. Köppe,* BAM Berlin, Germany

G5-4
Characterization of the Combination of Microwave and Laser Ablation Plasmas, ***E. Camps,*** *E. Campos-Gonzalez,* Instituto Nacional de Investigaciones Nucleares, Mexico

G5-6
Thermal Stability of Passivated Oxygen Vacancy in Indium Gallium Zinc Oxide with Supercritical Fluid Cosolvent Oxidation, Post Annealing or Oxygen Plasma Treatment, ***C. Lin,*** *P. Liu,* National Chiao Tung University, Taiwan*; D. Ruan,* National Chiao Tung University, China*; Y. Chiu, K. Gan, C. Hsu,* National Chiao Tung University, Taiwan*; S. Sze,* National Chiao Tung University, USA

Surface Engineering - Applied Research and Industrial Applications
Room On Demand - Session G6
Application-Driven Cooperations between Industry and Research Institutions
1:00pm

G6-1
Hard Protective Coatings Inside Narrow Tubes and Cavities in Aircraft Engine Components, *J. Crespo Villegas, A. Kilicaslan, O. Zabeida, E. Bousser,* Polytechnique Montreal, Canada*;* ***J. Klemberg-Sapieha,*** Polytechnique Montrtreal, Canada*; L. Martinu,* Polytechnique Montreal, Canada

G6-2
Prediction of Loss of Barrier Properties in Cracked Thin Coatings on Polymer Substrates Subjected to Tensile Strain, ***M. Tavares da Costa,*** *E. Gamstedt,* Uppsala University, Angstrom Laboratory, Sweden

G6-3
PALMS - Plasma Additive Layer Manufacture Smoothing, ***T. Brzezinka,*** *J. Housden, A. Fox,* Wallwork Cambridge Ltd, UK*; N. Laugel, A. Matthews, A. Yerokhin,* The University of Manchester, UK

Surface Engineering - Applied Research and Industrial Applications
Room On Demand - Session GP
Surface Engineering - Applied Research and Industrial Applications (Symposium G) Poster Session
1:00pm

GP-1
Corrosion Induced Diffusion Pathways in Thin Film Materials Investigated by Atom Probe Tomography, ***O. Hudak,*** CDL-SEC, TU Wien, Austria*; E. Aschauer,* TU Wien, CDL-SEC, Austria*; V. Dalbauer,* FAU Erlangen, Germany*; L. Shang, O. Hunold, M. Arndt,* Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein*; P. Polcik,* Plansee Composite Materials GmbH, Germany*; P. Felfer,* FAU Erlangen, Germany*; H. Riedl,* TU Wien, CDL-SEC, Austria

GP-2
Engineered Phase Differences between HiPIMS Power and Substrate Bias for Improved Mechanical Properties of Titanium Nitrides, ***Y. Lin,*** *W. Wu,* Da-Yeh University, Taiwan

GP-3
Thermally Spayed Coatings with Integrated Sensor Systems for Tribological Load Surfaces, ***A. Dorner-Reisel,*** Schmalkalden University of Applied Sciences, Germany*; W. Ahmad Akhtar, J. Seeger, G. Reisel,* Oerlikon Metco WOKA GmbH Barchfeld, Germany

GP-4
Performance Enhancement of pGe MOS device with Pre- and Post-Deposition Microwave Annealing Treatment, ***Y. Chien,*** National Tsing Hua University, Taiwan*; K. Chang-Liao, D. Ruan, S. Yi,* National Tsing Hua University, Taiwan*; F. Chu,* National Tsing Hua University, Taiwan

GP-5
Design of Surface Layers with Phase Change with Novel Properties, ***R. Basu,*** VTU Kundana, Bangalore, India

GP-6
Effect of Cu Content and Melting Temperature on the Oxide Film Formation and the Quality of Molten 6000-Series Aluminum Alloys, *H. Jang, P. Youn, H. Kang, G. Lee, J. Park, E. Kim, J. Jeon,* ***S. Shin,*** Korea Institute of Industrial Technology (KITECH), Republic of Korea

GP-7
TiO_2–Silicon Nanowire Arrays for Inorganic Solar Cell Applications, ***A. Chiou,*** National Formosa University, Taiwan

Advanced Characterization Techniques for Coatings, Thin Films, and Small Volumes
Room On Demand - Session H1
Spatially-resolved and In-Situ Characterization of Thin Films and Engineered Surfaces
1:00pm

