



Contents of IUVSTA News Bulletin Issue 189

Report on Executive Council Meeting 136	2
The 22 nd International Vacuum Congress	5
91 st IUVSTA Workshop Surface Chemistry of Catalytic Systems	9
The XLIII Brazilian Congress of Vacuum (CBrAVIC)	11

Ivan Petrov, petrov@illinois.edu
IUVSTA Communications Committee Chair



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 136, a Teleconference Meeting

Christoph Eisenmenger-Sittner, christoph.eisenmenger@ifp.tuwien.ac.at

ECM 136 was held on Saturday, March 26th, 2022 as a virtual Executive Council Meeting. ECM 136 was the penultimate meeting of the triennium. Therefore, the meetings associated to ECM 136 required more time than usual. For instance, the bids for IVC 24, to be held in 2028, were discussed during the meeting of the Congress Planning Committee. Owing to this, all events associated to ECM 136 were scheduled from Thursday, March 24th to Saturday, March 26th. The first Committee meetings, including the meeting of the Finance Committee were held on March 24th. The sessions on March 25th included the meetings of the Awards and Scholarship Committee and the meeting of the Congress Planning Committee. During the meeting of the Awards and Scholarship Committee the winners of the IUVSTA Prize for Science and for Technology were announced. These are Prof. Christian Mitterer from the Department of Materials Science of the Montanuniversität Leoben, Austria (IUVSTA Prize for Science) and Professor Ian Gilmore from the National Physical Laboratory, United Kingdom (IUVSTA Prize for Technology). After discussing the situation of the other IUVSTA awards, the meeting of the Congress Planning Committee started. Within this meeting the bids for IVC 24 were discussed. Two bids were received, one from Poland, one from Portugal. These bids were scrutinized by the members of CPC and the bidders were provided with additional input for their final presentations, which will be held during ECM 137 in September 2022. The events on Friday ended with the meeting of the Scientific and Technical Directorate, where it was a great pleasure to see that several Technical Training Courses and Short Courses were proposed and submitted to the Executive Council for financial support. Finally, ECM 136 was held on Saturday, March 26th.

After the President, Anouk Galtayries, opened ECM 136, the Secretary General C. Eisenmenger-Sittner in collaboration with the Recording Secretary, Ana G. Silva checked the attendance. ECM 136 was found to be safely quorate with 83% participation. As the quorum was established, the President opened ECM 136.

The President, Anouk Galtayries, welcomed the IUVSTA Officers, Councillors and Alternate Councillors and observers, attending and participating in ECM 136. After these welcome words the President gave the word to Ivan Petrov who introduced Evgenia Valcheva as the future Councillor of Bulgaria. A special welcome was delivered to the representatives of vacuum



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

societies who recently joined IUVSTA, Cuba and Serbia, represented by María Sánchez Colina and Ivana Cvijović-Alagić, respectively.

After these welcome messages the President shared the screen and briefly described the IUVSTA activities developed within the committees. Anouk Galtayries gave reverence to the 9 IUVSTA scientific divisions and opened a discussion concerning the creation of a 10th IUVSTA division or a working group focused on Sustainable Development. This is of particular importance since IUVSTA, as a scientific organization, in addition to previous initiatives related to sustainable development, such as the EBARA award, is endorsing and sponsoring the International Year of Basic Sciences for Sustainable Development (IYBSSD) 2022.

After finishing the President's report, selected committees presented their reports. For the Education Committee, Ana G Silva as vice-chair, reported shortly on the webinars held in the period between ECM135 and ECM136 in collaboration and sponsored by IOP. In addition, information on future webinars to be organized during the next months was given. For the Finance Committee, the Treasurer, Arnaud Delcorte, reported on the budget of 2021. Also, the provisional budget of 2022 was presented. Both budgets showed the financial health of the Union despite the difficult economic situation.

The report of the Congress Planning Committee given by Anton Stampfl was a major item of the agenda. First, he presented the list of the conferences for the period between 2019 and 2023, reporting on the status of the past and planned conferences. Katsuyuki Fukutani, chair of IVC-22, reported on several aspects of the preparation of IVC-22. After that, Anton Stampfl kindly asked Monika Kwoka to present the bid to organize IVC-24 in Katowice, Poland and, Carlos Tavares to present the bid to organize IVC-24 in Braga, Portugal. He informed the members of the Executive Council that both proposals were presented the previous day, followed by a discussion of the members of CPC. Both presentations were followed by a session of questions and answers, with additional input for the improvement of the proposals for the final presentation at ECM 137 in September 2022.

