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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

Report on ECM 132, a Teleconference Meeting

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ECM 132 was held on Saturday, March 21st, 2020. It was the first virtual Executive Council Meeting of the Union. Because of the COVID-19 pandemic, the face to face meeting in Annecy, France, which was scheduled for Friday, March 20 – Sunday, March 22, was cancelled. In its virtual form, ECM 132 and the associated meetings took place on Friday, March 20 and Saturday, March 21. Past President Lars Montelius kindly agreed to organize it via a teleconferencing system. Because of the strictly scheduled timeframe, the meetings were condensed to their essence. However, the new format proved to be successful and the meeting was extremely well attended. In fact, attendance was sufficient to make both, the Executive Council Meeting and the associated Annual General Meeting, fully quorate.

Because of time constraints regarding the virtual meeting the Secretary General, Christoph Eisenmenger-Sittner could not express his thanks to the Organizers of the previous ECMs 130 and 131, as well of GM 20 during IVC21 in Malmö, Sweden. This shall be done here. Many thanks the Swedish Vacuum Society (SVS) for taking the effort to organize ECM 130 and 131 as well as GM 20 in Malmö, at the site of IVC 21. All Meetings were successful and constructive thanks to the excellent conditions and hospitality provided by the SVS.

Next, President Anouk Galtayries presented brief opening remarks. The first item of the Agenda of ECM 132 was the presentation and discussion of the report of the finance committee on the budget of 2019, which was approved by the accountant a few days before ECM 132, and on the proposed budget of 2020. Also, the status of the finances of the Union was presented and discussed. After this, ECM 132 was adjourned, and the 6th Annual General Meeting (AGM 6) was opened. Within this meeting, the delegates of the national member societies unanimously approved both, the budget of 2019 and the budget proposal for 2020. After this vote, AGM 6 was closed, and ECM 132 was continued.



Screengrab from ECM132

Extensive reports on planned meetings, conferences and workshops were given during the Congress Planning Committee report within the virtual meeting on Friday. All meetings basically were found to be on track, although the present crisis made it necessary to shift many of them.

The next item on the Agenda of ECM 132 was the Scientific and Technical Directorate (STD) report. At this first STD meeting of the Triennium, held on March 20th, in total ten events, five workshops, one school, three technical training courses and one short course were proposed. Two of these were not recommended to ECM 132. This is a very successful start for the new STD which is headed by Jay Henricks

as Scientific Director and Katsuyuki Fukutani as Scientific Secretary. All events recommended by STD to ECM were put to votes. The following events were finally approved by the ECM.

1. The workshop proposal entitled "Workshop on Advanced Spectroscopy and Transport for 2D Materials at Surfaces", proposed by the Nanometer Structures Division and the Surface Science Division was approved as IUVSTA Workshop number 92 with a funding of EUR 6 000.



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2. The workshop proposal entitled "Advances in the characterization of surface engineering structures, coatings, and thin films", proposed by the Surface Engineering Division, and supported by the Nanometer Structures Division, the Thin Film Division and the Applied Surface Science Division, was approved as IUVSTA Workshop number 93 with a funding of EUR 6 000.
3. The workshop proposal entitled "Reliable sensing and control of reactive plasmas", proposed by the Plasma Science and Technique Division, was approved as IUVSTA Workshop number 94 with a funding of EUR 9 000.
4. The workshop proposal entitled "Plasmonic Thin Films: Theory, Synthesis and Applications", proposed by the Thin Film Division, was approved as IUVSTA Workshop number 95 with a funding of EUR 6 000.

Three Technical Training Courses were approved.

1. The Technical Training Course proposal entitled "Vacuum technology, principles and applications", proposed by the Slovak Vacuum Society, was approved as IUVSTA TTC number 21 with a funding of EUR 2 500. It was strongly recommended to hold this TTC as a virtual course because of the relatively low number of expected participants and due to the present COVID-19 crisis.
2. The Technical Training Course proposal entitled "IUVSTA TTC on Vacuum Technology Applications", proposed by the Pakistan Vacuum Society, was approved as IUVSTA TTC number 22 with a funding of EUR 2 500.
3. The Technical Training Course proposal entitled "Introduction to Vacuum Science, Technology, and Applications: from Nano science to outer space", proposed by the Argentinean Physical Society, was approved as IUVSTA TTC number 23 with a funding of EUR 2 500.

Finally, the Short Course proposal entitled "Low Energy and Photo Emission Electron Microscopy", proposed by the Spanish Vacuum Society, was approved with a funding of EUR 1 000.

