



Technical Programme

Thirteenth International Conference on HIPIMS

12-15 June 2023, Venlo, The Netherlands

DAY ONE | Wednesday 14 June 2023

8:00-8:10 am

Opening address by Prof. Arutiun P. Ehiasarian, *National HIPIMS Technology Centre, UK*, Prof. Dr. Christoph Herrmann, *Fraunhofer IST, Germany*, Dr. Dave Doerwald, CEO, *Hauzer, The Netherlands*.

First Morning session

Session Chairman: Prof. Arutiun P. Ehiasarian, *National HIPIMS Technology Centre, UK, Sheffield Hallam University, UK*

	Presentation time	Questions & Answers
1. Quo Vadis SE talk: D. Elliott , <i>SEA/SELF, UK</i> "Surface Engineering, the key to a sustainable future"	8:10 - 8:30	
2. Christoph Herrmann , Sabrina Zellmer, Ralf Bandorf, <i>Fraunhofer Institute for Surface Engineering and Thin Films IST, Germany</i> "The Hydrogen Campus Salzgitter an Innovative Hub for Transformation of the Region"	8:30 - 8:45	8:45 - 8:50
3. Lucia Mendizabal , Antía Villamayor, Eva G-Berasategui, <i>TEKNIKER, Spain</i> "High volume magnetron sputtering: time and cost effective technology to manufacture critical components in PEMWE"	8:50 - 9:05	9:05 - 9:10
4. Ton Hurkmans , <i>IHI Ionbond Group, The Netherlands</i> "Ionbond's DOT's technology (thermal spray!) on titanium bipolar plates for electrolyzers"	9:10 - 9:25	9:25 - 9:30
<i>Coffee break</i>		
	9:30 - 9:45	

Second Morning session

Session Chairman: Dr. Ralf Bandorf, *Fraunhofer IST, Germany*

	Presentation time	Questions & Answers
5. Chongchong Tang ¹ , Michael Dürrschnabel ¹ , Ute Jäntschi ¹ , Michael Klimenkov ¹ , Martin Steinbrück ¹ , Sven Ulrich ¹ , Marcus Hans ² , Jochen M. Schneider ² , Michael Stüber ¹ , ¹ <i>Institute for Applied Materials (IAM-AWP), Karlsruhe Institute of Technology (KIT), Germany</i> , ² <i>Materials Chemistry, RWTH Aachen University, Germany</i> "Solid Solution and Ordered Quaternary MAX Phase Thin Films: Phase Formation and Reaction Mechanisms in Magnetron Sputtered Nanostructured Multilayers"	9:45 - 10:00	10:00 - 10:05
6. Jochen M. Schneider , <i>Materials Chemistry, RWTH Aachen University, Germany</i> "Thin film materials design & some thoughts on complexity and sustainability"	10:05 - 10:20	10:20 - 10:25
7. Vincent Ott , Tomasz Wojcik, Christian Schäfer, Sven Ulrich, Szilard Koloszar, Peter Polcik, Paul Mayrhofer, Helmut Riedel, Christoph Pauly, Michael Stüber, <i>Institute for Applied Materials, Karlsruher Institut für Technologie, Germany</i> "Novel approaches for the PVD synthesis of advanced aluminide thin films: The example of Ruthenium-Aluminide"	10:25 - 10:40	10:40 - 10:45
<i>Coffee break</i>		
	10:45 - 11:00	

Third Morning session

Session Chairman: Prof. Jaroslav Vlcek, *University of West Bohemia, Czech Republic*

	Presentation time	Questions & Answers
8. Louise Antoine ¹ , Aurélie Achille ² , Angéline Poulon-Quintin ² , Dominique Michau ² , Marjorie Cavarroc ¹ , ¹ SAFRAN Paris-Saclay – SAFRAN Tech, F-78772 Magny-Les-Hameaux, France “Physical properties of pure tantalum nitride coatings”	11:00 - 11:15	11:15 - 11:20
9. M-P. Besland ¹ , N. Ginot ² , T. Minea ³ , A. Caillard ⁴ , J. Zgheib ¹ , A. Rhallabi ¹ , P-Y. Jouan ¹ , ¹ Université de Nantes, CNRS, Institut des Matériaux Jean Rouxel, IMN, France, ² Université de Nantes, CNRS, Institut d'Electronique et des Technologies du numérique, France, ³ Université Paris Saclay, CNRS, Laboratoire de Physique des Gaz et Plasmas, France, ⁴ Université d'Orléans, CNRS, Groupe de Recherche sur l'Energétique des Milieux Ionisés, France “Improvement of Crystallinity and Deposition Rate Using Multi e-HiPIMS”	11:20 - 11:35	11:35 - 11:40
10. Pauline Kümmerl , Sameer Aman Salman, Marcus Hans, Daniel Primetzhofer, Peter Polcik, Szilard Kolozsvari, Jochen M. Schneider, <i>Materials Chemistry (MCh), Lehrstuhl für Werkstoffchemie, RWTH Aachen, Germany</i> “Oxidation behaviour of HIPIMS and DC magnetron sputtered (Hf1-xAlx) by thin films”	11:40 - 11:55	11:55 - 12:00
Conference photograph and lunch break		
	12:00 - 13:00	