INVITED: H1-1

INVITED TALK: Multimodal and *in situ* Electron Microscopy to Understand Local Deformation Mechanics, ***J. Kacher,*** Georgia Institute of Technology, USA

H1-3

Development of In-situ Liquid Cell Transmission Electron Microscopy for Quantifying Temperature-Dependent Thin Film and Nanostructure Processing, ***S. Lee,*** Massachusetts Institute of Technology, USA; *N. Schneider,* Renata Global, USA; *J. Park,* Princeton University, USA; *S. Tan, F. Ross,* Massachusetts Institute of Technology, USA

H1-4

UHV Specimen Transfer Systems for Analysis of Reactive Materials with Atom Probe Tomography, ***R. Ulfig,*** *K. Rice, T. Prosa, D. Reinhard, J. Shepard,* CAMECA Instruments Inc., USA; *U. Maier,* Ferrovac GmbH, Switzerland

H1-5

Cold Sprayed Cr-coating on Optimized ZIRLO™ Claddings: An Atom Probe Tomography Study of the Cr/Zr Interface and its Microstructural and Chemical Evolution after Autoclave Corrosion Testing, ***A. Fazi,*** *H. Aboulfadl, H. Andrén, M. Thuvander,* Chalmers University of Technology, Gothenburg, Sweden

INVITED: H1-6

INVITED TALK: Multicracking of Thin Films and Nanostructures on Stretchable Substrates; Impact on Magnetic Properties, ***D. Faurie,*** *F. Zighem, S. Merabtine,* LSPM-CNRS, Université Paris13, France; *P. Lupo, A. Adeyeye,* National University of Singapore

H1-9

Nano-scale Residual Stress Profiling in Ultra-thin Si_3N_4/ZnO Multilayer Stacks using FIB-DIC Method, ***M. Sebastiani,*** Roma TRE University, Italy

Advanced Characterization Techniques for Coatings, Thin Films, and Small Volumes
Room On Demand - Session H2
Advanced Mechanical Testing of Surfaces, Thin Films, Coatings and Small Volumes
1:00pm

H2-1

Advanced Characterization Techniques for Zinc Based Coatings on Steel Varying from Microstructure Investigation to Mechanical Testing, ***H. Chaieb,*** Mines ParisTech, PSL Research University, Tunisia; *V. Maurel, K. Ammar, S. Forest, A. Koster,* Mines ParisTech, PSL Research University, France; *F. Nozahic, J. De Strycker,* ArcelorMittal Global R&D Gent, Belgium; *J. Mataigne,* ArcelorMittal Global R&D Maizières, France; *A. Tanguay,* LMS, Ecole Polytechnique, Paris-Saclay University, France; *E. Héripré,* MSSMat, CentraleSupélec, Paris-Saclay University, France

H2-2

Toward Novel Stretchable Electronics with Nanostructured Metallic Glass Films, ***M. Ghidelli,*** Max-Planck-Institut für Eisenforschung GmbH, Germany; *H. Idrissi,* Université Catholique de Louvain, Belgium; *A. Orekhov,* University of Antwerp, Belgium; *J. Raskin,* Université Catholique de Louvain, Belgium; *J. Park,* Yonsei University, Republic of Korea; *A. Li Bassi,* Politecnico di Milano, Italy; *T. Pardoen,* Université Catholique de Louvain, Belgium

H2-3

Intrinsic Mechanical Properties of Moderate Temperature Processed Cvd Amorphous Silicon Oxide (Sio_2) and Oxynitride (Sio_XN_Y) Thin Films, ***M. Puyo,*** *C. Lebesgue, K. Topka,* Université de Toulouse, France; *B. Diallo,* Univ. Orléans, France; *R. Laloo, V. Turq, H. Vergnes, D. Samelor, F. Senocq, B. Caussat,* Université de Toulouse, France; *N. Pellerin, C. Genevois,* Univ. Orléans, France; *C. Vahlas,* Université de Toulouse, France

H2-4

New Models and Advancement in Measuring the Elastic Behaviour of Thin Films using Impulse Excitation Technique, ***A. Alhussein,*** University of Technology of Troyes (UTT), France; *E. Zgheib,* University of Technology of Troyes (UTT) and Lebanese University (UL), France; *M. Slim,* University of Technology of Troyes (UTT), France; *K. Khalil,* Lebanese University, Lebanon; *M. François,* University of Technology of Troyes (UTT), France

