IUVSTA NEWS BULLETIN

Number: 169 2014 June

Union Internationale Pour La Science, La Technique et Les Applications du Vide
International Union for Vacuum Science, Technique and Applications
Internationale Union für Vakuum Forschung, Technik und Anwendung

Executive Council Meeting 118, Hotel Villa Madruzzo, Trento, Italy

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ECM 118 was held on Sunday, March 30 at Hotel Villa Madruzzo, in Trento, Italy. The President of the Union, Mariano Anderle presented his report. He noted that the Union should strengthen its connections to the other international bodies like UNESCO/ICSU and ISO. The Secretary General, Christoph Eisenmenger-Sittner first expressed his thanks to the previous Secretary General, Ron Reid, for his help and assistance in transfering the task of the Secretary General of the Union. He also thanked the French Vacuum Society for organizing an excellent ECM 117 and the organizers of IVC 19 for an exciting conference and for the flawless organizations of all IUVSTA meetings related therewith. Thanks were also expressed to the Italian Vacuum Society for organizing an excellent ECM 118.

The Secretary General then urged the members of the Union to frequently use the web-site of IUVSTA, now that it has become relatively easy to manage. The "Members" section of the web-site will be used to distribute agendas, working papers and general information rather than harassing the members with frequent e-mails. Relevant up-to date information between ECM's can be found in the "Meantime" section. Also information about the Union is available there as PowerPoint presentations or as flyers for printout. Special thanks went to the team at the University of Illinois, where the web page is hosted now, Ivan Petrov and especially John Koudelka. They always provide efficient help and without John's actions the web-site would have been down for rather long periods of time on several occasions.

Moving on in the agenda, two new workshops and two new IUVSTA schools were approved at ECM 118. Workshop proposal presented by Christian Teichert, entitled: Nanostructures on two dimensional solids, Eisenerz, Austria, September 22-26, 2014 and approved by the ECM 118. This workshop in Eisenerz/Austria will continue the numbering of the IUVSTA workshops, as the **73rd IUVSTA Workshop**.

Workshop proposal presented by Giacomo Ceccone, entitled Focus on the Blood-Biomaterial Interface: Surface Analysis meets Blood Compatibility will be the **74th IUVSTA Workshop** and will take place November 3 – 7, 2014 La Villa Clythia Fréjus, France.

School in San Servolo, Italy with title IUVSTA International School on Lasers in Materials Science – Laser Engineering of Surfaces and Coatings – LESC, July 13-20, 2014 was presented by Peter Shaaf, in San Servolo, Italy will be the **12th IUVSTA School**.

School in Thessaloniki, Greece with title Vacuum Gas Dynamics: Theory, Experiments and Applications in 2015 was presented by J. Hendricks in Thessaloniki, Greece will be the **13th IUVSTA School**

IUVSTA Endorsements were given to the First Ibero-American conference on Surface, Materials and Vacuum Applications, Natal, Brazil, from October 21st to 25th, 2014 co-jointly with 35th Brazilian Congress of Vacuum Application in Industry and Science. http://icsmva.org and the 15th Joint Vacuum Conference (JVC), organized by OGV in Vienna, Austria in June 15-20, 2014, http://www.iap.tuwien.ac.at/jvc15/.

The ECM 118 approved the TTC in Islamabad, Pakistan with title **Applied Vacuum Technology** will be the **16th IUVSTA Technical Training Course (#16)** COMSTECH Headquarters, 33-Constitution Avenue, Sector G-5/2, Islamabad-Pakistan, in August 26-28, 2014.

Finally, the venues and dates of ECM 119 and ECM 120 were decided. For ECM 119 there were three bids from Croatia, Portugal and Taiwan, for ECM 120 there were two bids from Austria and from Pakistan. In a secret vote it was

decided to hold ECM 119 in Dubrovnik, Croatia from October 10-12, 2014. In a second vote it was decided to hold ECM 120 from April 17-19, 2015 in Graz Austria. All other bidders were thanked for their high quality proposals.

