

Programme

Sunday 11 April

- 16.30 Registration**
Outside Flowers Theatre
- 18.30 Welcome Reception**
Conservatory

Monday 12 April

- 09:00 Conference Opening**
Flowers Theatre
Dr Vladimir Vishnyakov, Manchester Metropolitan University
- Welcome**
Prof John Brooks, Vice Chancellor, Manchester Metropolitan University
- 09.15 Plenary lecture**
Materials Challenges for the Fusion Program
Prof Steven Cowley, Director
United Kingdom Atomic Energy Authority, Culham, UK
- 10.15 Refreshments**
Conservatory

Session 1 – Flowers Theatre

Chair: Dr Vladimir Vishnyakov, Manchester Metropolitan University

- 10:45 1.1 (Invited) Atomic-scale characterisation of nuclear reactor materials**
Dr Emmanuelle Marquis
University of Oxford
- 11:15 1.2 Surface modification of nickel-based superalloy with ultrashort laser pulses**
B Gaković¹, J Stašić¹, S Petrović¹, B Radak¹, A Krmpot², B Jelenković², M Trtica¹
¹ *Institute of Nuclear Sciences “Vinča”, Belgrade, Serbia*
² *Institute of Physics, Belgrade, Serbia*
- 11:30 1.3 Modelling the deposition fuel derive particles and vapours**
M W Davies, N Simms
Cranfield University

- 11:45 1.4 Fusion island – latest considerations concerning magnetic fusion, hydrogen cryomagnetics and thermochemical hydrogen production**
W J Nuttall¹, B A Glowacki^{1,2}, L Bromberg³
¹ *University of Cambridge*
² *Institute of Power Engineering, Poland*
² *Plasma Science and Fusion Centre, Massachusetts Institute of Technology, USA*
- 12:00 1.5 CVD diamond: a candidate for fusion plasma-facing components**
J I B Wilson¹, P John¹, S Porro¹, G De Temmerman², S Lisgo^{2,3}, A Dunn⁴, D M Duffy^{2,4}
¹ *Heriot-Watt University, Edinburgh*
² *UKAEA Euratom Fusion Association, Oxfordshire*
³ *ITER Organisation, France*
⁴ *University College London*
- 12:15 1.6 (Invited) The effectiveness of mathematical models for fusion materials**
 Prof Sergei Dudarev
UKAEA Culham
- 12:45 Lunch**
 Carriage House Restaurant

Session 2: Poster Session – Marquis Room

14:00 Poster Session

Chair: Prof Janice Barton, University of Southampton

- P1 Novel aspects of electrical properties of the heterocontacts based on the layered crystals**
 M.O. Vorobets
Chernivtsi National University, Ukraine
- P2 Effect of plasma treatment on the wetting behaviour of polylactic acid and polyester fabrics**
 A Abdrabbo and R H Wardman
School of Textiles & Design, Heriot-Watt University
- P3 Photoluminescent properties comparison t-LaVO₄:Eu³⁺ with t-YVO₄:Eu³⁺**
 S W Park, H K Yang, B K Moon, B C Choi, J H Jeong
Pukyong National University, Korea
- P4 Synthesis and luminescence properties of Ce³⁺ doped aluminum garnet crystalline powders**
 H C Jung¹, J Y Park¹, G S R Raju¹, B K Moon^{1*}, J H Jeong¹, J H Kim²
¹ *Pukyong National University, Republic of Korea*
² *Dongueui University, Republic of Korea*