H2-5

Influence of the Bonding Nature on the Fatigue Resistance of Cr-based Thin Films, ***L. Zauner,*** *R. Hahn,* TU Wien, CDL-SEC, Austria; *M. Alfreider,* Montanuniversität Leoben, Department of Materials Science, Austria; *O. Hunold,* Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein; *P. Polcik,* Plansee Composite Materials GmbH, Germany; *D. Kiener,* Montanuniversität Leoben, Department of Materials Science, Austria; *H. Riedl,* TU Wien, CDL-SEC, Austria

H2-6

Development and Application of a Multifunctional Nanoindenter: Coupling to Electrical Measurements and Integration in-situ in a Scanning Electron Microscope, ***F. Volpi,*** *S. Comby-Dassonneville, C. Boujrouf, M. Verdier,* SIMaP – Univ. Grenoble Alpes, CNRS, SIMaP, France; *D. Pellerin,* CSI/Scientec, France

H2-7

X-Ray Photoelectron Spectroscopy Analysis of Electronic Band Structure for MIM Capacitor Interfaces, ***S. Hoang,*** *T. Ngo, E. Januar, M. McBriarty, A. Lee, C. Clavero,* Intermolecular Inc., a subsidiary of Merck KGaA, Germany

INVITED: H2-8

INVITED TALK: Strength and Fracture Toughness at Elevated Temperature of Monolithic and Multilayered Hard Coatings, ***J. Molina-Aldareguia,*** IMDEA Materials Institute, Spain

H2-10

The Spinodal Decomposition of Nanolamellar CVD $Ti_{1-x}Al_xN$ recorded by *in-situ* Scanning Transmission Electron Microscopy, ***C. Saringer,*** *M. Tkadletz,* Montanuniversität Leoben, Austria; *I. Letofsky-Papst,* Institute of Electron Microscopy and Nanoanalysis, NAWI Graz, Graz University of Technology and Graz Centre for Electron Microscopy, Austria; *C. Czettl,* CERATIZIT Austria GmbH, Austria; *N. Schalk,* Montanuniversität Leoben, Austria

H2-11

Improving the High Temperature Hardness of Nanocrystalline Copper through Tungsten Nanoparticles, *N. Rohbeck, T. Edwards, E. Huszár, L. Pethö,* ***X. Maeder,*** *J. Michler,* Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland

Advanced Characterization Techniques for Coatings, Thin Films, and Small Volumes
Room On Demand - Session H3
Characterization of Coatings and Small Volumes in Harsh Environments
1:00pm

INVITED: H3-1

INVITED TALK: Investigating Plasticity Effects on Failure and Fracture at the Microscale, ***N. Mara,*** *K. Schmalbach,* University of Minnesota, USA; *R. Ramachandramoorthy, J. Michler,* Empa - Swiss Federal Laboratories for Materials Science and Technology, Switzerland; *W. Gerberich,* University of Minnesota, USA

H3-3

High Temperature Erosion Performance Evaluation of Advanced Materials, ***D. Patro,*** *S. Josyula, H. Prasanna,* Ducom Instruments, India; *F. Alemano, D. Veeregowda,* Ducom Instruments, Europe

H3-4

Characterization of Selective Solar Absorbing Coatings Under Operating Conditions, *C. D'Alessandro,* ***A. Caldarelli,*** *D. De Maio, E. Gaudino,* UniNA and CNR - ISASI, Italy; *M. Musto,* UniNa - Univeristà degli Studi di Napoli "Federico II", Italy; *D. De Luca,* UniNA and CNR - ISASI, Italy; *E. Di Gennaro,* UniNa - Università degli Studi di Napoli "Federico II", Italy; *R. Russo,* CNR - ISASI, Italy

Advanced Characterization Techniques for Coatings, Thin Films, and Small Volumes
Room On Demand - Session HP
Advanced Characterization Techniques for Coatings, Thin Films, and Small Volumes (Symposium H) Poster Session
1:00pm

HP-1

Expanding the Information and Increasing the Reliability of XPS Analysis, ***D. Baer,*** Pacific Northwest National Laboratory, USA; *K. Artyushkova,* Physical Electronics, USA; *C. Easton,* CSIRO, Australia; *M. Engelhard,* Pacific Northwest National Laboratory, USA; *A. Shard,* National Physical Laboratory, UK

