

Programme of Events

Wednesday, 02 July 2014

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

Morning Session.

Moderator: Ralf Bandorf, Fraunhofer IST, Germany

8:40-9:00 Benefits of the controlled reactive high-power impulse magnetron sputtering of dielectric films.

Jaroslav Vlcek and Jiri Rezek. Department of Physics and NTIS – European Centre of Excellence, University of West Bohemia, Univerzitni 8, 306 14 Plzen, Czech Republic.*

9:00-9:20 Investigation of plasma parameters during the HIPIMS deposition of semiconductor oxide thin films for water splitting application.

Z. Hubička, Š. Kment, M. Čada, J. Olejníček, Institute of Physics ASCR, v.v.i. Na Slovance 2 182 21 Prague 8 Czech Republic*

9:20-9:40 HIPIMS deposition of p-type iridium oxide films

*V. Sittinger, S. K. Gurram, D. Niewerth, J. Köhler, G. Bräuer
Fraunhofer Institute for Surface Engineering and Thin Films IST, Bienroder Weg 54E, 38108 Braunschweig, Germany*

9:40-10:00 Comparison of plasma diagnostics and materials characterization of Ni and NiO thin films deposited by reactive DC and HiPIMS discharges.

J. Keraudy^{1,2}, A. Ferrec², M. Richard-Plouet², M.C. Fernandez², A. Goulet², P.Y. Jouan², ¹IRT Jules Vernes, Chemin du Chaffault, 44340 Bouguenais, Nantes, France, ²IMN Jean Rouxel, 2 Chemin de la Houssinière, 44300 Nantes, France

10:00-10:20 Reactive Process Control of HIPIMS Discharges

H. Gerdes, R. Bandorf, G. Bräuer, Fraunhofer Institute for Surface Engineering and Thin Films IST, Bienroder Weg 54 E, Braunschweig, Germany

10:20-10:40 COFFEE BREAK, POSTER SESSION AND EXHIBITION

Programme of Events

Wednesday, 02 July 2014

Second Morning Session.

Moderator: Arutiun P. Ehiasarian, Sheffield Hallam University, UK

10:40-11:00 The potential structure of ionization zones in high power impulse sputtering

*André Anders**, Matjaz Panjan, Robert Franz, Joakim Andersson, and Pavel Ni, Lawrence Berkeley National Laboratory, Berkeley, California, USA

11:00-11:20 Description of HiPIMS plasma regimes in terms of composition, spoke formation and deposition rate

Teresa de los Arcos¹, Yolanda Aranda Gonzalvo², Volker Schulz-von der Gathen¹, and Jörg Winter¹, ¹ Institute for Experimental Physics II, Faculty of Physics and Astronomy, Ruhr-Universität Bochum, Germany, ² Hiden Analytical Ltd, 420 Europa Boulevard, Gemini Business Park, Warrington, Cheshire, WA5 7UN, England

11:20-11:40 On periodic oscillations observed on cathode voltage and discharge current during HIPIMS process

P.Klein, J.Hnilica, P.Vašina, Department of Physical Electronics, Faculty of Science, Masaryk University, Kotlářská 2, CZ-61137, Brno, Czech Republic

11:40-12:00 On the origin of energetic metal ions during high power impulse magnetron sputtering of titanium

C. Maszl, W. Breilmann, A. Hecimovic, T. de los Arcos, J. Benedikt and A. von Keudell, Research Department Plasmas with Complex Interactions, Ruhr-Universität Bochum, Institute for Experimental Physics II, Universitystr. 150, D-44780 Bochum, Germany

12:00-12:20 Regime transition in HiPIMS: volume averaged and phenomenological models.

S. Gallian¹, J. Trieschmann¹, T. Mussenbrock¹, W. N. G. Hitchon², R. P. Brinkmann¹, ¹ Lehrstuhl für Theoretische Elektrotechnik, Ruhr-Universität Bochum, ² Department of Electrical and Computer Engineering, University of Wisconsin-Madison

12:20-14:00 LUNCH BREAK and Conference Photograph

Programme of Events

Wednesday, 02 July 2014

First Afternoon Session.

