

Graphene: the thinnest of all thin films and surfaces.

Chair's Welcome

Welcome to the first Thin Films and Surfaces Group (TFSG) Newsletter of 2013.

Much has happened in the world of thin films and surfaces since our last newsletter, partly because we have been busy supporting and promoting the thin films and surfaces community, and partly because we are spectacularly slow in producing newsletters. We had a very successful Interdisciplinary Surface Science Conference (ISSC-18) in Warwick from the 4th-7th April 2011 (see the report in this issue), and ISSC-19 will be held in Nottingham from the 25th-28th March 2013 at the East Midlands Conference Centre. In case you're wondering, we're planning to hold ISSC-20 in Birmingham in 2015. The community also played a key role in the combined CMD-24, ECOSS-29, ECSCD-11, CMMP-12 conference held in parallel at the Edinburgh International Conference Centre last September, which the TFSG was involved with through its affiliation with the Condensed Matter Division of the IOP and through co-sponsorship of ECOSS. We ran two successful Surfaces and Interfaces symposia at CMMP-11 which was held in Salford in December 2011. Through our affiliation with the Applied Physics and Technology division of the IOP, we also teamed up with other groups in the division, including the Ion & Plasma Surface Interactions and Nanoscale Physics and Technology groups to organise and co-sponsor some exciting one day meetings. The IOP divisions no longer exist of course, but our collaborations with these groups remain and will continue to lead to joint meetings in the future.

The group has also established two new schemes: the Woodruff Thesis Prize and the TFSG Lecture Series. More details about both of these can be found in this newsletter along with details of how to apply.

I look forward to seeing many of you in Nottingham next week for ISSC-19 where I and Wolfgang will step down as officers of the group after completing our elected term, and new officers and members will be elected at our AGM.

Best regards,

James O'Shea (Chair of the TFSG)
School of Physics & Astronomy
University of Nottingham
J.Oshea@nottingham.ac.uk

The AGM (BAGM)

The TFSG no longer has *annual* general meetings, but rather biennial general meetings (BAGMs if you like). This is because our flagship group conference, the ISSC is a bi-annual meeting, and the best place for us to meet as a group. The next AGM will therefore take place during the ISSC-19 conference in Nottingham (25th - 28th of March 2013). The AGM held at 12:45 on Wednesday 27th March at the ISSC-19 at the University of Nottingham in Conference Suite 3. Lunch will be served at the AGM for those that wish to attend.

Woodruff Thesis Prize 2011 - winner

Awarded by the Thin Films and Surfaces Group (TFSG) of the Institute of Physics (IOP) for the best PhD thesis completed by a student member of the TFSG in the year 2011



The winner of the 2011 Woodruff Thesis Prize was **Natalia Garcia-Rey** of the University of Liverpool for her thesis entitled "Interaction of a Copper Surface with Light: Plasmons, Electrons & Molecular Vibrations". The outstanding feature of this thesis was the variety of techniques and topics handled, covering continuous-wave photochemistry, reflection-absorption infrared spectroscopy, femtosecond electronic and vibrational sum frequency generation, femtosecond pump-probe spectroscopy and finite-element calculations of local field enhancement by nanostructured metal surfaces.

The winner of the 2012 Woodruff thesis prize will be announced at ISSC-19.

The opening date for nominations for the 2013 prize will be announced in the next newsletter.

Previous meetings

A Brief History of ISSC: A journey from York to Warwick in 38 years

The 18th Interdisciplinary Surface Science Conference (ISSC-18) was held at the University of Warwick in April 2011. This conference was the latest in a series that has run since the first meeting in York in 1973 and was established to showcase the latest issues in what was then an exciting new field of research in surface and interface science. This field was emerging across Physics, Chemistry and Materials Science as a result of the increasing availability of ultra-high vacuum technology in the UK, Europe and the USA, and a growing awareness that surfaces were important in fields such as catalysis and the fledgling semiconductor microelectronics industry.

The origins of the ISSC conference series date back to when it was formed as a UK meeting to run in alternate years with the Netherlands Vacuum Society (NEVAC) meeting called 'The Solid/Vacuum Interface' held in the intervening years. From the beginning the meeting has been supported by the Institute of Physics and the Royal Society of Chemistry, and it has since become the flagship meeting of the IoP Thin Films & Surfaces Group (TFSG). The second ISSC meeting was held in Warwick in 1975 and a NEVAC meeting in Holland in 1976, and it was as a result of these two meetings, and through an agreement with the French and German communities, that the European Conference on Surface Science (ECOSS) was 'born'. The first ECOSS meeting was held in Amsterdam in 1978 - the year after ISSC-3 in York (1977), and followed by ECOSS 2 in Cambridge in 1979 (which also encompassed ISSC-4). Both meeting series have since run in parallel with ISSC only not occurring every two years when ECOSS was due to be held in the UK the same year. The complete series of meetings and how they have moved around the surface science groups within the UK is shown below;

