SISF 2016

(www.skku-solar.org)

Multiscale Perovskite Solar Cells and Related Topics

600th Anniversary Hall

Sungkyunkwan University, Seoul, Korea

May 25 (Wed)-27(Fri), 2016

The 5th Sungkyun International Solar Forum

Organized by

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

Sponsored by

- The Korean Electrochemical Society
- Korea Photovoltaic Society
- Green Solar Inks Research Center, Yonsei University

멀티스케일 에너지 시스템 연구단
Global Frontier Center for Multiscale Energy Systems

Green Solar Inks Research Center

Welcome to SISF 2016

It is our great pleasure to host the **5th Sungkyun International Solar Forum (SISF)** that is held at 600th Anniversary Hall, Sungkyunkwan University, Seoul, Korea, **from May 25 (Wed) to May 27 (Fri)**, 2016. On behalf of the organizing committee, we are very pleased and honored to welcome all the participants to SISF2016.

We have successfully organized last four SISF2011 - SISF2014. At the first SISF, we discussed on next generation photovoltaic technologies. We stepped forward at SISF2016 to focus on perovskite solar cell and related topics. For SISF2016, we invite scientists at cutting edge of multiscale perovskite solar cells and related nanostructures and fundamentals.

Organizing Committee

Chairs

Nam-Gyu Park (School Chem. Eng., SKKU, Korea)
JiBeom Yoo (School Adv. Mater. Sci., SKKU, Korea)
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Min Jae Ko (KIST, Korea)

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Jae-Do Nam (Dept. Polymer Sci. Eng., SKKU, Korea)

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)

Lodging: Centermark Hotel (종로구 인사동 센터마크 호텔)

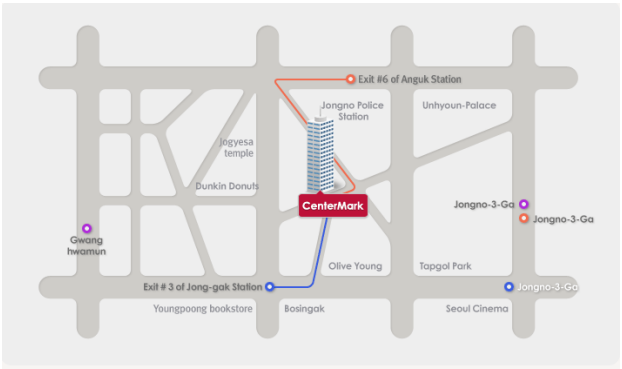
Website : (http://www.centermarkhotel.com/eng/)

Address: 38, Insadong 5-gil, Jongno-gu, Seoul, 110290 South Korea

Tel: +82-2-731-10002

Center Mark Hotel is located at the center of Insa-Dong at Jongno-gu, the very center of Seoul with vigorous activities of culture and business, from which it takes less than 10 minutes to walk to the famous attractions such as Gyoungbok Palace, Changgyoung Palace, Samcheong Dong and major shopping area of Myoung-dong.
The hotel has the easy access to subway lines 1, 3 and 5 and from the hotel it takes one hour to get to Incheon International Airport by car.

How to access



198-42 Gwanhun-Dong, Jongno-Gu Seoul
(New Address: 38 Street-5 Insa-Dong Jongno-Gu Seoul)

From Incheon Int'l Airport

Buses

A. #6005-Get on the Limousine Bus #6005 at 5B/12A(arrival floor at Incheon International Airport and get off at CenterMark & Aventree Hotel Station), first floor and get off at Insa-Dong takes about 80 minutes (60km) / Fare: 15,000KRW.
B. #6011- Get on the Limousine Bus #6011 at 5B/12A, first floor get off at Ankuk-Dong.
C. #6002 – Get on the Limousine Bus #6002 at 5B/12A, first floor and get off at Jonggak Station(Jongno-1-Ga) takes about 80 minutes (60km)/ Fare: 10,000 KRW.
* Due to traffic condition, schedule can be changed without prior notice.

Subway

Incheon International Airport – Get off at Seoul Station – Change to Subway line no. 1- Get off at Jonggak Station – Exit no. 3 / takes about 70 minutes(60km) / Fare: 3,850 KRW.

List of Invited Speakers

(Pleneary Speaker)

PS1. Michael Gratzel (EPFL, Switzerland): michael.graetzel@epfl.ch

PS2. Mansoo Choi (SNU, Korea): mchoi@snu.ac.kr

(Invited Speakers)

I-1. Tom Miyasaka (Toin Univ., Japan): miyasaka@toin.ac.jp

I-2. Ted Sargent (U Toronto, Canada) ted.sargent@utoronto.ca

I-3. Arie Zaban (Bar Ilan University, Israel): zabana@mail.biu.ac.il

I-4. Filippo de angelis (CNR-ISTM, Italy): filippo@thch.unipg.it

I-5. Yi-Bing Cheng (Monash Univ., Australia): yibing.cheng@eng.monash.edu.au

I-6. Sang Il Seok (UNIST, Korea): seoksi@unist.ac.kr

I-7. Subodh Mhaisalkar (NTU, Singapore) : subodh@ntu.edu.sg

I-8. Andrew M. Rappe (University of Pennsylvania, USA): rappe@sas.upenn.edu

I-9. Jonathan E. Spanier (Drexel University, USA): spanier@drexel.edu

I-10. Yang Yang (UCLA, USA): uclayy@icloud.com (yangy@ucla.edu)

