SSVS 2015

Joint Symposium of the Surface Science Society of Japan and the Vacuum Society of Japan
SSSJ’s 35th Annual Meeting and VSJ’s 56th Annual Symposium

Sponsored by: The Surface Science Society of Japan (SSSJ), The Vacuum Society of Japan (VSJ)

Supported by: The Japan Society of Applied Physics; The Physical Society of Japan; The Ceramic Society of Japan; The Institute of Electronics, Information and Communication Engineers; The Institute of Electrical Engineers of Japan; The Electrochemical Society of Japan; The Japanese Society of Microscopy; The Japan Society for Precision Engineering; The Society of Materials Science, Japan; The Society of Powder Technology, Japan; The Japan Society of Mechanical Engineers; The Society of Polymer Science, Japan; The Spectroscopical Society of Japan; Materials Science Society of Japan; The Society of Chemical Engineers, Japan; The Japan Oil Chemists’ Society; The Surface Finishing Society of Japan; The Institute of Image Information and Television Engineers; The Japan Institute of Light Metals; The Society of Nano Science and Technology; The Japan Institute of Metals and Materials; The Japan Society for Analytical Chemistry; Japan Society of Corrosion Engineering; The Mass Spectrometry Society of Japan; Japan Society of Powder and Powder Metallurgy; The Crystallographic Society of Japan; The Japanese Association for Crystal Growth; The Atomic Collision Society of Japan; Semiconductor Equipment Association of Japan; The Japan Titanium Society; The Magnetics Society of Japan; Particle Accelerator Society of Japan; Atomic Energy Society of Japan; Japan Vacuum Industry Association; Japanese Society of Tribologists; Cryogenics and Superconductivity Society of Japan; The Japan Society of Plasma Science and Nuclear Fusion Research; The Iron and Steel Institute of Japan; The Japanese Society for Synchrotron Radiation Research.

In Cooperation with: Tsukuba Tourism and Convention Association

Date: December 1st (Tue.), 2nd (Wed.), and 3rd (Thu.), 2015

Venue: Tsukuba International Congress Center (2-20-3 Takezono, Tsukuba, Ibaraki 305-0032, Japan)

10 minutes’ walk from “Tsukuba” Station for “Tsukuba Express” or “Tsukuba Center” Bus Stop
http://www.epochal.or.jp/index.html

For oral presentations, corporate seminars & presentations:
Hall A: Main Convention Hall (Entrance on the 2nd Floor)
Room B: 1st Floor, Conference Room 101
Room C: 1st Floor, Conference Room 102
Room D: 2nd Floor, Conference Room 201A
Room E: 2nd Floor, Conference Room 201B
Room F: 2nd Floor, Conference Room 202A
Room G: 2nd Floor, Conference Room 202B
Room H: 3rd Floor, Conference Room 303
Room I: 3rd Floor, Conference Room 304

For poster sessions, vendors' exhibitions, and mixer: Multi-Purpose Hall

Presentation Time: per each presentation.

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<tr>
<td>Invited Talk</td>
<td>30 minutes (including discussion time)</td>
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<tr>
<td>Joint Symposium Talk</td>
<td>Society Award: 35 min, Rev. Paper or Technique Award: 30 min. (including discussion time)</td>
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<tr>
<td>Joint Intl Symposium Talk</td>
<td>Award for Technology, Young Scientist or JVSJ: each 15 min. (including discussion time)</td>
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<tr>
<td>SSSJ Award Talk</td>
<td>Contribution Talk: 15 minutes (Talk 10 min. + Discussion 5 min.)</td>
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<tr>
<td>VSJ Award Talk</td>
<td>Contribution Poster: Display: 120 min. incl core time of 60 min. (Award applicants:120 min)</td>
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**Registration Fee** : including one Abstract Book (bound for both VSJ Annual Symp. and SSSJ Annual Mtg.).

