



ISSC-22 Interdisciplinary Surface Science Conference

15–18 April 2019, Village Hotel, Swansea, UK

Organised by the IOP Thin Films and Surfaces Group

<http://issc22.iopconfs.org>

Programme

Monday 15 April

Session 1

Chair: Walther Schwarzacher, University of Bristol, UK

12:30	Lunch and registration <i>Foyer and Energy Suite</i>
13:45	Welcome
14:00	(Invited) High-speed non-contact AFM of soft surfaces under ambient conditions Mervyn Miles, University of Bristol, UK
14:30	(Invited) Alloying size-selected cluster catalysts to improve stability Scott Anderson, University of Utah, USA
15:00	Controlling the rotational orientation of molecular beams, a new hypersensitive method for studying molecule-surface interactions Gil Alexandrowicz, Swansea University, UK
15:20	Probing the structure of a potential model single atom catalyst David Duncan, Diamond Light Source, UK
15:40	Refreshments <i>Energy Suite</i>

Session 2

Chair: Neil Curson, London Centre for Nanotechnology, UK

16:10	(Invited) Electrostatic self-assembly on surfaces Elena Besley, University of Nottingham, UK
16:40	(Invited) Determining molecular adsorption structures: STM and DFT are not enough Phil Woodruff, University of Warwick, UK
17:10	Nanoscale characterisation of thin film electronics with electrical and near-field scanning probe microscopy Sebastian Wood, National Physical Laboratory, UK
17:30	Molecular Maracas: Li@C₆₀ as a multi-state molecular switch Henry Chandler, University of St Andrews, UK
18:00	Poster session 1 <i>Foyer</i>
19:30	Close

Tuesday 16 April**Session 3****Chair:** Karen Syres, University of Central Lancashire, UK

08:30	Registration <i>Foyer</i>
09:00	(Invited) How surface science provides new insights into the behaviour of grain boundaries in nanocrystalline metals John Boland, Trinity College Dublin, Ireland
09:30	(Invited) Transition metal based clusters and nanoparticles for electrocatalytic water splitting Lifeng Liu, International Iberian Nanotechnology Laboratory, Portugal
10:00	Bridging the gaps: imaging surface reactions with <i>in situ</i> environmental microscopies Cédric Barroo, Université Libre de Bruxelles – CPMCT, Belgium
10:20	Surface functionalization of TiO₂ NPs to formulate aqueous and organic precursors compatible with low-temperature fabrication of thin TiO₂ compact films Giovanni Zummo, Swansea University, UK
10:40	Refreshments and exhibition <i>Foyer and Energy Suite</i>

Session 4**Chair:** Chris Baddeley, University of St Andrews, UK

11:10	(Invited) Cluster-assembled nanostructured surfaces for the study of mechanotransduction in neuronal cell networks Paolo Milani, University of Milano, Italy
11:40	Hard X-ray Photoelectron Spectroscopy for depth profiling beyond the elastic scattering limit Ben Spencer, The University of Manchester, UK
12:00	Performance of preformed Au/Cu nanoclusters deposited on MgO powders in the catalytic reduction of 4-nitrophenol in solution Rongsheng Cai, Swansea University, UK
12:20	Study of fundamental processes on Au-Ag model surfaces with electron microscopies Luc Jacobs, Université libre de Bruxelles, Belgium
12:40	Electrochemical modification and characterization of topological insulator single crystals Walther Schwarzacher, University of Bristol, UK
13:00	Lunch and exhibition <i>Foyer and Energy Suite</i>

Session 5**Chair:** Andrew Thomas, The University of Manchester, UK

14:00	(Invited) Maximising the resolving power of the scanning tunneling microscope Martin Castell, University of Oxford, UK
14:30	(Invited) Development and standardisation of graphene characterisation methods Keith Paton, National Physical Laboratory, UK
15:00	Atomic-resolution imaging and ab initio modelling of surface and core melting of supported, size-selected Au nanoclusters Theodoros Pavludis, Swansea University, UK
15:20	Modelling a capped carbon nanotube by linear-scaling density-functional theory Sabrina Masur, University of Cambridge, UK
15:40	Refreshments and exhibition <i>Foyer and Energy Suite</i>

Session 6**Chair:** Martin Allen, University of Canterbury, New Zealand

16:10	(Invited) Recent advances in surface characterisation using neutral helium atoms Andrew Jardine, University of Cambridge, UK
16:40	Morphological control of size-selected iron nanoparticles during formation for NO₂ detection Jerome Vernieres, Swansea University, UK
17:00	Structure and reactivity of Cu-doped Au(111) surfaces Federico Grillo, University of St Andrews, UK
17:20	The de-halogenation and subsequent polymerisation of TIPB on hBN Abigail Browning, University of Nottingham, UK
18:00	Poster session 2 <i>Foyer</i>

Wednesday 17 April**Session 7****Chair:** Andrew Jardine, University of Cambridge, UK