ISSC-1, York, 1973; ISSC-2, Warwick, 1975; ISSC-3, York, 1977; ISSC-4, Cambridge, 1979 (& ECOSS-2); ISSC-5, Liverpool, 1981; ISSC-6, Warwick, 1983; ECOSS-6, York, 1986; ISSC-7, Cardiff, 1987; IRC in Surface Science, Liverpool 1988-98; ISSC-8, Liverpool, 1989; ISSC-9, Southampton, 1991; ECOSS-13, Warwick, 1993; ISSC-10, Liverpool, 1994; ISSC-11, Cambridge, 1996; ISSC-12, Daresbury, 1999; ISSC-13, UCL, 2001; ISSC-14, Liverpool, 2003; ISSC-15, Cardiff, 2005; ISSC-16, St Andrews, 2007; ECOSS-25, Liverpool, 2008; ISSC-17, Reading, 2009; ISSC-18, Warwick, 2011.

With two further meetings already planned in Nottingham (ISSC-19) in 2013 and Birmingham (ISSC-20) in 2015 the future of this meeting seems assured even as we move into a new era where funding for surface science is under threat from cuts in directed EPSRC funding, and surface science itself is becoming viewed more as an underpinning technology for related areas of nanoscience and new materials development. While it is important to embrace both change and scientific evolution, fundamental surface science still has much to offer the condensed matter physics and solid state chemistry communities, however, it is clear it will need to be staunchly defended if the ISSC-conference series is to survive well into its twenties.

Professor Chris McConville
Conference Chair ISSC-18, Warwick

**Conference Report:
ISSC-18, University of Warwick, 4th-7th April 2011**

The ISSC meeting returned to Warwick for the third time in April 2011 for ISSC-18, following the two previous occasions in 1975 (ISSC-2) and 1983 (ISSC-6), for what turned out to be the largest ever meeting in the ISSC conference series. There was also a very special feel to the meeting as one of the days was completely dedicated to a celebration of the many contributions to the field of surface science made by Professor D. Phil Woodruff FRS over the past 40 years.

The meeting was opened by Prof Mark Smith, deputy vice-chancellor and himself a Warwick PhD graduate, who began by recalling his time working for the young Phil Woodruff as a graduate student laboratory demonstrator in the Physics department. He also confessed that having studied NMR for a career, surfaces were somewhat of a mystery to him! The opening afternoon of the conference highlighted some areas of traditional surface science with catalysis and molecular adsorption on single crystal surfaces taking centre-stage. Mike Bowker (Cardiff) started the proceedings with a discussion of d-band theory of surface reactivity and catalysis in particular when applied to Cu-Pd alloys, pointing out that a delocalized d-band does not describe the reactivity, which is mainly dictated by ensemble effects and the local chemical identity of the two alloy components. A second session dedicated to molecular adsorption studies saw Kevin Smith (Boston) and James O'Shea (Nottingham) discussing soft X-ray spectroscopy and charge transfer dynamics related to large molecules adsorbed on surfaces respectively, while Rob Jones (Nottingham) discussed the surface science of ionic liquids and Wendy Brown (UCL) outlined what surface science can tell you about the formation of stars and planets, collectively emphasizing the diversity of impact that surface science can make on a research field. Monday evening saw the first of two poster sessions including students presenting their work in three of the identified prize areas on Molecules on Surfaces, Oxide Materials & Surfaces, and Biological & Solid-Liquid Interfaces.

The first full day of the meeting had a strong focus on scanning probe microscopies, particularly applied to the study of oxide and oxidized surfaces. Invited talks from Martin Castell (Oxford), who discussed the large range of different nanostructures and reconstructions observed on SrTiO₃ surfaces using STM; and Hans Christen (Oak Ridge) who discussed how interfaces could be tuned to control the properties of complex oxide (perovskite) heterostructures. Hans demonstrated how coupling mechanisms act across interfaces and ultra-thin layers in both ferroelectric and magnetic oxides and how new magnetic properties emerge from varying the period of LaMnO₃-SrTiO₃ superlattices. Later in the day an invited talks by Armando Rastelli (IFW Dresden) explored the shape and composition of semiconductor quantum dots with AFM and selective chemical etching, in both the GeSi/Si(001) and InGaAs /GaAs(001) material systems. There was also a session of invited and contributed talks on electrochemical and solid-liquid interfaces. Patrick Unwin (Warwick) discussed the application of scanning electrochemical microscopy (SECM) in multifunctional electrochemical imaging to produce topological and flux maps of interfaces that can be related to other surface properties via techniques such as AFM, while Chris Lucas (Liverpool) explored the structure of solid-liquid interface with in-situ synchrotron radiation x-ray scattering and cyclic voltammetry. Finally in this session Manfred Buck (St Andrews) discussed self-assembled molecular systems and supra-molecular networks studied by STM to investigate the kinetics and thermodynamic control of molecular systems. Tuesday evening also saw the second of the poster sessions with work in the broad categories of Surface Structure & Reactivity, Carbon, and Semiconductor Materials being presented.