Before ECM 118 was adjourned, the history and the main fields of the Italian Vacuum Society, which is now named "Italian Society for Science & Technology" was presented by the Councillor of Italy, Espedito Vassallo.

Directly after the adjournment of ECM 118, the 2nd annual General Meeting of the Union (AGM2) was held in which the Annual Accounts for the financial year 2013 and the budget for the financial year 2014 were unanimously adopted.

After the successful completion of the Sunday morning meetings the participants were invited to have lunch and to continue discussions. All delegates agreed that this was an excellent and productive meeting and are looking forward to meeting again at ECM 119 this fall in Dubrovnik.

Images from ECM 118 can be found at https://www.dropbox.com/sh/qxlzkf5co5ln7bc/YqyWXOItzv

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IVC-19/ICSS-15

in conjunction with ICN+T 2013, CIP 2013, ITFPC 2013, MIATEC 2013 and RSD 2013 Paris, 9-13 September 2013

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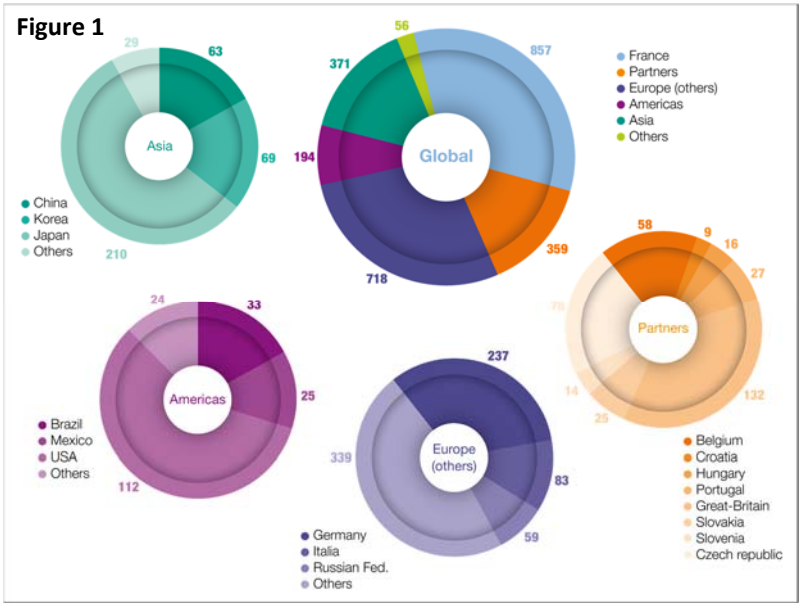
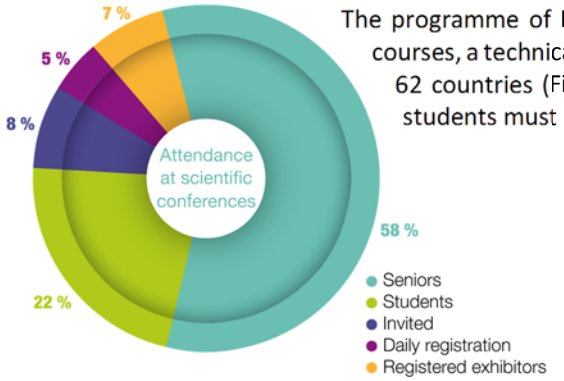
Following Stockholm in 2007 and Beijing in 2010, the 19th International Vacuum Congress (IVC-19) and 15th International Conference on Solid Surfaces (ICSS-15) were held in Paris from 9 to 13 September 2013. They were held in conjunction with the International Conference on Nanoscience + Technology (ICN+T 2013) and four regional European meetings: Innovations in Thin Film Processing and Characterisation (ITFPC 2013); Magnetron, Ion Processing & Arc Technologies European Conference (MIATEC 2013); 19th International Colloquium on Plasma Processes (CIP 2013) and Reactive Sputter Deposition (RSD 2013), thus allowing to gather scientific communities working in closely related fields.