Moderator: Gery van der Kolk, IonBond, The Netherlands

14:00-14:20 Structure and properties of group IB metal containing diamond like carbon nanocomposite films deposited by HIPIMS

Š. Meškiniš, A. Vasiliauskas, A. Čiegis, K. Šlapikas, R. Gudaitis, M. Andrulevičius, S. Tamulevičius, G. Niaura, Kaunas University of Technology, Institute of Materials Science, Savanoriu 271, Kaunas LT-50131, Lithuania

14:20-14:40 Langmuir probe measurements of negative ion densities in reactive HiPIMS discharges

J.W. Bradley and M. Bowes, Department of Electrical Engineering & Electronics, University of Liverpool, Brownlow Hill, Liverpool, L69 3GJ, UK

14:40-15:00 Different process parameters controlling reactive high-power impulse magnetron sputtering of dielectric oxide films

Jiri Rezek, Jaroslav Vitek, Alexandr Belosludtsev, Department of Physics and NTIS – European Centre of Excellence, University of West Bohemia, Univerzitni 8, 306 14 Plzen, Czech Republic

15:00-15:20 Si_yN_x coatings deposited by reactive High Power Impulse Magnetron Sputtering

S. Schmidt, C. Goyenola, T. Hänninen, J. Jensen, G. K. Gueorguiev, and H. Högberg, Thin Film Physics Div., Department of Physics (IFM), Linköping University, SE-581 83, Sweden

15:20-15:40 The influence of substrate-bias on the HIPIMS Tungsten films

N. Gordillo¹, M. Panizo-Laiz¹, G. Balabanian¹, G. Pedroche-Sanchez¹, I. Fernandez-Martinez², F. Briones³, J. M. Perlado¹ and R. Gonzalez-Arrabal¹, ¹Instituto de Fusión Nuclear, ETSII de Industriales, Universidad Politécnica de Madrid, C/ José Gutierrez Abascal, 2, E-28006 Madrid, Spain. ²Nano4Energy SLNE, C/o José Gutierrez Abascal, 2, E-28006 Madrid, Spain. ³Instituto de Microelectrónica de Madrid, IMM-CNM-CSIC, Isaac Newton 8 PTM, E-28760 Tres Cantos, Madrid, Spain

15:40-16:00 COFFEE BREAK, POSTER SESSION AND EXHIBITION

Programme of Events

Wednesday, 02 July 2014

Second Afternoon Session.

Moderator: Thomas Krug, Hauzer Techno Coating, The Netherlands

16:00-16:20 Industrial scale HIPIMS equipment from design concept to operation

*C. Constable¹, G van der Kolk², A. Santana³, A. P. Ehiasarian⁴, P. Eh. Hovsepian⁴,
1Ionbond UK, 2Ionbond The Netherlands, 3Ionbond Switzerland, 4Sheffield Hallam
University, UK*

16:20-16:40 Coating solutions and applications, produced by Ingenia -S3p™, the HIPIMS technology of Oerlikon Balzers

*Siegfried Krassnitzer, Denis Kurapov, Helmut Rudigier, Oerlikon Balzers Coating
AG, Liechtenstein*

16:40-17:00 Integration of HiPIMS Equipment into an Industrial Coating Production for Cutting Tools

*Toni Leyendecker, Oliver Lemmer, Werner Kölker, Stephan Bolz, Christoph Schiffers,
CemeCon AG, Adenauerstrasse 20A4, 52146 Würselen, Germany*

17:00-17:20 Combination of HiPIMS and PBII for the generation of high functional surfaces

Martin Polak, Antje Quade, Angela Kruth, Thomas Weihe, Maik Fröhlich, Klaus-Dieter Weltmann, Leibniz-Institute for Plasma Science and Technology (INP Greifswald), Greifswald, Germany

17:20-17:40 On the HiPIMS benefits of multi-pulse operating mode

O. Antonin¹, V. Tiron², C. Costin², T.M. Minea¹, 1 LPGP, UMR 8578, Bat. 210, rue Becquerel, 91405 Orsay, France, 2 Alexandru Ioan Cuza University, Faculty of Physics, Bd. Carol I nr. 11, 700506 Iasi, Romania

17:40-18:00 Influence of pulse on time and frequency variation on the properties of Cu coatings performed by HiPIMS power source

*Naresh Vaghela, Suryakant Gupta, Keena Kalaria and S.Mukherjee
FCIPT, Institute for Plasma Research, India*

19:30 CONFERENCE DINNER: CUTLERS' HALL, SHEFFIELD

Programme of Events

Thursday, 03 July 2014.

