

PRELIMINARY PROGRAM

DAY 1, 27 June 2018

8:00-8:30 REGISTRATION AT CUTLERS' HALL

8:30-8:40 WELCOME ADDRESS:

Prof. Roger Eccleston, Board member Joint SHU-Fraunhofer IST HIPIMS Research Centre

Prof. Günter Bräuer, Director Fraunhofer IST

Prof. Arutiun P. Ehiasarian, Conference Chairman

8:40 - 9:00	<p>HIPIMS superimposed sputtering of Al-doped zinc oxide films from rotatable targets</p> <p><u>V. Sittinger</u>¹, S. Jung¹, C. Britze¹, H. Gerdes¹, D. Schorn², T. Wallendorf³, G. Bräuer¹</p> <p>¹) Fraunhofer Institute for Surface Engineering and Thin Films IST, Bienroder Weg 54e, 38108 Braunschweig, Germany</p> <p>²) MAGPULS Stromversorgungs Systeme GmbH, Im Unterfeld 19, 76547 Sinzheim</p> <p>³) IBW Technologieberatung, Niedstr. 6, 12159 Berlin</p>
9:00 - 9:20	<p>Low-temperature (300°C) HiPIMS deposition of thermochromic VO₂ films with antireflection SiO₂ overlayers</p> <p><u>D. Kolenaty</u>, J. Vlcek, J. Houska, T. Kozak</p> <p>Department of Physics and NTIS – European Centre of Excellence, University of West Bohemia, Univerzitni 8, 306 14 Plzen, Czech Republic</p>
9:20 - 9:40	<p>Codeposition of Silicon-doped tantalum oxide films by HiPIMS for tunable resistive switching applications</p> <p><u>Rajesh Ganesan</u>¹, Kerstin Thorwarth¹ and Hans-Josef Hug¹ David McKenzie² and Marcela Bilek²</p> <p>1 School of Physics, University of Sydney, Sydney, NSW 2006, Australia 2 EMPA – Swiss Federal Labs for Material Science and Technology, Duebendorf CH 8600, Switzerland</p>
9:40 - 10:00	<p>Reactive deep oscillation magnetron sputtering of Al-O-N films with tunable composition and properties</p> <p><u>J. Vlcek</u>, A. Belosludtsev, J. Houska, R. Cerstvy, S. Haviar</p> <p>Department of Physics and NTIS – European Centre of Excellence, University of West Bohemia, Univerzitni 8, 306 14 Plzen, Czech Republic</p>
10:00 - 10:20	<p>Current peak profiles and plasma optical emission spectra during HiPIMS of Zn/Al in an Ar and Ar/O₂ atmosphere</p> <p><u>M. Zubkins</u>, H. Arslan, J. Purans</p> <p>Institute of Solid State Physics, Kengaraga 8, Riga, Latvia, LV-1063</p>

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10:20 - 10:40

Coffee Break

10:40 - 11:00	<p>Erosion performance of CrAlYN/CrN nanoscale multilayer coatings deposited on Ti6Al4V by HIPIMS</p> <p><u>D. Ma</u>^a, T. J. Harvey^a, R. G. Wellman^b, A. P. Ehasarian^c, P. Eh. Hovsepian^c, A. A. Sugumaran^c, Y. P. Purandare^c, R. J. Wood^a</p> <p>^a nCATS, University of Southampton, Southampton, SO17 1BJ, UK ^b Surface Engineering, Roll-Royce plc, Derby, DE24 8BJ, UK ^c National HIPIMS Technology Centre, Materials and Engineering Research Institute, Sheffield Hallam University, Sheffield, S1 1WB, UK</p>
11:00 - 11:20	<p>Advanced Quality Assurance for PVD Coatings and Processes Using Optical Emission Spectroscopy</p> <p>A.P. Ehasarian¹, A.A. Sugumaran¹, P. Eh. Hovsepian¹, C. Davies², L. Chen², <u>P. Hatto</u>²</p> <p>¹ National HIPIMS Technology Centre – UK, Materials and Engineering Research Institute, Sheffield Hallam University, Howard St, Sheffield, S1 1WB, UK ² Ionbond UK Ltd., Consett, Co Durham, UK</p>
11:20 - 11:40	<p>Spokes in Large Rectangular Cathodes</p> <p>Arutian P. Ehasarian</p> <p>National HIPIMS Technology Centre – UK, Materials and Engineering Research Institute, Sheffield Hallam University, Howard St, Sheffield, S1 1WB, UK</p>
11:40 - 12:00	<p>Structural and mechanical properties of DLC films deposited by Ne HiPIMS</p> <p><u>Fábio Ferreira</u>¹, Ricardo Serra¹, A. Cavaleiro^{1,2} and João Oliveira¹</p> <p>1 SEG-CEMMPRE-Department of Mechanical Engineering, University of Coimbra, Rua Luis Reis Santos, 3030-788, Coimbra, Portugal 2 LED&Mat-IPN, Instituto Pedro Nunes, Laboratório de Ensaios Desgaste e Materiais, Rua Pedro Nunes, 3030-199 Coimbra, Portugal</p>
12:00 - 12:20	<p>Graphene Growth by Using HIPIMS</p> <p>Cheng-Ming Tseng, En-Yi Liao, Chun-Ming Chen, Ping-Yen Hsieh, Tsung-Han Chen, Ying-Hung Chen, <u>Ju-Liang He</u></p> <p>Department of Materials Science and Engineering, Feng Chia University, Taichung City, Taiwan</p>