Figure 1



To foster cooperation between European Vacuum Societies, this series of conference have been jointly organized for the first time by a consortium of 9 societies from Belgium, Croatia, Czech Republic, France, Hungary, Portugal, Slovakia, Slovenia and UK, coordinated by the French Vacuum Society.

Figure 2



The programme of IVC-19 and partner conferences consisted of scientific presentations, short courses, a technical exhibition and industrial presentations. Over 2500 participants coming from 62 countries (Figure 1) around the world attended the congress. A strong participation of students must be underlined in the total number of participants (Figure 2).

Scientific programme

Almost 1500 scientific presentations were distributed in 15 parallel oral sessions (979 oral communications in 110 topical sub-sessions) and 3 poster sessions (482 posters for 31 topical sub-sessions). 5 plenary conferences were proposed to the participants: Dan Shechtman (2011 Nobel Prize in Chemistry) and André Borschberg (Solar Impulse Aircraft Project) on the Monday morning, and Schoucheng Zhang (2010 Europhysics Prize), Lars Samuelson (2013 IUVSTA Prize for Science) and John Grant (2013 IUVSTA Prize for Technology) on the Tuesday morning. The 15 parallel sessions were offering the choice between the 8 thematics corresponding to

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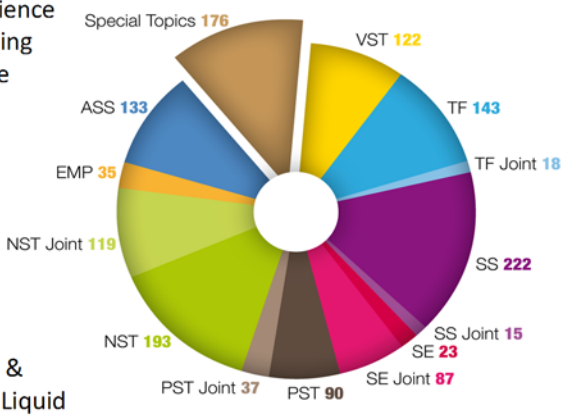
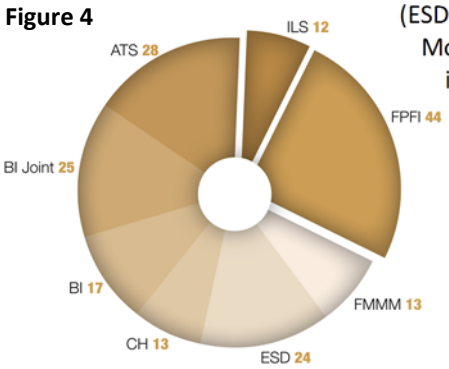
each scientific IUVSTA divisions (Surface Science (SS), Surface Engineering (SE), Plasma Science & Technology (PST), Nanoscience & Technology (NST), Applied Surface Science (ASS), Vacuum Science & Technology (VST), Electronic and Molecular Processing (EMP), Thin Films (TF)), and the 7 Special Topics. The weight of each of these thematics (8 IUVSTA divisions + Special topics considered here as one additional division) are displayed in Figure 3.

Figure 3



These special topics were proposed by the Scientific Committee for this IVC issue: they corresponded to carte blanche given to various dedicated scientific groups such as Biointerfaces (BI), which has become a new scientific IUVSTA division since then, Cultural Heritage (CH), Energy & Sustainable Development (ESD), Functional Molecules and Molecular Machines (FMMM), Frontiers in Photoelectron Full-Field Imaging & Spectromicroscopy (FPFI), Ionic Liquid Surfaces and Interfaces (ILS) and Astronomical Frontiers for Surface Science (ATS). The distribution of these talks is presented in Figure 4.

Figure 4



This program reflected the very large number of disciplines and centers of interest of all the participants of IVC and associated conferences.