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<th>General</th>
<th>VSJ member or an individual belonging to a VSJ’s corporate member</th>
<th>¥ 6,000</th>
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<tr>
<td></td>
<td>SSSJ member or an individual belonging to a SSSJ’s corporate member</td>
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<td></td>
<td>Member of any supporting society</td>
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<td>Non-Member</td>
<td>¥ 8,000</td>
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<tr>
<td>Student</td>
<td>SSSJ Student Member, VSJ Student Member</td>
<td>¥ 3,000</td>
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<td></td>
<td>Student member of any supporting society, Student non-member</td>
<td>¥ 5,000</td>
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**Exhibition for Vacuum and Surface Sciences' Instruments and Corporate Seminars & Presentations**:

All of you are welcome back this year again to the Exhibition in the poster session site (Multi-Purpose Hall) on December 1st and 2nd to meet newly commercialized products as well as to obtain networking opportunities between industry and academia. No registration fee is required if you only visit the Exhibition. During these two days, some of the exhibitors will have seminars or presentation sessions during the lunchtime in oral presentation sites: lunch will be served on a first-come-first-served basis. Information on exhibitors and their products can be found in the final part of this Book (in Japanese), while seminars and presentations are shown in the Timetable and the Program.

**Keynote Lectures (English Session)**:

Wednesday, December 2nd, 10:30~12:00  Hall A: Main Convention Hall (Entrance on the 2nd Floor)
Akira Fujishima (Tokyo Univ. Sci.)  “TiO₂ Photocatalysis, Present Situation and Future Approaches”
Hideo Hosono (Tokyo Inst. Technol.)  “Creating Active Functionality Utilizing Abundant Elements”

**Joint Symposium “Fabrication of Novel Low-Dimensional Materials and Their Device Application”**
Tuesday, December 1st, 9:15~12:00  Room B: Conference Room 101
Kazuhito Tsukagoshi (NIMS)  “Atomically Thin Semiconducting Films for Field Effect Transistors”
Toshihiro Shimada (Hokkaido Univ.)  “Nanostructure Control of Layered Metal Chalcogenides by Thermal CVD Growth”
Hideki Yamamoto (NTT Basic Res. Labs.)  “Fabrication of Two-Dimensional and Three-Dimensional Layered Heterostructures and Their Applications to Devices”
Takayoshi Sasaki (NIMS)  “Development of Oxide Nanosheets and Application”
Yukiko Yamada-Takamura (JAIST)  “Possibility of Silicene as a Device Material”

**Joint Symposium “Front-line Research on Wide-Gap Semiconductors for Power Devices”**
Tuesday, December 1st, 15:30~18:45  Room B: Conference Room 101
Toru Ujihara (Nagoya Univ.)  “Ultra-High Quality SiC Grown by Solution Method Utilizing Dislocation Conversion Phenomenon”
Hiroshi Yano (Univ. Tsukuba)  “Recent Progress in SiC MOSFET and Its Interface”
Yusuke Mori (Osaka Univ.)  “GaN Crystal Growth by Na Flux Method”
Tamotsu Hashizume (Hokkaido Univ.)  “Control of GaN-Based Heterostructure Interfaces for Advanced HEMT Technologies”
Shinichi Shikata (Kwansei Gakuin Univ.)  “Diamond Wafer for Power Device Application”
Makoto Kasu (Saga Univ.)  “Recent Progress of Diamond MOSFET Interface Research”
Joint Symposium “Cutting-Edge Accelerators in Asia and Their Future Perspectives”  (English Session)
Thursday, December 3rd, 9:00~11:45  Room B: Conference Room 101
Lixin Yin (SINAP, CAS, China)
“Progress and Future of the Shanghai Synchrotron Radiation Facility”
Gao-Yu Hsiung (NSRRC, Taiwan)
“Achievement of Taiwan Photon Source Project”
Junichiro Kamiya (JAEA)
“Vacuum Technologies in High Power Proton Beam Accelerator”
Masaya Oishi and Haruo Ohkuma (JASRI/SPring-8)
“Steps and Strides of SPring-8 and Its Future Perspective: A Viewpoint from Vacuum Technology”
Hiroshi Sakai (KEK)
“Superconducting RF Accelerator Cavity Techniques as a Basis for Future Accelerators -Learn from the development and beam operation for Compact ERL-”