Wednesday was the day chosen to represent the many contributions to the field of surface science made by Phil Woodruff and so all the sessions were associated with areas of surface science where either Phil himself has made significant contributions, or where the presenters were people with whom he had had a close scientific association. The first speaker, Maria Asensio (SOLEIL) a former postdoc in Warwick, reviewed a number of metal-semiconductor phase transitions using photoelectron diffraction (PhD) data – one of the many experimental techniques Phil pioneered the development of, while Georg Held (Reading) discussed chirality in molecular adsorption of serine on Cu(110), and Richard Palmer (Birmingham) outlined the science of size-selected gold clusters. Three invited talks then reflected on Phil's long association with the Fritz-Haber-Institut in Berlin, which began in 1982. Firstly Alex Bradshaw, with whom Phil developed photoelectron diffraction as a viable synchrotron based probe of surface structure, discussed the question, at what physical size do clusters acquire bulk-like properties?, while Karsten Horn showed how graphene has developed in only five years into the model system for 2D solids, before Philip Hofmann (Aarhus) - who worked as a PhD student at the FHI, used angle-resolved photoemission to investigate spin-split metallic surface states and reveal the secrets of a new Bi, Te, Sb class of topological insulators.



Phil Woodruff at the conference dinner

Phil Woodruff then delivered the conference plenary lecture entitled “*Serendipity and curiosity in surface science*”. He discussed the development of techniques in surface science at Warwick over 40 years and demonstrated in the clearest possible way, the need for curiosity driven, blue-sky research in Universities and in particular in surface science, where the need for the element of chance or luck, serendipity are among the most important and exciting elements of research. He described the development and evolution of alkali-metal low-energy ion scattering, normal incidence x-ray standing wave (NIXSW), photoelectron diffraction (PhD) and k-resolved inverse photoemission spectroscopy (KRIPES), which Phil developed at AT&T Bell Labs with Peter Johnson (BNL) and the late Neville Smith. He finished with “the one that got away”, a reference to the fact that with the benefit of 20:20 hindsight, Phil, Steve Kevan (Oregon) and myself effectively discovered graphene in the summer of 1986 – we just didn't realise it! At least Andre Geim, in his Nobel Lecture following the award of the 2010 Nobel prize for Physics, was kind enough to reference our work as the first surface science paper to identify and investigate a single layer of adsorbed graphitic carbon. C'est la vie!

(This session was followed by a reception and the conference dinner where a number of people (Alex Bradshaw included) made speeches – Phil is shown at the dinner)

The final half-day of the meeting saw sessions dedicated to atomic scale growth and molecular organisation. The day opened with Cyrus Hirjibehedin (LCN) discussing the idea of controlling strain engineering in silicon at the atomic scale with the aim of controlling the properties of atomic scale devices. John McGilp (TCD) then showed the influence of step morphology on the growth of Au-chains on Si(111), while Andrew Jardine (Cambridge) used transition state theory to interpret surface dynamics from helium ion scattering measurements. The final conference talk was an invited lecture by Peter Beton (Nottingham) who described a beautiful piece of work using STM to follow the formation of a random network when terphenyl tetracarboxylic acid is absorbed on graphite, and which can be understood and modelled by a rhombus tiling model based on the statistics of molecular placement. A great presentation to end the conference.

As with previous ISSC meetings, ISSC-18 aimed to showcase the latest issues in surface, interface and nanoscience and I believe it was a great success. With over 190 attendees it was the largest ISSC meeting in the series to date. Traditionally the ISSC meeting has always encouraged PhD students to attend and to participate by presenting their work, and ISSC-18 was no exception, with over 75 students presenting posters in the two sessions (around half the total number). Generations of students in surface science have made their first conference presentation at an ISSC meeting (personally, mine was at ISSC-5 in Liverpool in 1981). This year the judging was particularly difficult as the standard was again very high. The joint chairs of the judging panel (Philip Moriarty and Giovanni Costantini) with a significant amount of help, identified a winner in each of the six categories; Molecules on Surfaces; Surface Structure and Reactivity; Oxide materials & Surfaces; Carbon; Biological & Solid-Liquid Interfaces; and Semiconductor Surfaces who each received an Apple iPod Nano and a certificate as their prize. The prize committee also chose an overall winner and two runners-up, who each received £150. The winner was Kelsey Stoerzinger from Cambridge, who received the prize of £250 for her poster entitled "*Molecular adsorption and dynamics at a graphene surface*", although there were many potential contenders for the top honour.