First Afternoon session

Session Chairman: Prof. Günter Bräuer, *TU Braunschweig, Germany*

	Presentation time	Questions & Answers
11. Ryan Bower ¹ , Jiaze Sun ¹ , Daniel D. Price ¹ , Bruno Rente ¹ , Ethan Muir ² , Papken Eh. Hovsepian ² , Arutiun P. Ehasarian ² , R. Oulton ¹ , Peter K. Petrov ¹ , ¹ Imperial College London, UK, ² National HIPIMS Technology Centre, UK, Sheffield Hallam University, UK “Preparation of robust nanostructured antimicrobial surfaces from TiN thin films deposited via HIPIMS”	13:00 - 13:15	13:15 - 13:20
12. Christian Poltorak ¹ , Andreas Bergmaier ² , Klaus Seemann ¹ , Michael Stüber ¹ , Sven Ulrich ¹ , ¹ Karlsruhe Institute of Technology (KIT) - <i>Institute for Applied Materials (IAM-AWP), Germany, ²Universität der Bundeswehr München, Institut für Angewandte Physik und Messtechnik (LRT2), Germany</i> “Constitution and properties of TiC1-x:H/a-C:H nanocomposite thin films prepared by HiPIMS processes at low and elevated temperature”	13:20 - 13:35	13:35 - 13:40
13. M. Kaufman , J. Vlcek, J. Houska, S. Farrukh, <i>University of West Bohemia, Czech Republic</i> “Low-temperature reactive HiPIMS of high-performance thermochromic VO2-based coatings for energy-saving smart windows”	13:40 - 13:55	13:55 - 14:00
Coffee break		
	14:00 - 14:15	

Second Afternoon session

Session Chairman: Dr. Chris Constable, *Ionbond, UK Ltd., UK*

	Presentation time	Questions & Answers
14. Philipp Immich , Louis Tegelaers, Geert-Jan Fransen, Huub Vercoulen, Gabriela Negrea, Ruud Jacobs, Andreas Fuchs, Daniel Barnholt, <i>IHI Hauzer Techno Coating B.V., The Netherlands</i> "HIPIMS - The tool for a modern production for coat tools and components"	14:15 - 14:30	14:30 - 14:35
15. Jan Philipp Liebig , Veit Schier, <i>Walter AG, Germany</i> "Al-rich (Al,Ti)N at the cutting edge: Insights into the incipient nucleation of the B4 phase"	14:35 - 14:50	14:50 - 14:55
16. Stephan Bolz , Biljana Mesic, Werner Kölker, Oliver Lemmer, <i>CemeCon, Germany</i> "The Influence of Pulse Parameters on Plasma Properties and Performance of HiPIMS Coatings for Cutting Tools"	14:55 - 15:10	15:10 - 15:15
17. Maurizio Giorgio ¹ , M. Steinhorst ^{1,2} , S. Topalski ¹ , C. Leyens ^{1,2} , T. Roch ¹ , ^{1)Fraunhofer Institute for Material and Beam Technology IWS, Germany, 2)Institute of Materials Science, Technische Universität, Germany} "Performance and perspectives of roll-to-roll coatings for metallic bipolar plates"	15:15 - 15:30	15:30 - 15:35
<i>Coffee break</i>		15:35 - 15:50

Third Afternoon session

Session Chairman: Prof. Jochen Schneider, *Materials Chemistry, RWTH Aachen University, Germany*