- P5 Photoluminescence behavior of Tm³⁺ and Yb³⁺ doped LiYO₂ nanophosphors by solvothermal method**
J W Chung¹, J H Jeong^{1*}, K Jang², H S Lee², S S Yi³
¹ Pukyong National University, Korea
² Chanwon National University, Korea
³ Silla University, Korea
- P6 Electrical and optical properties of PLL/CMC multilayer films**
T Yovcheva¹, M Marudova¹, G Zsivánovits², E Vozary³, S Sainov⁴
¹ University of Plovdiv, Bulgaria
² Canning Research Institute of Plovdiv, Bulgaria
³ Corvinus University of Budapest, Hungary
⁴ CLOSPI, Bulgarian Academy of Sciences, Bulgaria
- P7 Optimisation of activated gallium arsenide photocathode surface for application as a high brightness electron source for particle accelerators**
N Chanlek^{1,2}, J D Herbert², L B Jones², R M Jones^{1,3}, K J Middleman²
¹ University of Manchester
² STFC Daresbury Laboratory
³ The Cockcroft Institute, Warrington
- P8 The effect of morphology and surface structures on hydrophobic behaviour of plant leaves**
LC Chen, CC Hong and JH Chou
National Cheng Kung University, Taiwan
- P9 Pulsed laser deposition of tungsten thin films on graphite for magnetic fusion applications**
M Tabbal¹, W Kassem¹, M Roumie², G Y Antar¹
¹ American University of Beirut, Lebanon
² Lebanese Atomic Energy Commission, Lebanon
- P10 Electrical stability of platinum thin films on elastomeric substrates**
M Fernández, M C Fuentes, I Ayerdi, F J Gracia
University of Navarra, Spain
- P11 The formation control of intermetallic compounds by means of ion bombardment**
S Krivelevich¹, V Bachurin²
¹ Institute of Physics and Technology, Yaroslavl, Russia
² Yaroslavl State Technical University, Russia
- P12 Heavy ion range anisotropy in muscovite mica**
M Singh, L Singh, N Kaur
Guru Nanak Dev University, Amritsar, India

P13 Investigation of the artificial aging behaviour of ceramic particle reinforced aluminium matrix composites
M F Aycan, M Übeyli
TOBB University of Economics and Technology, Ankara, Turkey

P14 The formation of covalently bonded porphyrin networks on metal surfaces
C M Doyle¹, S A Krasnikov¹, A B Preobrajenski³, N A Vinogradov³,
N N Sergeeva², Y N Sergeeva², H L Lee¹, M O Senge², A A Cafolla¹
¹ *Dublin City University, Ireland*
² *Trinity College Dublin, Ireland*
³ *University of Lund, Sweden*

15.30 Refreshments
Outside Marquis Room

Session 3 – Flowers Theatre

Chair: Dr Alec Goodyear, The Open University

16:00 3.1 (Invited) High brightness photoelectron injectors for modern accelerators
Dr Boris Militsyn
STFC Daresbury Laboratory

16:30 3.2 Optical absorption mechanism and interfacial analysis of HPTs for lightwave technologies
H A Khan, A A Rezazadeh
University of Manchester

16:45 3.3 Modification of polymer surfaces using a laser plasma EUV source
H Fiedorowicz, A Bartnik, R Jarocki, J Kosteki, A Szczurek, M Szczurek, P Wachulak
Military University of Technology, Warsaw, Poland

17:00 3.4 Using nanomechanics to optimise the durability of hard nanocomposites
B Beake^{1,2}, V Vishnyakov², J Colligon²
¹ *Micro Materials Ltd*
² *Manchester Metropolitan University*

17.15 3.5 Phase control of manganese dioxide thin films by plasma assisted pulsed laser deposition
M Tabbal¹, M Abi-Akl^{1,2}, M Kazan³, S Isber¹, T C Christidis¹
¹ *American University of Beirut, Lebanon*
² *Texas A & M University, Qatar*
³ *Université de Technologie de Troyes - CNRS, France*

17:30 End of session

18:00 **Drinks Reception**

Conservatory

19:00 **Free Evening**

No evening meal provided (unless booked in advance)

Tuesday 13 April

Session 4 – Flowers Theatre

Chair: Prof Frank Walsh

- 09:00 4.1 (Invited) Real-time TEM observation of ion irradiation of solids**
Prof Steve Donnelly
University of Salford
- 09:30 4.2 The formation of covalently bonded porphyrin networks on metal surfaces**
C M Doyle¹, S A Krasnikov¹, A B Preobrajenski³, N A Vinogradov³, N N Sergeeva², Y N Sergeeva², H L Lee¹, M O Senge², A A Cafolla¹
¹ *Dublin City University, Ireland*
² *Trinity College Dublin, Ireland*
³ *University of Lund, Sweden*
- 09:45 4.3 (Invited) Single molecule electronics and single molecule electrochemistry**
Prof Richard Nichols
University of Liverpool
- 10.15 Refreshments and Exhibition Opening**
Armitage Centre