12:20 - 13:45

Lunch Break

13:45 - 14:00 Conference photograph

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<p>14:00 - 14:20</p>	<p>High sp3 DLC with iPVD through Modified High Impulse Magnetron Sputtering</p> <p>Ian Haehnlein^{1,2}, Baohua Wu^{1,3}, Jake McLain², Brian Jurczyk², <u>David N. Ruzic</u>¹</p> <p>1 Department of Nuclear, Plasma, and Radiological Engineering, University of Illinois at Urbana-Champaign, IL 61801, USA 2 Starfire Industries, IL 61801, USA 3 Southwest Jiaotong University, Chengdu 610031, China</p>
<p>14:20 - 14:40</p>	<p>Controlling stoichiometry and ionization of reactive HIPIMS processes by using plasma emission monitoring</p> <p><u>J. Rieke</u>¹, R. Bandorf², H. Gerdes², T. Schütte³, G. Bräuer^{1,2}</p> <p>¹Institute for Surface Technology IOT TU-Braunschweig, ²Fraunhofer IST, ³Plasus GmbH</p>
<p>14:40 - 15:00</p>	<p>Tribological and wear behavior of cutting tools with AlTiN PVD coating deposited by HiPIMS during machining of Inconel DA718</p> <p>Edinei Locks Junior, <u>Jose Mario Paiva</u>, German Fox-Rabinovich, D. Covelli and Stephen Veldhuis</p> <p>McMaster University, 1280 Main Street West, Hamilton, ON- Canada L8S 4L7</p>
<p>15:00 - 15:20</p>	<p>HiPIMS meets Diamond</p> <p>Toni Leyendecker, Oliver Lemmer, Werner Kölker, Stephan Bolz, <u>Christoph Schiffers</u></p> <p>CemeCon AG, Adenauerstr. 20 A4, 52146 Würselen., Germany</p>
<p>15:20 - 15:40</p>	<p>The implementation of a reversed voltage pulse technology enables enhanced coating properties for glass, plastics, fiber and other non-conductive substrates. A special consideration of this work will be given to medical coatings of biocompatible polymers on implantable devices.</p> <p><u>Gerhard Eichenhofer</u>^{1,2}; Dr. Ivan Fernandez-Martinez^{2,4}, Michael Banghard³, Carlos de la Viesca⁵</p> <p>1 4A-PLASMA, Germany; 2 hiP-V-Collaboration, Germany, Spain, Sweden; 3 NMI, Natural and Medical Sciences Institute at the University of Tübingen, Germany; 4 Nano4Energy, S.L. Spain; 5 INGENIERIA VIESCA, S.L. Spain;</p>