HP-2

Electric Field Strength-Dependent Accuracy of TiAlN Thin Film Composition Measurements by Laser-Assisted Atom Probe Tomography, ***M. Hans***, *J. Schneider,* RWTH Aachen University, Germany

HP-3

Integrated Atom Probe/tEBSD for Grain and Phase Boundary Analysis of Coatings and Thin Films, ***R. Ulfig***, *Y. Chen, K. Rice, T. Prosa,* CAMECA Instruments Inc., USA

HP-4

Sub-50 nm X-ray Diffraction Reveals Nanoscale Residual Stress and Microstructure Distributions across the Cutting Edge Area of a TiN Coating on WC-Co, ***M. Meindlhumer***, *N. Jäger, S. Spor,* Montanuniversität Leoben, Austria; *M. Rosenthal,* ESRF Grenoble, France; *H. Hruby,* eifeler-Vacotec GmbH, Düsseldorf, Germany; *J. Keckes, C. Mitterer,* Montanuniversität Leoben, Leoben, Austria; *R. Daniel, J. Keckes, J. Todt,* Montanuniversität Leoben, Austria

HP-5

e-Poster Presentation: Nanoindentation Analysis as a Two-Dimensional Tool for Mapping the Mechanical Properties of Complex Microstructures, ***N. Randall***, *J. Breguet,* Alemnis, Switzerland

HP-6

Microstructural Influences on the Fracture Properties of CrN Coatings, ***R. Hahn***, *S. Rosenecker,* CDL-SEC, TU Wien, Austria; *T. Wojcik,* TU Wien, Institute of Materials Science and Technology, Austria; *O. Hunold,* Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein; *S. Kolozsvári,* Plansee Composite Materials GmbH, Germany; *H. Riedl,* TU Wien, CDL-SEC, Austria

HP-9

Thin Film Characterization Utilizing Broad Ion Beam Specimen Preparation and FESEM, ***N. Erdman***, *N. Inoue,* JEOL USA Inc, USA

Topical Symposia
Room On Demand - Session TS1
Anti- and De-icing Surface Engineering
1:00pm

TS1-1

Role of the Thin Coating in the Durability of Icephobic Thin-on-Thick Coating Systems, ***S. Brown***, *J. Lengaigne,* Polytechnique Montreal, Canada; *N. Sharifi, A. Dolatabadi,* Concordia University, Canada; *L. Martinu, J. Klemberg-Sapieha,* Polytechnique Montreal, Canada

TS1-2

Improving the Efficiency of Electro-Thermal De-Icing Systems With Icephobic Coatings, ***J. Brierley***, *X. Hou, B. Turnbull, W. Sun,* University of Nottingham, UK

TS1-3

Icephobic Coatings by Thermal Spraying as Surface Engineering Technique, ***H. Koivuluoto***, Tampere University , Finland; *R. Khammas, V. Donadei,* Tampere University, Finland

TS1-4

Limitations of Anti-icing Materials for Aeronautic Applications, ***P. Garcia***, National Institute of Aerospace Technology, Spain; *J. Mora,* Isdefe, Spain; *A. Agüero,* National Institute of Aerospace Technology, Spain

TS1-5

Fluorination of Aluminum Surfaces as a General Strategy to Induce an Effective Anti-Icing Response, ***C. Santos***, *V. Rico, J. Mora, P. Garcia,* University of Seville, Spain; *A. Agüero Bruna,* Instituto Nacional de Técnica Aeroespacial (INTA), Spain; *A. González-Elipe, C. López-Santos,* Instituto de Ciencia de Materiales de Sevilla (CSIC-USE), Spain

Topical Symposia
Room On Demand - Session TS2
New Horizons in Boron-Containing Coatings: Modeling, Synthesis and Applications
1:00pm

TS2-1

The Industrially Deposited W-B-C Coatings from Segmented Target, ***M. Kroker***, *P. Matej, P. Souček, L. Zábranský, V. Buršíková,* Masaryk University, Czechia; *V. Sochora, M. Jílek,* SHM, Czechia; *P. Vašina,* Masaryk University, Czechia

TS2-2

Thermo-physical Properties of CVD Ti(B,N) Coatings, ***C. Kainz***, *N. Schalk, M. Tkadletz, C. Saringer,* Montanuniversität Leoben, Austria; *M. Winkler,* Fraunhofer Institute for Physical Measurement Techniques IPM, Germany; *A. Stark, N. Schell,* Institute of Materials Research, Helmholtz-Zentrum Geesthacht, Germany; *J. Julin,* Institute of Ion Beam Physics and Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, Germany; *C. Czettl,* Ceratizit Austria GmbH, Austria

