

KJF 2012

KJF International Conference on Organic Materials for Electronics and Photonics

August 29–September 1, 2012

Sakura Hall,
Katahira Campus, Tohoku University
Sendai, Miyagi, Japan



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**KJF International Conference on Organic Materials
for Electronics and Photonics**

Program & Abstracts

August 29-September 1, 2012

Sakura Hall,
Katahira Campus, Tohoku University
Sendai, Miyagi, Japan

Conference Scope

Organic electronics and photonics are on the forefront of materials science and technology. The activities in Korea and Japan are remarkable in this field. This conference provides an excellent opportunity for scientists and engineers to share their achievements. The representative technical sessions are as follows:

Organic Transistors, Memories and Photovoltaics

Molecular Photonics

Organic EL Materials and Devices

Nonlinear Optical Materials and Devices

Optical Properties and Devices

Fabrication and Characterization

Molecular Recognition

Sensors and Bioelectronics

Other Related Topics

Sponsors

- Sendai Tourism & Convention Bureau
- The Society of Polymer Science, Japan
- The Japan Society of Applied Physics
(Division of Molecular Electronics and Bioelectronics)
- Institute of Multidisciplinary Research for Advanced Materials, Tohoku University
- Kyowa Interface Science Co., Ltd.

Supports

- Nano-Macro Materials, Devices and System Research Alliance
(Management Expenses Grants for National Universities Corporations, MEXT, Japan)
- Network Joint Research Center for Materials and Devices
- The Japanese Photochemistry Association

Greeting

On behalf of the KJF2012 organizing committee, it is my great pleasure and honor to host the KJF (Korea-Japan Joint Forum) International Conference on Organic Materials for Electronics and Photonics 2012 (KJF2012). I would like to cordially invite all of you to Tohoku University (Katahira Campus) in Sendai City, Japan on August 29 to September 1, 2012.

Next-generation organic electronic and photonic devices will become essential to surely solve some serious environment and energy source problems at the present time, and to further realize ubiquitous society in the near future. Organic and polymer materials have a great deal of advantages from the viewpoints of highly devices application: various molecular designs, well-controlled nanostructure, hybridization and direct-assembly, high figure of merit and ultra-fast response, flexibility, processability and easy-manufacturing, light weight, low cost, and so on. Currently, organic transistor, photovoltaics, organic EL, nonlinear optical materials and devices, molecular photonics, bio-sensors, bio-electronics etc., these emerging topics are progressing and growing exceedingly in both fundamental science and technology under excellent interdisciplinary collaborations in chemistry, physics, photonics, material science, electronic engineering, bio-related area, and others.

I believe firmly that the KJF2012 could provide a lot of opportunities not only to exchange and discuss the forefront outcomes in the concerned fields but also to advance the future cooperation and friendship.

The KJF2012 is the continuation and expansion of Korea-Japan Joint Forum on Organic Materials for Electronics and Photonics, which celebrated the 20th anniversary in the KJF2008.

Please join the KJF2012 to do pioneering research works, to build up scientific networks, and to enjoy the traditional and modern Sendai City.