I-11. Atsushi Wakamiya (Kyoto Univ., Japan) wakamiya@scl.kyoto-u.ac.jp

I-12. Parashant Kamat (Notre Dame Univ., USA): pkamat@nd.edu

I-13. Anders Hagfeldt (EPFL, Switzerland): anders.hagfeldt@epfl.ch

I-14. Juan Bisquert (Universitat Jaume I, Spain): bisquert@fca.uji.es

I-15. Hiroshi Segawa (The University of Tokyo, Japan): csegawa@mail.ecc.u-tokyo.ac.jp

I-16. Shuzi Hayase (KIT, Japan) hayase@life.kyutech.ac.jp

I-17. David Cahen (Weizmann Institute of Sceince, Israel): David.Cahen@weizmann.ac.il

I-18. Chun-Sing Lee (City U, Hong Kong) apcslee@cityu.edu.hk

I-19. Seigo Ito (Hyogo Univ., Japan): itou@eng.u-hyogo.ac.jp

I-20. Hyun Suk Jung (SKKU, Korea): hsjung1@skku.edu

I-21. Songyuan Dai (North China Electric Power University, China) sydai@ipp.ac.cn

I-22. Jinsong Huang (University of Nebraska-Lincoln, USA): jhuang2@unl.edu

I-23. Aron Walsh (University of Bath, UK): A.Walsh@bath.ac.uk

I-24. Alex Jen (University of Washington, USA): ajen@u.washington.edu

I-25. Jung-Kun Lee (Univ. Pittsburgh, USA): jul37@pitt.edu

I-26. Jao van de Lagemmat (NREL, USA): jao.vandelagemaat@nrel.gov

Biography

Plenary Speaker (PS)

PS-1. Michael Gratzel (EPFL, Switzerland): michael.graetzel@epfl.ch

Professor at the Ecole Polytechnique de Lausanne, **Michael Graetzel** directs there the Laboratory of Photonics and Interfaces. He pioneered the use of mesoscopic materials in energy conversion systems, in particular photovoltaic cells, lithium ion batteries and photo-electrochemical devices for the splitting of water into hydrogen and oxygen by sunlight. He discovered a new type of solar cell based on dye sensitized nanocrystalline oxide films. Mass production has started in October 2009. Author of over 900 publications, two books and inventor of more than 50 patents, his work has been cited over 88'000 times (h-index 138) making him one of the 10 most highly cited chemists in the world.

PS-2. Mansoo Choi (Seoul National Univ., Korea): mchoi@snu.ac.kr

Mansoo Choi received his B.S. (1980) and M.S. (1982) from Seoul National University and Ph.D. (1987) from University of California, Berkeley. After Ph.D., he moved to Chicago to work as an assistant mechanical engineer at Argonne National Laboratory from 1988 to 1991. In 1991, he returned home country, Korea to join in ME department of Seoul National University as an assistant professor and he is now a Professor of School of Mechanical and Aerospace Engineering. He was a Director of National CRI Center for Nano Particle Control from 1997 to 2011. In 2011, he became a Director of Global Frontier Center for Multiscale Energy Systems that the Ministry of Science, ICT & Future Planning is going to support up to 2020. He has been serving as a Co- Editor-in-Chief of the Journal of Aerosol Science since 2004. His current research interests include aerosol synthesis and assembly of nanoparticles and their applications to solar and fuel cell.

Invited Speakers

I-1. Tom Miyasaka (Toin Univ., Japan): miyasaka@toin.ac.jp

Tsutomu(Tom) Miyasaka received his Doctor of Engineering from The University of Tokyo in 1981, and joined Fuji Photo Film, Co., conducting R&Ds on high sensitivity photographic materials, lithium-ion secondary batteries, and design of an artificial photoreceptor, all of which relate to electrochemistry and photochemistry. In 2001, he moved to Toin University of Yokohama (TUY), Japan, Graduate School of Engineering, to continue photoelectrochemistry. In 2006 to 2009 he was the dean of the Graduate School. In 2005 to 2010 he served as a guest professor at The University of Tokyo. Main topic of his research has been development of solution-printable and lightweight flexible photovoltaic (PV) cells. Since the discovery of the organic inorganic perovskite as PV material in 2006, his research has focused on the lead halide perovskite PV cells. In 2004 he has established a TUY-based company, Peccell Technologies, in charge of CEO. In 2009 he was awarded a Ministry of Science & Education prize on his achievements of green sustainable solar cell technology. He is directing R&D teams of national research programs, NEDO and JST, on dye-sensitized and perovskite solar cells.

I-2. Ted Sargent (U Toronto, Canada) ted.sargent@utoronto.ca

Edward (Ted) H. Sargent holds the Canada Research Chair in Nanotechnology at the University of Toronto, where he also serves as Vice Dean for Research for the Faculty of Applied Science and Engineering. He is Fellow of the Royal Society of Canada, Fellow of the AAAS "...for distinguished contributions to the development of solar cells and light sensors based on solution-processed semiconductors," Fellow of the Canadian Academy of Engineering, and Fellow of the IEEE "... for contributions to colloidal quantum dot optoelectronic devices." He is is founder and CTO of InVisage Technologies of Menlo Park, CA; and is a co-founder of Xagenic Inc. His publications have been cited more than 12,000 times.