08:30	Registration <i>Foyer</i>
09:00	(Invited) Epitaxial growth of InAs quantum dots for quantum light sources David Ritchie, University of Cambridge, UK
09:30	(Invited) On the interplay between structure, reaction medium and performance in heterogeneous catalysis Laurent Piccolo, University of Lyon, France
10:00	Recognising multiple scanning probe tip states in real time with convolutional neural network ensembles Oliver Gordon, University of Nottingham, UK
10:20	Enhanced catalytic activity of MoS₂ nanoclusters for the hydrogen evolution reaction by Ni-doping and sulphur-enrichment Yubiao Niu, Swansea University, UK
10:40	Refreshments and exhibition <i>Foyer and Energy Suite</i>

Session 8**Chair:** Lifeng Liu, International Iberian Nanotechnology Laboratory, Portugal

11:10	(Invited) The interplay between the surface chemistry and surface electronic properties of wide bandgap oxide semiconductors Martin Allen, University of Canterbury, UK	
11:40	Imaging of topological insulator single crystal surfaces under electrochemical control Chaolong Yang, University of Bristol, UK	
12:00	Investigating and influencing on-surface covalent-coupling reactions Alex Saywell, University of Nottingham, UK	
12:20	Graphene based electrochemical biosensor for high sensitivity detection of dementia biomarkers Hina Abbasi, Swansea University, UK	
13:00	Lunch and exhibition <i>Foyer and Energy Suite</i>	IOP Thin Film and Surfaces Group (closed committee meeting) <i>Inspiration Suite</i>

Session 9**Chair:** Kristina Rusimova, University of Bath, UK

14:00	(Invited) Near-ambient pressure X-ray photoelectron spectroscopy of metal oxides and perovskites Andrew Thomas, The University of Manchester, UK
14:30	(Invited) Closing the chlorine cycle Philip Davies, Cardiff University, UK
15:00	Probing electrochemically controlled solid/liquid interfaces with XPS Robert Temperton, University of Nottingham, UK
15:20	Reversible CO₂ capture by a superbasic ionic liquid studied with near-ambient pressure X-ray photoelectron spectroscopy Karen Syres, University of Central Lancashire, UK
15:40	Refreshments and exhibition <i>Foyer and Energy Suite</i>

Session 10**Chair:** Scott L Anderson, University of Utah, USA

16:10	(Invited) Multiplexed biosensing for disease diagnosis and health monitoring Sofia Teixeira, Tyndall National Institute, Ireland
16:40	Diamond and cBN surfaces as templates for the epitaxial growth of 2D overlayers Joseph Durk, Aberystwyth University, UK
17:00	Surface and interface science advances for the fabrication of As-in-Si nanoelectronic devices Neil Curson, London Centre for Nanotechnology, UK
17:30	IOP Thin Film and Surfaces Group AGM (open meeting) <i>Inspiration Suite</i>
19:15	Conference Dinner <i>Inspiration Suite</i>

Thursday 18 April**Session 11****Chair:** Sofia Teixeira, Tyndall National Institute, Ireland

08:30	Registration <i>Foyer</i>
09:00	(Invited) Photoelectron characterisation of diamond and nanodiamond surfaces Andrew Evans, Aberystwyth University, UK
09:30	Controlling and relating defects in ZnO nanowires and nanosheets to electrical conductivity and contact type Chris Barnett, Swansea University, UK
09:50	Extremely high anisotropy due to hybridization in Co/C₆₀ interfaces Timothy Moorsom, University of Leeds, UK
10:10	<i>In Situ</i> Metal Electroplating for High Energy and High Power rechargeable batteries Serena Margadonna, Swansea University, UK
10:30	Refreshments <i>Energy Suite</i>

Session 12**Chair:** Richard Cobley, Swansea University, UK

11:00	(Invited) Hot electrons: a new source of light on the nanoscale Kristina Rusimova, University of Bath, UK
11:30	(Invited) Model oxide surfaces to elucidate the factors controlling oxygen evolution in electrolysers Ifan Stephens, Imperial College London, UK
12:00	Metallization of self-assembled monolayers by coordination-controlled electrodeposition Zhen Yao, University of St Andrews, UK
12:20	Towards motion based chemical contrast in Helium Scattering Nadav Avidor, University of Cambridge, UK
12:40	Close of conference <i>Packed lunch (Pre-booked only)</i>