Joint Symposium “Surface Analysis under Device Operation or during Chemical Reaction: State-of-the-art Operando Observations”
Thursday, December 3rd, 13:00~15:45  Room B: Conference Room 101
Koji Amezawa, Takashi Nakamura (Tohoku Univ.)
“Operando Analysis of Solid Oxide Fuel Cells by Synchrotron X-Ray”
Nobuyuki Ishida (NIMS)
“Operando Measurement of Green Device using Scanning Probe Microscopy”
Daisuke Asakura (AIST)
“Operando Analyses of Lithium Batteries by Means of Soft X-ray Emission Spectroscopy”
Yasutaka Nagai (Toyota Central R&D Labs.)
“XAFS Study of Automotive Exhaust Catalysts”
Yasumasa Takagi (IMS)
“Operando Measurement by Photoelectron Spectroscopy”

2015 International Joint Symposium on Recent Progress of Advanced Nanocharacterization * (English Session)
Wednesday, December 2nd, 13:00~18:45  Room DE: Conference Room 201A+B
Robert W. Carpick (Univ. Pennsylvania, USA)
“New Insights into Friction and Wear through In-Situ Nanotribology”
Haiming Guo (Institute of Physics, Chinese Academy of Sciences, China)
“Control of Kondo Effect of Individual Magnetic Atom/Molecule on Surfaces”
Zee Hwan Kim (Seoul National Univ., Korea)
“Nano-Plasmonics: from Single-Molecule Chemistry to Structures of Low-Dimensional Materials”
Jiandong Guo (Institute of Physics, Chinese Academy of Sciences, China)
“Precise Growth control of Oxide Polar Films”
Tae-Hwan Kim (Pohang Univ. Sci. Technol., Korea)
“Chiral Edge States of One-Dimensional Topological Insulators”
Ing-Shou Hwang (Institute of Physics, Academia Sinica, Taiwan)
“Adsorption and Ordering of Nitrogen and Oxygen Molecules at the HOPG/Water Interface”
Jun Yoshinobu (Institute for Solid State Physics, Univ. Tokyo, Japan)
“In-Situ Observation of Pd Surfaces under Hydrogen Pressure”
Chia-Hao Chen (National Synchrotron Radiation Research Center, Taiwan)
“Soft X-ray Spectromicroscopy for Surface Nanocharacterization”
Takanori Koshikawa (Fundamental Electronics Research Institute, Osaka Electro-Communication Univ., Japan)
“Development of High Brightness and High Spin-Polarized Low Energy Electron Microscopy and Application to Spintronics Magnetic Thin Film Materials”

*This international symposium is also organized as the 4th KVS-VSJ-SSSJ Joint Symposium with Korean Vacuum Society (KVS) and endorsed by American Vacuum Society (AVS) as AVS Endorsed Topical Conference. Cooperation from Chinese Vacuum Society (CVS) and Taiwan Vacuum Society (TVS) is also acknowledged for organizing this program.
Joint Sessions

Theoretical and Practical Aspects of Semiconductors for Electronics
  Tuesday, December 1st, 9:15～12:00  Room F: Conference Room 202A

Synthesis and Properties of Carbon Nanomaterials
  Tuesday, December 1st, 15:30～18:30  Room G: Conference Room 202B

Optical and X-ray Analysis of Nanomaterials
  Wednesday, December 2nd, 15:30～18:30  Room G: Conference Room 202B

Surface Chemistry: Adsorption, Diffusion, Interaction and Their Dynamic Processes
  Thursday, December 3rd, 13:00～16:15  Room F: Conference Room 202A