Moving on in the agenda, the next item was the report of STD. The Scientific Director, Jay Hendricks, welcomed the attendants. First, the reports of the nine divisions were presented, followed by information on the status of events like Workshops, Schools, Technical Training Courses and Short Courses to be held during the year 2022. Two proposals for Short Courses



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

and three proposals for Technical Training Courses were presented. All proposals were recommended by STD for funding and also received unanimous approval from the Executive Council. These events were (i) a Short course entitled "Eight courses associated with IVC-22" to be held in Sapporo, Japan in September 2022, (ii) a Short Course entitled "Secondary Ion Mass Spectrometry Short Course" to be held in Minneapolis, USA in 2022, (iii) the 25th Technical Training Course entitled "Vacuum, Plasma, Surfaces and Thin Films" to be held in Sorocaba, Brazil in 2022, (iv) the 26th Technical Training Course entitled "Fundamentals of Vacuum Technique and Technologies" to be held 2022 in Ljubljana, Slovenia and (v) the 27th Technical Training Course entitled "Science and Technology of Vacuum", proposed by the Spanish Vacuum Society to be held virtually in 2023. In conclusion of the STD meeting, the Scientific Director, Jay Hendricks, acknowledged all Division Chairs, the Scientific Secretary Katsuyuki Fukutani and the chair of the Education Committee, Alberto Tagliaferro, for their work and efforts.

Finally, as an extremely important item of ECM 136 and of the whole triennium, the bids for candidates for the position of the president elect of the Union were presented. There was one bid for this position submitted by Jay Hendricks and strongly endorsed by the American Vacuum Society. Jay Hendricks presented his vision for the future of the Union. He remarked first on IUVSTAs rich history, which however has to be connected to a vision for the future which has to take into account the changes within our society accompanied by the pandemic situation. He remarked his firm position in the Union and made it clear that he would be excited and thrilled to collaborate with such a fantastic group of people working on 100% voluntary basis. The presentation was followed by an enthusiastic session of questions and answers to Jay Hendricks. After this session Anouk Galtayries kindly invited Jay Hendricks to leave the "room" for a moment, giving the members of the Executive Council the opportunity to discuss and comment on Jay Hendricks bid for President-Elect. After the discussion a secret vote was held on the bid. The vote resulted in the unanimous recommendation of the nomination of Jay Hendricks as IUVSTA President-Elect to the 21st General Meeting in September 2022. Jay Hendricks returned to the room and acknowledged the strong support and the recommendation.

As there were no other items to be discussed as "Any other Business", the President, Anouk Galtayries, expressed her gratitude to all attendants in the ECM 136 and closed the Meeting.



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

The 22nd International Vacuum Congress

Katsuyuki Fukutani and Yasunori Tanimoto
Japan Society of Vacuum and Surface Science (JVSS)

For updates and registration, visit <https://ivc22.org>

THE 22ND INTERNATIONAL VACUUM CONGRESS

IVC-22

DATE 2022 9.11^{SUN} - 16^{FRI}

Sapporo Convention Center, Sapporo, Japan

The International Vacuum Congress (IVC) is a triennial and the biggest congress for IUVSTA. The next event, IVC-22, will take place from 11 to 16 September 2022 at the Sapporo Convention Center in Hokkaido, Japan, in conjunction with ICSS-18, ICN+T 2022, VASSCAA-11, ICSPM30, ISSP2022, and JVSS-AM2022. The main congress is chaired by Profs. Hidemi Shigekawa (Former president of JVSS) and Katsuyuki Fukutani (President of JVSS), co-organized by JVSS and the Science Council of Japan (SCJ) and supported by the Japan Vacuum Industry Association (JVIA).

Scope and Topics

IVC-22 will provide an excellent opportunity to comprehensively overview the latest scientific and engineering discoveries and will cover a wide range of topics including **11 Division Topics (ASS, BI, EMP, NS, PST, SS, TF, VST, ICN+T/ICSPM, ISSP/SE, JVSS-AM)** and the following Special Sessions and Focus Topics:

- IUVSTA Highlight Seminar in the Honor of Joe Greene
- Vacuum Vision 2030
- Engineering Biology and Medicine
- Data-driven Materials Science and Process Informatics
- Advanced Light Spectroscopy
- Nano-optics
- Low-dimensional Quantum Materials
- Non-Evaporable Getter Coating
- Science and Technologies for SDGs

As of early June, the Program Committee, chaired by Prof. Hidemi Shigekawa, has confirmed 72 invited speakers and received about 800 abstracts for contributed presentations. Late-breaking abstracts for additional poster presentations will be accepted and welcomed. The Exhibition Committee, chaired by Masahide Kuroiwa, will install 50 exhibition booths and more.