After the approval of the above events it was discussed how to handle them in the context of the COVID-19 crisis, especially those which were planned to be held in 2020. This resulted in a statement of the Union which is now prominently posted at <https://www.iuvsta.org/> that "Moving forward, IUVSTA recommends that the organizers of all workshops, schools, technical training courses, short courses, and conferences keep a close watch on the COVID-19 situation and make adjustments to the meeting date(s) to ensure the safety of the participants and to avoid the dissemination of the virus. IUVSTA encourages science to continue with the use of electronic meetings, webinars and virtual meetings."

In connection with this, Alberto Tagliaferro, chair of the Education Committee also briefly reported on the three IUVSTA webinars held so far.

The Chair of the Awards and Scholarship Committee, Martin Wüest, announced that Jennifer MacLeod, Alternate Councilor of Australia, would replace Hongjun Gao as member of the Welch Scholarship Committee due to the ending his term. This was unanimously approved by ECM 132.

Before the conclusion of ECM 132 the venues and dates of the following ECMs were fixed. As already determined at ECM 130, ECM 133 will be held from October 9 – 11, 2020 in Suzhou, China, in connection with VASSCAA 10 which will take place from October 12 – 15, 2020 in Shanghai, China. So far this is still valid and confirmed by the Chinese Vacuum Society. For ECM 134, President Anouk Galtayries, announced that the French Vacuum Society would be happy to organize ECM 134 again in Annecy at the Beginning of 2021. This proposal was unanimously approved by ECM 132.

After that, President Anouk Galtayries closed the meeting, but invited delegates to stay in the virtual meeting place for further informal discussion. Many delegates used this opportunity to discuss items related to the Awards and Scholarship Committee and to other issues related to the organization of the Triennium and to the Union in general.



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Science meets industry – a new committee in IUVSTA

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At the IVC-21 in Malmö, IUVSTA members decided on a proposal of their new president Anouk Galtayries to establish a new special committee - Science meets industry. The chair of the committee is Ute Bergner, owner and president of VACOM from Germany.



Ute Bergner

The goal of this committee is to bring science, which is publicly financed, closer to industries. Whereas big and international acting companies are able to pay for projects, there is often a gap in cooperation, technology transfer or students exchange between R&D of universities and institutes on the one hand and smaller and midsize companies on the other hand. Often, there is a lack of understanding why the other side is dealing with certain topics, what they are doing or which knowledge or infrastructure could be used in a beneficial cooperation.

IUVSTA sees a huge potential in the case of closer cooperation and mutual understanding for innovation and benefits also in earlier stages of application and more comfortable usability.

At least yearly, we will organize one virtual international meeting dedicated to a topic of societal importance in order to bring minds exchange and beneficial discussions forward.

The topic of 2020/2021 meeting is environment protection by improved resource management and recycling economy.¹ What contribution can be provided by vacuum technologies and vacuum based or supported technologies?

German Vacuum Society DVG held such a conference at KIT in Kaiserslautern in February 2020. We had very inspiring discussions between academic researchers and representatives from industry.

It is a matter of fact, that all resources on our globe are limited we have to accept that growth does not mean only quantity. Usability and quality are equally important. Vacuum engineering and science are basic keys elements deciding on reproducibility and reliability of high-tech processes worldwide. Hence, thinking in on the basis of circular economy is especially important.

We find circular processes in our nature, that take up to millions of years. Because of human acting, an accelerating of cycle time is required, which fits our needs. Let's have a look into companies and institutes and their basic resources

- Energy
- Water
- Air
- Raw material
- Human resources

All of them are limited and invaluable. The only apparently unlimited available source is the sun with its energy. Its extensive use - except of natural processes - is possible by photovoltaic technology, which is produced with the aid of vacuum.

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We can win fresh and clean air -besides of filter systems - by plants, which bring CO₂ into the cycle, indoor and outdoor.
By the way, first time right processes in industry contribute an important amount to environmental protection. We save raw material, energy, time and human resources. Industry 4.0 is a great tool pushing first time right, because clear processes and their understanding are necessary to transfer them into software.

Vacuum based technologies like modern PVD/CVD coating or reactive HIPIMS extend tool life in chipping processes. This is a great challenge especially in treatment of extreme hard material such as nickel-based alloys, Inconel- Signum or CFK-diamond.

Compact and miniaturized valve combinations save material and make devices more efficient.