First Morning Session.

Moderator: Jaroslav Vlcek, University of West Bohemia, Czech Republic

8:30-9:00 15 Year of HIPIMS – a success story

R. Bandorf, Fraunhofer IST, Bienroder Weg 54E, 38108 Braunschweig

9:00-9:20 Effects of HIPIMS Deposition Pressure on (Ti, Al)N Film Properties at Inner Wall of Sub-Millimeter Scale Small Holes

Tetsuhide Shimizu¹, Hidetoshi Komiya², Tomotaro Watanabe², Yoshikazu Teranishi², Hiroshi Nagasaka², Kazuo Morikawa², Ming Yang¹

1Division of Human Mechatronics Systems, Tokyo Metropolitan University, Tokyo / Japan; 2Tokyo Metropolitan Industrial Technology Research Institute, Tokyo/ Japan

9:20-9:40 Structural, electrical and optical properties of Zn-Ir-O thin films

M. Zubkins, R. Kalendarevs, J. Gabrusenoks, K. Vilnis, A. Azens, J. Purans, Institute of Solid State Physics, Kengaraga 8, Riga, Latvia, LV-1063

9:40-10:00 High-rate reactive high-power impulse magnetron sputtering of hafnium dioxide films

A. Belosludtsev, J. Rezek, J. Vlcek, J. Houska, R. Cerstvy, Department of Physics and, NTIS – European Centre of Excellence, University of West Bohemia, Univerzitetni 8, 306 14 Plzen, Czech Republic

10:00-10:20 Impact of coating defects on the corrosion protection capabilities of TiN films deposited by dc-magnetron sputtering and HIPIMS by a novel scanning method

Martin Balzer, Martin Fenker, fem – Forschungsinstitut für Edelmetalle und Metallchemie, Katharinenstrasse 17, 73525 Schwäbisch Gmünd, GERMANY

10:20-10:40 COFFEE BREAK, POSTER SESSION AND EXHIBITION

Programme of Events

Thursday, 03 July 2014.

Second Morning Session.

Moderator: A.Anders, Lawrence Berkeley National Laboratory, USA

10:40-11:00 Investigation of ionized metal flux in enhanced High Power Impulse Magnetron Sputtering discharge

V. Stranak¹, Z. Hubicka², M. Cada², S. Drache³, R. Hippler³, 1 University of South Bohemia, Branisovska 31, 370 05 Ceske Budejovice, Czech Republic, 2 Academy of Sciences of the Czech Rep., Institute of Physics, Na Slovance 2, 18221 Prague 8, Czech Republic, 3 University of Greifswald, Institute of Physics, Felix-Hausdorff-Str. 6, 17489 Greifswald, Germany

11:00-11:20 Simulation of Neutral Particle Transport in High Power Impulse Magnetron Sputtering

Jan Trieschmann, Sara Gallian, Denis Eremin, Ralf Peter Brinkmann, Thomas Mussenbrock, Ruhr University Bochum, Department of Electrical Engineering and Information Sciences, Institute of Theoretical Electrical Engineering, D-44780, Germany

11:20-11:40 Determination of sputtered species densities in HIPIMS discharge by optical emission spectroscopy

Matej Fekete¹, Petr Vašina¹, Peter Klein¹, Lenka Dosoudilová¹, Zdeněk Navrátil¹, Jaroslav Hnilica¹, Pavel Dvořák¹, 1 Department of Physical Electronics, Faculty of Science, Masaryk University, Kotlářská 2, CZ-61137, Brno, Czech Republic

11:40-12:00 Time-resolved study of simultaneous combination of HiPIMS and mid-frequency pulsed dc discharge

M. Cada, Z. Hubicka, P. Adamek, J. Olejnicek, S. Kment, Institute of Physics ASCR, v. v. i., Na Slovance 2, 182 21 Prague 8, Czech Republic

12:00-12:20 Ag- and Cu-flexible surfaces leading to fast bacterial inactivation in the dark: comparative study DCMS vs HIPIMS depositions