I-3. Arie Zaban (Bar Ilan University, Israel): zabana@mail.biu.ac.il

Prof. Arie Zaban earned a B.Sc. in Chemistry (summa cum laude) and a Ph.D. in Electrochemistry (with highest distinction) at Bar-Ilan University (1987-1995). After a 2 year postdoctoral stint at the US National Renewable Energy Laboratory, he was appointed to the senior faculty at Bar-Ilan (1998), where he is currently a Full Professor of Chemistry and Director of the Bar-Ilan Institute for Nanotechnology and Advanced Materials. Prof. Zaban has published over 150 papers in refereed journals, 4 book chapters, 70 invited lectures and 11 patents. He is the entrepreneur of four start-up companies that utilize 8 of his patents. Prof. Zaban has been awarded several prizes and fellowships including the Israel Chemical Society Prize for Outstanding Young Scientist, the Rothschild Fellowship, the Michael Landau Research Prize in Renewable Energy and the IVS Research Excellence Prize.

I-4. Filippo de angelis (CNR-ISTM, Italy): filippo@thch.unipg.it

Filippo De Angelis is the founder and leader of the Computational Laboratory for Hybrid/Organic Photovoltaics, www.clhyo.org. He is the deputy director of CNR Molecular Science and Technologies (CNR-ISTM) in Perugia, Italy. He is an expert in the development and application of first principles computational methods to the simulation of inorganic and hybrid materials and related interfaces. His main results are in the field of solar energy materials, with focus on dye-sensitized and perovskite solar cells. He holds four patents and has published more than 250 papers, with an h-index of 57, and 5 book chapters. He is member of the Editorial Advisory Board of Journal of Physical Chemistry, and CNR delegate at CECAM. He is the 2007 recipient of the Nasini Gold Medal of the Italian Chemical Society.

I-5. Yi-Bing Cheng (Monash Univ., Australia): yibing.cheng@eng.monash.edu.au

Yi-Bing Cheng is a professor in Department of Materials Engineering, Monash University, Australia and an elected Fellow of the Australian Academy of Technological Sciences and Engineering. He completed his undergraduate (1978) and Master (1983) studies at Wuhan University of Technology, China and received a PhD degree from University of Newcastle-upon-Tyne, U.K. in 1989. He joined Monash University in 1991 after three years of postdoctoral research in the U.K. and worked through as a Lecturer, Senior Lecturer, Reader and Professor at Monash University. He specialises in inorganic materials and composites. He has worked in a number of research areas covering glass, glass-ceramics, structural ceramics, ultra high temperature ceramics and ceramic-polymer composites. His recent work on dye sensitised solar cells has been focused on the processing of flexible solar cell devices by printing techniques, which has received significant grants from the Australian government and industry. His work has received a number of awards in Australia and overseas. He has published over 360 papers and 17 patents, and has an h-index of 31. He has been a Thousand Talent Professor at Huazhong University of Science and Technology, China since 2010, where he is Director of the Michael Grätzel Center for Mesoscopic Solar Cells in the Wuhan National Laboratory for Optoelectronics.

I-6. Sang Il Seok (UNIST/KRICT, Korea): seoksi@unsit.ac.kr

Sang Il Seok is currently a Distinguished Professor at the School of Energy and Chemical Engineering, Ulsan National Institute of Science and Technology (UNIST), Korea. He also holds a dual appointment as an adjunct professor at the Korea Research Institute of Chemical Technology (KRICT), Korea. He is directing Global Research Laboratory, funded through the National Research Foundation of Korea under the Ministry of Science, ICT & Future, Korea. He obtained his PhD degree at Department of Inorganic Materials Engineering of Seoul National University, Korea, in 1995. From 1996 to 1997, he experienced a post-doc to investigate defects and transport in Fe-Ti-O Spinel structure in Cornell University, USA, and visiting scholar in University of Surrey, UK, in 2003, and École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, in 2006 respectively. His major research interests were inorganic/organic hybrid materials through sol-gel process for optical amplifier, high dielectrics, corrosion-resistance coatings etc. Since 2006, his research focus is based on the integration of mesoporous architecture/semiconductor nanocrystals (including quantum dots)/polymeric hole conductors for high-performance inorganic-organic hybrid photovoltaics such as photodetectors and solar cells, and novel materials for them. He published around 150 peer-reviewed papers including Nature, Science etc. with several awards for his Excellency.