Solar powered water cleaning systems with diamond filters, which are made with HFBEN (Hot Filament Bias Enhanced Nucleation) technology, are used in cruises and water poor regions like South Africa or Mozambique.

Especially inspiring was the contribution due to Tribology by IFOS Institute. Controlling water and particle inclusion in their surfaces generates huge potential for minimization of losses of moving parts.

A few applications are mentioned only. There are much more in common use. We are sure that new innovative ideas can be created on the basis of vacuum assisted technologies. That's why the IUVSTA honors environmental protection technologies by the EBARA Award once in every triennium and the DVG by the yearly VACOM Award.



**Participants in the second member contact meeting
"industry meets science" in Germany**

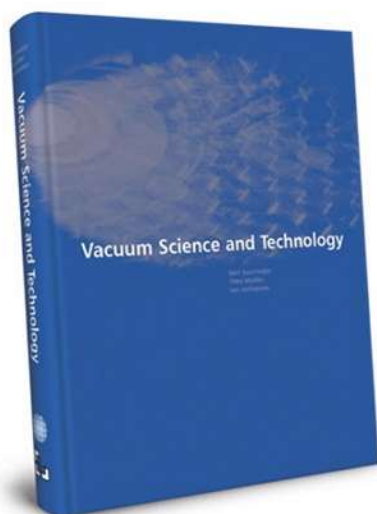


Smart factory – production area of VACOM

¹ Note that the IUVSTA societal concerns were highlighted during the celebration of the IUVSTA 60th anniversary at EVC-15, Geneva, June 17th 2018 which took place at the Globe of Science and Innovation in near CERN. The concrete topics were addressed with the two talks: (i) on "Groundbreaking technologies for a carbon-based sustainable development" given by Alberto Tagliaferro, Politecnico Torino (Italy) and(ii) "Water Stewardship, a constructive approach to cope with the water crisis", given by Cedric Egger, a hydrogeologist from Nestlé Waters in Lausanne, Switzerland. There was an additional short presentation by the CEO of the Swedish startup company, Watersprint, who explained their intelligent water purification approach.



A marvellous book about almost nothing.....



Vacuum Science and Technology

Bert Suurmeijer, Theo Mulder, Jan Verhoeven

Published by HIGH TECH INSTITUTE, Eindhoven, NL

'Vacuum Science and Technology' (VST) is a fully new international edition of the Dutch standard work 'Basisboek Vacuümtechniek', first published in 2000 by the Dutch Vacuum Society NEVAC and since a real "bestseller" in the Dutch language region. The book is written by PhD and BSc titled authors, all being Dutch experts in vacuum physics and technology, former lecturers in this field and all three honorary members of NEVAC. 18 years of use in numerous vacuum courses have proven the book not only to be an excellent reference work but as well an outstanding textbook because of its unique two-level "graded" structure. Text meant for high

graduates is placed behind margin lines. Omitting this text gives a textbook for middle graduates. Both with and without the margin texts the book shows the desired internal coherence for the corresponding training level. Perfectly suited for (combined) higher and secondary level trainings. Exercises are included in two degrees of difficulty. As it were "two books in one".

This book provides a clear, authoritative and comprehensive overview of vacuum with all its ins and outs. This is done in such an educative and natural way that the material is even accessible to laymen in vacuum science and technology.

- Harold J.W. Zandvliet - MESA Institute for Nanotechnology, UTwente, Enschede, NL -

The analysis of a self-measured residual gas spectrum with a unique way of argumentation deserves all the praise. The book goes beyond exclusively vacuum and explains all related physics backgrounds. A 'must-have' for all working with vacuum.

- Aart W. Kleijn - Center of Interface Dynamics for Sustainability, Chengdu, China -

Based on my experiences over fifty years as a scientist, researcher and developer, manufacturer and marketer in the industry of vacuum science, I wholeheartedly endorse this book. It is a seminal work in the field.

- Sherman Rutherford - Formerly of Duniway Stockroom, Fremont, CA, USA -

Yes we need a book with the latest developments in pumps and gauges. Yes we need a book dedicated to Pascal as a SI unit. Yes we need a book like 'Vacuum Science and Technology' - easy to read and to comprehend.

- Falk Braunschweig - Formerly of Alcatel Vacuum Technology, Pfeiffer Vacuum, Wertheim, Germany -

for more information and ordering please go to book-vacuum-science-and-technology.com

This book announcement is recommended by the Dutch Vacuum Society NEVAC