Sungkyun International Solar Forum

SISF 2020

(www.skku-solar.org)

- 10th Anniversty -

Halide Perovskites for Next 10 Years: Chemistry, Physics and Materials

600th Anniversary Hall

Sungkyunkwan University (SKKU), Seoul, Korea

June 10 (Wed)-12(Fri), 2020

The 10th Sungkyun International Solar Forum

***Organized** by*

- BK Plus, School Chemical Engineering, School of Advanced Materials Science and Engineering, Department of Energy Science, Sungkyunkwan University (SKKU)
- Global Frontier Center for Multiscale Energy Systems, Seoul National University (SNU)
- Energy Frontier Institute, SKKU

***Sponsored** by*

- Korea Photoscience Society
- Korean IPS
- TCI
- SHARECHEM

Welcome Address and Chronicle of SISF

It is our great pleasure to host the **10th** Sungkyun International Solar Forum (SISF2020) that is held at 600th Anniversary Hall, Sungkyunkwan University (SKKU), Seoul, Korea, from June 10 (Wed) to June 12 (Fri), 2020. The SISF2020 is 10th anniversary of SISF because the first SISF was held in 2011. The organizing committee members are very pleased to invite world-leading scientists to SISF2020. Recent advances and Hot issues on photovoltaics and opto-electronics of halide perovskite will be discussed in SISF2020. Since 2011, SISF held annually in SKKU campus, where except for the 1st SISF in 2011, the venue for SISF was decided to be the 600th Anniversary Hall in SKKU, Seoul.

The **1st SISF** was held in Science and Engineering campus of SKKU, located in Suwon, in 2011, where world-leading experts in PV from academy and industry were invited including C. S. Choi (Samsung Electronics), A. Hagfeldt (Uppsala Univ, Sweden), A. Ebong (Univ. North Carolina, USA), C.W. Tang (Univ. Rochester, USA), K. Baert (IMEC, Germany), O. Ikki (RTS, Japan), D.L. Officer (Univ. Wollongong, Australia), M. Yamaguchi (Prof. Toyota Tech, Japan), J. van de lagemaat (NREL, USA), C.H. LEE (Dongjin Semichem, Korea), P.V. Kamat (Univ. Notre Dame, USA), D. Kim (Samsung Electronics, Korea), J. Song (KIER, Korea), J.W. Lee (LG Innotek, Korea), M. Konagai (Tokyo Tech., Japan), T. Nakada (Aoyama Univ., Japan), H.-S. Lee (Sinsung Holdings, Korea), E.-C. Cho (Hyundai Heavy Ind., Korea), J. Yi (SKKU, Korea), D.-Y. Jung (SKKU, Korea), N.-G. Park (SKKU, Korea).

Since **2nd SISF in 2012**, SISF has been held in 600th anniversary hall in SKKU, Seoul. Invited speakers mainly working on dye-sensitized solar cells were composed for the SISF2012, including M. Gratzel (EPFL, Switzerland), A. Zaban (Bar-ilan Univ., Israel), Gang Li (UCAL, USA), A. Hagfeldt (Uppsala Univ., Sweden), W. You (Univ. North Carolina, USA), E. Nakamura (Univ. Tokyo, Japan), J. Zhai (Beihang Univ., China), J.H. Park (SKKU, Korea), H.S. Jung (SKKU, Korea), S.-H. Han (Hanyang Univ., Korea), P. j. Yoo (SKKU, Korea), H. Segawa (Univ. Tokyo, Japan), J.-K. Lee (Univ. Pittsburgh, USA), K. Kim (Ewha Womans Univ., Korea), S.-W. Kim (SKKU, Korea), T. Toyoda (Univ. Electro-Communications, Japan),D.-Y. Kim (GIST, Korea), M.H. Park (Samsung Fine Chemicals, Korea), T.H. Ahn (Kolon Indusries, Korea), S. Mori (Shinshu Univ., Japan), S. Ito(Univ. Hyogo, Korea).

In the **3rd SISF in 2013**, topics were still related to dye-sensitized solar cells but quantum-dot and halide perovskite issues were involved. Invited speakers were M. Grätzel, N.-G. Park, A. Hagfeldt, P. Kamat, W.I. Lee (Inha Univ., Korea), S. Hayase (Kyushu Institute of Technology, Japan), J.-J. Lee (Kunkuk Univ., Korea), T. Ma (Dalian Univ, China), J. Moon (Yonsei Univ., Korea), M. Choi (SNU, Korea), S. Mhaisalkar (NTU, Singapore), S. Ito, A. Zaban, X. Zheng (Stanford Univ., USA), H. Shin, E. W.-G. Diau (National Chiao Tung Uinv. Taiwan), H. Segawa, S.I. Seok (KRICT, Korea), N.K. Park (SNU, Korea), K. Cho (POSTEC, Korea), W.-Y. Wong (National Chiao Tung Uinv. Taiwan), H. Ohkita (Kyoto Univ., Japan), J. Bisquert (Universitat Jaume I, Spain), J.-K. Lee, W.S. Shin (KRICT, Korea), B. Kim (Yonsei Univ., Korea).

In the **4th SISF in 2014**, topics related to perovskite solar cell were in depth discussed, in which lectures of science and technologies toward high efficiency of perovskite solar cell were delivered by invited speakers of M. Gratzel, Y.S. Kang (Hanyang Univ., Korea), A. Hagfeldt, P. Kamat, A. Zaban, I. Mora Sero (Univ. Jaume I, Spain), E. W.-G. Diau, S. Ito, S. Hayase, S. Mhaisalkar, Y.-B. Cheng (Monash Univ., Australia), H. Míguez (CSIC-US, Spain), A.J. Frank (NREL, USA), S. Bent (Stanford Univ., USA), J.-K. Lee, H. Segawa, L. Mueller-Meskamp (IAPP, Germany), A. Wakamiya (Kyoto Univ.), P. Earis (Managing Editor, Royal Society of Chemistry), B.M. Clemens (Stanford

Univ., USA), K. Zhu (NREL, USA), S. Uchida (Univ. Tokyo, Japan), T.H. Park (POSTECH, Korea), M.J. Ko (KIST, Korea).