I-7. Subodh Mhaisalkar (NTC, Singapore) : subodh@ntu.edu.sg

Subodh Mhaisalkar is a Professor in the School of Materials Science & Engineering at the Nanyang Technological University, Singapore. At NTU, he also holds the post of Executive-Director, Energy Research Institute at NTU (ERI@N). Prof Subodh's main areas of research comprise printed electronics, sensors, photovoltaics, and supercapacitors and batteries. Common to all these projects are methods of solution processing of semiconductors (organic, carbon nanotubes, or inorganic nanowires), fundamental device physics studies, and device integration. For his work in Organic Thin Film Transistors, Subodh and his team recently won the IEEE 2008 George E. Smith Award. Subodh is also the recipient of Ohio State University's Professional Achievement Award 2012 and also the Nanyang Award for Innovation and Entrepreneurship in 2012. Major research projects include Competitive Research Program Funding from the National Research Foundation on "Nanonets: New Materials & Devices for Integrated Energy Harnessing & Storage," Polymer & Molecular Electronics with A*STAR, and a DARPA funded program on printed charge storage devices. Prof Subodh has graduated 21 Masters and PhD students and is currently supervising a group of 11 PhD students and research fellows. Subodh received his Bachelors' degree from IITBombay and his MS/Ph.D. degrees from The Ohio State University.

I-8. Andrew M. Rappe (University of Pennsylvania, USA): rappe@sas.upenn.edu

1986 B.A. Chemistry and Physics, Summa Cum Laude, Harvard University
1986-1989 ONR Graduate Fellow, Massachusetts Institute of Technology
1990-1992 JSEP Graduate Fellow, Massachusetts Institute of Technology
1992 Ph. D. Physics and Chemistry, Massachusetts Institute of Technology
1992-1994 IBM Postdoctoral Fellow, University of California at Berkeley
1994-2000 Assistant Professor of Chemistry, University of Pennsylvania
2000-2006 Associate Professor of Chemistry, University of Pennsylvania
2006-present Professor of Chemistry, University of Pennsylvania
1997-2001 NSF CAREER Award
1998-2000 Alfred P. Sloan Foundation Fellow
1999-2004 Dreyfus Teacher-Scholar Award

I-9. Jonathan E. Spanier (Drexel University, USA): spanier@drexel.edu

Jonathan E. Spanier is Professor of Materials Science & Engineering and of Physics at Drexel University in Philadelphia PA, USA. He received the PhD with Distinction from Columbia in 2001 in applied physics (condensed matter) and completed a two-year postdoctoral fellowship in physical chemistry at Harvard University prior to joining the faculty at Drexel in 2003. His research spans topics in semiconductor nanoscience and ferroelectricity, synthesis of inorganic nanostructures and thin films, and electronic, optoelectronic, functional and lattice dynamical properties. He received the US Presidential Early Career Award for Scientists and Engineers, the US Army Research Office Young Investigator Award, the Distinguished Service Award from the Louis R Stokes Alliance for Minority Participation, and was named a Louis and Bessie Stein Family Fellow in 2013. He was awarded a Japan Trust International Research Cooperation Fellowship from the NICT and was a visiting scientist at Fujitsu Labs in 2014, and he was an invited participant for the National Academy of Engineering Frontiers of Engineering in 2014. Presently, his research focuses on light-matter interactionss in semiconducting ferroelectric oxide and trihalide perovskites, and growth of oxides via physical and atomic layer deposition.

I-10. Yang Yang (UCLA, USA): uclayy@icloud.com (yangy@ucla.edu)

Yang Yang holds a BS in Physics from the National Cheng-Kung University in Taiwan in 1982, and he received his M.S. and Ph.D. in Physics and Applied Physics from the University of Massachusetts, Lowell in 1988 and 1992, respectively. Before he joined UCLA in 1997, he served on the reseasrch staff of UNIAX (now DuPont Display) in Santa Barbara from 1992 to 1996. Yang is now the Carol and Lawrence E. Tannas Jr. Endowed Chair Professor of Materials Science and Engineering at UCLA. He is a materials physicist with expertise in the fields of organic electronics, organic/inorganic interface engineering, and the development and fabrication of related devices, such as photovoltaic cells, LEDs, and memory devices.

I-11. Atsushi Wakamiya (Kyoto Univ.) wakamiya@scl.kyoto-u.ac.jp

Atsushi Wakamiya was born in Mie (Japan) in 1974. He received his PhD from Kyoto University in 2003 under the supervision of Professor Koichi Komatsu. During the summer of 2000, he worked with Professor Lawrence T. Scott at Boston College (USA) as a visiting researcher. He started his academic carrier at Nagoya University as an Assistant Professor with Professor Shigehiro Yamaguchi in 2003. In 2010, he moved to Kyoto University, where he became an Associate Professor. He received the Toso Award in Synthetic Organic Chemistry in 2004, the Young Boron Chemist Award in 2008, the Chemical Society of Japan Award for Young Chemists in 2009, and the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology: the Young Scientists' Prize in 2012. His research interests include structural organic chemistry, organoboron chemistry, materials science, and solar cells (http://www.scl.kyoto-u.ac.jp/~kouzou/en/index.html).

I-12. Parashant Kamat (Notre Dame Univ., USA): pkamat@nd.edu

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 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 nearly 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 400 scientific papers that have been well received by the scientific community (36000+ citations, *h*-index 104). He is currently serving as the deputy editor of the *Journal of Physical Chemistry Letters*. He is a member of the advisory board of several scientific journals (Langmuir, Research on Chemical Intermediates, Journal of Colloid & Interface Science, 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, American Chemical Society and American Academy of Science.