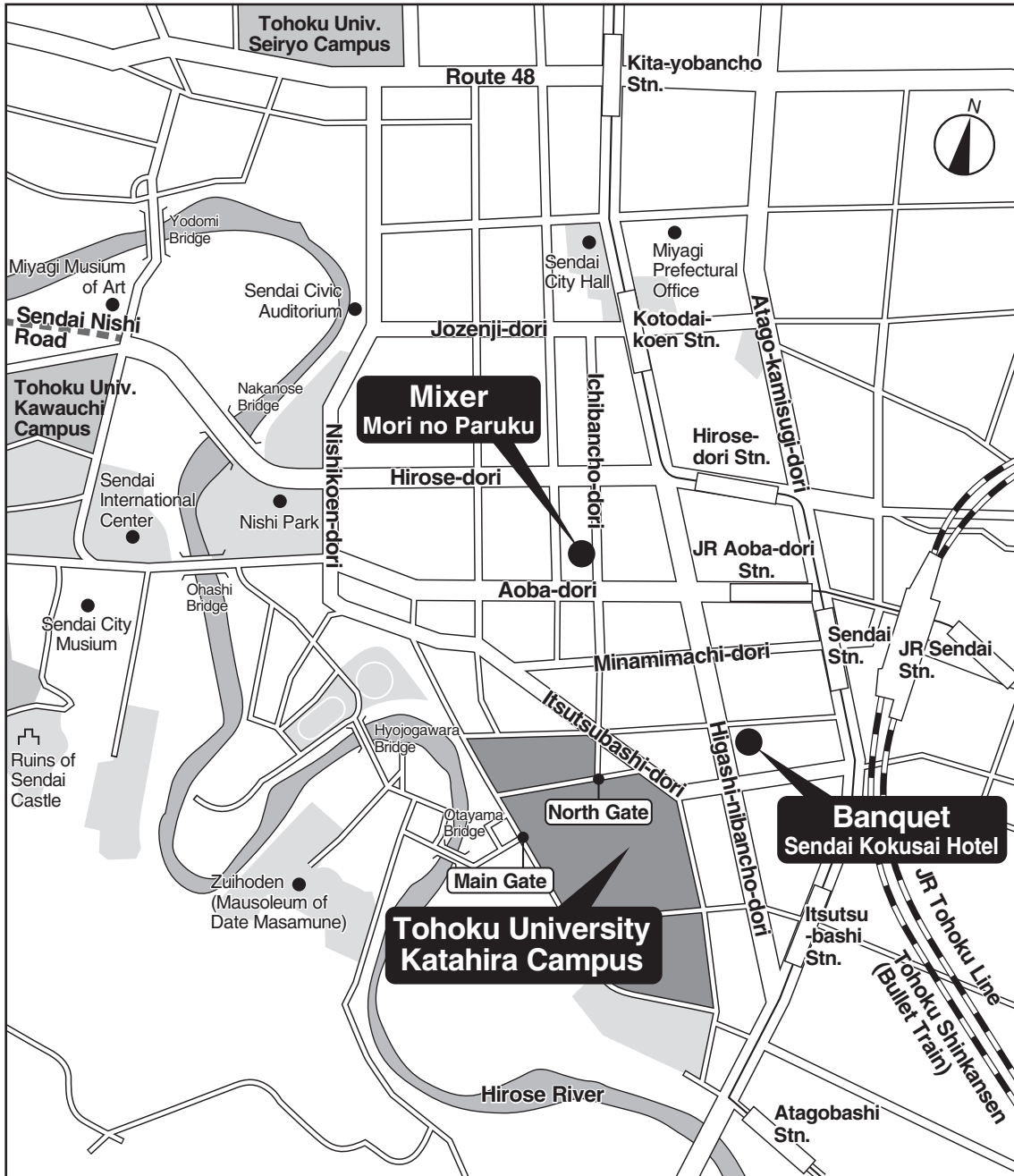
Hidetoshi Oikawa

Conference Chair of KJF2012

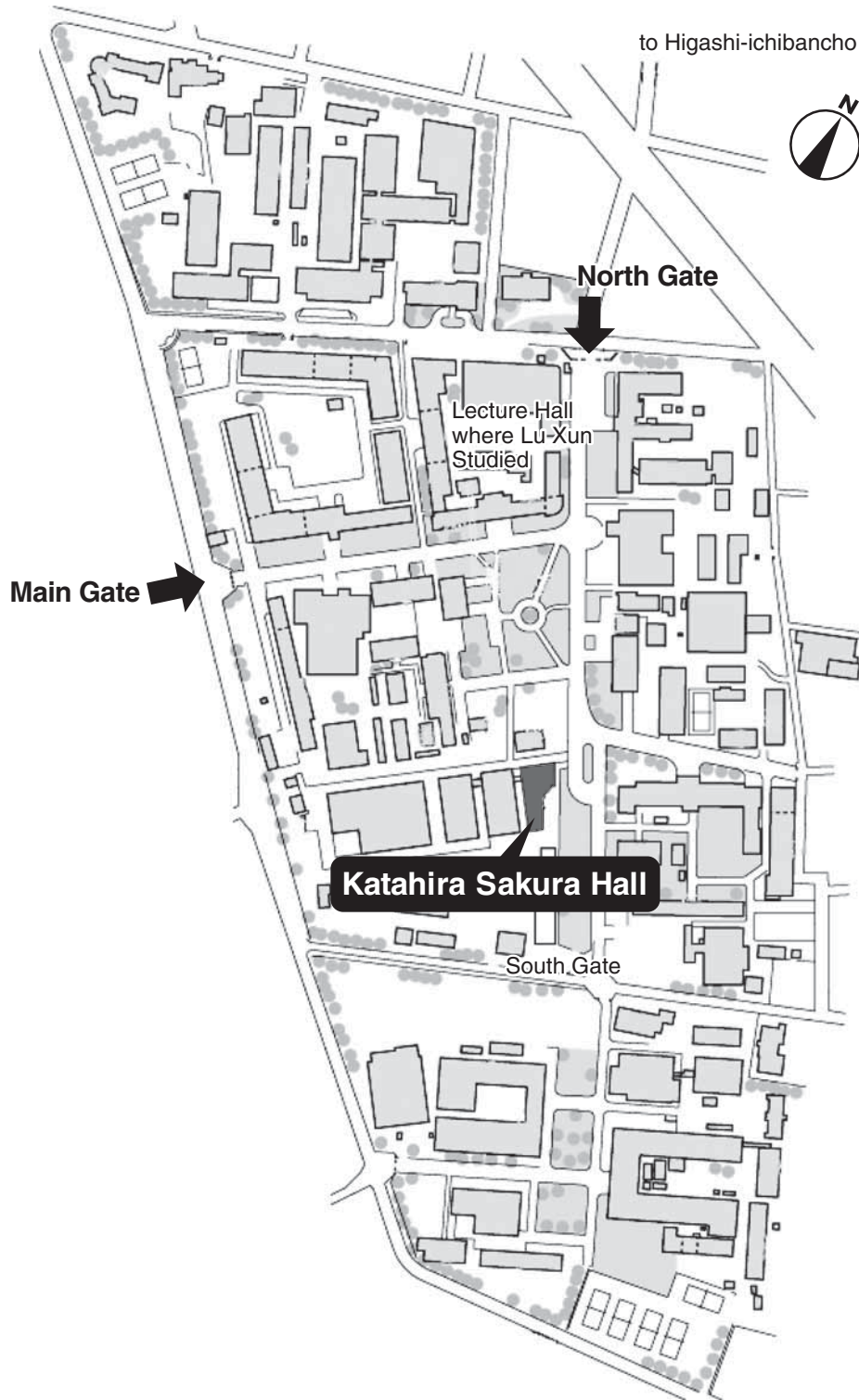
History of KJF

Year	Meeting	Place (City)	Participants	Papers
			(Korea/Japan/others)	
1989	KJF'89	KIST (Seoul)	10/20	20
1990	KJF'90	RIKEN (Wako)	15/30	20
1991	KJF'91	KIST (Seoul)	40/15	20
1992	KJF'92	RIKEN (Wako)	25/50	42
1993	KJF'93	KRICT (Daejeon)	70/25	60
1994	KJF'94	NIMC (Tsukuba)	40/60	80
1995	KJF'95	Korea Univ. (Seoul)	120/30	85
1996	KJF'96	AIST (Tsukuba)	40/120	150
1997	KJF'97	K-JIST (Gwangju)	140/44	117
1998	KJF'98	Hokkaido Univ. (Sapporo)	48/63	89
1999	KJF'99	Kyeongju TEMF-Hotel (Gyeongju)	126/44	170
2000	KJF2000	Kyoto Research Park (Kyoto)	72/80	126
2001	KJF2001	Seoul National Univ. (Seoul)	173/46	159
2002	KJF2002	TG Hall (Sendai)	92/97	174
2003	KJF2003	Pusan National Univ. (Pusan)	200/45	226
2004	KJF2004	Okinawaken Seinenkaikan (Naha)	150/70	191
2005	KJF2005	Yousung Hotel (Daejeon)	180/70	212
2006	KJF2006	Toki Messe (Niigata)	128/146	217
2007	KJF2007	Korea Univ. (Seoul)	232/69	243
2008	KJF2008	CIST (Chitose)	140/190	247
2009	KJF2009	KAL Hotel (Jeju)	313/80/10	283
2010	KJF2010	Kitakyushu International Conference Center (Kitakyushu)	159/168/7	245
2011	KJF2011	Hyundai International Hotel (Gyeongju)	248/101/8	301
2012	KJF2012	Tohoku Univ. (Sendai)		201