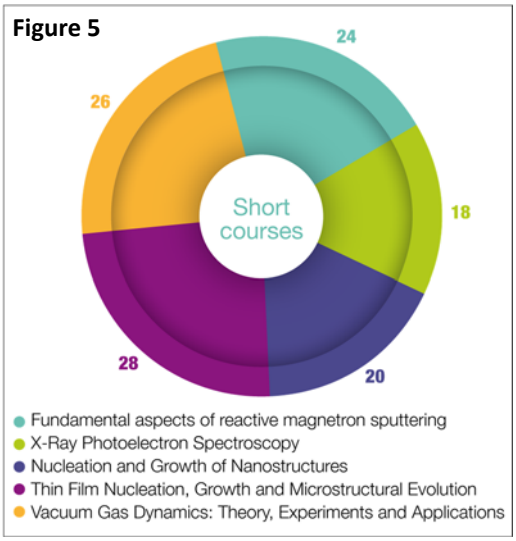
Short courses

Almost 120 participants were registered to the 5 short courses which were running in parallel with the congress and lectured by leading world experts (Figure 5):

- Fundamental aspects of reactive magnetron sputtering, *Diederik Depla*
- X-Ray Photoelectron Spectroscopy (XPS/ESCA), *John T. Grant*
- Nucleation and Growth of Nanostructures, *Joe E. Greene*
- Thin Film Nucleation, Growth and Microstructural Evolution, *Joe E. Greene*
- Vacuum Gas Dynamics: Theory, Experiments and Applications
  F. Sharipov, I. Graur, O. Malyshev

This high number of participants was mainly due to the high quality of the professors of the courses, of international status.

Figure 5



Exhibition

An extensive **technical exhibition** was conveniently located on the same floor as the lecture halls. It brought together more than 110 companies coming from France (46%), Europe (44%) or other parts of the world (10%), who presented their new products and services to delegates and over 400 visitors (the exhibition was free access).

Future IVCs

ICV-20/ICSS-16 will be held in Busan (Korea) 22-26 August 2016, in conjunction with ICN+T 2016.
IVC-21/ICSS-17 will be held in Malmöe (Sweden) in July 2019.

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72nd IUVSTA Workshop "Plasma-assisted vapour deposition of oxide-based thin films and coatings"

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The 72th IUVSTA Workshop was held in the wine region of southern Styria in Austria (Schloss Seggau near Graz) from 6 – 11 April 2014 and it attracted 55 attendees from 18 countries; organized by the IUVSTA Surface Engineering Division, with support from the Thin Film and Plasma Science & Technique Divisions. The workshop was organized by Andre Anders (Lawrence Berkeley National Laboratory, Berkeley, CA, USA), Robert Franz (Montanuniversität Leoben, Austria), Christian Mitterer (Montanuniversität Leoben, Austria) und Jochen Schneider (RWTH Aachen, Germany), with additional support from the Austrian Vacuum Society.

The workshop addressed all issues encountered in the synthesis and characterisation of oxide-based thin films and coatings used in various application areas such as optical and hard coatings, transparent conductive oxides, thermochromic and electrochromic thin films, decorative coatings, and photocatalytic films. Its scope was to bring together scientists working in these different areas, to stimulate discussions and to create synergies. 20 leading scientists from Austria, Belgium, Canada, Czech Republic, Germany, Liechtenstein, Singapore, Slovenia, South Korea, Switzerland, U.K., and USA accepted invitations to present their recent achievements in this rapidly growing field. Typical methods employed for synthesising these materials that were discussed during the workshop include sputtering techniques, e.g. magnetron sputtering, pulsed and rf sputtering as well as high power impulse magnetron sputtering (HiPIMS) but also cathodic arc evaporation and plasma-enhanced chemical vapour deposition. Additional 21 attendees presented their work in talks and poster presentations. Ample time was planned and used for discussions.

The workshop was complemented by a Welcome Reception on Sunday evening, a visit to the historic Seggau Castle, the seat of the Styrian Bishopric until 1786 and the summer residence of its Bishops until the mid-20th century, and an evening wine tasting on Wednesday in the 300 years old wine cellar of the castle. The detailed workshop programme and pictures can be found at the workshop website http://iuvsta72.unileoben.ac.at/. The final report is posted at: http://www.iuvsta.org/iuvsta2/assets/docs/pdf/Final_Report_IUVSTA72.pdf

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The 73rd IUVSTA workshop on "**Nanostructures on two-dimensional solids**" will be held in Eisenerz, Province of Styria in Austria from Sept. 22nd - 26th 2014.