I-13. Anders Hagfeldt (EPFL, Switzerland): anders.hagfeldt@epfl.ch

Anders Hagfeldt is at present Professor in 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 field of mesoporous dye-sensitized solar cells, specifically physical chemical characterization of mesoporous electrodes for different types of optoelectronic devices. He has published more than 280 scientific papers that have received over 23,000 citations (with an h-index of 73), and has 8 patent applications. He was ranked number 46 on a list of the top 100 material scientists of the past decade by Times Higher Education. He is a member of the Royal Swedish Academy of Sciences, Stockholm, Royal Society of Sciences in Uppsala (founded 1710), and the Royal Swedish Academy of Engineering Sciences in Stockholm. He is a visiting professor at Nanyang Technological University, Singapore, and was a Fellow Professor at Sungkyankwan University, Korea, during 2013.

I-14 Juan Bisquert (Universitat Jaume I, Spain): bisquert@uji.es

Juan Bisquert (pHD Universitat de Valencia, 1991) is a Professor of applied physics at Universitat Jaume I de Castelló, Spain. He is the director of the Institute of Advanced Materials at UJI. He authored 330 peer reviewed papers, and a reference book, *Nanostructured Energy Devices*. His h-index 68, and is currently a Senior Editor of the Journal of Physical Chemistry, and member of Editorial Board of Energy and Environmental Science and ChemElectroChem. He has been distinguished in the 2014 and 2015 list of ISI Highly Cited Researchers and he develops projects in cooperation with King Abdulaziz University and King Saud University of Saudi Arabia. He conducts experimental and theoretical research on nanoscale devices for production and storage of clean energies. His main topics of interest are materials and processes in perovskite solar cells, nanostructured solar cells, solar fuel production, and lithium battery. He has developed the application of measurement techniques and physical modeling of nanostructured energy devices, that relate the device operation with the elementary steps that take place at the nanoscale dimension: charge transfer, carrier transport, chemical reaction, etc., especially in the field of impedance spectroscopy, as well as general device models.

I-15. Hiroshi Segawa (The University of Tokyo, Japan): csegawa@mail.ecc.u-tokyo.ac.jp

Hiroshi Segawa is a professor at Research Center for Advanced Science and Technology (RCAST), The University of Tokyo, Japan. He obtained 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. He held an additional researcher post (1994-1997) of PREST project of Japan Science and Technology Agency (JST). 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 RCAST. In 2010, he was appointed director of Academic-Industrial Joint Laboratory for Renewable Energy of RCAST. His research group are focused on construction of photo-energy conversion system. Currently the object is the efficiency enhancement of the molecular-based solar cells. He previously discovered several materials with panchromatic absorption by charge-transfer transitions, and they have successfully prepared a novel type of solar cells. Additionally, he is developing an energy-storable dye-sensitized solar cell.

I-16. Shuzi Hayase (KIT, Japan) hayase@life.kyutech.ac.jp

Shuzi Hayase, PhD: Full Professor of Kyushu Institute of Technology, Japan Shuzi Hayase http://www.life.kyutech.ac.jp/~hayase/ 1978: Graduated from Osaka University (Major: Polymer Chemistry) 1983: Received Ph.D. from Osaka University (Stereo-selective polymerization cat.) 1978: Joined Toshiba Research and Development Center (Latent catalysts for ring opening polymerization (epoxy compounds), LSI lithography, Opto and electronic polymers) 1988-1990: Joined a polysilane research group in Wisconsin University (Professor Robert. West) (P-type conductive polymer-Organic Polysilanes-)) 1990: Returned to Toshiba Research and Development Center (Application of polysilanes to LSI, Materials for solar cells, and fuel cells) 2001-present: Full Professor of Kyushu Institute of Technology (Solar cells, Fuel cells) 2009-present: Supervisor of "Photoenergy conversion systems and materials for the next generation solar cells" project, PRESTO Japan Science and Technology Agency (JST) Award: 1996: Award for Technological Development by The Japan Electrical Manufacturers' Association 1992: The Chemical Society of Japan Award for Technological Development : Awarded for distinguished contributions in technological development in chemical industry 1987: National Commendation for Invention by Japan Institute of Invention and Innovation Specialty : Solar cells, and fuel cells and materials employed for these devices Publication: 201 Patent applications: 351

I-17. David Cahen (Weizmann Institute of Science, Israel): David.Cahen@weizmann.ac.il

David Cahen completed his B.Sc. in chemistry & physics at the Hebrew Univ. of Jerusalem (HUJI), his Ph.D. in Materials Research and Phys. Chem. at Northwestern Univ, and did postdoctoral research in biophysics of photosynthesis at HUJI and the Weizmann Inst. of Science (WIS) In 1976 he joined the WIS, starting work on photoelectrochemical and solid-state solar cells. This expanded into work on chemical aspects of electronic materials and devices, including fundamental chemical limits to device miniaturization and device stability; the latter provided significant scientific bases for developing 2nd generation solar cells. In parallel he explored how and when defects in materials can actually improve material quality and device performance. His solar cell interests led to work on hybrid molecular/non-molecular materials, which evolved into his other present activities, understanding electronic transport across (bio)molecules, and looking for novel science in such systems.