The **5th SISF in 2015** was cancelled because of MERS (Middle East Respiratory Syndrome). For this reason, the **5th SISF** was held in next year 2016 with topics on perovskite solar cells and related topics. World-leading scientists gave invited talks, including M. Gratzel, A. Hagfeldt, P. Kamat, A. Zaban, F. de Angelis (CNR-ISTM, Italy), Y.-B. Cheng, S.I. Seok, S. Hayase, A.M. Rappe (Univ. Pennsylvania, USA), J.E. Spanier (Drexel Univ., USA), A. Wakamiya, Y. Yang (UCLA, USA), T. Sargent (Univ. Toronto, Canada), T. Miyasaka (Toin Univ., Japan), J. Bisquert, H. Segawa, S. Mhaisalkar, D. Cahen (Weizmann Institute of Science, Israel), CS Lee (City U, Hong Kong), S. Ito, H.S. Jung, E. Palomares (ICREA, Spain), S. Dai (North China Electric Power University, China), J. Huang (University of Nebraska-Lincoln, USA), A. Walsh (University of Bath, UK), A. Jen (University of Washington, USA), J.-K. Lee, J. van de Lagemmat. In 2017, perovskite solar cell achieved its efficiency over 22% surpassing the conventional inorganic photovoltaic technologies.

The **6th SISF** was organized and the invited speakers were arranged. However, the 6th SISF could not be held due to MERS (Middle East Respiratory Syndrome).

For the **7th SISF** (announced as 6th SISF) in 2017, opto-electronic properties of halide perovskite were discussed to extend its application from photovoltaics to light emitting diode, resistive memory etc. We invited M. Gratzel, T. Sargent, S.I. Seok (UNIST, Korea), Y. Yang, A. Hagfeldt (EPFL, Switzerland), P. Kamat, T. Miyasaka, N.-G. Park, T.-W. Lee (SNU, Korea), H. Han (HUST, China), F. de Angelis, H.W. Jang (SNU, Korea), S. Mhaisalkar, S. Ito, E. Palomares, S. Dai, A. Wakamiya, A. Jen, S. Uchida, J. van de Lagemmat, D. Mitzi (Duke University, USA), Y. Qi (OIST, Japan), J. Kim (MIT, USA), H. Segawa, J.S. Lee (POSTECH, Korea),H. Shin.

In the **8th SISF** (announced as 7th SISF) in 2018, we invited M. Grätzel, K. Lee ,A. Wakamiya, H.J. Bolink (University of Valencia, Spain), Y. Yang, J. Huang, M. Saliba, Kylie Catchpole, K. Zhu, H. Segawa, A. Hagfeldt, Y. Qi, L. Etgar, T. Miyasaka, D.S. Ginger, K.T. Nam, P. Kamat, S. Ito, I. Mora-Sero, S. Mhaisalkar, X. Zheng, L. Sun, J. Moon, S. Hayase, H. Han. After the SISF2018, efficiency of perovskite solar cell was announced to reach 23.3%.

In the **9th SISF** ((announced as 8th SISF) in 2019 (June 19-21), more physics on halide perovskite was discussed to better understand high efficiency perovskite photovoltaics and related issues. In addition, improved external quantum efficiency of perovskite LED was discussed in this forum. Before SISF2019, the record efficiency of 24.2% was announced, which was explained by our invited speaker Dr. Jangwon Seo from KRICT, Korea. Invited speakers were M. Grätzel, L. Herz, P. Kamat, A. Wakamiya, L. Etgar, J. Bisquert, T. Miyasaka, Y. Yan, A. Petrozza, H. Snaith, M. Kovalenko, T. Lee, J. Kim, N. Dean (Nature Energy Editor), A. Hagfeldt, M. D. McGehee, H. Segawa, M. Saliba, F. D. Angelis, Y. Qi, K. T. Nam, L. Sun, S. Hayase, H. Shin, S. Mhaisalkar, J. H. Park, and S. Ito.

In the **10th SISF** in 2020 (June 10-12), research direction of perovskite photovoltaics and opto-electronics for next 10 years will be discussed to achieve theoretical efficiency and realize commercialization. Invited speakers for SISF2020 are Michael Grätzel, Laura Herz, Prashant Kamat, Yanfa Yan, Annamaria Petrozza, Maksym Kovalenko, Anders Hagfeldt, Hiroshi Segawa, Michael Saliba, Filippo De Angelis, Licheng Sun, Subodh Mhaisalkar, Seigo Ito, Jangwon Seo, Kai Zhu, Henk J. Bolink, Ivan Mora-Sero, Jingbi You, Mansoo Choi, Aron Walsh, Nitin P. Padture, Mercouri Kanatzidis, Shengzhong (Frank) Liu, Sven Huettner, Pil J. Yoo, Duk-Young Jung, Jacky Even, Sohee Jeong, Lianzhou Wang, Gang Li.

Organizing Committee

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Venue

600th Anniversary Hall

Sungkyunkwan University, Humanities and Social Science Campus, Seoul, Korea (www.skku.edu)

✈Ways to Get From Incheon Airport to the Campus

From Incheon Int'l Airport

By subway

A. Take the Airport Railroad from Incheon Airport. There is a commuter line and express line. It will be better for you to take express line if you can.
B. Transfer to line 1 at the Seoul station. You should take the subway in the direction of City Hall station and Jonggak station, not Yongsan station and Singil station.
C. Transfer to line 4 at the Dongdaemun Station. Take the subway toward Hyehwa station.
D. Get off the train at Hyehwa station. Exit the station out of exit number 1 and walk straight. There will be university shuttle bus.
E. Take the shuttle bus you will be arrived in Seoul campus of Sungkyunkwan University.
Fares : 3,800KRW(subway) + 300KRW(shuttle bus) = 4100KRW
Time : 103 minutes
More information about subway in Seoul : http://www.seoulmetro.co.kr/

By bus

A. Walk to the bus stop in the Incheon Airport.
B. Buy ticket for, and take bus number 6011.
C. Get off the bus at the SungDae Ipgu. It may also say HyeHwa station, it is the same stop.
D. Walk to Sungkyunkwan University main gate or take a university shuttle bus from in front of Daiso.
Fair : 10,000KRW(bus) + 300KRW(shuttle bus)

List of Invited Speakers

I-1 (psc) Michael Grätzel (EPFL, Switzerland)

I-2 (psc) Prashant Kamat (Notre Dame Univ., USA)

I-3 (psc) Jangwon Seo (KRICT, Korea)

I-4 (psc) Annamaria Petrozza (IIT, Itlay)

I-5 (psc) Hiroshi Segawa (The University of Tokyo, Japan)

I-6 (psc and peled) Subodh Mhaisalkar (NTU, Singapore)

I-7 (psc) Shengzhong (Frank) Liu (CAS, China)

I-8 (psc) Jingbi You (Institute of Semiconductors, CAS, China)

I-9 (peled) Maksym Kovalenko (ETH, Switzerland)