Sami Rtimi¹, Cesar Pulgarin¹, Arutiun Ehiasarian², Ralf Bandorf³ and John Kiwi⁴, 1 Ecole Polytechnique Fédérale de Lausanne, EPFL-SB-ISIC-GPAO, Station 6, CH-1015, Lausanne, Switzerland, 2 Sheffield Hallam Univ, Howard St, Sheffield, S1 1W, BUK, 3 Fraunhofer-Institute for Surface Engineering and Thin Films (IST), Bienroder Weg 54E, 38108 Braunschweig, Germany, 4 Ecole Polytechnique Fédérale de Lausanne, EPFL-SB-ISIC-LPI, Bat Chimie, Station 6, CH1015, Lausanne, Switzerland

12:20-12:40 Cr thin films deposited by DOMS (Deep Oscillations Magnetron Sputtering) with a Cyprium III power source.

J.C. Oliveira, F. Ferreira, R. Serra, and A. Cavaleiro, SEG-CEMUC, University of Coimbra, Dept. Mechanical Engineering, Rua Luis Reis Santos, 3030-788, Coimbra, Portugal

Poster Presentations. Exhibition Hall - 02 and 3 July 2014.

1. Effect of peak power on Cr thin films deposited by HiPIMS in DOMS (Deep Oscillations Magnetron Sputtering) mode.

F. Ferreira, R. Serra, J.C. Oliveira, A. Cavaleiro
SEG-CEMUC, University of Coimbra, Dept. Mechanical Engineering, Rua Luis Reis Santos, 3030-788, Coimbra, Portugal

2. Dynamic and isothermal oxidation behaviour of HIPIMS deposited Mo-W doped carbon-based coating

Paranjayee Mandal¹, A. P. Ehasarian¹, P.Eh. Hovsepian¹, R. Jacobs², D. Doerwald², R. Tietema², ¹ Nanotechnology Centre for PVD Research, HIPIMS Research Centre, Sheffield Hallam University, City Campus, Howard Street, Sheffield S1 1WB, United Kingdom, ² IHI Hauzer Techno Coating BV

3. ZrN coatings deposited by High Power Impulse Magnetron Sputtering

Y. P. Purandare, A. P. Ehasarian and P. Eh Hovsepian, Nanotechnology Centre for PVD Research, Materials and Engineering Research Institute, Sheffield Hallam University, UK S1 1WB.

4. Corrosion Properties of TiN Thin Films Grown by Combined HIPIMS/DCMS and Arc Evaporation Techniques

Arunprabhu A. Sugumaran, Arutiun P. Ehasarian and Papken Eh. Hovsepian
Nanotechnology Centre for PVD Research, Sheffield Hallam University, Howard Street, Sheffield, S1 1WB, United Kingdom.

5. Analysis of Cu, Ti and Ni Plasma Generated by Inductively Coupled Impulse Sputtering (ICIS)

Daniel A. L. Loch, Arutiun P. Ehasarian, HIPIMS Technology Centre, Materials and Engineering Research Institute, Sheffield Hallam University, Howard St., Sheffield, S1 1WB, UK

6. Target poisoning control in High Power Impulse Magnetron Sputtering

Anna W. Oniszczyk, Arutiun P. Ehasarian HIPIMS Technology Centre, Materials and Engineering Research Institute, Sheffield Hallam University, Howard St., Sheffield, S1 1WB, UK

7. HIPIMS Chromium etching as a coating pre-treatment step; investigating how the plasma and substrate are affected by process parameters.

Thomas J. Morton, Arutiun P. Ehasarian, HIPIMS Technology Centre, Materials and Engineering Research Institute, Sheffield Hallam University, Howard St., Sheffield, S1 1WB, UK

8. Development of HIPIMS technology for superconductive coated cavities

Giovanni Terenziani¹, Arutiun P. Ehasarian², Sergio. Calatroni¹, ¹ CERN CH-1211, Geneva 23, Switzerland, ² HIPIMS Technology Centre, Materials and Engineering Research Institute, Sheffield Hallam University, Howard St., Sheffield, S1 1WB, UK

9. New generation of HIPIMS power supplies – outstanding features in a compressed volume

Piotr Rozanski, Pawel Ozimek, TRUMPF Huettinger Sp. z o.o., Marecka 47, 05-220 Zielonka, Poland

12:40-14:00 LUNCH BREAK

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