TS2-3

Chemical Shift in W-B-C Systems: Experiments and Modeling, ***J. Ženíšek***, Masaryk University, Czechia; *P. Ondračka,* RWTH Aachen University, Germany; *P. Souček,* Masaryk University, Czechia; *D. Holec,* Montanuniversität Leoben, Austria; *M. Stupavská,* Masaryk University, Czechia; *J. Schneider,* RWTH Aachen, Germany; *P. Vašina,* Masaryk University, Czechia

TS2-4

Superior High-temperature Behavior of Amorphous Coatings from Quinary Hf-B-Si-C-N System, ***P. Zeman***, *S. Zuzjakova, R. Cerstvy,* University of West Bohemia, Czech Republic; *E. Meletis,* University of Texas at Arlington, USA; *J. Vlcek,* University of West Bohemia, Czech Republic

TS2-5

Application of the Heat Balance Integral Method to the Growth Kinetics of Nickel Boride Layers on Inconel 718 Superalloy, ***A. Contla-Pacheco***, Instituto Politecnico Nacional, Mexico; *M. Keddam,* Laboratoire de Technologie des Matériaux, Faculté de Génie Mécanique et Génie des Procédés, Algeria; *L. Lartundo-Rojas, M. Ortega-Avilés, I. Mejia-Caballero, I. Campos-Silva,* Instituto Politecnico Nacional, Mexico

TS2-6

Influence of the Diffusion Annealing Process in the Corrosion Susceptibility of Cobalt Boride Layer Immersed in Hank's Solution, *A. Delgado-Brito,* ***I. Mejia-Caballero***, Instituto Politecnico Nacional, Mexico; *M. Palomar-Pardavé,* Universidad Autonoma Metropolita-AZC, Mexico; *J. Martinez-Trinidad, I. Campos-Silva,* Instituto Politecnico Nacional, Mexico

TS2-7

Pulsed-DC Powder-Pack Boriding: Growth Kinetics of Boride Layers on AISI 316 L Steel and Inconel 718 Alloy, ***E. Hernandez-Ramirez***, *I. Campos-Silva, J. Rosales-Lopez, A. Contreras-Hernandez, E. Valdez-Zayas, I. Mejia-Caballero, J. Martinez-Trinidad,* Instituto Politecnico Nacional, Mexico

TS2-8

Stoichiometry, Structure and Mechanical Properties of Co-Sputtered $Ti_{1-x}Ta_xB_{2\pm\Delta}$ Coatings, ***B. Grancic***, *K. Viskupova, M. Mikula,* Comenius University in Bratislava, Slovakia; *M. Caplovicova,* Slovak University of Technology in Bratislava, Slovakia; *L. Satrapinskyy, T. Roch, M. Truchly,* Comenius University in Bratislava, Slovakia; *M. Sahul,* Slovak University of Technology in Bratislava, Slovakia; *M. Gregor,* Comenius University in Bratislava, Slovakia; *P. Svec Sr.,* Slovak Academy of Sciences, Slovakia; *M. Zahoran, P. Kus,* Comenius University in Bratislava, Slovakia

TS2-9

Effect of MB_2 (M = Zr, Ta, Nb, Hf, Ti, V, Cr) and W_2B_5 Target Composition on Plasma Properties and Thin-Film Stoichiometry During Magnetron Sputtering, ***I. Zhirkov***, Linköping University, Sweden; *F. Klimashin,* Linköping University, Sweden; *G. Greczynski,* Linköping University, Sweden; *P. Polcik, S. Kolozsvári,* Plansee Composite Materials GmbH, Germany; *J. Greene,* University of Illinois, USA, Linköping University, Sweden, National Taiwan Univ. Science & Technology, Taiwan; *I. Petrov,* University of Illinois, USA, Linköping University, Sweden; *J. Rosen,* Linköping University, Sweden

TS2-10

Recent Process Development of Magnetron Sputtering Deposited Boron Carbide Thin Films for Neutron Detection at the European Spallation Source, ***C. Lai***, *C. Höglund, P. Svensson,* Detector Group, European Spallation Source ERIC, Sweden; *L. Robinson,* Detector Group, European Spallation Source ERIC,Sweden; *J. Birch, L. Hultman,* Thin Film Physics Division, IFM, Linköping University, Sweden; *R. Hall-Wilton,* Detector Group, European Spallation Source ERIC, Sweden