I-18. Chun Sing Lee (City U, Hong Kong) apcslee@city.edu.hk

Member of RGC's Physical Science Panel
Editorial board member of Materials Research Express (IOP)
Associate Editor of Nano Micro Letters (Springer)
Editorial board member of Physica Status Solidi
Advisory board member of Asian Materials (Nature Publishing Group)
Published over 580 papers in SCI journals, including two papers in Science and two papers in Nature Communications

I-19. Seigo Ito (Hyogo Univ., Japan): itou@eng.u-hyogo.ac.jp

Seigo Ito received his Ph.D. from the University of Tokyo (Japan), 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, making new printable cost-effective solar cells.

I-20. Hyun Suk Jung (SKKU, Korea): hsjung1@skku.edu

Hyun Suk Jung is an associate professor in school of advanced materials science & engineering at Sungkyunkwan university (SKKU). He received his BS, MS, and PhD degrees in materials science & engineering from Seoul National University (SNU), in 1997, 1999, and 2004, respectively. He joined Los Alamos National Laboratory (LANL) as a director's postdoctoral fellow in 2005. He had worked for Kookmin University (KMU) since 2006 and joined SKKU in 2011. He published over 110 peer-reviewed papers regarding synthesis of inorganic nanomaterials and dye-sensitized solar cells. He presently researches perovskite solar cells and flexible solar cells.

I-21. Songyuan Dai (North China Electric Power University, China) sydai@ipp.ac.cn

Songyuan Dai is the Professor and Dean of Renewable Energy School, North China Electric Power University. He received his BS in Department of Physics from Anhui Normal University in 1987. And got his MS, and PhD degrees in Institute of Plasma Physics Chinese Academy of Sciences, in 1991, and 2001, respectively. He works as a chief scientist of National Key Basic Research Project (973 project) during 2006-2010 and 2011-2015. He was an assistant director in Institute of Plasma Physics Chinese Academy of Sciences during 2009-2013. He published over 150 peer-reviewed papers regarding dye-sensitized solar cells.

I-22. Jinsong Huang (University of Nebraska-Lincoln, USA): jhuang2@unl.edu

Ph.D. Materials Science & Engineering, University of California-Los Angeles, 2007
M.S. Semiconductor Physics, Chinese Academy of Sciences, 2003
B.E. Materials and Photoelectronic Physics, Xiangtan University, 2000
Postdoc Mentor Award, University of Nebraska Lincoln, 2015
College Faculty Research and Creative Activity Award,2015
Susan J. Rosowski University Professorship, 2015
William E. Brooks Engineering Leadship Fellow, 2014
NSF CAREER Award, 2013
Edgerton Innovation Award, UNL College of Engineering, 2012
Faculty Research Award, UNL Department of Mechanical Engineering,2011
College Faculty Research and Creative Activity Award,2011
DTRA Young Investigator Award, 2010
Society for Information Display Scholarship Award, 2007
Materials Research Society Graduate Student Awards (Silver Medal), MRS Fall 2006
Chinese Government Award for Outstanding Self-finance Students Abroad, 2006

I-23. Aron Walsh (University of Bath, UK): A.Walsh@bath.ac.uk

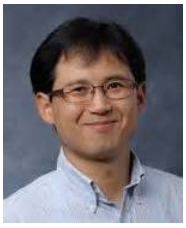
The research group of **Professor Aron Walsh**, Royal Society University Research Fellow and Chair of Materials Theory in Chemistry at the University of Bath. He also holds a dual faculty position in Materials Science and Engineering at Yonsei University, Korea. Aron studied at Trinity College Dublin (Ireland), and later held positions at the National Renewable Energy Laboratory (USA) and University College London (UK). Our interests in materials modelling cover the condensed matter physics and solid state chemistry of advanced materials, including the bulk and defect properties of metal oxides, chalcogenides, halides, and metal-organic frameworks. Key application areas involve energy conversion, storage and transport.

24 Alex Jen (University of Washington, USA): ajen@u.washington.edu

Alex Jen is currently serving as the Boeing-Johnson Chair Professor and Chair of the Department of Materials Science & Engineering at the University of Washington. He is also serving as the Chief Scientist for the Clean Energy Institute endowed by the Washington State Governor. His research interest is focused on utilizing molecular, polymeric and biomacromolecular self-assembly to create ordered arrangement of organic and inorganic functional materials for photonics, opto-electronics, nanomedicine, and nanotechnology. He has co-authored more than 560 publications, given over 450 invited presentations, and has >28,000 citations with a H-index of 84. He is also a co-inventor for more than 50 patents and invention disclosures.

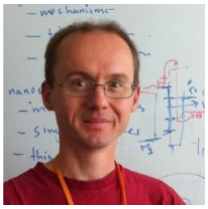
For his pioneering contributions in organic photonics and electronics, he was elected as AAAS, MRS, ACS, PMSE, OSA, and SPIE Fellow. He has also been appointed as the Changjiang Endowed Chair by the Chinese Ministry of Education, as the World Class University Professor by the Korean National Research Foundation, and as the Distinguished Chair Professor by the National Taiwan University. He has also been elected as an Academician by the Washington State Academy of Sciences.