Within the last decade, **exfoliated graphene**, an all-surface material with extraordinary physical properties, initiated an extremely fruitful research topic in nanostructure science, namely research on two-dimensional (2D) solids. In the meantime, the family of 2D materials has been extended by **hexagonal boron nitride, transition metal dichalcogenides, silicene**, etc. and shares analogies with topological insulators and quasi-crystalline thin films. Besides the exploration of those materials' fundamental properties, there is an emerging research community studying the formation of nanostructures on them. The aim of this specialized IUVSTA workshop is to discuss **the potential of two-dimensional crystallites and ultrathin solids as templates for nanostructure arrays** of metallic, magnetic, semiconducting, organic, and biological materials. Topics will include synthesis and characterization, surface diffusion on and below 2D solids as well as potential applications of nanostructure arrays on 2D materials.

The workshop will gather 20 leading experts from Europe, Asia, and the US, as well as up to 30 Post-Docs and experienced Ph. D. students in this emerging field. Besides **invited lectures and poster presentations including a poster advertisement**, also a **round table discussion** is planned to evaluate the future potential of the field. It is believed that the vicinity of the Styrian "Erzberg" (Iron Ore Mountain that has been mined for ages) will inspire lively and fruitful discussions during the four days in the Austrian Alps.

Further information and application at the workshop website: http://iuvsta.unileoben.ac.at/
Deadlines:
Abstract submission deadline: July 1st 2014
Registration deadline: July 1st 2014
Information on acceptance of attendance based on the submitted poster contribution poster contributions: July 10th 2014
Payment of registration fee until August 1st 2014.
Email: physics@unileoben.ac.at

Organized by:
Christian Teichert (Montanuniversität Leoben, Austria)
Hongjun Gao (Chinese Academy of Sciences, PR China)
Thomas Michely (University of Cologne, Germany)
Markus Kratzer (Montanuniversität Leoben, Austria)

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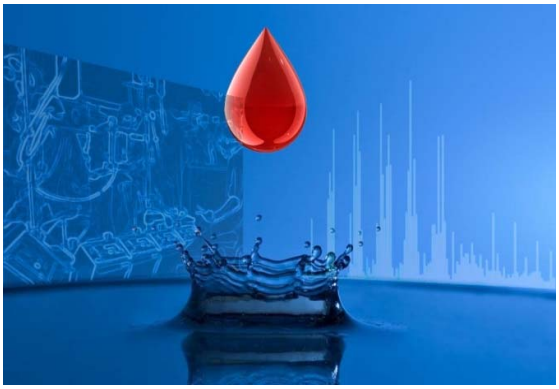
74th IUVSTA Workshop on "Focus on the Blood-Biomaterial Interface: Surface Analysis meets Blood Compatibility"



The workshop will take place November 3 – 7, 2014 La Villa Clythia Fréjus, France. The meeting brings together scientists from the clinical and the physicochemical side of the blood-biomaterial interface. Some half a century of research into blood-biomaterial interactions has not yielded an understanding of the processes at play at the interface between artificial materials and blood at the level required for designing hemocompatible materials. Our goal is to examine the current state of affairs and explore promising new research directions that will bring about changes to this catastrophic situation.

Invited Speakers include David Castner (Seattle, US), Maud Gorbet (Waterloo, Canada), Buddy Ratner (Seattle, US), Wim van Oeveren (Groningen, the Netherlands), Robert Latour (Clemenson, US), Alan Michelson (Harvard, US), Hans Peter Wendel (Tubingen, Germany).

Further Information about the meeting, special events planned, and practical details, can be found at www.vide.org/bloodsurf/

Organizers
Ilya Reviakine (KIT/Germany)
Anouk Galtayries (Chimie ParisTech/SFV, France)
Giacomo Ceccone (EU-JRC/Italy)
Miguel Manso (Madrid/Spain)
Morgan Alexander (Nottingham/UK)