So the ISSC conference series moves on, this time to a new location in Nottingham in March 2013 and yet another new venue in Birmingham in 2015. I hope in some way that ISSC-18 brought together the surface science community and helped rejuvenate the efforts to ensure the future success of surface science as a discipline in UK Universities. I offer my best wishes for good fortune to both James O'Shea and Richard Palmer as the conference chairs of ISSC's 19 and 20 respectively, and look forward to attending these meetings and to not doing the organization!

Professor Chris McConville (Conference Chair)

Conference Report: EuroCVD18, Kinsale, County Cork, Ireland, 4th-9th September 2011

This conference brought some 188 delegates together with a range of industry sponsors to Kinsale during the week of 4th-9th September 2011, providing a considerable boost to the local economy via the need for delegates to explore local bars and restaurants for their evening meal provision. Some 65 oral presentations and 100 poster presentations were given by the ca. 188 delegates, who ranged from 23 different countries across the globe. The Local Organising committee which consisted of Martyn Pemble, Mary-Claire O'Regan,

Ian Povey and Simon Elliott (all from the Tyndall National Institute at University College Cork) were invited Guest Editors for the published conference proceedings, which have now appeared in a special edition of the Journal of Nanoscience and Nanotechnology. Delegates were presented with a memory stick containing all papers submitted upon arrival as part of their registration pack. The fully edited conference proceedings were subsequently sent to all delegates in the form of a CD prepared by the journal editorial staff in collaboration with the Guest Editorial team.

Sponsorship from Science Foundation Ireland and other professional bodies including IOP TFSG, allowed the organisers to offer 3 prizes for oral presentations made by students. First prize went to Ms Sarah Hindley, University of Liverpool, for her presentation entitled 'Metal Organic Chemical Vapour Deposition of Vertically-Aligned ZnO Nanowires using Oxygen Adducts'. Second prize went to Ms Daniela Bekermann, Padova University, for her presentation entitled 'Development of Co₃O₄-Based Nanomaterials for Gas Sensing Applications'. Third prize went to Mr Alfons Groenland, University of Twente, for his presentation entitled, 'A difference in using ALD or PVD TiN as electrode material in MIM and MIS capacitors'.

Thanks to kind sponsorship from Picosun Oy, Wiley Publications and the ECS we were also able to award Best Student Poster prizes. First prize went to Ms Aleksandra Szkudlarek, University of Krakow, for her poster entitled 'Coefficient and the Residence Time via Focused Electron-Beam CVD'. Second prize went to Mr Martyn Busch, University Duisburg-Essen, for his poster entitled, 'Synthesis of Activated Carbon-based Catalysts by Chemical Vapour Infiltration for Nitrogen Oxide Conversion'. Third prize went to Mr Michael Thomson, University of Salford, for his poster entitled, 'Atmospheric Pressure Plasma Etching of a Zinc Oxide (ZnO) for Photovoltaic Applications'.

The conference also served to help put Ireland on the map, in terms of raising the profile of the many industries within Ireland that either already exploit CVD and related methods (e.g. Intel, Analog Devices) , or that could benefit from such technologies. During the course of the conference Tyndall staff hosted a number of trips into Cork with a series of academic and industry-based parties, all keen to view the excellent facilities that exist at Tyndall.



Some of the delegates at EuroCVD18, Kinsale, County Cork, Ireland, 4-9 September 2011, captured at the now obligatory 'group photograph'.

Conference Report:**2nd International Conference 'Chirality at the Nanoscale'**

The 2nd International Conference on Chirality at the Nanoscale was held on 9-10th June 2011 in the Maritime Museum at the historic Albert Dock, which forms part of a UNESCO World Heritage Site in Liverpool. The meeting brought together world leaders in chirality who have sought to understand nanoscale aspects of chiral phenomena across physics, chemistry and biology, thus embracing a broad range of scientific fields that would not normally intersect. This conference showcased their latest developments and insights, and provided a vigorous forum for interdisciplinary scientific exchange and debate. Specifically, the meeting covered all aspects of nanoscale chirality including the generation of chiral nanostructures, stereodifferentiation in molecular recognition, synthetic separation science, the hierarchical transfer of chirality in soft and hard matter, effects of chiral fields and the origins of homochirality of life. 85 delegates registered for the conference - very high quality abstract submissions were received and it was a challenge to incorporate them all into the oral programme. The positive outcome of this was that the exciting oral programme of plenary, keynote and contributed lectures was joined by a very vibrant poster session.

I would thank the international programme committee for their guidance and the local organizing team who worked tirelessly to bring this conference to fruition. Finally, and most importantly, we are extremely grateful to our sponsors. These include the TFSG who sponsored one of our three poster prizes awarded as follows: 1st Poster Prize: Matthew Forster, University of Liverpool; Runner-up Poster Prize: Celia Blanco (Astrobiology Centre, Madrid).