TS2-11

Thermomechanical Properties and Oxidation Resistance of Ternary $W_{1-x}Ta_xB_{2-z}$ Coatings, ***C. Fuger***, TU Wien, CDL-SEC, Austria; *V. Moraes,* Institute of Materials Science and Technology, TU Wien, Austria; *R. Hahn,* TU Wien, CDL-SEC, Austria; *O. Hunold,* Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein; *P. Polcik,* Plansee Composite Materials GmbH, Germany; *P. Mayrhofer,* Institute of Materials Science and Technology, TU Wien, Austria; *H. Riedl,* TU Wien, CDL-SEC, Austria

TS2-12

Fracture–Microstructure Relations of W-diboride Thin Films, ***R. Hahn***, *C. Fuger,* TU Wien, CDL-SEC, Austria; *G. Habler,* University of Vienna, Austria; *H. Bolvardi,* Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein; *P. Polcik,* Plansee Composite Materials GmbH, Germany; *P. Mayrhofer,* Institute of Materials Science and Technology, TU Wien, Austria; *H. Riedl,* TU Wien, CDL-SEC, Austria

TS2-13

Configurational and Vibrational Thermodynamics of Metastable Ternary $Ti_{1-x}Al_xB_2$ Alloys with Age-Hardening Potential, and their Constituent Binaries, ***E. Johansson,*** Linköping Univ., IFM, Theoretical Physics Div., Sweden*; N. Nedfors,* Linköping University, IFM, Thin Film Physics Division, Sweden*; F. Eriksson,* Linköping Univ., IFM, Thin Film Physics Div., Sweden*; A. Ektarawong,* Linköping Univ., IFM, Theoretical Physics Div., Sweden*; J. Rosen,* Linköping Univ., IFM, Thin Film Physics Div., Sweden*; B. Alling,* Linköping Univ., IFM, Theoretical Physics Div., Sweden

TS2-14

Design of Under/Overstoichiometric Superhard $TaB_{2\pm x}$ Films, ***V. Šroba,*** *T. Fiantok, M. Truchlý,* Comenius University in Bratislava, Slovakia*; P. Švec, Jr.,* Slovak Academy of Sciences, Slovakia*; T. Roch, L. Satrapinskyy, M. Zahoran, B. Grančič, P. Kúš, M. Mikula,* Comenius University in Bratislava, Slovakia

TS2-15

Vacancies and Related Substoichiometry in Magnetron Sputtered Transition Metal Diboride Thin Films, ***V. Moraes,*** *H. Riedl, P. Mayrhofer,* TU Wien, Institute of Materials Science and Technology, Austria

INVITED: TS2-16

INVITED TALK: Boron-containing Metallic-glass Coating: Unique Properties and Various Applications, ***J. Chu,*** National Taiwan University of Science and Technology (NTUST), Taiwan

TS2-18

XPS Analysis of TiB_x Thin Films, ***N. Hellgren,*** Messiah University, USA*; G. Greczynski,* Linköping University, Sweden*; M. Sortica,* Uppsala University, Sweden*; I. Petrov,* University of Illinois at Urbana Champaign, USA*; L. Hultman,* Linköping University, Sweden*; J. Rosen,* Linköping Univ., IFM, Thin Film Physics Div., Sweden

TS2-19

Mechanical Property Evaluation of VNbMoTaWCrB Refractory High-entropy Alloy Thin Films by Micropillar Compression and Nanoindentation, ***Y. Chen,*** Chinese Culture University, Taiwan*; S. Chang,* National Tsing Hua University, Taiwan*; S. Hung, C. Wang,* National Taiwan University of Science and Technology, Taiwan*; J. Duh,* National Tsing Hua University, Taiwan*; J. Lee,* Ming Chi University of Technology, Taiwan

TS2-20

Effects of Stoichiometry and Individual Layer Thickness Ratio in the Quality of Epitaxial CrB_x/TiB_y Superlattice Thin Films, ***S. Dorri,*** *N. Ghafoor, F. Eriksson, J. Palisaitis, B. Bakhit, L. Hultman, J. Birch,* Linköping University, IFM, Thin Film Physics Division, Sweden