I-10 (QD PV) Lianzhou Wang (U. Queensland, Australia)

I-11 (QD PV) Sohee Jeong (SKKU, Korea)

I-12 (physics psc) Laura Herz (Oxford University, UK)

I-13 (theory) Yanfa Yan (University of Toledo, Spain)

I-14 (psc) Mansoo Choi (SNU, Korea)

I-15 (theory) Aron Walsh (Imperial Colleage, UK)

I-16 (psc) Jacky Even (INSA Rennes, France)

I-17 (theory) Filippo De Angelis (CNR-ISTM, Italy)

I-18 (psc) Mercouri Kanatzidis (Northwestern University, USA)

I-19 (psc) Nitin P. Padture (Brown University, USA)

I-20 (htm psc) Licheng Sun (KTH Royal Institute of Technology, Sweden)

I-21 (psc) Michael Saliba (Darmstadt University, Germany)

I-22 (psc): Duk-Young Jung (SKKU, Korea)

I-23 (psc) Sven Huettner (Bayreuth University, Germany)

I-24 (carbide): Pil J. Yoo (SKKU, Korea)

I-25 (psc) Anders Hagfeldt (EPFL, Switzerland)

I-26 (psc) Kai Zhu (NREL, USA)

I-27 (psc) Henk J. Bolink (University of Valencia, Spain)

I-28 (psc) Seigo Ito (Hyogo Univ., Japan)

I-29 (eis) Ivan Mora-Sero (Universitat Jaume I, Spain)

I-30 (tandem) Gang Li (The Hong Kong Polytechnic University, Hong Kong, China)

Biography

Invited Speakers (I)

I-1. Michael Grätzel (EPFL, Switzerland)

Michael Gräetzel, Ph.D. is a Professor at the Ecole Polytechnique Fédérale de Lausanne where he directs the Laboratory of photonics and interfaces. He pioneered investigations of electron transfer reactions in mesoscopic systems and their application for electricity and fuel generation from sunlight. He invented the dye-sensitized solar cell (DSSC) that engendered perovskite photovoltaics one of the most exciting break-troughs in the history of photovoltaics. The DSSC is meanwhile commercially produced at the multi-Megawatt scale. His recent awards include the Global Energy Prize, Millenium Technology Prize, Balzan Prize, King Faisal International Science Prize, Einstein World Award of Science and 10 honorary doctor's degrees. He presented close to 100 named lectures and published some 1400 peer-reviewed articles that received over 200,000 citations (h-factor =210, by ISI-Web of Science) as well as several books. He serves on the editorial board of 12 peer-reviewed journals. He is an elected member (fellow) of the Royal Chemical Society, the German and Bulgarian Academies of Science and Royal Spanish Academy of Engineering.

I-2. Prashant Kamat (Notre Dame Univ., USA)

Prashant V. Kamat is a Rev. John A. Zahm, C.S.C., Professor of Science in the Department of Chemistry and Biochemistry and Radiation Laboratory at the University of Notre Dame. He is also a Concurrent Professor in the Department of Chemical and Biomolecular Engineering. He earned his doctoral degree (1979) in Physical Chemistry from the Bombay University, and postdoctoral research at Boston University (1979-1981) and University of Texas at Austin (1981-1983). He joined Notre Dame in 1983. Professor Kamat has for more than three decades worked to build bridges between physical chemistry and material science to develop advanced nanomaterials that promise cleaner and more efficient light energy conversion. He has published more than 450 scientific papers that have been well recognized by the scientific community (57000+ citations, h-index 125 –Source Web of Science). Thomson-Reuters has featured him as one of the most cited researchers in 2014, 2016 and 2017. He is currently serving as the Editor-in-Chief of ACS Energy Letters. He has also served as the deputy editor of the Journal of Physical Chemistry Letters. He is a member of the advisory board of several scientific journals (Chemical Reviews, Journal of Colloid & Interface Science, ACS Applied Nanomaterials, and Applied Electrochemistry). He was awarded Honda-Fujishima Lectureship award by the Japanese Photochemical Society in 2006, CRSI medal by the Chemical Research Society of India in 2011 and Langmuir lectureship award in 2013. He is a Fellow of the Electrochemical Society (ECS), American Chemical Society (ACS) American Association for the Advancement of Science (AAAS) and Pravasi Fellow of the Indian National Science Academy.

I-3. Jangwon Seo (KRICT, Korea)

Jangwon Seo is principal scientist at Division of Advanced Materials, Korea Research Institute of Chemical Technology (KRICT). He received his B.S., M.S. and Ph.D. from Seoul National University in 1998, 2000 and 2006, respectively. He worked at University at Buffalo, the State University of New York, from 2007 to 2012 as postdoctoral researchers. He works as senior/principal scientist of inorganic-organic hybrid solar cell team at KRICT since 2013. His research interest lies in synthesis of organic semiconducting materials/ polymers, and their optoelectronic applications. He has been doing researches on highly efficient and stable hybrid perovskite solar cells since 2013.

I-4. Annamaria Petrozza (IIT, Itlay)

Annamaria Petrozza was born in Matera (Italy) in 1979. She was awarded a Master of Science in Electronic Engineering (emphasis on Devices, design and modelling) at Ecole Supèrieure d'Electricité (Paris, France) in 2003 under the T.I.M.E. (Top Industrial Manager in Europe) program. In 2004 she got a Master degree in Electronic Engineering (emphasis on Optoelectronics) at Politecnico of Milan with a thesis carried out at the Cavendish Laboratory of the University of Cambridge (UK) on the optical characterisation of a class of organic semiconductors with a supramolecular architecture for Organic Light Emitting Diodes. The research work was under the supervision of Prof. C. Cacialli and Prof. C. Silva. In 2008 she received her PhD in Physics from the

University of Cambridge (UK) with a thesis on the study of optoelectronic processes at organic and hybrid semiconductors interfaces under the supervision of Dr. J.S. Kim and Prof Sir R.H. Friend. From July 2008 to December 2009 she worked as research scientist at the Sharp Laboratories of Europe, Ltd on the development of new market competitive solar cell technologies (Dye Sensitized Solar cells/Colloidal Quantum Dots Sensitized Solar cells). Her main tasks were to establish key needs of PV market, write research proposals to submit to the Sharp Business Group, and design and implement experiments. Since January 2010 she has a Team Leader position at the Center for Nano Science and Technology -IIT@POLIMI. She is in charge of the development of photovoltaic devices and their characterization by time-resolved and cw Photoinduced Absorption Spectroscopy, Time-resolved Photoluminescence and electrical measurements. Her research work mainly aims to shed light on interfacial optoelectronic mechanisms, which are fundamental for the optimization of operational processes, with the goal of improving device efficiency and stability.