Plenary Speakers:

Prof Meir Lahav, Weizmann Institute, Israel

Prof David M J Lilley FRS, University of Dundee, UK

Prof E W Bert Meijer, Technische Universiteit Eindhoven, Netherlands

Keynote Speakers:

Prof Thomas Bürgi, Ruprecht-Karls-Universität Heidelberg, Germany

Dr Jeanne Crassous, CNRS-Université de Rennes, France

Dr George Darling, University of Liverpool, UK

Prof Andrew J Gellman, Carnegie Mellon University, USA

Prof David Hochberg, Centro de Astrobiología, Madrid, Spain

Dr Stephen J Jenkins, University of Cambridge, UK

Prof Richard M Kellogg, Syncom BV, Netherlands

Prof David K Smith, University of York, UK

Prof Thierry Verbiest, Katholieke Universiteit Leuven, Belgium

Sponsors: Biotools; Omicron Nanotechnology; Specs Surfaces Nanoanalysis GmbH;
Thin Films and Surfaces Group of the Institute of Physics;
Solid Surfaces Group of the Royal Society of Chemistry.

Chair: Rasmita Raval (Liverpool)

International Programme Committee: David Amabilino (Barcelona); Mier Lahav (Weizmann Inst); Roberto Lazzaroni (Mons), Albert Schenning (Eindhoven), Steven de Feyter (Leuven).

Local Organising Committee: Steve Barrett (Liverpool), George Darling (Liverpool), Andrew Mark (Liverpool), Matthew Forster (Liverpool), Chi Lun Pang (Liverpool), Sue Barlow (Liverpool), Glenys Kitto and Jackie Sharp (Liverpool).

Report by: Rasmita Raval (Conference Chair)

Forthcoming TFSG sponsored meetings

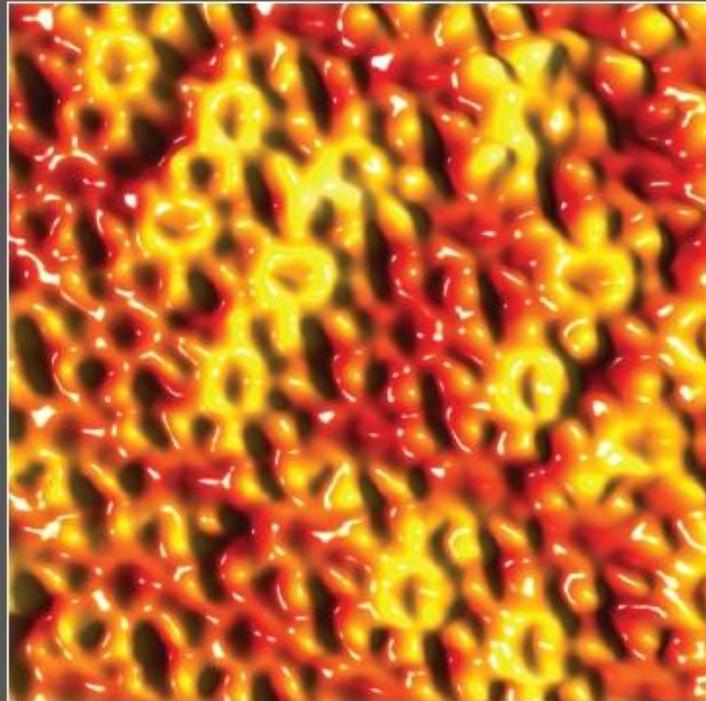


Image: Subhashis Gangopadhyay, School of Physics & Astronomy, University of Nottingham

Interdisciplinary Surface Science Conference (ISSC-19)

25 – 28 March 2013
East Midlands Conference Centre,
Nottingham, UK

issc19.iopconfs.org

Organised by the IOP Thin Films and Surfaces Group

IOP Institute of Physics

Forthcoming TFSG sponsored meetings

Plasmas, Surfaces and Thin Films

12th June 2013

Organization: Institute of Physics**Type:** Meeting**Venue:** [Institute of Physics](#)**Location:** [76 Portland Place, London, United Kingdom](#)**Website:** [Plasmas, Surfaces and Thin Films](#)**Phone number:** +44(0)2074704800**Area** Physical Sciences**Specialty** Physics**Subject** Plasma and Fluids

This one day meeting has become an annual event providing a forum for those involved in using plasmas or ion beams for surface modification and thin film deposition. Topics covered include modelling of fundamental atomic collisions in solids through to new techniques for high throughput industrial processes. The meeting usually attracts equal numbers of participants from Universities and Industry.