PRELIMINARY PROGRAM

15:40 - 16:00

Coffee Break

<p>16:00 - 16:20</p>	<p>Molybdenum back contacts for photovoltaic applications deposited by HIPIMS</p> <p><u>Daniel A. L. Loch</u>, Arutiun P. Ehiasarian</p> <p>National HIPIMS Technology Centre – UK, Materials and Engineering Research Institute, Sheffield Hallam University, Howard St, Sheffield, S1 1WB, UK</p>
<p>16:20 - 16:40</p>	<p>Ar-Nb plasma characterization and thin film properties in HiPIMS regimes for coating of superconducting cavities</p> <p><u>Fabio Avino</u>, Alban Sublet, Sergio Calatroni, Pedro Costa Pinto, Thibaut Richard, Guillaume Rosaz, Mauro Taborelli, Wil Vollenberg, Alexej Grudiev, Kai Papke.</p> <p>CERN, Switzerland</p>
<p>16:40 - 17:00</p>	<p>The study of deposition method of NbN film on Cu substrate By HIPIMS</p> <p><u>Li Xiao</u>, Xiangyang Lu, Datao Xie, Weiwei Tan, Deyu Yang, Yujia Yang</p> <p>Peking University, Beijing, China</p>
<p>17:00 - 17:20</p>	<p>BeW coatings deposited by hybrid HiPIMS/dcMS co-sputtering system as plasma facing material for fusion applications</p> <p><u>C. Porosnicu</u>¹, P. Dinca¹, O.G. Pompilian¹, B. Butoi¹, V. Tiron², I. Burducea³, I.-L. Velicu⁴ and C.P. Lungu¹</p> <p>¹National Institute for Lasers, Plasma and Radiation Physics, Bucharest-077125, Romania</p> <p>²Research Department, Alexandru Ioan Cuza University, Iasi-700506, Romania</p> <p>³Horia Hulubei National Institute of Physics and Nuclear Engineering, IFIN-HH, Magurele 077125, Romania</p> <p>⁴Faculty of Physics, Alexandru Ioan Cuza University, Iasi-700506, Romania</p>

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17:20 - 17:40	<p>Bipolar High Power Impulse Magnetron Sputtering: A new approach to control the metal ion flux</p> <p><u>Ioana-Laura VELICU</u>¹, Corneliu POROSNICU², Ilarion MIHĂILĂ³, Ion BURDUCEA⁴, Alin VELEA⁵, Daniel CRISTEA⁶, Daniel MUNTEANU⁶, Vasile TIRON⁷</p> <p>¹<i>Faculty of Physics, Alexandru Ioan Cuza University, Iasi-700506, Romania</i> ²<i>National Institute for Lasers, Plasma and Radiation Physics, 077125, Bucharest, Romania</i> ³<i>Integrated Center of Environmental Science Studies in the North-Eastern Development Region (CERNESIM), Alexandru Ioan Cuza University of Iasi, Iasi-700506, Romania</i> ⁴<i>Horia Hulubei National Institute of Physics and Nuclear Engineering, IFIN-HH, Magurele 077125, Romania</i> ⁵<i>The National Institute of Materials Physics, Magurele 077125, Romania</i> ⁶<i>Faculty of Materials Science and Engineering, Department of Materials Science, Transilvania University, Brasov 500068, Romania</i> ⁷<i>Research Department, Alexandru Ioan Cuza University, Iasi-700506, Romania</i></p>
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19:30 - 23:00

Conference Dinner, Cutler's Hall, Sheffield

PRELIMINARY PROGRAM

DAY 2, 28 June 2018

08:30 - 09:00	<p>Chromium Target composition in reactive high-power impulse magnetron sputtering characterized by in-vacuum X-ray photoelectron spectroscopy</p> <p>Vincent Laves¹, Carles Corbella¹, <u>Sascha Monjé</u>¹, Volker Schulz-von der Gathen¹, Achim von Keudell¹ and Teresa de los Arcos²</p> <p>1 Institute for Experimental Physics II, Ruhr-University Bochum, Universitätsstr. 150, 44780 Bochum, Germany</p> <p>2 Technical and Macromolecular Chemistry, Paderborn University, Warburgstr. 100, 33098 Paderborn, Germany</p>
09:00 - 09:20	<p>Properties of spokes observed with a linear magnetron</p> <p>André Anders¹ and <u>Yuchen Yang</u>²</p> <p>¹ Leibniz Institute of Surface Engineering (IOM), Permoserstr. 15, 04318 Leipzig, Germany</p> <p>² Institute of High Energy Physics, Chinese Academy of Sciences, Academy of Sciences, Beijing, China</p>
09:20 - 09:40	<p>Control of voltage and current peak shape for reactive HIPIMS deposition</p> <p><u>Wojciech Gajewski</u>, Anna W. Oniszczyk, Piotr Róžański, Paweł Lesiuk, Paweł Ozimek</p> <p>TRUMPF Huettinger, Marecka 47, 05-220 Zielonka, Poland</p>
09:40 - 10:00	<p>Industrial system solution approach utilizing HIPIMS for improved process optimization: a Ti-Cr-based anticorrosion coating case study</p> <p><u>Krzysztof Ruda</u>, Wojciech Gajewski, Paweł Lesiuk, Paweł Ozimek</p> <p>TRUMPF Huettinger, Marecka 47, 05-220 Zielonka, Poland</p>
10:00 - 10:20	<p>Advantages associated with applying a Positive Pulse option to a HIPIMS power supply</p> <p><u>Jason Hrebik</u></p> <p>Kurt J. Lesker Company, USA</p>