	Presentation time	Questions & Answers
18. Kristian A. Reck ¹ , Yusuf Bulut ^{2,3} , Thomas Strunskus ¹ , Jonas Drewes ¹ , Peter Muller-Buschbaum ³ , Stephan V. Roth ^{2,4} , Franz Faupel ¹ , ^{1)Faculty of Engineering at Kiel University, Germany, 2)Deutsches Elektronen-Synchrotron (DESY), Germany, 3)Lehrstuhl für Funktionelle Materialien, Technische Universität München (TUM), Germany, 4)KTH Royal Institute of Technology, Department of Fibre and Polymer Technology, Germany} "Real-time monitoring of early stages of HiPIMS film formation on polymers with GISAXS"	15:50 - 16:05	16:05 - 16:10
19. J. Vlcek , <i>University of West Bohemia, Czech Republic</i> "Deposition rate of the dielectric films prepared using reactive HiPIMS can be very high"	16:10 - 16:25	16:25 - 16:30
20. P. Zeman ¹ , S. Haviar ¹ , M. Červená ¹ , A. Bondarev ² , R. Čerstvý ¹ , ^{1)Department of Physics and NTIS – European Centre of Excellence, University of West Bohemia, Czech Republic, 2)Department of Control Engineering, Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic} "Dual-phase nanocomposite coatings based on crystalline ZrN and glassy ZrCu"	16:30 - 16:45	16:45 - 16:50
21. Holger Kersten ¹ , Mathis Klette ¹ , Thomas Trottenberg ¹ , Sven Gauter ² , Maik Fröhlich ³ , ^{1)Kiel University, Germany, 2)Dyson, UK, 3)FH Zwickau, Germany} "Non-conventional plasma diagnostics – also for HiPIMS processes?"	16:50 - 17:05	17:05 - 17:10
<i>Coffee break</i>		17:10 - 17:25

Fourth Afternoon session

Session Chairman: Dave Elliott, *Surface Engineering Association, UK*

	Presentation time
Quo Vadis panel discussion session: "Surface Engineering for Hydrogen Economy. Opportunities and challenges: the industry perspective"	17:25 - 18:00
<i>End of first day</i>	18:00
Conference Dinner	19:00 - 21:30

DAY TWO | Thursday 15 June 2023

First Morning session

Session Chairman: Prof. Ludvik Martinu, Polytechnique Montreal, Canada

	Presentation time	Questions & Answers
22. K. Bobzin, C. Kalscheuer, M. P. Möbius, C. Schulze, <i>Surface Engineering Institute IOT, RWTH Aachen University, Germany</i> "Prediction of OES data based on HPPMS process parameters by ANN"	8:00 - 8:15	8:15 - 8:20
23. Piotr Rozanski, <i>TRUMPF Huettinger Sp. z o.o., Poland</i> "Effect of metal oxide dielectric layers deposition by High Power Impulse Magnetron Sputtering on Resistive-Random Access Memory performance"	8:20 - 8:35	8:35 - 8:40
24. Stefan Körner ^{1,2} , Ralf Bandorf ² , Holger Gerdes ² , Thomas Schütte ³ , G. Bräuer ¹ , ^{1)Institute for Surface Technology IOT (TU Braunschweig), Germany,} ^{2)Fraunhofer Institute for Surface Engineering and Thin Films IST, Germany, 3)PLASUS GmbH, Germany} "Reactive High Power Impulse Magnetron Sputtering (HIPIMS) of titanium oxide: Transition from metallic to poisoned regimes analysed by optical emission spectroscopy"	8:40 - 8:55	8:55 - 9:00
<i>Coffee break</i>		9:00 - 9:15

Second Morning session

Session Chairman: Dr. Ton Hurkmans, IHI Ionbond Group, The Netherlands

	Presentation time	Questions & Answers
25. Christopher Fleming ¹ , A. P. Ehiasarian ¹ , A. Sugumaran ¹ , P. Eh. Hovsepian ² , ^{1)Advanced Forming Research Centre, University of Strathclyde, Scotland, UK, 2)National HIPIMS Technology Centre, MERI, Sheffield Hallam University, UK} "Extending the lifetime of H13 hot forging dies with a HIPIMS CrAlYN/CrN multilayer coating"	9:15 - 9:30	9:30 - 9:35
26. T. Omiya ^{1,3} , M. Fontes ^{1,2} , T. Vuchkov ^{1,3} , S. Cruz ^{1,3} , A. Cavaleiro ^{1,3} , F. Ferreira ^{1,3,4} , ^{1)University of Coimbra, CEMMPRE Centre for Mechanical Engineering Materials and Processes, Department of Mechanical Engineering, Portugal,} ^{2)Federal Institute of Education, Science and Technology of Sao Paulo, Brasil, 3)LED&Mat-IPN, Instituto Pedro Nunes, Laboratório de Ensaios Desgaste e Materiais, Portugal,} ^{4)Walker Department of Mechanical Engineering, The University of Texas at Austin, USA} "Tribological performance of doped-DLC coatings produced by HiPIMS in the presence of environmental-friendly additives"	9:35 - 9:50	9:50 - 9:55
27. João Carlos Oliveira ¹ , Alireza Vahidi ¹ , Ricardo Serra ¹ , A. Cavaleiro ^{1,2} , ^{1)Department of Mechanical Engineering, University of Coimbra, Portugal, 2)IPN – Instituto Pedro Nunes, Portugal} "Carbon hybridization states quantification by EELS and NEXAFS in hard DLC films deposited by HiPIMS-DOMS"	9:55 - 10:10	10:10 - 10:15
<i>Coffee break</i>		10:15 - 10:30