Deadlines

Abstract Deadline:

7th May 2013

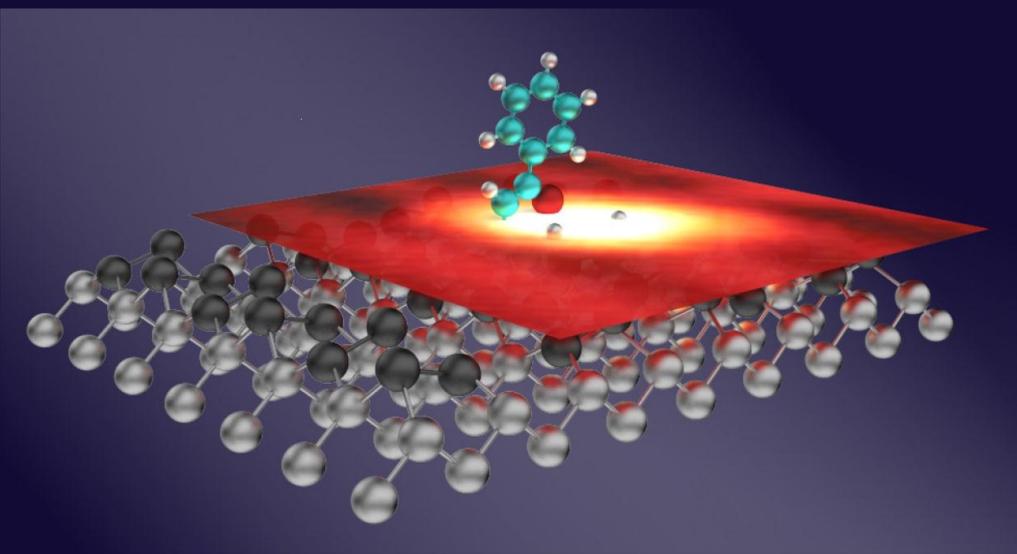
Registration Deadline:

5th June 2013

76 Portland Place, London, United Kingdom

Forthcoming TFSG sponsored meetings

Theory Meets Experiment: Organic Molecules on Semiconductor Surfaces



24 June 2013

London Centre for Nanotechnology, University College London

Invited Speakers:

John Boland
(Trinity College Dublin)

Saw Wai Hla
(Ohio University)

Damien Riedel
(Institut des Sciences Moléculaires d'Orsay)

Andrew Teplyakov
(University of Delaware)

Oliver Warschkow
(University of Sydney)

This focussed one-day workshop has invited talks from two leading experimental and two leading theoretical scientists in the area of organic molecules on semiconductor surfaces. The main theme is the powerful role that close collaboration between theory and experiment can have, and we welcome contributed talks and posters that exemplify this idea.

The workshop will be an opportunity not only to learn about the latest developments in the field, but also to form new collaborations. There will be plenty of time for informal discussions, and we hope that the workshop will allow us to frame the developments needed to advance the field.

Abstract & registration deadline: 31 May 2013

✉ tyc-administrator@ucl.ac.uk

☎ +44 (0) 20 7679 9950

🌐 thomasyoungcentre.org/events

Poster prize!

Organisers: Veronika Brázdová, David R. Bowler, Steven Schofield



Sponsored by University College London and the Institute of Physics

Supported by the Thomas Young Centre



Forthcoming TFSG sponsored meetings (IVC-19)



September 9-13, 2013
Paris, France

IVC-19
ICN+T 2013
ICSS-15
ITFPC 2013
CIP 2013

PARIS • SEPTEMBER 9-13, 2013

- 19th International Vacuum Congress IVC-19
- International Conference on Nanoscience and Technology ICN+T 2013
- 15th International Conference on Surface Science ICSS-15
- Innovations in Thin Film Processing and Characterisation ITFPC 2013
- 19th International Conference on Plasma Processes CIP 2013

www.ivc19.com and www.icnt2013.com

DATE and VENUE

September 9-13, 2013
Convention Centre, Paris, France

CONGRESS SECRETARIAT

SFV

E-mail: contact@ivc19.com

General Chair: M.G. Barthés-Labrousse (F)
Vice-Chairs: V. Matolin (CZ)
N. Radic (HR)

Program Committee Chair:

F. Reniers (B)

Vice-Chairs: A. Galtayries (F)

M.R.S. McCoustra (UK)

JOINTLY ORGANISED BY:

Belgian Vacuum Society (BELVAC)
British Vacuum Council (BVC)
Croatian Vacuum Society (HVD)
Czech Vacuum Society (CVS)
French Vacuum Society (SFV)
Hungarian Vacuum Society (HVS)
Portuguese Vacuum Society (SOPORVAC)
Slovak Vacuum Society (SVS)
Slovenian Vacuum Society (DVTS)

ON BEHALF OF:

IUVSTA – International Union
for Vacuum Science, Technique
and Applications
www.iuvsta.org

MAIN TOPICS

- Surface Science
- Nanometer Science
- Applied Surface Science
- Thin Films and Coatings
- Advanced Surface Engineering
- Plasma Science and Technology
- Electronic Materials
- Vacuum Science

SPECIAL TOPICS

- Bio-Surfaces
- Frontier Materials
- Energy and Sustainable Development
- Surface Science in Astronomical and Planetary Sciences

This event will provide a unique worldwide opportunity for professionals in the academic and industrial research communities to share their latest scientific findings and technological developments in the fields of materials, coatings, nanosciences and surfaces. More than 150 invited speakers, including Nobel Prize winners, will present the state-of-the-art in their research fields. About 2,000 presentations will be made in 15 parallel oral sessions and 3 poster sessions. Supporting this will be an exhibition of scientific instruments, which will take place in the poster area next to the lecture halls to encourage networking amongst the delegates, and a programme of relevant and competitively priced short courses, delivered by experienced professionals.