I-5. Hiroshi Segawa (The University of Tokyo, Japan)

Hiroshi Segawa is professor of The University of Tokyo, Japan. He received his Ph.D. in Molecular Engineering from Graduate School of Engineering of Kyoto University in 1989 and was Research Associate (1989-1995) at the division of Molecular Engineering of Graduate School of Engineering at Kyoto University. In 1995 he joined the University of Tokyo as Associate Professor of Department of Chemistry at Graduate School of Arts and Sciences. From 1997 he has also been in charge of Department of Applied Chemistry at Graduate School of Engineering. In 2006 Professor Segawa joined Research Center for Advanced Science and Technology (RCAST), The University of Tokyo. From 2016, he was appointed a professor of Department of Multi-Disciplinary Sciences, Graduate School of Arts and Sciences, The University of Tokyo. His research group is focused on the molecular-based solar cells.

I-6. Subodh Mhaisalkar (NTU, Singapore)

Subodh Mhaisalkar is the Tan Chin Tuan Centennial Professor in the School of Materials Science & Engineering at the Nanyang Technological University (NTU), Singapore. Subodh is also the Associate Vice President Research (Strategy and Partnerships) and the Executive Director of the Energy Research Institute @ NTU (ERI@N), a pan-University multidisciplinary research institute for innovative energy solutions. Prior to joining NTU in 2001, Subodh has over 10 years of research and engineering experience in the microelectronics industry and his areas of expertise and research interests includes semiconductor technology, perovskite solar cells, printed electronics, and energy storage. Subodh received his Bachelors' degree from IIT-Bombay and his MS/Ph.D. degrees from The Ohio State University.

I-7. Shengzhong (Frank) Liu (CAS, China)

Professor Liu is currently active in Key Laboratory of Applied Surface and Colloid Chemistry, National Ministry of Education; Shaanxi Engineering Lab for Advanced Energy Technology, Shaanxi Normal University; and iChEM, Dalian Institute of Chemical Physics. He received his Ph. D. from Northwestern University, USA. His research focuses on perovskite solar cells and optoelectronic devices, single-crystalline perovskite materials and devices, photocatalyst and electrocatalyst materials. He has published more than 90 papers in peer-reviewed journals including Science, Nature and Nature Communications.

I-8. Jingbi You (Institute of Semiconductors, CAS, China)

Prof. Jingbi You got his PhD degree from Institute of Semiconductors, Chinese Academy of Sciences in 2010. And then he worked as postdoc in University of California, Los Angeles, USA. His work mainly in polymer tandem solar cells and perovskite solar cells. In 2015, he moved back to Institute of Semiconductors, Chinese Academy of Sciences as a full professor, and he was also enrolled as Thousand Youth Talents Plan Project in China in 2015. Now his research interests mainly in perovskite optoelectronic devices, including solar cells, light-emitting diodes. He has published over than 80 papers including 10 nature series papers. The total citation of his paper is over than 15000 times.

1-9. Maksym Kovalenko (ETH, Switzerland)

Maksym Kovalenko has been an associate professor (with tenure) of Functional Inorganic Materials since January 2017 and a Head of the Institute of Inorganic Chemistry at ETH Zurich since January 2018. He jointed ETH Zurich in summer 2011 as a tenure-track assistant professor. Previously, he had completed doctoral studies at the University of Linz, (Austria, 2004-2007) and postdoctoral training at the University of Chicago (USA, 2008-2011). The research activities of M. Kovalenko and his group focus on chemistry, physics and applications of inorganic solid-state materials and nanostructures. In particular, present research efforts concern: (i) the precision synthesis of highly luminescent semiconductor nanocrystals; (ii) nanocrystal surface chemistry; (iii) exploration of novel semiconductor materials by solution- and solid-state synthesis; (iv) novel semiconductors for hard radiation detection; (iv) novel materials and concepts for Li-ion and post-Li-ion rechargeable batteries. Many of these activities are strongly linked to industrial partners. Academic collaborations involve various groups ranging from first-principles theory of materials to applications in photovoltaics and thermoelectrics. He is also affiliated with Empa (Swiss Federal Laboratories for Materials Science and Technology). To date, Maksym Kovalenko has published ca. 200 scientific publications in international leading journals, co-authored 3 book chapters, and is listed as an inventor on 11 patents. He has been the recipient of highly prestigious awards including ERC Consolidator Grant (2018), ERC Starting Grant (2012), Ruzicka Preis (2013), and Werner Prize (2016). He also serves as an associate editor of the Chemistry of Materials.

I-10. Lianzhou Wang (U. Queensland, Australia)

Lianzhou Wang is Professor in the School of Chemical Engineering and Director of Nanomaterials Centre (Nanomac), the University of Queensland. He received his PhD degree from Shanghai Institute of Ceramics, Chinese Academy of Sciences in 1999. Before joining UQ in 2004, he has worked at two leading national research institutions (NIMS and AIST) of Japan as a research fellow for five years. Since joining UQ, he has worked/working as ARC Queen Elizabeth II Fellow (2006), Senior Lecturer (2007), Associate Professor (2010), and Professor (2012-) in School of Chemical Engineering and Nanomac, and Senior Group Leader of Australian Institute for Bioengineering and Nanotechnolgy, UQ. Professor Wang's research focuses on the synthesis, characterisation and application of semiconductor nanomaterials for use in renewable energy conversion/storage systems including photocatalysts for solar, hydrogen and valuable chemical production, rechargeable batteries and low cost solar cells. In late 2018, his team has broken the certified efficiency record of quantum dot solar cells which was recognised in the highly influential Best Research-Cell Efficiencies chart. In the last ten years' time, as a Chief Investigator, he has succeeded in winning 23 competitive ARC grants, two CSIRO Flagship Cluster projects, two CRC programs, and a number of industry funds. Prof. Wang has contributed 3 edited books, 12 edited book chapters, more than 330 journal publications (including top ranking journals such as Chem. Rev., Chem Soc. Rev., Angew. Chem., Adv. Mater., J. Am Chem. Soc., etc.), 12 patents and delivered over 100 plenary/keynote/invited presentations. He is serving as Associate Editor of Journal of Nanoparticles Research and Science Bulletin and is also on the Editorial Boards of other 3 international journals. He also won some prestigious Fellowships/awards including STA Fellowship of Japan, ARC QEII Fellowship, UQ Research Excellence Award of 2008, Scopus Young Researcher Award of 2011 (Engineering and Technology category), ARC Future Fellowship of 2012. He has served on the ARC College of Experts between 2016-18 and is the fellow of Royal Society of Chemistry