Third Morning session

Session Chairman: Dr. Dave Doerwald, IHI Hauzer Techno Coating B.V., The Netherlands

	Presentation time	Questions & Answers
28. Jörg Pantförder , <i>iwis mobility systems GmbH & Co. KG, Germany</i> "PVD coating in the production environment Industry 4.0"	10:30 - 10:45	10:45 - 10:50
29. Ralf Bandorf ¹ , Holger Gerdes ¹ , Stefan Körner ^{1,2} , Felix Huth ² , ¹ Fraunhofer Institute for Surface Engineering and Thin Films IST, Germany, ² Technische Universität Braunschweig, Institut für Oberflächentechnik IOT, Germany "Reactive HIPIMS of Oxides for Industrial Processes"	10:50 - 11:05	11:05 - 11:10
30. Thomas Schütte ¹ , Jan-Peter Urbach ¹ , Peter Neiß ¹ , Stefan Körner ^{2,3} , Holger Gerdes ³ , Ralf Bandorf ³ , ¹ PLASUS GmbH, Germany, ² Institute for Surface Technology IOT (TU Braunschweig), Germany, ³ Fraunhofer Institute for Surface Engineering and Thin Films IST, Germany "Advanced Process Control for Metallic and Reactive HIPIMS Applications for Production Lines"	11:10 - 11:25	11:25 - 11:30
<i>Coffee break</i>		11:30 - 11:45

Fourth Morning session

Session Chairman: Holger Gerdes, Fraunhofer IST, Germany

	Presentation time	Questions & Answers
31. L.B. Varela-Jimenez ¹ , V. Simova ¹ , A. Miletic ¹ , O. Zabeida ¹ , P. Immich ² , G. Negrea ² , R. Schäfer ³ , D. Schorn ⁵ Th. Schuette ⁴ , S. Williams ⁶ , J.E. Klemberg-Sapieha ¹ and L. Martinu ¹ , ¹ Department of Engineering Physics, Polytechnique Montreal, Canada, ² IHI Hauzer Techno Coating BV, The Netherlands, ³ Robeko GmbH & Co. KG, Germany, ⁴ MAGPULS GmbH, Germany, ⁵ PLASUS GmbH, Germany, ⁶ Sputtering Components Inc, USA "Tuning Residual Stress Depth Profile for Enhanced Tribological Properties of TiAlN Coatings Prepared by HiPIMS Using a Cylindrical Magnetron"	11:45 - 12:00	12:00 - 12:05
32. Ricardo Sera , S.A. Adebayo, J.C. Oliveira, CEMMPRE, Mechanical Engineering department, University of Coimbra, Portugal "Thick and smooth nanostructured Cr coatings by HiPIMS"	12:05 - 12:20	12:20 - 12:25
33. Chayan Ranjan Das , Mufaddal Rangwala, Amitava Ghosh, Indian Institute of Technology Madras, India "Influence of Ti and Si content on the structure and mechanical characteristics of HiPIMS deposited TiAlSiN nanocomposite"	12:25 - 12:40	12:40 - 12:45
<i>Lunch break</i>		12:45 - 13:45

First Afternoon session

Session Chairman: Dr. Philipp Immich, *IHI Hauzer Techno Coating B.V., The Netherlands*

	Presentation time	Questions & Answers
34. A. Bertè , P. Civardi, L. Parenti, P. Colombi, A. Sordi, <i>R&D Department, Lafer Rivestimenti Spa, Italy</i> "Industrial scale innovative doping of DLC coatings deposited by MW-PACVD technique: mechanical and physical characterisation"	13:45 - 14:00	14:00 - 14:05
35. Marek Betiuk ¹ , Aleksandra Mirońska ¹ , Anna W. Oniszczyk ² , Wojciech Trzewiczyński ² , Wojciech Gajewski ² , Piotr Domanowski ³ , ¹ Łukasiewicz, Research Network, Institute of Precision Mechanics (IMP), Poland, ² TRUMPF Huettinger sp. z o.o. Zielonka, Poland, ³ Department of Production Engineering, University of Technology and Life Sciences in Bydgoszcz, Poland "Comparative study of DC and HIPIMS discharge characteristics of Cr cylindrical magnetron"	14:05 - 14:20	14:20 - 14:25
36. H. Gerdes , F. Oldenburg, A. Pflug, R. Bandorf, M. Vergöhl, C. Herrmann, <i>Fraunhofer IST, Germany</i> "Digital Transformation in Thin Film Deposition"	14:25 - 14:40	14:40 - 14:45
<i>Coffee break</i>		14:45 - 15:00