Poster programme

- P.01 Alloyed and core-shell Au/Ag nanoislands prepared by annealing of sputtered layers**
Ondrej Kvittek, University of Chemistry and Technology Prague, Czech Republic
- P.02 The surface tension of nanodroplets**
Georgii Kharlamov, Siberian State University of Telecommunications and Information Sciences, Russia
- P.03 Electrochemical modification and characterization of topological insulator single crystals**
Walther Schwarzacher, University of Bristol, UK
- P.04 Structure Function Relationships: CO on Cu(110)**
Simon Anetts, University of St Andrews, UK
- P.05 Surface modification of graphene for lab-on-chip with rapid biomarker detection**
Hina Abbasi, Swansea University, UK
- P.06 Near-ambient pressure photoemission study of the interaction between anatase TiO₂(101) and water vapour**
Simran Dhaliwal, University College London, UK
- P.07 Electronic defect states induced in Graphene Nanoribbons by surface confined hydrogenation**
Yi-Ying Sung, University of St Andrews, UK
- P.08 Identifying x-ray photoelectron spectroscopy peaks with neural networks**
Peter Starrs, Diamond Light Source Ltd., UK
- P.09 Controlling the toxicity of Zinc Oxide Nanowires (ZnONWs)**
Chrysovalanto Louka, Swansea University, UK
- P.10 Surface treatments and in-situ photoelectron spectroscopy of nanodiamonds**
Kerry Whittlesea, Aberystwyth University, UK
- P.11 A theoretical investigation of the Schottky Barrier and tunability at the SrRuO₃/SrTiO₃ and SrRuO₃/SrHfO₃ [001] interfaces within DFT and NEGF frameworks**
Karthikeyan Raghuraman, IIT Hyderabad, India
- P.12 Hydrogen free selective hydrogenation of furfural over Cu/Au/ceria catalysts**
Rory Megginson, University of St Andrews, UK
- P.13 A first-principles investigation of structural and electronic properties of AgNbO₃ (001) surfaces**
Karuna Kumari Pillala, IIT Hyderabad, India
- P.14 The Interfacial Performance of Recycled Polypropylene Printer Filament**
Benjamin Cummings, Swansea University, UK, Murex Group, UK
- P.15 Band alignment analysis of 2D SnS with Anatase (101), Rutile (110), and ZnO (100) by x-ray photoelectron spectroscopy.**
Rosemary Jones, The University of Manchester, UK
- P.16 Band alignment engineering of ZnS/Cu₂O heterojunction photovoltaics**
Simon Cooil, Aberystwyth University, UK
- P.17 Operando characterization of oxide-supported bimetallic methane oxidation catalysts**
Alexander Large, University of Reading, UK
- P.18 Fabrication and characterization of ZnO@TiO₂ nanowires heterostructure using versatile kinetics-controlled coating growth method**
Naif Alshehri, Swansea University, UK

- P.19 The role of atomic oxygen in the decomposition of self-assembled monolayers during dielectric deposition**
Anita Brady-Boyd, Aberystwyth University, UK
- P.20 Hydrogen-bonded structures of melamine on hBN**
Abigail Browning, University of Nottingham, UK
- P.21 Analysing rotational control molecular beam surface science experiments**
Helen Chadwick, Swansea University, UK
- P.22 Surface characteristics of native entomopathogenic fungi as indicators of insect pathogenicity**
Jack Wade, Swansea University, UK
- P.23 Epitaxial growth of YPtSb on c-plane sapphire by DC magnetron co-sputtering**
Matthew Vaughan, University of Leeds, UK
- P.24 Low temperature metal oxide/anti-stiction layer deposition via molecular vapour deposition (MVD)**
Chung Man Fung, Swansea University, UK
- P.25 Combined electron and optical spectroscopy of diamond surfaces**
Johnathan Ash, Aberystwyth University, UK
- P.26 Characterization of CVD grown MoS₂ crystals by spatially-resolved ARPES**
Sungwon Jung, Diamond Light Source, UK
- P.27 Cluster beam deposition of preformed Pd clusters for vapour phase 1-pentyne hydrogenation**
Rongsheng Cai, Swansea University, UK
- P.28 Effect of thermal annealing and substrate morphology on mechanical properties of graphene**
Mashael Alshaikh, Swansea University, UK
- P.29 Rational design of complex nanomaterials using cluster beam deposition**
Jerome Vernieres, Swansea University, UK
- P.30 Reducing CO poisoning of Pt nano-catalysts by alloying with Ni**
Yubiao Niu, Swansea University, UK
- P.31 Binding and structure of size-selected gold nanoparticles on graphene: The role of point defects**
Theodoros Pavloudis, Swansea University, UK
- P.32 Graphene-on-CMOS integration for food safety application**
Alan Leung, Swansea University, UK
- P.33 The AlGaN/GaN heterostructure surface and its effect on sensors and devices**
Jon Evans, Swansea University, UK
- P.34 Growth of Truncated Pyramidal Ni Nanocrystals on a SrTiO₃ (001) Support**
Aatif Rasheed, University of Oxford, UK
- P.35 The Swansea cluster beam sources**
James McCormack, Swansea University, UK
- P.36 Interface modification of Hybrid Solar Cells by Self-assembling molecules deposition**
Claudia Lorena Compean Gonzalez, The University of Manchester, UK