I-11. Sohee Jeong (SKKU, Korea)

Sohee Jeong is currently an Associate Professor in Department of Energy Science (DOES) at Sungkyunkwan University (SKKU). Her current research interest includes the synthesis of colloidal nanocrystals, microscopic understanding of the surface of colloidal nanocrystals, and design a surface chemistry of colloidal nanocrystals for efficient energy applications. Before joining SKKU, she was a Principle Researcher of Nanomechanical Systems Research Division at Korea Institute of Machinery and Materials (KIMM), Daejeon, as well as Professor in Department of Nanomechatronics at University of Science and Technology (UST), leading a Quantum Dot Research Team. She obtained B.S. and M.S. in Chemistry from KAIST. She obtained her PhD in Chemistry from University of Michigan in Ann Arbor, MI, USA. She joined Dr. Victor Klimov group in Los Alamos National Lab. (LANL), NM, USA while pursuing her doctorate studying surface related photophysical properties of nanocrystal quantum dots. After a postdoctoral research in synthesizing multishell quantum dots for lasing applications at LANL, she started her research career at KIMM located in Daejeon.

I-12. Laura Herz (Oxford University, UK)

Laura Herz is a Professor of Physics at the University of Oxford where she directs the Semiconductors Group at the Clarendon Laboratory. She received her PhD in Physics from the University of Cambridge in 2002 and was a Research Fellow at St John's College Cambridge from 2001 – 2003, after which she moved to a faculty position at Oxford Physics. Professor Herz has published more than 150 peer-reviewed research articles (20000 citations, h-index 55 – Google Scholar 2018) and is currently listed by Clarivate Analytics/Web of Science as a Highly Cited Researcher. Her research interests lie in the area of organic, inorganic and hybrid semiconductors, including aspects such as photophysical and nano-scale effects, self-assembly, charge-carrier dynamics, energy-transfer and light-harvesting for solar energy conversion. Recently, she was awarded the Nevill Mott Medal and Prize by the Institute of Physics and the Friedrich-Wilhelm-Bessel Award of the Alexander von Humboldt Foundation. She is an Associate Editor of Applied Physics Reviews (AIP) and a member of the editorial advisory board for ACS Energy Letters. Prof Herz is a Fellow of the Royal Society of Chemistry, the Institute of Physics, and University College Oxford.

I-13. Yanfa Yan (University of Toledo, Spain)

Yanfa Yan is a Professor and an Ohio Research Scholar Endowed Chair for Photovoltaics Innovation and Commercialization in the Department of Physics and Astronomy at the University of Toledo (UT). He earned MS and Ph D in Physics from Wuhan University. Previously, he was a Principal Scientist at the National Renewable Energy Laboratory (NREL), USA. His research interest includes (1) Theory of defect physics and electronic properties in semiconductors; (2) Materials synthesis and thin film solar cell fabrication; and Nanoscale characterization of thin film solar cell materials. His current research efforts include developing processes to fabricate high efficiency thin-film solar cells (CdTe and perovskite). He has received DOE/EERE Young Investigator and R&D 100 awards. He is a Fellow of the American Physical Society.

I-14. Mansoo Choi (SNU, Korea)

Mansoo Choi is currently a Professor of Mechanical and Aerospace Engineering of Seoul National University and a Director of the Global Frontier Center for Multiscale Energy Systems. The Global Frontier Center for Multiscale Energy Systems aims to develop novel renewable energy systems based on multiscale architectures that can compete with conventional fossil fuel based systems. He received his B.S. (1980) and M.S. (1982) from Seoul National University and Ph.D. (1987) from University of California, Berkeley, all from mechanical engineering. After working as an engineer at Argonne National Laboratory until 1991, he returned to Korea to join in Seoul National University as a faculty. His current research interests include aerosol synthesis & assembly of nanoparticles and nanoparticle based nanodevices. He has been a Co-Editor-in-Chief of Journal of Aerosol Science since 2004 and he is now serving as a Vice-President of International Aerosol Research Assembly. He invented IAAL (Ion-Assisted Aerosol Lithography) method which is a parallel process that can assemble nanoparticles in multiscales and multidimensions with nanoscale resolution at atmospheric condition.

I-15. Aron Walsh (Imperial Colleage, UK)

Aron Walsh is a Full Professor and Fellow of the RSC in the Department of Materials. He leads the Materials Design Group at Imperial College and holds an Underwood Distinguished Professorship at Yonsei University, Korea. Aron was awarded his PhD from Trinity College Dublin. He then worked for the US Department of Energy at the National Renewable Energy Laboratory (NREL), followed by a Marie Curie Fellowship hosted by University College London, and a Royal Society University Research Fellowship held at the University of Bath. His research involves cutting-edge materials theory and simulation applied to problems across solid-state chemistry and physics, including materials for solar cells and fuels, batteries, thermoelectrics, and solid-state lighting. He has an expertise in the theory of semiconductors and dielectrics, and is developing innovative solutions for materials data, informatics and design. His group published a review on machine learning for molecules and materials in Nature. In 2015, Aron was awarded the EU-40 prize from the European Materials Research Society and the Chemistry Society Reviews Emerging Investigator Lectureship for his work on the

theory of next-generation perovskite photovoltaics. In 2017, he was a recipient of the Philip Leverhulme Prize. In 2019, he received the Corday-Morgan Prize from the RSC for his breakthrough research on hybrid organic-inorganic solids. Aron features in the Highly Cited Researchers list. A full publication list can be found on Google Scholar.

I-16. Jacky Even (INSA Rennes, France)

1984-1988: ENS Cachan (now ENS Paris-Saclay): Physics
1987: Agrégation in Physics
1988: Master Degree in Liquid Physics
1989-1992: University Paris VI/ Rennes I, PhD Thesis
1992-1999: Associate Professor (University Rennes I)
1999: Habilitation Degree
1999-now: Professor, Institut National des sciences Appliquées (INSA) de Rennes
1999-now: Creation and head of FOTON-INSA simulation team
http://foton.cnrs.fr/v2016/spip.php?article124
2006-2009: Head of Materials Science and Nanotechnology Department, INSA Rennes
2010-2012: Director of Education, INSA Rennes
2018-: Senior Member of IUF (Institut Universitaire de France)
http://www.iufrance.fr/les-membres-de-liuf/membre/1913-jacky-even.html
2019: Highly Cited Researcher (Clarivate Analytics)

I-17. Filippo De Angelis (University of Perugia, Italy)

Filippo De Angelis is chair professor of inorganic chemstry at the University of Perugia and associate to the CNR Institute of Molecular Sciences and Technology, in Perugia, Italy. He is the founder and leader of the Computational Laboratory for Hybrid/Organic Photovoltaics. He earned a BS in Chemistry in 1996 and a PhD in Theoretical Inorganic Chemistry in 1999, both from the University of Perugia. He is an expert in the development and application of quantum mechanical methods to the study of hybrid/organic photovoltaics and materials for energy applications. He is Senior Editor of ACS Energy Letters. He is Fellow of the European Academy of Sciences and Highly cited researcher in 2018. He has published >300 papers with > 24000 citations.