Session 5 – Flowers Theatre

Chair: Dr Vladimir Vishnyakov, Manchester Metropolitan University

- 11.15 5.1 (Invited) The He-Ion microscope: a new tool for high resolution imaging and analysis**
Dr Peter Gnauck
Carl Zeiss NTS, Oberkochen, Germany
- 11:45 Exhibitor presentations**
Chair: Dr Vladimir Vishnyakov
- 13:00 Lunch and Exhibition**
Armitage Centre

Session 6 – Flowers Theatre

Chair: Prof Janice Barton, University of Southampton

- 14:00 6.1 (Invited) Multifunctional surfaces and materials for tribological applications**
Prof Robert Wood
University of Southampton

- 14:30 6.2 Laser surface modification of HVOF MMC coatings for improvement of tribological performance**
M. Rakhes and Z Liu
University of Manchester
- 14:45 6.3 Electrodeposition of nickel carbon nanotube coatings**
 C Carpenter, Y Q Zhu, P H Shipway
University of Nottingham
- 15:00 6.4 Electrochemical formation of metal, polymer, ceramic and multi-layer coatings from methanesulphonic acid**
 V Caramia¹, M de la Toba Corral¹, D Egan¹, S H Hambali¹, A N Kulak¹, P K Leung¹, X Li¹, C T J Low¹, D Pletcher², C Ponce de León¹, A A Shah¹, I Sires¹, R Tangirala¹, F C Walsh¹, S Wang¹, R G A Wills¹
¹*School of Engineering Sciences, University of Southampton*
²*School of Chemistry, University of Southampton*
- 15:15 6.5 (Invited) EPSRC: Future Directions and Opportunities**
 Dr Andrew Bourne (Head of Physical Sciences Programme)
EPSRC, Swindon
- 15:45 Refreshments**
 Armitage Centre

Session 7 – Flowers Theatre

Chair: Prof Bruce Hamilton, Manchester University

- 16:15 7.1 (Invited) Polymers and functional surfaces**
 Dr Mark Geoghegan
University of Sheffield
- 16:45 7.2 Tailoring the surface of polyethylene**
S Hardman, R Thompson, L Hutchings and N Clarke
Durham University
- 17:00 7.3 Probing surface charges of hydrogel gradients for lateral control of protein adsorption**
F-I Tai, T Ekblad, O Andersson, T Ederth, B Liedberg
Linköping University, Sweden

17.15 7.4 Electron beam-induced modifications in High Density Polyethylene Films

R D Mathad¹ H G Harish Kumar¹ S Ganesh² M V Badiger³ and K S S Sarma³

¹ *Dept of Physics, Gulbarga University, Gulbarga, India*

² *Microtron Centre, Mangalore and BRIT, India*

³ *Bhabha Atomic Research Centre, Mumbai, India*

17:30 End of session

18:30 Exhibition reception

Armitage Centre

19:30 Buffet Dinner

Armitage Centre

Wednesday 14 April

Session 8 – Flowers Theatre

Chair: Prof Sergei Dudarev, UKAEA Culham

- 09:00 8.1 (Invited) Keeping track of chemistry at surfaces and interfaces: the role of surface analysis in materials development**
Prof John Watts
University of Surrey
- 09:30 8.2 A new approach to high throughput diffraction analysis**
S Roncallo¹, O Karimi¹, S A Ansari¹, J M Gregoire², K D Rogers³, D W Lane¹
¹ *DASSR, Cranfield University*
² *Cornell Fuel Cell Institute, Cornell University, USA*
³ *Cranfield Health, Cranfield University, Cranfield*
- 09:45 8.3 Magnetic surface phase transitions in FCC magnets**
M S Hopper, M W Long J Quintanilla
University of Birmingham

Session 9 – Special Session on Wind Energy - Flowers Theatre

Chair: Prof Janice Barton, University of Southampton

- 10:00 9.1 (Invited) Composite wind turbine rotor blades - materials, structural design and testing**
Prof Ole Thomsen
Aalborg University, Denmark
- 10:30 9.2 (Invited) Bamboo transforms wind turbine blade technology**
Dr Jim Platts
University of Cambridge
- 11:00 Refreshments**
Armitage Centre

Session 10 – Flowers Theatre

Chair: Prof Roger Smith, University of Loughborough

- 11:30 10.1 (Invited) Non-evaporable getter coatings for UHV/XHV**
Dr Oleg Malyshev
STFC Daresbury Laboratory