INVITED: TS2-21

INVITED TALK: Boron-based Thin Film Materials for Future Neutron Technologies at the ESS, ***J. Birch,*** Linköping University, IFM, Thin Film Physics Division, Sweden

TS2-23

Thermal and Mechanical Properties of $(W,Zr)B_{2-z}$ Coatings Deposited by RF Magnetron Sputtering Method, ***J. Chrzanowska-Giżyńska,*** *R. Psiuk, P. Denis,* Polish Academy of Sciences, Poland*; Ł. Kurpaska,* National Centre for Nuclear Research, Poland*; T. Mościcki ,* Polish Academy of Sciences, Poland

Topical Symposia
Room On Demand - Session TS3
In-Silicio Design of Novel Materials by Quantum Mechanics and Classical Methods (jointly sponsored by ICMCTF and AQS)
1:00pm

INVITED: TS3-1

INVITED TALK: Computational Modeling of 3D Thin Film Growth Morphology: Influence of Angular and Energy Distribution of Particle Flux, ***G. Abadias,*** *C. Mastail, C. Furgeaud, F. Nita, R. Mareus, A. Michel,* Institut Pprime - CNRS - ENSMA - Université de Poitiers, France

TS3-3

Prediction of Composition, Crystalline Structure and Microstructure of Sputtered Multi-Component Coatings by a Virtual Machine, ***D. Böhm,*** Vienna University of Technology, Austria*; T. Schrefl,* Danube University Krems, Austria*; A. Eder,* MIBA High Tech Coatings GmbH, Austria*; C. Eisenmenger-Sittner,* Vienna University of Technology, Austria

TS3-4

Atomistic Modelling of Diffusion in Quasi-amorphous Nanocomposite Coatings, ***G. Nayak,*** *D. Holec,* Montanuniversität Leoben, Austria

TS3-5

Identifying Fingerprints of Point Defects in X-ray Photoelectron Spectroscopy Measurements of TiN and TiON with *ab initio* Calculations, ***P. Ondračka,*** RWTH Aachen University, Germany*; D. Holec,* Montanuniversität Leoben, Austria*; M. Hans, J. Schneider,* RWTH Aachen University, Germany

TS3-6

Structural Ordering of Molybdenum Disulfide studied via Reactive Molecular Dynamics Simulations, ***P. Nicolini,*** Czech Technical University in Prague, Czech Republic*; R. Capozza,* Italian Institute of Technology, UK*; T. Polcar,* Czech Technical University in Prague, Czech Republic

TS3-7

Strength, Transformation Toughening and Fracture Dynamics of Rocksalt-structure $Ti_{1-x}Al_xN$ ($0 \le x \le 0.75$) Alloys, ***D. Sangiovanni,*** *F. Tasnadi, M. Oden, I. Abrikosov,* Linköping University, Sweden

Topical Symposia
Room On Demand - Session TS4
Photocatalytic and Superhydrophilic Surfaces
1:00pm

TS4-1

Bixbyite-based Ta-N-O film: A Promising Candidate for Water Splitting?, ***J. Capek,*** *S. Batkova, S. Haviar, M. Matas, J. Houska,* University of West Bohemia, Czech Republic*; F. Dvorak,* University of Pardubice, Czech Republic

TS4-2

Double Perovskite $LaFe_{1-x}Ni_xO_3$ Coating Urchin-like Golden Nanoparticles to Enhance Water Splitting Reaction, ***H. Tsai,*** *Y. Su,* National Cheng Kung University (NCKU), Taiwan

TS4-3

Effect of Tungsten-Substitution on the Structure and Photocatalytic Properties of Anatase TiO_2 Thin Films Deposited on Polymer by PECVD, ***W. Ravisy,*** Université de Nantes, France*; B. Dey, S. Bulou, P. Choquet,* Luxembourg Institute of Science and Technology, Luxembourg*; N. Gautier,* Université de Nantes, France , France*; A. Goullet,* Université de Nantes, CNRS, France*; M. Richard-Plouet, A. Granier,* Université de Nantes, France

TS4-4

Photocatalytic Activity of a ZnO/Bi_2O_3 Thin Film Heterojunction, ***S. Rodil,*** Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, Mexico*; A. Hernandez-Gordillo, M. Bizarro,* Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México*; J. Medina,* Instituto de Ciencias Aplicadas y Tecnologias, Universidad Nacional Autonoma de Mexico

Topical Symposia
Room On Demand - Session TS5
Thin Films on Polymer Substrates: Flexible Electronics and Beyond
1:00pm