I-18. Mercouri Kanatzidis (Northwestern University, USA)

Mercouri Kanatzidis was born in Thessaloniki, Greece in 1957. After obtaining a B. Sc from Aristotle University in Greece, he received his Ph D. in chemistry from the University of Iowa in 1984. He was a post-doctoral research associate at the University of Michigan and Northwestern University from 1985 to 1987 and is currently the the Charles E. and Emma H. Morrison Professor of Chemistry at Northwestern University. Mercouri moved to Northwestern in the fall of 2006 from Michigan State University where he was a University Distinguished Professor of Chemistry since 1987. Mercouri also holds an appointment at Argonne National Laboratory and is the editor in chief of the Journal of Solid State Chemistry

I-19. Nitin P. Padture (Brown University, USA)

Nitin P. Padture joined Brown University in January 2012 as Professor in the School of Engineering, and he served as Director of Brown's Center for Advanced Materials Research (CAMR) until December 2013. He was appointed Director of Brown's Institute for Molecular and Nanoscale Innovation (IMNI) in January 2014. Previously Padture was College of Engineering Distinguished Professor at the Ohio State University (OSU) in Columbus, and also the founding Director of the NSF-funded Materials Research Science and Engineering Center (MRSEC) at OSU. He received B.Tech. in Metallurgical Engineering from Indian Institute of Technology, Bombay (1985), M.S. in Ceramic Engineering from Alfred University (1987), and Ph.D. in Materials Science & Engineering from Lehigh University (1991). Padture was a postdoctoral fellow at NIST (Gaithersburg, MD) for about 3 years, before joining the University of Connecticut (UConn, Storrs) faculty in January 1995 as Assistant Professor. He became Associate Professor in 1998 and Professor in 2003. Padture served as Interim Department Head at UConn for one year before moving to OSU in January 2005. Padture's research and teaching interests are in advanced ceramics and nanomaterials. His research has been funded by NSF, ONR, DoE, AFOSR, DARPA, Government of Spain, State of Ohio, and industry. Padture has published over 130 refereed-journal papers.

I-20. Licheng Sun (KTH Royal Institute of Technology, Sweden)

Prof. **Licheng Sun** received his PhD degree in 1990 from Dalian University of Technology (DUT), and went to Germany as a postdoc at Max-Planck-Institut für Strahlenchemie with Dr. Helmut Görner (1992-1993), and then as an Alexander von Humboldt postdoc at Freie Universität Berlin (1993-1995) with Prof. Dr. Harry Kurreck. He moved to KTH, Stockholm in 1995 as a postdoc with Prof. Björn Åkermark, became assistant professor in 1997 at KTH, associate professor in 1999 at Stockholm University and full professor in 2004 at KTH. He is presently also a distinguished professor at DUT, and director of DUT-KTH Joint Education and Research Center on Molecular Devices. His research interests cover artificial photosynthesis (solar fuels), dye sensitized solar cells, perovskite solar cells. He has made outstanding contribution to the design and synthesis of molecular catalysts for water oxidation and deep insight studies on the reaction mechanisms of O-O bond formation. Prof. Sun has published more than 500 peer reviewed papers in well-known international scientific journals including *Science*, *Nature Chemistry*, *Nature Communications*, *Advanced Materials, Angew. Chem. Int. Ed., J. Am. Chem. Soc.* and *Energy Environmental Sci*., with total number of citations >30 000, and H-index of 83 (*Web of Science*). He serves as editorial board chairman of *ChemSusChem*, associate editor of *J. Energy Chemistry*. He is the recipient of Ulla och Stig Holmquist Prize in Organic Chemistry 2013, Arrhenius Medal 2014, Smart Energy Technology Award 2016 from International Association of Advanced Materials, and Wallmark Prize 2016 from the Royal Swedish Academy of Sciences, elected as Member (No. 1775) of the Royal Swedish Academy of Engineering Sciences (IVA) 2017, Thomson Reuters Highly Cited Researcher 2014 and 2017.

I-21. Michael Saliba (Darmstadt University, Germany)

Michael Saliba is a group leader at the Adolphe Merkle Institute in Fribourg, Switzerland. From 2015-2017, he was a Marie Curie Fellow at EPFL (with a research visit at Stanford University). He studied mathematics and physics at Stuttgart University (BSc) as well as physics at the Max Planck Institute for Solid State Research (MSc, simulation methods for plasmonic oligomers). He completed his PhD at Oxford University in 2014 (with a research visit at Cornell University) working on crystallisation behaviour and plasmonic nanostructures in perovskites. He has an h-index of 34 and published over 80 works in the fields of plasmonics, lasers, LEDs, and perovskite solar cells. In 2016, he was awarded the *Young Scientist Award* of the German University Association. In 2017, he was awarded the *Science Award of the Fraunhofer UMSICHT* institute, the *René Wasserman Award of EPFL*, and the *Postdoctoral Award of the Materials Research Society (MRS)*. He was also named as one of the *World's 35 Innovators Under 35* by the MIT Technology Review for his pioneering discoveries in the field of perovskite solar cells and optoelectronics. In 2018, he was selected as a Member of the Global Young Academy and the Young Academy of Germany.

I-22. Duk-Young Jung (SKKU, Korea)

Duk-Young Jung is Professor of Chemistry and the Sungkyun Advanced Institute of NanoTechnology (SAINT) at Sungkyunkwan University (SKKU). He obtained B.S. and M.S. in chemistry from Seoul National University, Korea in 1987 and 1989. He studied unusual high oxidation state of iridium in the perovskite oxide, in the high-pressure group of the Institut de Chimie de la Matière Condensée de Bordeaux (ICMCB-CNRS) and received Ph.D. in solid state chemistry from University of Bordeaux I, France in 1995. He was a post-doctoral research associate in the materials chemistry group of Beckman Institute at the University of Illinois at Urbana-Champaign, working on the perovskite oxides. He joined to the Department of Chemistry of SKKU in 1998 and his main interests are syntheses and physico-chemical study of metal oxides (layered double hydroxides) and chalcogenides (transition metal sulfides including CIGS solar cells), especially concerning on the crystal structures and stoichiometry in single crystals, thin films and polycrystallines. He is currently working on the chemical nature and optical properties of cesium lead bromide compounds.