*On behalf of the organizers, it is a pleasure to invite you to Paris,
"la ville lumière", for September 9 - 13, 2013.*

www.ivc19.com and www.icnt2013.com

Forthcoming TFSG sponsored meetings

Advances in Photovoltaics Tuesday, 24 September 2013

Location	Institute of Physics, 76 Portland Place, London, W1B 1NT, UK
Event type	Conference
Event Title	Advances in Photovoltaics
Organised by	IOP Ion and Plasma Surface Interactions Group
Requires registration	Yes
Contact details	Claire Garland Tel: +44 (0)20 7470 4800 E-mail: claire.garland@iop.org
Further information	www.eventsforce.net...



[View full map](#)

This one day meeting provides a forum to help assess the current state of the art in solar cells. It brings together a list of distinguished invited speakers whose expertise covers the range of photovoltaic technologies.

Forthcoming TFSG sponsored meetings



VS4: 4th Vacuum Symposium UK

16/17 October 2013 - Ricoh Arena, Coventry

The VS4 Conference comprises four technical meetings - two parallel one-day meetings held within the same complex as Vacuum Expo 2013.

Call for Papers & Posters now OPEN

Please contact relevant Programme Chair with an expression of interest

Wednesday 16 October

RGA11 - RGA Calibration in Industry and Research

RGA's are associated with leak detection and residual gas analysis. However, the same quadrupole mass spectrometer is extensively used as an instrument to provide quantitative analysis in processes and to control processes like physical and chemical vapour deposition, etch processes, etc. BUT, they are difficult to calibrate, and at present there is no traceability to any national primary standard - the meeting shall be a step towards a reasonable calibration scheme of quadrupole mass spectrometers.

Programme Chair: Robin Hathaway, SS Scientific Ltd.

Vacuum-based coating techniques and applications

This one day session will include some tutorial-level talks with up-dates on the latest coating methods and talks on new applications.

Programme Chair: John Colligon, Manchester Metropolitan University

Thursday 17 October

Leak Detection

Covering all aspects of leak detection methods from both research and industrial communities. To include a Hands-on practical demonstration.

Programme Chair: Mark Pendleton, ASTeC, STFC Daresbury.

Functional Thin Films 2013

This meeting will bring together scientists and technologists with expertise in the production and characterisation of functional thin film materials and integrated devices from a broad spectrum of scientific and industrial applications, with the aim of sharing knowledge, ideas and experiences. We particularly invite contributions in the following areas: Smart materials, optical coatings, display technologies, active devices in the fields of opto-electronics, flexible electronics, photovoltaics, photocatalytic coatings, sensors, etc.

Programme Chair: Glen West, Manchester Metropolitan University

Your articles for future newsletters

Popular press/outreach

In the next newsletter we would like to highlight any articles from members that have been published in the popular press and are relevant to the TFSG readership. The article can be directly reproduced (if you have obtained permission) or re-written in a summarised form and should be accompanied by a web-link to the article. The length of the article should be no more than half a page of A4, including images, with 12 point text and Ariel font. We would also like to hear about any relevant outreach activities such as stands at science fairs and exhibitions. The same formatting restrictions apply.

Member profiles

As a way for readers to get to know their fellow members we are inviting articles that describe your research group or company. The articles should be no more than a page of A4 and should follow the formatting outlined above. They should give an overview of your work, perhaps including pictures of your laboratory or research team and the work of which you are most proud. It is an opportunity to advertise yourself to your colleagues in the Thin Films and Surface Group. An example of a member profile has been kindly supplied by Heike Arnolds of the Surface Science Research Centre at University of Liverpool, and is shown on the next page.