- 12:00** **10.2 Aromatic and antiaromatic hydrocarbons adsorbed on graphene: benchmarking current first-principles approaches to the dispersion problem**
F Hanke, J Björk, M Persson
University of Liverpool
- 12:15** **10.3 (Invited) Recent developments in printing and holography**
Prof Hans Bjelkhagen
Technium OpTIC
- 12:45** **Lunch**
Armitage Centre

Session 11

Chair: Dr James O'Shea, University of Nottingham

- 14:00** **11.1 (Invited) Plasmas in liquids and their applications**
Prof Bill Graham
Queen's University Belfast
- 14:30** **11.2 Positive ion mass spectrometry detection from the atmospheric pressure plasma treatment of polymers**
Y Aranda Gonzalvo¹, A J Beck², T Pilkington², A Yerokhin², A Matthews²
¹ Hiden Analytical Ltd., Warrington
² University of Sheffield
- 14:45** **11.3 Properties of thin MAX Phase films produced by ion-beam-assisted deposition**
R Valizadeh, J S Colligon and V Vishnyakov
Manchester Metropolitan University
- 15:00** **11.4 (Invited) Modelling the deposition of magnetron-sputtered titania coatings**
Prof Roger Smith
University of Loughborough
- 15.30** **Refreshments**
Armitage Centre

Session 12 – Flowers Theatre

Chair: Prof Ole Thomsen, Aalborg University, Denmark

- 16:00** **12.1 (Invited) Nano interfaces self-organisation under extensive ion bombardment**
Dr Arutjun Ehasarian
Sheffield Hallam University

- 16:30 12.2 Zinc oxide/type IIb diamond heterojunction**
K G Saw, S S Tneh, F K Yam, S S Ng, Z Hassan
Universiti Sains Malaysia, Malaysia
- 16:45 12.3 Paint coating characterisation for thermoelastic stress analysis**
A F Robinson¹, J M Dulieu-Barton¹, S Quinn¹, R L Burguete²
¹ *University of Southampton*
² *Airbus Ltd, Bristol*
- 17:00 Hot topics in applied physics - breakouts for brainstorming**
Chair: Prof John Colligon

Session A: New challenges for coatings and surface treatment

Session B: Materials contributions to sustainable energy systems

Session C: Materials analysis: new requirements – new techniques

- 18:00 End of session**
- 18:30 Drinks Reception**
- 19:00 Bar-B-Que, Entertainment**
Conservatory
- APTD Chairman's After Dinner Speech**
Prof Janice Barton, Chair of Applied Physics and Technology Division

Thursday 15 April

Session 13 – Flowers Theatre

Chair: Dr Arthur Jones, University of Nottingham

- 09:00** **Hot topics in applied physics – Summary, outcomes and discussion**
Chair: Prof John Colligon
- 09:45** **13.1 (Invited) Oxidation-induced stresses in thermal barrier coating systems**
Prof Hugh Evans
University of Birmingham
- 10:15** **13.2 3D multi-layer finite element model for thermo-mechanical stress distributions in thermal barrier coatings**
L F C Jeanmeure, I A Jones, D G McCartney
University of Nottingham
- 10:30** **13.3 Piezoelectric paint: a novel material for thick-film vibration sensors**
J M Hale
Newcastle University
- 10:45** **Refreshments**
Conservatory

Session 14

Chair: Dr Jack Hale, Newcastle University

- 11:15** **14.1 (Invited) Nucleation and growth phenomena of polycrystalline thin films**
Prof Peter Barna
Research Institute for Technical Physics and Materials Science, Budapest, Hungary
- 11:45** **14.2 Reversible first order semiconductor to metal phase transition in fully and partially confined SmS thin films**
E Rogers¹, P F Smet², P Dorenbos¹, D Poelman² and E van der Kolk¹
¹ *Delft University of Technology, The Netherlands*
² *Ghent University, Belgium*
- 12:00** **14.4 InSb grown on CdZnTe substrate by liquid phase epitaxy**
M Yin and A Krier
Lancaster University

12:15 **Closing Remarks**
Dr Vladimir Vishnyakov, Conference Chair
End of conference

12:30 **Lunch**
Carriage House Restaurant