I-23. Sven Huettner (Bayreuth University, Germany)

Sven Huettner currently works at the Department of Chemistry, University of Bayreuth. Sven does research in Nanotechnology, Materials Chemistry and Physical Chemistry. A major focus of interest are structure-function relations of organic and hybrid (organic-inorganic) materials that are used for energy applications, mainly solar cells and also further related applications such as sensors and energy storage applications which can tremendously benefit from functional nanostructured materials. In our latest research we look into the ionic migration in organo metal lead halide perovskite based solar cells.

I-24. Pil J. Yoo (SKKU, Korea)

Pil Jin Yoo is the professor of School of Chemical Engineering and SKKU Advanced Institute of Nanotechnology (SAINT) at the Sungkyunkwan University (SKKU) of Korea. He received his BS (1998), MS (2000) and PhD (2004) in the department of chemical engineering from the Seoul National University of Korea. He has also worked as a postdoctoral associate in the department of chemical engineering of the Massachusetts Institute of Technology (MIT), then he joined as the faculty of the School of Chemical Engineering of SKKU in 2007. He has published more than 140 SCI papers and his research works have been cited more than 7,500 times and his H-index is 38. He is serving as the provost of industrial-cooperation affairs of SKKU and in charge of technology transfer to industrial partners. He also serves an associate editor of 'Korean Journal of Chemical Engineering (ISSN: 0256-1115)' and 'NANO (ISSN: 1793-2920)'. Currently, his research expertise includes interfacial manipulation of functionalized thin films using multiscale architecturing methods and organic/inorganic hybridization for next-generation energy device and environmental applications.

I-25. Anders Hagfeldt (EPFL, Switzerland)

Anders Hagfeldt is Professor in Physical Chemistry at EPFL, Switzerland. He obtained his Ph.D. at Uppsala University in 1993 and was a post-doc with Prof. Michael Grätzel (1993-1994) at EPFL, Switzerland. His research focuses on the fields of dye-sensitized solar cells, perovskite solar cells and solar fuels. From web of science January 2019, he has published more than 480 scientific papers that have received over 54,000 citations (with an h-index of 114). He was ranked number 46 on a list of the top 100 material scientists of the past decade by Times Higher Education. In 2014-2018 he was on the list of Thomson Reuter's Highly Cited Researchers. He is a member of the European Academy of Sciences, Royal Swedish Academy of Sciences, Stockholm, Royal Society of Sciences in Uppsala, and the Royal Swedish Academy of Engineering Sciences in Stockholm.

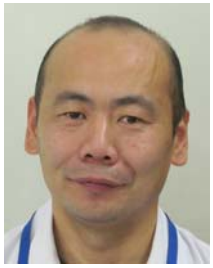
I-26. Kai Zhu (NREL, USA)

Kai Zhu is currently a senior scientist in the Chemistry and Nanoscience Center at the National Renewable Energy Laboratory (NREL). He received his PhD degree in physics from Syracuse University in 2003, where he studied the electrical & optical properties and device physics of solar cells based on amorphous-silicon thin films and dye-sensitized mesoporous TiO_2 films. He then spent about one year at Kansas State University as a postdoctoral researcher, working on III-Nitride wide-bandgap semiconductors for high-power blue and UV light emitting diodes. In 2004, he joined NREL as a postdoctoral researcher, working on fundamental charge carrier transport and recombination in photoelectrochemical cells, especially dye-sensitized solar cells. Since 2007, he has worked as a staff scientist at NREL. Dr. Kai Zhu's current research interests are focused on both basic and applied research on perovskite solar cells, including perovskite material development, device fabrication and characterization, and basic understanding of charge carrier dynamics in these cells. In addition to solar cell applications, his research interests have also included hydrogen production via photoelectrochemical cells as well as nanostructured electrodes for Li-ion batteries and supercapacitors.

I-27. Henk J. Bolink (University of Valencia, Spain)

Hendrik (Henk) Bolink is a research professor and group leader at the Instituto de Ciencia Molecular of the University of Valencia. He received his B.S., M.S. and Ph.D. from University of Groningen, The Netherlands in 1991, 1993 and 1997, respectively. He worked at DSM from 1997 to 2001 as a materials scientist and project manager in the central research and new business development department, respectively. In 2001 he joined Philips, to lead the materials development activity of Philips´s PolyLED project. In 2003 he moved to Valencia to start a new research group on molecular opto-electronic devices. Since 2016 he is visiting associate professor at Nanyang Technological University (Singapore). He has been doing research on solution processed organic light-emitting diodes in particular those employing ionic transition metal complexes that are referred to as light-emitting electrochemical cells. Since 2013 he has been working on perovskite based photovoltaic and light-emitting devices, focusing on thin film architectures prepared using vacuum based processing methods. He received awards, including Premio a la Excelencia Investigadora (Award for excellent research) from the Royal Spanish society of Chemistry in 2016 and Premio a la Investigación y Desarrollo (Research and development award) received from the Social Board of the Universitat de València in 2011.

I-28. Seigo Ito (Hyogo Univ., Japan)



Seigo Ito received his Ph.D. from the University of Tokyo (Japan) at 2000, with a thesis that was the first to discuss Grätzel-type dye-sensitized solar cells in Japan. He worked in the Laboratory of Professor Shozo Yanagida (Osaka University, Japan) for two years, and in the Laboratory of Professor Michael Grätzel, at the Swiss federal Institute of Technology (EPFL) in Lausanne as a postdoctoral scientist for over three years, where his efforts focused on the progress of high-efficiency dye-sensitized solar cells. He is currently professor at University of Hyogo from 2007, making new printable cost-effective solar cells, including non-vacuum-processed silicon solar cells and perovskite solar cells.