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

Plenary Speakers

Plenary talks will be given by seven prominent researchers and two IUVSTA Prize winners.

- **Beatriz Roldán Cuenya** (Fritz Haber Inst., Germany)

"Operando Nanocatalysis"

- **Rupert Huber** (Univ. of Regensburg, Germany)

"Single-molecule choreography with lightwave tunneling microscopy"

- **Hidetoshi Katori** (Univ. of Tokyo, Japan)

"Transportable optical lattice clocks to test and use gravitational redshift"

- **Sergei V. Kalinin** (Oak Ridge National Lab., USA)

"Data Science and Artificial Intelligence in Scanning Probe and Electron Microscopy: from Learning Physics to Atomic Fabrication"

- **Hitoshi Kuninaka** (JAXA, Japan)

"Asteroid Exploring Spacecraft "Hayabusa", "Hayabusa2" and "DESTINY+" Powered by Microwave Discharge Ion Engines"

- **Michael S. Strano** (MIT, USA)

"Applications of Nanoparticles in Plant Biology: Nanocarriers and Nanosensors"

- **Kazuo Ushida** (Nikon Corp., Japan)

"Clear and Present Chance"

- **Christian Mitterer** (Montanuniversität Leoben, Austria)

IUVSTA Prize for Science 2022 Winner

- **Ian Gilmore** (National Physical Laboratory, UK)

IUVSTA Prize for Technology 2022 Winner

Public Lectures

Two public lectures are scheduled for Sunday, 11th Sept. at the Hokkaido University. One will be given by **Dr. Hitoshi Kuninaka**, President of the Japan Aerospace Exploration Agency (JAXA), and the other by **Dr. Hisayoshi Yurimoto**, Distinguished Professor at the Hokkaido University.

Banquet and Excursion

The banquet will be served on Thursday evening following the congress closing ceremony. The excursion is planned for Friday morning and will visit **the Upopoy National Ainu Museum and Park**, where the visitors will come into contact with traditional Ainu culture and admire the natural splendor of the Lake Poroto.

Remote Participation

To cope with the current difficult situations worldwide, remote participation will be accepted from outside Japan. All the talks will be broadcasted in real time, and most of them will be recorded and delivered later on demand.



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

In-person Participation

As the COVID-19 situation in Japan is improving and the Government of Japan is considerably easing the border restrictions, in-person participation from all around the world is cordially welcome. Please follow the administrative steps and take necessary measures, the details of which are being updated at <https://ivc22.org/covid19.html>.

As of June 2022, a valid visa is required from all those entering Japan, and for its application we will provide them a Certificate for Completion of Registration to ERFS*. And if required by the Embassy or Consulate General of Japan in their country, we will provide them a Letter of Invitation.

According to **the current Japanese border measures**

<https://www.mhlw.go.jp/stf/covid-19/bordercontrol.html>

those coming from the countries and regions classified in BLUE at **the grouping by the Government**

https://www.mhlw.go.jp/stf/covid-19/border_category.html

are neither required to be isolated for quarantine nor to submit a vaccination certificate, and only required to take a pre-departure test (within 72 hours) for a negative certificate on arrival. **Fast Track**

<https://www.hco.mhlw.go.jp/fasttrack/en/>

is available at some airports (unfortunately the New Chitose Airport is not included as of June) by pre-registering necessary information on their smartphone.

* Entrants, Returnees Follow-up System (ERFS) is a system that provides the quarantine service for border measures related to new coronavirus infection, the entry approval procedures of Ministries and Agencies in Japan, and the operation of the Health Confirmation Center for Immigrants of the Ministry of Health, Labor and Welfare.

Short Courses

IUVSTA-sponsored Short Courses will be held in a hybrid format at the same venue of the IVC-22 on 10th (Sat), 11th (Sun), and 16th (Fri) September 2022. A number of highly renowned scientists will give advanced short courses on vacuum, plasma, thin film, and surface science. Expected participants are PhD students, research engineers, scientists, and R&D staff at companies who like to expand their horizons in new scientific fields and in new scientific methods. Discounted course fees are applied to IVC-22 participants and students.