VSJ Organized Session (OS)

“Vacuum Nanoelectronics – Challenges to Ultimate Performances –”  Organizer: Yasuhiro Gotoh (Kyoto Univ.)
  Thursday, December 3rd, 13:00～16:00  Room E: Conference Room 201B
<table>
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<tr>
<th>Topics (Session)</th>
<th>Speaker (Affln)</th>
<th>Title</th>
<th>Time (Room)</th>
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<td>Theoretical and Practical Aspects of Semiconductors</td>
<td>Kenji Shiraishi (Nagoya Univ.)</td>
<td>Physics in Interfaces of Widegap Semiconductor MOSFET</td>
<td>Dec. 1 (Tue) 9:15 (Room F)</td>
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<tr>
<td>for Electronics (Joint)</td>
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<tr>
<td>Theoretical and Practical Aspects of Semiconductors</td>
<td>Koichi Kakimoto (Kyushu Univ.)</td>
<td>Numerical Analysis on Crystal Growth of Semiconductors</td>
<td>Dec. 1 (Tue) 11:30 (Room F)</td>
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<tr>
<td>for Electronics (Joint)</td>
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<tr>
<td>Synthesis and Properties of Carbon Nanomaterials</td>
<td>Koichiro Saiki (Univ. Tokyo)</td>
<td>Analysis on the Reduction Process of a Coated Graphene-Oxide for</td>
<td>Dec. 1 (Tue) 15:30 (Room G)</td>
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<td>(Joint)</td>
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<td>Recovering Mobility</td>
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<tr>
<td>Surface Chemistry: Adsorption, Diffusion, Interaction</td>
<td>Mitsunori Kurahashi (NIMS)</td>
<td>Generation of a Spin- and Alignment-Controlled Molecular Oxygen Beam and Its Application to Surface Reaction Analysis</td>
<td>Dec. 3 (Thu) 13:00 (Room F)</td>
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<td>and Their Dynamic Processes (Joint)</td>
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<tr>
<td>Surface Structure (SSSJ)</td>
<td>Takeo Yamada (AIST)</td>
<td>Development of Mass Production and Application of Super-Growth Single Walled Carbon Nanotube</td>
<td>Dec. 3 (Thu) 13:00 (Room H)</td>
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<td>Surface Physical Properties (SSSJ)</td>
<td>Noriaki Takagi (Univ. Tokyo)</td>
<td>Surface Molecular Magnetism</td>
<td>Dec. 2 (Wed) 15:30 (Room H)</td>
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<td>Surface Reaction (SSSJ)</td>
<td>Junji Nakamura (Univ. Tsukuba)</td>
<td>Activation of CO$_2$ and Methanol Synthesis</td>
<td>Dec. 3 (Thu) 9:00 (Room F)</td>
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<tr>
<td>Surface Analysis &amp; Characterization (SSSJ)</td>
<td>Yasuhiro Sugawara (Osaka Univ.)</td>
<td>Development of Novel SPM Technique for Observing the Surface Magnetism at the Atomic Scale</td>
<td>Dec. 1 (Tue) 9:15 (Room D)</td>
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<tr>
<td>Low-Dimensional and Nanoscale Materials (SSSJ)</td>
<td>Atsushi Ando (AIST)</td>
<td>Layered Compound Semiconductor Electronics</td>
<td>Dec. 3 (Thu) 9:00 (Room C)</td>
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<td>Soft Matter (SSSJ)</td>