I-29. Ivan Mora-Sero (Universitat Jaume I, Spain)

Iván Mora-Seró is researcher at Universitat Jaume I (UJI) de Castelló (Spain). His research during the Ph.D. was centered on crystal growth of thin film semiconductors. At 2006 he started his own research line on quantum dot sensitized solar cells. Currently he is leading the Group of Advanced Semiconductors (GAS) at Institute of Advanced Materials (INAM) of UJI. He had been granted with a fellowship at Weizmann Institute, Israel (2016). His research has been focused on crystal growth, nanostructured devices, transport and recombination properties, photocatalysis, electrical characterization of photovoltaic, electrochromic, and water splitting systems, making both experimental and theoretical work. Recent research activity is focused on new concepts for photovoltaic conversion and light emission (LEDs and light amplifiers) based on nanoscaled devices and semiconductor materials following two mean lines: semiconductor quantum dots and lead halide perovskites, been this last line probably the current hottest topic in the development of new optoelectronic devices. He is included in the 2016 and 2017 list of Highly Cited Researchers of the Web of Science.

I-30. Gang Li (The Hong Kong Polytechnic University, Hong Kong, China)

Dr Li Gang obtained his BS degree in Space Physics from Wuhan University (1994), followed by M.S. and PhD in Electrical Engineering and Condensed Matter Physics from Iowa State University, U.S.A. (2003), respectively. His postdoctoral research in University of California Los Angeles (UCLA) from 2004 to 2007 was on polymer solar cells and LEDs, under Prof. Yang Yang, Dept. of materials Science and technology.From 2007 to 2011, he was the founding technical member who oversaw the printable polymer solar cell R&D in Los Angeles based Solarmer Energy Inc., during which several world records were achieved. Dr Li has a good mix of academic and industrial experience. He was a Research Professor in UCLA from 2011 to 2016, focusing on interface engineering and tandem polymer solar cell research. He joins the EIE Department of Hong Kong PolyU in August 2016. He has published ~100 peer reviewed papers on Science, Nature Materials, Nature Photonics, Chem. Reviews, Nature Reviews Materials, JACS, Advanced Materials, Physical Reviews B etc. The papers have been cited ~50,000 times according to Google Scholar. Dr. Li is on the list of Thomson Reuter/ Clarivate Analytics Highly Cited Researchers in Materials Science (2014 - 2017) and Physics (2017), with a H-index of 63

SISF 2020 Program Table

	Time	June 10 (Wed)	June 11 (Thu)	June 12 (Fri)
Morning	8:30 - 9:00	Registration	Registration	Registration
	9:00 - 9:30		Maksym Kovalenko	Mercouri Kanatzidis
	9:30 - 10:00		Lianzhou Wang	Nitin P. Padture
	10:00 - 10:30		Sohee Jeong	Licheng Sun
	10:30 - 11:00		Coffee Break	Coffee Break
	11:00 - 11:30		Laura Herz	Michael Saliba
	11:30 - 12:00		Yanfa Yan	Duk-Young Jung
Lunch	12:00 - 13:00		Lunch	Lunch
Afternoon	13:00 - 13:30	***Opening Remark***	Mansoo Choi	Sven Huettner
	13:30 - 14:00	Michael Grätzel	Aron Walsh	Pil J. Yoo
	14:00 - 14:30	Prashant Kamat	Jacky Even	Anders Hagfeldt
	14:30 - 15:00	Jangwon Seo	Filippo De Angelis	Kai Zhu
	15:00 - 15:30	Coffee Break	Excursion	Coffee Break
	15:30 - 16:00	Annamaria Petrozza		Henk J. Bolink
	16:00 - 16:30	Hiroshi Segawa		Seigo Ito
	16:30 - 17:00	Subodh Mhaisalkar		Ivan Mora-Sero
	17:00 - 17:30	Shengzhong Liu		Gang Li
	17:30 - 18:00	Jingbi You		***Closing Remark***

All Invited Speakers: 30 min (or 25 min) including discussion
(25 min talk and 5 min discussion or 22 min talk and 3 min discussion)

Program

June 10 (Wed): Day 1

13:00-13:30 *Opening Remark*

13:30-15:00 Presider: Sohee Jeong

13:30-14:00 (I-1) Michael Grätzel
Title:

14:00-14:30 (I-2) Prashant Kamat
Title :

14:30-15:00 (I-3) Jangwon Seo
Title:

15:00-15:30 *Coffee Break*

15:30-17:30 Presider: Prashant Kamat

15:30-16:00 (I-4) Annamaria Petrozza
Title:

16:00-16:30 (I-5) Hiroshi Segawa
Title:

16:30-17:00 (I-6) Subodh Mhaisalkar
Title:

17:00-17:30 (I-7) Shengzhong Liu
Title:

17:30-18:00 (I-8) Jingbi You
Title:

June 11 (Thu): Day 2

09:00-10:30 Presider: Pil J Yoo

09:00-09:30 (I-9) Maksym Kovalenko
Title:

09:30-10:00 (I-10) Lianzhou Wang
Title:

10:00-10:30 (I-11) Sohee Jeong
Title:

10:30-11:00 *Coffee Break*

11:00-12:00 Presider: Lianzhou Wang

11:00-11:30 (I-12) Laura Herz
Title:

11:30-12:00 (I-13) Yanfa Yan
Title:

12:00-13:00 *Lunch (Lunch Box)*

13:00-14:30 Presider: Seigo Ito

13:00-13:30 (I-14) Mansoo Choi
Title:
13:30-14:00 (I-15) Aron Walsh
Title:
14:00-14:30 (I-16) Jacky Even
Title:
14:30-15:00 (I-17) Filippo De Angelis
Title:

15:00-18:00 Excursion

June 12 (Fri): Day 3

09:00-10:30 Presider: Yanfa Yan
09:00-09:30 (I-18) Mercouri Kanatzidis
Title:
09:30-10:00 (I-19) Nitin P. Padture
Title:
10:00-10:30 (I-20) Licheng Sun
Title:

10:30-11:00 *Coffee Break*

11:00-12:00 Presider: Jong Hyeok Park
11:00-11:30 (I-21) Michael Saliba
Title:
11:30-12:00 (I-22) Duk-Young Jung
Title:

12:00-13:00 *Lunch (Lunch Box)*

13:00-15:00 Presider: Aron Walsh
13:00-13:30 (I-23) Sven Huettner
Title:
13:30-14:00 (I-24) Pil J. Yoo
Title:
14:00-14:30 (I-25) Anders Hagfeldt
Title:
14:30-15:00 (I-26) Kai Zhu
Title:

15:00-15:30 *Coffee Break*

15:30-16:50 Presider : Hyunjung Shin
15:30-16:00 (I-27) Henk J. Bolink
Title:
16:00-16:30 (I-28) Seigo Ito
Title:
16:30-17:00 (I-29) Ivan Mora-Sero
Title:

17:00-17:30 (I-30) Gang Li
Title:

17:30-18:00 (Nam-Gyu Park) *Closing Remark*