25. Jung-Kun Lee (Univ. Pittsburgh, USA): mailto:jul37@pitt.edu



Dr. Jung-Kun Lee is currently Associate Professor and William Kepler Whiteford Faculty Fellow in the Department of Mechanical Engineering and Materials Science at University of Pittsburgh (Pitt). He joined Pitt in September 2007 after more than 5 year service at Los Alamos National Laboratory. He received his Ph. D degree from the Department of Materials Science and Engineering at Seoul National University, Korea. His research interest lies in electronic and optical properties of semiconductor materials and their energy application. Specific emphasis is placed on 1) photovoltaic application of wide band-gap nanoparticles, 2) material processing of electronic materials in forms of nanoparticles and thin films, 3) optical and magnetic properties of nanoparticles, 4) the surface modification using ion implantation and chemical methods, 5) domain and strain engineering of ferroic materials. The scientific quality of his research is validated by more than 130 publications in refereed journals. He also holds 10 patents on the dielectric and optical applications of functional materials.

26. Jao van de Lagemmat (NREL, USA): jao.vandelagemaat@nrel.gov



Dr. van de Lagemaat is currently the Center Director of the Chemistry and Nanoscience Center at NREL. He received his PhD in 1998 from the University of Utrecht. He worked on the exciton dynamics, charge transport properties, and the physical and chemical properties of interfaces of large-band-gap semiconductors such as SiC, GaP, GaN, and diamond. From 1998 to 2001, he worked as a postdoctoral researcher at NREL. His studies focused on charge transport and recombination in dye-sensitized solar cells. His papers in this field have proven seminal to the understanding of this unique system. From 2001 to the present, he has worked as a scientist at NREL on the energetics and transport properties of single semiconductor nanoparticles (quantum dots) and arrays of nanoparticles using tunneling spectroscopy and microscopy, transient photocurrent, transistor measurements, and computer modeling. He is currently researching tunneling-induced luminescence and plasmon-resonance imaging of individual quantum dots, the interaction between carbon nanotubes and organic semiconductors, and the use of plasmonic-enhancement effects in solar energy conversion systems. In addition to his position at NREL, Dr. van de Lagemaat is also a fellow of the Renewable and Sustainable Energy Institute as well as a fellow of the Materials Science and Engineering Program, both at the University of Colorado at Boulder. Lastly, he is a lecturer in the Department of Physics at the same university.

SISF 2016 Program Table

	Time	May 25 (Wed)	May 26 (Thu)	May 27 (Fri)
Morning	8:30 - 9:00		Registration	Registration
	9:00 - 9:30		I-7 (**S. Mhaisalkar**)	I-15 (**H. Segawa**)
	9:30 - 10:00		I-8 (**A. M. Rappe**)	I-16 (**S. Hayase**)
	10:00 - 10:30		I-9 (**J. E. Spanier**)	I-17 (**D. Cahen**)
	10:30 - 11:00		 Coffee Break	 Coffee Break
	11:00 - 11:30	Registration	I-10 (**Y. Yang**)	I-18 (**C. S. Lee**)
	11:30 - 12:00		I-11 (**A. Wakamiya**)	I-19 (**S. Ito**)
Lunch	12:00 - 13:00		Lunch	Lunch
Afternoon	13:00 - 13:30	***Opening Remark*** **(13:10-14:00)** **PS1 (M. Graetzel)**	I-12 (**P. Kamat**)	I-20 (**H. S. Jung**)
	13:30 - 14:00		I-13 (**A. Hagfeldt**)	I-21 (**S. Dai**)
	14:00 - 14:30	I-1 (**T. Miyasaka**)	I-14 **(J. Bisquert)**	I-22 **(J. Huang)**
	14:30 - 15:00	I-2 (**T. Sargent**)	Excursion (SAMSUNG Art center and Seoul N Tower)	I-23 **(A. Walsh)**
	15:00 - 15:30	 Coffee Break		 Coffee Break
	15:30 - 16:00	I-3 (**A. Zaban**)		I-24 **(A. Jen)**
	16:00 - 16:30	I-4 (**F. de Angelis**)		I-25 **(J.-K. Lee)**
	16:30 - 17:00	I-5 (**Y.-B. Cheng**)		I-26 **(J. van de Lagemaat)**
	17:00 - 17:30	I-6 (**S. I. Seok**)		***Closing Remark***
	17:30 - 18:00	**PS2 (M. Choi)**		

PS (Plenary Speaker)
I (Invited Speaker)

Program

PS = Plenary Speaker, I = Invited Speaker

May 25 (Wed)

13:00-13:10 ***Opening Remark (President of SKKU, Kyu Sang Chung)***

13:10-15:00 **Session Chair *Hyunjung Shin***

13:10-14:00 **(PS-1) Michael Gratzel (EPFL, Switzerland)**
The Extraordinary PV Performance of Mixed A-cation ABX3 Metal Halide Perovskite Solar Cells

14:00-14:30 **(I-1) Tom Miyasaka (Toin Univ., Japan)**
Low Temperature Printing Process for Metal Oxide-based High Performance Perovskite Solar Cells

14:30-15:00 **(I-2) Ted Sargent (U Toronto, Canada)**
Materials and Devices that Combine Perovskites with Size-tuned Nanoparticles