10:20 - 10:40

Coffee Break

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10:40 - 11:00	<p>Gas rarefaction in HiPIMS – comparison of a particle simulation and volume-averaged models</p> <p><u>T. Kozak</u>¹, J. Lazar²</p> <p>¹Department of Physics and NTIS-European Centre of Excellence, University of West Bohemia, Univerzitni 8, 30614 Plzen, Czech Republic ²New Technologies – Research Centre, University of West Bohemia, Univerzitni 8, 30614 Plzen, Czech Republic</p>
11:00 - 11:20	<p>Novel HIPIMS deposited nanostructured CrN/NbN coatings for environmental protection of steam turbine components</p> <p>P. Eh. Hovsepian ^{a*}, A. P. Ehiasarian ^a, <u>Y. P. Purandare</u> ^a, P. Mayr ^b, K. G. Abstoss ^b, M. Mosquera Feijoo ^c, W. Schulz ^c, A. Kranzmann ^c, M.I. Lasanta ^d, J.P-Trujillo ^d</p> <p>^a UK National HIPIMS Technology Centre, Materials and Engineering Research Institute, Howard Street, Sheffield Hallam University, Sheffield, S1 1WB, UK. ^b Welding Engineering Institute of Joining and Assembly, Technische Universität Chemnitz, Reichenhainer Strasse 70, 09126 Chemnitz, Germany ^c BAM, Federal Institute for Materials Research and Testing, Unter den Eichen 87 12205 Berlin, Germany. ^d Grupo de Investigación Ingeniería de Superficies y Materiales Nanoestructurados, Facultad de Ciencias Químicas, Universidad Complutense de Madrid, Spain</p>
11:20 - 11:40	<p>Coated Shoulders for Friction Stir Welding of Aluminium Alloys</p> <p><u>Arunprabhu A. Sugumaran</u>^a, Arutiun P. Ehiasarian^a, Yashodhan Purandare^a, Papken Eh. Hovsepian^a, Peter Hatto^b, Jeroen DeBacker^c</p> <p>^a National HIPIMS Technology Centre, Materials and Engineering Research Institute, Sheffield Hallam University, City Campus, Howard Street, Sheffield S1 1WB, United Kingdom ^b Ionbond UK, Number One Industrial Estate, Medomsley Road, Consett, Durham, DH8 6TS, United Kingdom ^c TWI Ltd., United Kingdom</p>
11:40 - 12:00	<p>QCM integrated Vapour Sorption Ellipsometry</p> <p>Ziyou Zhang, Robert Price, <u>Vladimir Martis</u>, Daryl Williams</p> <p>Surface Measurement Systems, London, UK HA0 4PE</p>
12:00 - 12:20	<p><u>Barry Dolan</u> (TBC)</p> <p>Fischer Instrumentation (GB) Ltd, S041 8JD Lymington/Hampshire United Kingdom</p>

12:20 - 14:00

Lunch

END OF CONFERENCE

PRELIMINARY PROGRAM

POSTER SESSION

8:30, 27 June - 13:00, 28 June

1. Optimization of magnetic field configuration for Titanium Nitride deposition using HIPIMS

Anas GHAILANE, Heinz Busch, Jones ALAMI

Mohammed VI Polytechnic University, Benguerir, Morocco,

2. Probing the Electron Density of Spokes Using Target Inserts

Ante Hecimovic, Julian Held, Wolfgang Breilmann, Christian Maszl, Volker Schulz-von der Gathen and Achim von Keudell

Experimental Physics II, Ruhr-University Bochum, Universitätsstr. 150, 44780 Bochum, Germany

3. Effect of pulse power on controlled reactive HiPIMS deposition of ZrO₂ films examined by an optical emission spectroscopy

A.D. Pajdarová and J. Vlček

Department of Physics and NTIS – European Centre of Excellence, University of West Bohemia, Univerzitiní 8, 306 14 Plzeň, Czech Republic

4. Controlling the polymorphic composition of TiO₂ thin films by modifying the target surface conditions using HiPIMS deposition parameters

G. Christidis[†], R. Ganesan^{‡§}, V. Shklover[†], K. Thorwarth[‡], M. Bilek[§] H.-J. Jug[‡], J. Leuthold[†]

[†]ETH Zurich, Institute of Electromagnetic Fields (IEF), 8092 Zurich, Switzerland

[‡]EMPA, Swiss Federal Labs for Material Science and Technology, 8600 Dübendorf, Switzerland

[§]The School of Physics, The University of Sydney, 2006 NSW, Australia

5. Low-temperature deposition of thermochromic VO₂ films on glass and kapton using reactive deep oscillation magnetron sputtering