<td>Ko Okumura (Ochanomizu Univ.)</td>
<td>Soft Matter Physics</td>
<td>Dec. 1 (Tue) 9:15 (Room C)</td>
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<td>Environmental and Energy Materials (SSSJ)</td>
<td>Nagahiro Hoshi (Chiba Univ.)</td>
<td>Active Sites from Well-Defined Surfaces to Nanoparticles</td>
<td>Dec. 2 (Wed) 17:15 (Room I)</td>
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<td>Vacuum Science &amp; Technology (VSJ, VST)</td>
<td>Toshiya Tanabe (Brookhaven Natl. Lab.)</td>
<td>National Synchrotron Light Source-II and Its Insertion Devices</td>
<td>Dec. 1 (Tue) 9:15 (Room G)</td>
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<tr>
<td>Surface Engineering (VSJ, SE)</td>
<td>Koshi Adachi (Tohoku Univ.)</td>
<td>Creation of Nanointerface by Tribological Coating for Low Friction in Vacuum</td>
<td>Dec. 2 (Wed) 15:30 (Room F)</td>
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<tr>
<td>Applied Surface Science (VSJ, ASS)</td>
<td>Satoshi Ninomiya (Univ. Yamanashi)</td>
<td>Development of a Vacuum-Type Charged Droplet Beam Gun and Its Application to Surface Analysis</td>
<td>Dec. 2 (Wed) 17:15 (Room F)</td>
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<tr>
<td>Thin Films (VSJ, TF)</td>
<td>Masataka Hasegawa (AIST,TASC)</td>
<td>Plasma Synthesis of Graphene for Transparent Conductive Films</td>
<td>Dec. 3 (Thu) 9:00 (Room G)</td>
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<td>VSJ Award Ceremonies and Award Talks:</td>
<td>Wednesday, December 2nd, 9:00~10:25, Room B: 1st Floor, Conference Room 101</td>
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<td>SSSJ Award Ceremony and Award Talks for the Society Award:</td>
<td>Wednesday, December 2nd, 9:00~10:25, Hall A: Main Convention Hall (Entrance on the 2nd Floor)</td>
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<td>Exhibition for Vacuum and Surface Sciences' Instruments:</td>
<td>Tuesday, December 1st, 12:00 to Wednesday, December 2nd, 17:00 to be held at the Multi-Purpose Hall</td>
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<td>Corporate Seminars &amp; Presentations:</td>
<td>Tuesday, December 1st and Wednesday, December 2nd; during the lunchtime in oral presentation rooms</td>
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<td>Mixer:</td>
<td>Tuesday, December 1st, 18:45~20:00, in the Multi-Purpose Hall.</td>
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<td>Get-Together Party:</td>
<td>Wednesday, December 2nd, 18:45~20:15, in the Conference Room on the 1st Floor. Fee: ¥4,000 (to be paid in cash with your on-site registration fee)</td>
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<td>VSJ School Course: “Ultrahigh Vacuum Technique for Surface Science Studies”</td>
<td>Thursday, December 3rd, 14:45~16:15, Room G: Conference Room 202B on the 2nd Floor Additional payment required: (to be paid in cash on-site at the Registration Desk)</td>
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**Contents:**
1. Fundamentals of UHV Technique
2. UHV Materials
3. Vacuum Pumps and Gauges
4. Fabrication Techniques of an UHV Apparatus
5. Manipulators and Holders of a Specimen