15:00-15:30 *Coffee Break*

15:30-17:30 **Session Chair *Seigo Ito***

15:30-16:00 **(I-3) Arie Zaban (Bar Ilan University, Israel)**
Photo-Induced Reversible Modification of Perovskite Films and Perovskite Based Devices

16:00-16:30 **(I-4) Filippo de angelis (CNR-ISTM, Italy)**
Interplay of Electronic and Dynamical Processes in Organohalide Perovskites

16:30-17:00 **(I-5) Yi-Bing Cheng (Monash Univ., Australia)**
Stability of Perovskite Solar Cells under Static and Dynamic Illumination Conditions

17:00-17:30 **(I-6) Sang Il Seok (UNIST/KRICT, Korea)**
Advancements in Inorganic-Organic Hybrid Perovskite Thin Layers for Solar Cells

17:30-18:00 **(PS-2) Mansoo Choi (Seoul National Univ., Korea)**
A Mechanism for Irreversible Degradation of Perovskite Solar Cells : Trapped Charge Driven Degradation

May 26 (Thu)

09:00-10:00 **Session Chair *Juan Bisquert***

09:00-09:30 **(I-7) Subodh Mhaisalkar (NTC, Singapore)**
Multidimensional Perovskites for Photovoltaic and Light-Emitting Devices

09:30-10:00 **(I-8) Andrew M. Rappe (University of Pennsylvania, USA)**
Making Connections: Theory and Modeling to Link Mechanical, Electronic, and Optical Properties of Hybrid/Halid Perovskites

10:00-10:30 **(I-9) Jonathan E. Spanier (Drexel University, USA)**
Semiconducting Ferroelectric Photovoltaics

10:30-11:00 *Coffee Break*

11:00-12:00 **Session Chair *Yi-Bing Cheng***

11:00-11:30 **(I-10) Yang Yang (UCLA, USA)**
Recent Progress in Perovskite Solar Cells at UCLA

11:30-12:00 **(I-11) Atsushi Wakamiya (Kyoto Univ.)**
Hole-Transporting Materials for Highly Efficient Perovskite Solar Cells

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

13:00-14:00 **Session Chair *Duk-Young Jung***

13:00-13:30 **(I-12) Parashant Kamat (Notre Dame Univ., USA)**
Making and Breaking of Organic Lead halide Perovskite FIlms

13:30-14:00 **(I-13) Anders Hagfeldt (EPFL, Switzerland)**
The Versatility of Mesoscopic Solar Cells

14:00-14:30 **(I-14) Juan Bisquert (Universitat Jaume I, Spain)**
Dynamic Effects of Bulk and Contacts at Lead Halide Perovskite Solar Cells

14:30-18:00 **Excursion (SAMSUNG and Seoul N Tower) Guided by *Duk-Young Jung***

May 27 (Fri)

09:00-10:30 **Session Chair *Jong Hyeok Park***

09:00-09:30 **(I-15) Hiroshi Segawa (The University of Tokyo, Japan)**
Hybrid Solar Cells for Next Generation Photovoltaics

09:30-10:00 **(I-16) Shuzi Hayase (KIT, Japan)**
Interface Architecture between TiO_2/Perovskite, Perovskite/Hole Transport Layer, and Perovskite Grain Boundary

10:00-10:30 **(I-17) David Cahen (Weizmann Institute of Science, Israel)**
Halide Perovskites, More Than Meets The Eye?

10:30-11:00 *Coffee Break*

11:00-12:00 **Session Chair *Atsushi Wakamiya***

11:00-11:30 **(I-18) Chun-Sing Lee (City U, Hong Kong)**
The Influences of Charge Transfer States on Properties of Organic Optoelectronic Devices -- From OLEDs to Perovskite Solar Cells

11:30-12:00 **(I-19) Seigo Ito (Hyogo Univ., Japan)**
Stability of Perovskite Solar Cells using Porous Carbon Electrodes

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

13:00-15:00 **Session Chair *Pil J. Yoo***

13:00-13:30 **(I-20) Hyun Suk Jung (SKKU, Korea)**
Advanced Charge Extraction Layers in Perovskite Solar Cells

13:30-14:00 **(I-21) Songyuan Dai (North China Electric Power University, China)**
Study on The Structures and Interfaces of Perovskite Solar Cells

14:00-14:30 **(I-22) Jinsong Huang (University of Nebraska-Lincoln, USA)**
Ion Migration in Hybrid Perovskite Materials and Influence to Photovoltaic

14:30-15:00 **(I-23) Aron Walsh (University of Bath, UK)**
Four Perovskite Puzzles (with Solutions)

15:00-15:30 *Coffee Break*

15:30-17:00 **Session Chair *Jinsong Huang***

15:30-16:00 **(I-24) Alex Jen (University of Washington, USA)**

An Integrated Approach Combining Compositional and Interfacial Material Engineering to Improve the Performance and Stability of Perovskite Solar Cells

16:00-16:30 **(I-25) Jung-Kun Lee (Univ. Pittsburgh, USA)**

Interfacial Electron Transfer in Transparent Conducting Nanocomposites for All-Solution Processed Solar Cells

16:30-17:00 **(I-26) Jao van de Lagemmat (NREL, USA)**

Interfacial energetics and ultrafast dynamics of excitons and charge carriers in perovskites

17:10-17:30 ***Closing Remark***