2-day Course

Vacuum Gas Dynamics: Theory, Experiments and Applications

Felix Sharipov, Irina Graur, Oleg B. Malyshev, and Roberto Kersevan

9:00 – 18:00, Saturday 10th and Sunday 11th September

1-day Course

Scanning Probe Microscopy

Franz Giessibl

9:00 – 16:00, Sunday 11th September



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

Reactive Magnetron Sputter Deposition

Diederik Depla

10:00 – 18:00, Sunday 11th September

Half-day Course

Introduction to High Power Impulse Magnetron Sputtering (HiPIMS)

Daniel Lundin

14:00 – 18:00, Sunday 11th September

Plasma Processing; From Fundamentals to Atomic Layer Processes

Satoshi Hamaguchi

10:00 – 13:00, Friday 16th September

Fundamentals of Sputter Deposition; Control of Micro- and Nanostructure

Ivan G. Petrov

14:00 – 17:00, Friday 16th September

Properties of Small Molecules: Bridging Surface Science and Vacuum Technology

Katsuyuki Fukutani

14:00 – 17:00, Friday 16th September

For more information and registration, please visit https://ivc22.org/short_course.html

IUVSTA Meetings

The JVSS will host the 137th Executive Council Meeting (ECM-137) on 9th (Fri) and 10th (Sat), the VASSCAA International Steering Committee Meeting on 13th (Tue), and the 21st General Meeting (GM-21) and ECM-138 on 14th (Wed). All these meetings will be held in the evenings in a hybrid format.



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

מכון ויצמן למדע
WEIZMANN INSTITUTE OF SCIENCE

91ST IUVSTA WORKSHOP ON
**Surface Chemistry of
Catalytic Systems**

March 1st - March 3rd, 2022

ZOOM WEBINAR- Israel time zone (GMT+2)

The 91st IUVSTA Workshop “Surface Chemistry of Catalytic Systems” took place as two subsequent events in early 2022. The workshop was initially planned as a single, international, in-person event in 2020, but it had to be postponed and the format had to change due to the covid19 pandemic. The first event was in-person and took place at the Lopatie Conference Centre of the Weizmann Institute of Science on February 27-28, 2022. Due to pandemic related travel restrictions, only scientists based in Israel could participate in the first event with only one exception. The second event was held online and took place on March 1-3, 2022. The workshop was sponsored by the Surface Science division of IUVSTA, the Israel Vacuum Society, the Israel Science Foundation, the British Council, and some internal grants from the Weizmann Institute of Science. Baran Eren (Weizmann Institute of Science) and Elad Gross (Hebrew University of Jerusalem) chaired the first event, and Robert Weatherup (Oxford University) joined them for the second event. 16 half-hour talks were presented in the first workshop, which also included two poster sessions with catering, and a conference dinner. On average



Dr. Vogt (Technion - Israel Institute of Technology) on how to interpret the concept of active sites on heterogeneous catalysts

70 people joined each session, with roughly equal number of participants who are established scientist and students/postdocs. Three best posters by students/postdocs were awarded poster prizes. 19 half-hour talks were presented in the second event, with participants from North America, Europe, and Asia. On average 40 people participated in the online sessions of the second event. The first event reached its goals. Despite the second event attracted the world-leading scientists in the field, the attendance was slightly lower than the expected goal due to the 'zoom fatigue' people developed after two years of the pandemic.

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

There were talks from different sub-fields of chemistry, physics, and material science. Whilst most of the talks in the second event were on basic surface science, there were also many talks from tangential fields in the first event. These tangential fields include applied catalysis, thin films, and applied

electrochemistry such as energy storage and battery research. Topics of the talks in the second event included water on oxides, single-atom alloy catalysts, bottom-up design of catalysts from single-atoms to cluster and then to nanoparticles, and other interesting topics. Topics of the talks in the second event included using metal-organic frameworks as electrocatalysts, following the microscopic pathways to energy dissipation and adsorption on metals, probing the interfacial chemistry of energy storage materials by solid state NMR spectroscopy, and others.