**Fee:**
- SSVS 2015 Participant (VSJ or SSSJ Member or an individual of Corporate Member): ¥2,000
- SSVS 2015 Participant (Non-Member, General): ¥3,000
- SSVS 2015 Participant (Student): ¥0
- SSVS 2015 Non-Participant (VSJ or SSSJ Member or an individual of Corporate Member): ¥5,000
- SSVS 2015 Non-Participant (Non-Member, General): ¥10,000
- SSVS 2015 Non-Participant (Non-Member, Student): ¥5,000
- SSVS 2015 Non-Participant (VSJ or SSSJ Student Member): ¥0

Construction of an ultrahigh vacuum (UHV) chamber, which is best optimized to its purpose, is highly expected for surface science studies in an UHV environment. However, because of financial limitation and other reasons, scientists must often make their new apparatus or upgrade existing ones by themselves. Thus, in this School Course, a professionally experienced instructor in this field will provide detailed explanation on necessary knowledge and know-hows to make or upgrade an UHV chamber on their own for surface science studies, based upon his own practical experiences. Prospective attendees are those who have just started their work this April in the labs at universities/research institutions or that have obtained their jobs in the manufacturing companies in relation with vacuum and/or surface science and technology, or those who are ambitious to improve their skills for designing, fabricating and modifying experimental apparatus.
6. Evaporation Source
7. Safety, Environmental Protection and Saving Energy
Capacity: 50 seats (on a first-come-first-served basis)

Contact:
The Vacuum Society of Japan (VSJ)
Room306, Kikai shinko kaikan 3-5-8, Shibakoen, Minato-ku, Tokyo 105-0011, Japan
TEL: 03-3431-4395  FAX: 03-3433-5371
(For international calls)
TEL: 81-3-3431-4395  FAX: 81-3-3433-5371
E-mail: ofc-vsj@vacuum-jp.org  URL: http://www.vacuum-jp.org/english

The Surface Science Society of Japan (SSSJ)
2-40-13-402 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan
TEL: 03-3812-0266  FAX: 03-3812-2897
(For international calls)
TEL: 81-3-3812-0266  FAX: 81-3-3812-2897
E-mail: office@sssj.org  URL: http://www.sssj.org
Program Numbers
(Example)

- For the session of oral presentations in principle, time of 15 minutes as one unit is numbered in sequence, while there is a 15 minutes' break between 6th and 7th units. Above example means the talk in the 8th unit in the afternoon on December 2nd, in the Room B. (One unit for a contributed talk and two units for an invited or symposium talk)
- Therefore, the same program numbers except the rooms indicate that the talks start at the same time.
- Please note that program numbers for keynote lectures and award talks in the morning and invited talks in the joint international symposium in the afternoon on December 2nd are not obedient to this rule so that the number in sequence is not indicated in two digits but in one digit to notify this exception.
- The following alphabet after the number indicates that the presenter is an applicant for a respective award.
  - Y: Applicant for SSSJ Young-Researcher Lecture Award
  - R: Applicant for SSSJ Rising-Researcher Lecture Award
  - S: Applicant for SSSJ Student Award
  - V: Applicant for VSJ Award for excellent poster presentations

Guideline for the Presenters
1. Oral Presentations
   Time for each contributed talk is 15 minutes long including 5 minutes for discussion. Only an LCD projector is available in each room. Each presenter is requested to bring his/her own laptop computer. Check to it if the laptop is properly connected to the projector by previewing presentations materials in advance during the break time before the presentation.

2. Poster Presentations
   Schedule for poster presenters is indicated below: each presenter is requested to be present during her/his core time in accordance with odd or even program number, although they are expected to be present beyond their core time, if possible. No such core time is provided for award applicants of both SSSJ and VSJ: They should be present throughout two hours during the poster session for presentation and discussion. Although the size of a poster board is 2,055 mm high and 855 mm wide, the size of a poster is recommended to be less than 1,200 mm high and 855 mm. Leave a blank space of 10 cm high and 20 cm wide on the top-left corner of a board, where its program number is put in advance by the Secretariat. Program number ends with S, Y, R or V for applicants for SSSJ Student Award, Young-Researcher Lecture Award, Rising-Researcher Lecture Award, or VSJ applicants for awarding excellent poster presentations, respectively. For mounting posters, only thumbtacks/drawing pins are to used, which can be provided at the site. After the session is finished, posters are to be removed within the removal time indicated below.

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<th>Dec. 1 (Thu)</th>
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<td>9:00-12:00</td>
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<td>Core time (with odd program number)</td>
<td>13:30-14:30</td>
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<tr>
<td>Core time (with even program number)</td>
<td>14:30-15:30</td>
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<td>Removal</td>
<td>15:30-21:00</td>
<td>15:30-17:00</td>
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