TS5-1

Conversion of Aluminium Oxide Coated Films for Food Packaging Applications – From a Single Layer Material to the Finished Pouch, *C. Struller,* Bobst Manchester Ltd., UK*;* ***P. Kelly,*** Manchester Metropolitan University, UK*; N. Copeland,* Bobst Manchester Ltd, UK

TS5-2

Functionalised Copper Nanoparticle Catalysts for Electroless Copper Plating on Textiles, ***G. Taghavi Pourian Azar,*** *A. Cobley,* Coventry University, UK

TS5-3

Low-temperature Plasma Enhanced Atomic Layer Deposition of ZnO and Al_2O_3 Thin Films for Applications in Flexible Electronic Devices, ***J. Castillo,*** Universidad Autónoma de Baja California , Colombia*; N. Nedev,* Universidad Autónoma de Baja California , Bulgaria*; B. Valdez,* Universidad Autónoma de Baja California, Mexico*; N. Hernandez,* Instituto Politécnico Nacional (IPN), Mexico*; E. Martinez,* Centro de Investigación en Materiales Avanzados (CIMAV) , Mexico*; M. Curiel,* Universidad Autónoma de Baja California , Mexico*; M. Mendivil, M. Martinez,* Centro de Investigación en Materiales Avanzados (CIMAV), Mexico

TS5-4

Roll-to-Roll Reactive Ion Etching of Nanoscale Features in Si for Next Generation Flexible Electronics, ***Z. Ghaznavi,*** Emerson and Renwick Ltd., USA*; N. Butcher, J. Crowther,* Emerson and Renwick Ltd., UK

TS5-5

HiPIMS Metallization of Polymers: Titanium on PEEK, ***A. Chacko**, K. Thorwarth, R. Crockett, U. Müller, H. Hug,* Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland

TS5-6

Fragmentation of ALD-PVD Multilayers on Flexible Substrates in Uniaxial and Biaxial Tension: Insights from in situ SEM and Synchrotron Diffraction Experiments, ***B. Putz**, T. Edwards, T. Xie, E. Huszar, L. Pethö,* Empa, Swiss Federal Laboratories for Materials Science and Technology, Thun, Switzerland*; P. Kreiml,* Montanuniversität Leoben, Department of Material Physics, Austria*; M. Cordill,* Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Leoben, Austria*; D. Thiaudiere,* Synchrotron SOLEIL, France*; D. Faurie,* LSPM-CNRS, Université Paris13, France*; P. Renault,* Université de Poitiers, France*; J. Michler,* Empa, Swiss Federal Laboratories for Materials Science and Technology, Thun, Switzerland

TS5-7

Optically Transparent Bacterial Nanocellulose Composites and Fibroin Substrates for Flexible Organic Devices, ***M. Cremona**,* Pontifícia Universidade Católica do Rio de Janeiro, Brazil*; H. Barud,* Universidade de Araraquara, Brazil*; R. Carvalho,* Pontifícia Universidade Católica do Rio de Janeiro, Brazil*; A. Cebrian,* UNESP, Brazil*; A. Barreto,* PUC-Rio, Brazil*; F. Maturi,* UNESP, Brazil*; R. Silva,* Chalmers University Technology, Sweden*; C. Legnani,* Universidade Federal de Juiz de Fora, Brazil*; S. Ribeiro,* UNESP, Brazil

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Topical Symposia
Room On Demand - Session TSP
Topical Symposia (TS) Poster Session
1:00pm

TSP-1

Transparent nc-Z_rB_2/a-BN Films for Protection of Optical Devices, ***P. Kiryukhantsev-Korneev**, A. Kozlova, K. Kozlova, E. Levashov,* National University of Science and Technology "MISiS", Russia

TSP-2

Novel AuAgSI Thin Film Metallic Glasses With Outstanding Electrical and Mechanical Properties, ***L. Weniger**, O. Glushko, C. Mitterer,* Montanuniversität Leoben, Austria*; J. Eckert,* Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Austria

TSP-3

Fe-based Thin Film Metallic Glass Coated on Porous Substrates as an Alternative Photocatalysts for Decolorization of Dye in Industrial Wastewater, ***B. Hubert**,* National Taiwan University of Science and Technology,Taiwan*; J. Chu,* National Taiwan University of Science and Technology (NTUST), Taiwan*; P. Yiu,* National Taiwan University of Science and Technology, Taiwan

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