M. Prochazka, S. Babae Tooski, J. Vlcek and R. Cerstvy

Department of Physics and NTIS-European Centre of Excellence, University of West Bohemia, Univerzitiní 8, 30614 Plzen, Czech Republic

6. Niobium coatings onto complex accelerating structures by HiPIMS

Guillaume Rosaz, Fabio Avino, Sergio Calatroni, Thibaut Richard, Alban Sublet, Mauro Taborelli

CERN – CH 1211 Geneva

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7. Deposition of Niobium for Superconducting Accelerator on Copper by High Power Impulse Magnetron Sputtering

Weiwei Tan, Xiangyang Lu, Datao Xie, Li Xiao, Yujia Yang, Boting Li, Deyu Yang,

Institute of Heavy Ion Physics, Peking University, China

8. Laser Annealing for Niobium Film on Copper Deposited by HiPIMS

Yujia Yang, Xiangyang Lu, Datao Xie, Weiwei Tan, Li Xiao, Deyu Yang, Boting Li

Peking University

9. Dual-HiPIMS system as source of fusion related W-Al composite layers having helium and deuterium inclusions

P. Dinca^a, V. Tiron^b, I. Mihaila^c, I.-L. Velicu^d, C. Porosnicu^a, B. Butoi^a, A. Velea^e, E. Grigore^a, C. Costin^c, C.P. Lungu^a

^aNational Institute for Lasers, Plasma and Radiation Physics, Bucharest-077125, Romania

^bResearch Department, Faculty of Physics, Alexandru Ioan Cuza University, Iasi-700506, Romania

^cIntegrated Center of Environmental Science Studies in the North-Eastern Development Region (CERNESIM), Alexandru Ioan Cuza University of Iasi, Iasi-700506, Romania

^dFaculty of Physics, Alexandru Ioan Cuza University, Iasi-700506, Romania

^eNational Institute of Material Physics, Bucharest-077125, Romania

10. First HiPIMS activities at Politecnico di Milano

D. Dellasega, A. Maffinia; F. Mirania, A. Pazzagliaa, M. Passonia

Dipartimento di Energia, Politecnico di Milano, Milano, Italy

11. Influence of spokes on the ionized metal flux fraction in chromium high power impulse magnetron sputtering

B Biskup, C Maszl, W Breilmann, J Held, M Böke, J Benedikt and A von Keudell

Experimental Physics II, Ruhr-University Bochum, Universitätsstr. 150, 44780 Bochum, Germany

12. MAGNETRON WITH A HOT TARGET. INDIRECT METHOD OF DETERMINING THE target EFFECTIVE TEMPERATURE

A.A. Kozin, V.V. Smirnov, E.A. Minzhulina, A.O. Goncharov, A.V. Zav'yalov

St. Petersburg State Electrotechnical University, Department of Physical Electronics and Technology, 5 Prof. Popov St., St. Petersburg, Russia

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**13. THERMAL MODEL FOR sputtered UNIT OF MAGNETRON USED TO deposit
FILM OF ALLOY CONTAINING TWO METALS**

A.A. Kozin, V.V. Smirnov, E.A. Minzhulina, A.A. Morozova

St. Petersburg State Electrotechnical University, Department of Physical Electronics and
Technology, 5 Prof. Popov St., St. Petersburg, Russia

**14. TRIBOLOGICAL TESTING of TITANIUM OXYNITRide Films Deposited by
Reactive Sputtering OF A HOT TARGET**

A.A. Kozin, V.V. Smirnov, E.A. Minzhulina, D.S. Shestakov, A.A. Komlev

St. Petersburg State Electrotechnical University, Department of Physical Electronics and
Technology, 5 Prof. Popov St., St. Petersburg, Russia

15. HIPIMS for pretreatment and coating of plastics

H. Gerdes, R. Bandorf, G. Bäuer

Fraunhofer Institute for Surface Engineering and Thin Films IST, Bienroder Weg 54e, 38108
Braunschweig, Germany

**16. Effect of chamber pressure on defect generation and their influence on corrosion
and tribological properties of HIPIMS deposited CrN/NbN Coatings**

Barnali Biswas¹, Y. Purandare, A. Sugumaran¹, Papken Eh. Hovsepian¹ and Imran Khan²

¹National HIPIMS Technology Centre, Materials and Engineering Research Institute, Sheffield Hallam
University, City Campus, Howard Street, Sheffield S1 1WB, United Kingdom

²Zimmer-Biomet UK Limited, Dorcan Industrial Estate, Murdoch Road, Swindon SN3 5HY, United Kingdom