Second Afternoon session

Session Chairman: Prof. Kirsten Bobzin, *IOT - Surface Engineering Institute, RWTH Aachen University, Germany*

	Presentation time	Questions & Answers
37. Ivailo Dolchinkov , Gerrit Jan van der Kolk, Ton Hurkmans, <i>IHI Ionbond AG, The Netherlands</i> "Doped ta-C films deposited by pulsed Arc"	15:00 - 15:15	15:15 - 15:20
38. Mathis Klette ¹ , Martin Kopte ² , Wolfgang Fukarek ² , Holger Kersten ¹ , ¹ Kiel University, Germany, ² VTD Vakuumtechnik Dresden GmbH, Germany "Characterization of a Pulsed Plasma and Macroparticles in an Industrial Scale ta-C Laser-Arc Coating System"	15:20 - 15:35	15:35 - 15:40
39. J. Vyskočil ¹ , P. Mareš ¹ , M. Čada ² , Z. Hubička ² , J. Vlček ³ , J. Blažek ¹ , T. Mates ^{1,4} , I. Venkrbcová ⁴ , ¹ HVM PLASMA, Czech Republic, ² Institute of Physics, Czech Academy of Sciences, Czech Republic, ³ HVM PLASMA, Czech Republic, ⁴ Institute of Physics, Czech Academy of Sciences, Czech Republic "Properties of hard C coating prepared by different HIPIMS processes"	15:40 - 15:55	15:55 - 16:00
<i>Coffee break</i>		16:00 - 16:15

Third Afternoon session

Session Chairman: Dr. Chris Constable, *Ionbond, UK Ltd., UK*

	Presentation time	Questions & Answers
40. Wojciech Trzewiczyński ¹ , Anna W. Oniszczyk ¹ , Wojciech Gajewski ¹ , Jerzy Robert Sobiecki ² , ¹ <i>TRUMPF Huettinger sp. z o.o. Zielonka, Poland</i> , ² <i>Division of Surface Engineering, Warsaw University of Technology, Poland</i> "Effect of current-voltage characteristic on plasma ionization in HIPIMS discharge of graphite target in argon atmosphere"	16:15 - 16:30	16:30 - 16:35
41. M. Učík ^{1,2} , J. Hnilica ¹ , P. Klein ¹ , P. Vašina ¹ , J. Klusoň ² , M. Jílek ² , A. Lümke ³ , ¹ <i>Department of Physical Electronics, Masaryk University, Czech Republic</i> , ² <i>PLATIT a.s., Czech Republic</i> , ³ <i>PLATIT AG, Switzerland</i> "Novel Sputter Cathode Design to Obtain Very High Ionized Flux Fraction of Deposited Material in Industrial Conditions"	16:35 - 16:50	16:50 - 16:55
42. Szilárd Kolozsvári, Peter Polcik, <i>Plansee Composite Materials GmbH, Germany</i> "Target design for HIPIMS process challenges."	16:55 - 17:10	17:10 - 17:15
43. J. Capek, K. Shaji, S. Haviar, <i>Department of Physics and NTIS - European Centre of Excellence, University of West Bohemia, Czech Republic</i> "Preparation of multi-composite nanoparticle-based thin films for gas sensing"	17:15 - 17:30	17:30 - 17:35
44. Olayinka O. Abegunde ¹ , Mohammed Makha ¹ , Karima Machkih ¹ , Hicham Larhlimi ¹ , Anas Ghailane ^{1,2} , Youssef Samih ¹ , and Jones Alami ¹ , ¹ <i>Department of Materials Science, Energy and Nano-engineering, Mohammed VI Polytechnic University (UM6P), Morocco</i> , ² <i>Avaluxe Coating Technology, Germany</i> "Structural, mechanical and corrosion resistance of Phosphorus-doped TiAlN thin film"	17:35 - 17:50	17:50 - 17:55
Student Prize announcement, closing remarks: A. P. Ehasarian, R. Bandorf	17:55 - 18:10	
<i>End of conference</i>	18:10	
Hauzer Dinner	19:00	