The national workshop almost definitely will act as a catalyst for starting new collaborations in the surface science community in Israel. For instance, we are aware of a starting collaboration between two science groups based at the Weizmann Institute and Hebrew University after this workshop. However, it is not possible to comment on whether the international event inspired any collaborations. Because it was held online, such collaborations start via e-mail exchange, and we do not have access to the e-mails exchanged between the participants.

An overwhelmingly positive feedback was received after both events. Whilst participants of the first event requested a second workshop to take place in 2-3 years, the participants of the second event voiced their interest on an international workshop taking place in-person at the Weizmann Institute of Science or elsewhere in Israel in the near future. This has convinced us to organize another workshop in a few years.

The second part of the workshop has its own webpage:

<https://www.weizmann.ac.il/conferences/SCCS2020/surface-chemistry-catalytic-systems>.

We are currently considering posting the videos of the talks from the workshop online on this webpage. A decision will be reached in the next few months, depending on the consent of the speakers.



Dr. Leskes (Weizmann Institute of Science) on how insights on the solid-electrolyte interface can be gained using solid state NMR spectroscopy

Dr. Baran Eren baran.eren@weizmann.ac.il
For the Chairs of the 91st IUVSTA Workshop



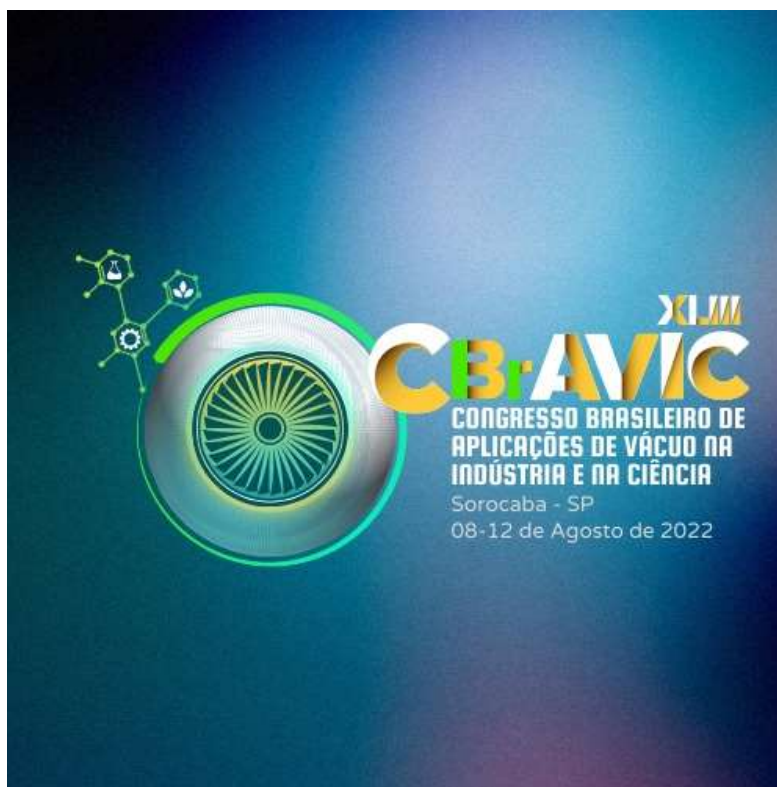
Union Internationale Pour La Science, La Technique et Les Applications du Vide
International Union for Vacuum Science, Technique and Applications
Internationale Union für Vakuum Forschung, Technik und Anwendung

The XLIII Brazilian Congress of Vacuum (CBrAVIC), which is organized by the Brazilian Vacuum Society yearly, will be held in Sorocaba, Sao Paulo state, August 8th-12th, 2022.

Since 1979, researchers and institutions working in the area of Science, Technology and Engineering, together with the Brazilian Vacuum Society (SBV) have been organizing, annually, the Brazilian Congress of Vacuum Applications in Industry and Science CBrAVIC. This important and traditional event has the support of universities and research institutions that bring together the main segments of the scientific community.

After two years of holding the event virtually because of the pandemic, this year the event will be held in person again. The CBrAVIC comprises of 6 plenary talks (one of the speakers represents AVS), oral and poster presentations, a workshop, a panel discussion on borderless plasma, and a IUVSTA Technical Training Course entitled "Vacuum, Plasma, Surfaces, and Thin Films" that includes seven modules. The Organizing Committee is formed by 14 professors from 6 different local universities and institutes.

More information at <https://www.cbравic.com.br>



Pedro Nascente <nascente@ufscar.br>