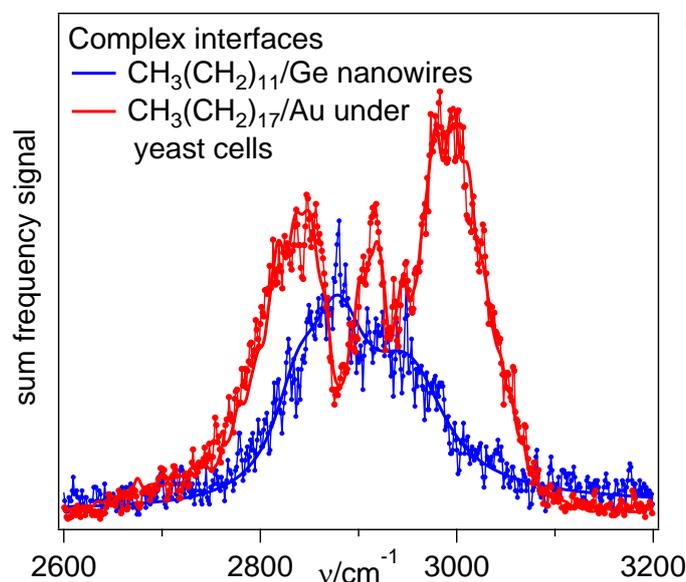


Heike Arnolds, University of Liverpool

Sum Frequency Spectroscopy at Interfaces – from UHV to liquids

Heike Arnolds, Surface Science Research Centre, University of Liverpool

The field of surface science is addressing increasingly complex interfaces and optical methods are playing an important role in this process. Amongst these, nonlinear optical spectroscopy has a great advantage: combining two photons in a material to cause emission of a photon at the sum or difference frequency, is only allowed at an interface! Sum frequency spectroscopy (SFS) uses an infrared and a visible photon from a high intensity, short-pulse laser source to produce a spectrum of infrared and Raman-active vibrations. The emitted light is coherent, so we can tell whether a molecule points “up” or “down” at an interface and also determine its absolute configuration in space. SFS has been used for the study of catalyst surfaces, biological and synthetic membranes, biomedical materials, surface coatings, nanostructures and –particles, emulsions and many other interfaces.



Our group currently uses SFS in two areas – ultrafast dynamics and the structure of molecules at solid-liquid interfaces. Natalia Garcia-Rey, who won the 2011 Woodruff prize, used pump-probe SFS to investigate the ultrafast charge transfer between pyridine and Cu(110) in UHV; you can read her thesis [online](#). Our new arrival, Takuma Omiya, will follow in her footsteps and investigate charge transfer in porphyrins in collaboration with Ras Raval in Liverpool and Yousoo Kim at RIKEN. Sergio Mauri, on a project funded by Sanofi-Aventis, is investigating the adsorption of proteins to understand structural changes triggered by hydrophobic and hydrophilic surface coatings.

One of the current drawbacks of SFS is its need for large, expensive femtosecond laser sources. In collaboration with Eann Patterson at Liverpool’s School of Engineering we are using a compact femtosecond oscillator to create a portable spectrometer. While SFS is used by a large number of groups internationally, in the UK there are currently only Paul Davies’ group in Cambridge and us in Liverpool. So I’m very excited to report that, despite football rivalry, I have been working with Rob Lindsay and Andrew Thomas at Manchester’s Photon Science Institute to get started on SFS. Alex Cowan at Imperial College is also setting up for sum frequency, so watch this space.

For references and contact details, use pcwww.ac.uk/~arnolds or read the reviews: Arnolds, Prog. Surf. Sci. **86** (2011) 1 and Arnolds, Bonn, Surf. Sci. Rep. **65** (2010) 45.

The Committee

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Ideas for future meetings: The group welcomes ideas from members for topics for future events, including conferences, meetings and workshops. Please contact the Chair or Secretary.

This newsletter is also available on the web and in larger print sizes

The contents of this newsletter do not necessarily represent the views or policies of the Institute of Physics, except where explicitly stated.

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Thin Films & Surface Lecture Series 2013/14

Application Form

Details

The IOP Thin Films and Surface (TFSG) Lecture Series is coordinated by the TFSG committee to enable Universities in the UK to bring a European or International inspirational surface scientist to give a lecture at their institution which would be open to all the surface science community to attend free of charge. The lectures will be publicised to all members of the Thin Films and Surface Group of the IOP and must be open to attendees outside of the host institution (subject to the capacity of the available venue). To facilitate this series, funds can be requested from the Thin Films & Surfaces group via this application form to contribute towards the travel costs of the invited speaker. There will be 3 lectures funded each academic year, with a single point application deadline of the 1st October. For the coming academic year of 2013/14 funds of up to £300 for a speaker from Europe, or £500 for an International speaker may be applied for. Applications should be submitted by email to the Chair of the TFSG (currently Dr. Neil Curson – n.curson@ucl.ac.uk) by the 1st October 2013.

1. Applying department/school/institution

Institution	
School/Department	
Research group (if applicable)	
Address	
Contact Person	
Telephone	
Email	

2. Lecture details

Name of speaker	
Institution/Department	
Address	
Email address	
Lecture title	
Case for support (increase box to size required up to one page max)	
Preferred period (from 1 st Nov 2012 to 31 st Oct 2013) if applicable	
Amount requested (subject to maximum contributions stated above)	