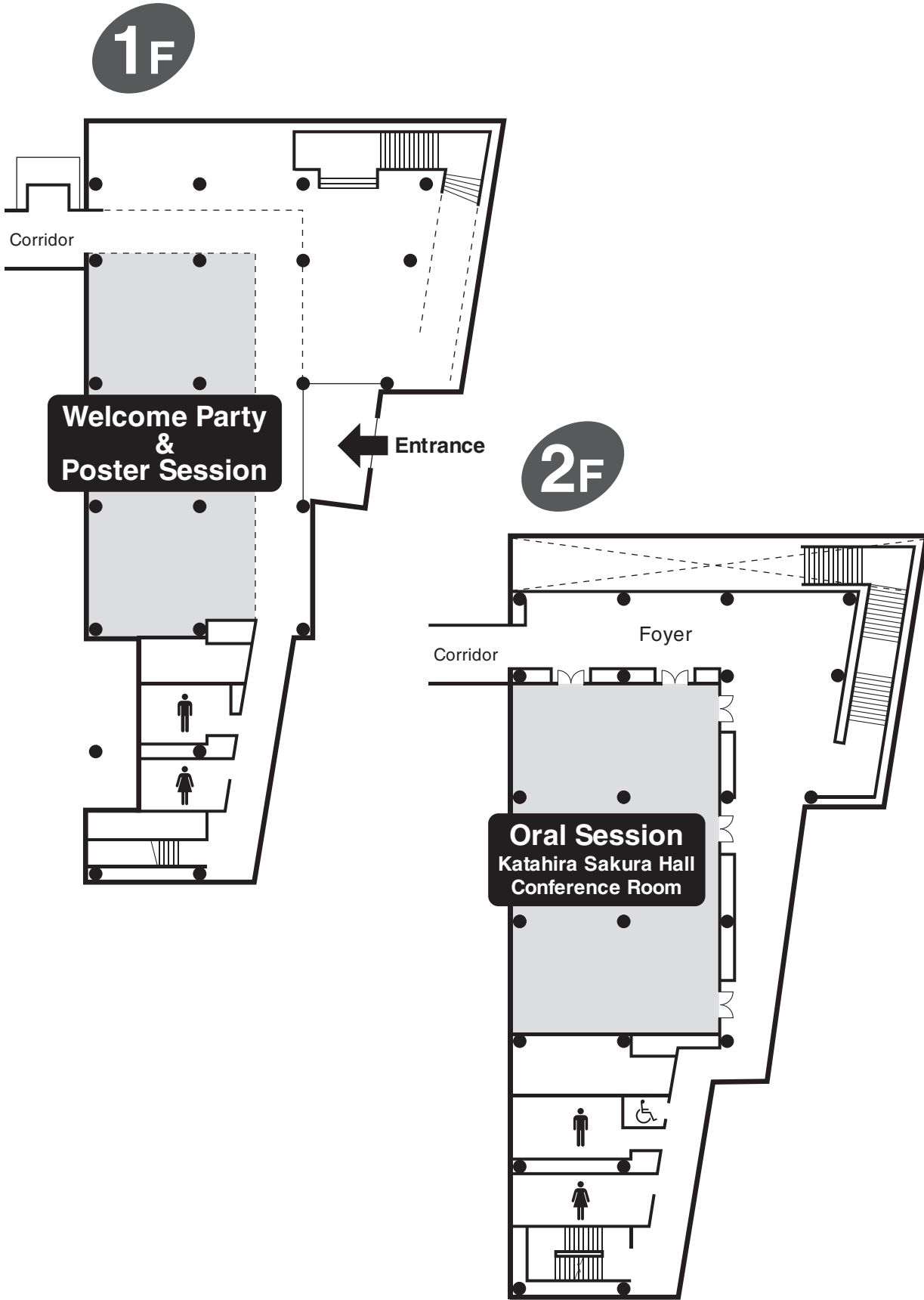
Venue Location



Campus Map



Sakura Hall



Organization

KJF2012 International Committee

Honorary Chair:	Hiroyuki Sasabe (Chitose Inst. Tech.) Nakjoong Kim (Hanyang Univ.)
Chair:	Kwang-Sup Lee (Hannam Univ.) Kiyoshi Yase (National Inst. Adv. Indust. Sci. Tech.)
Members:	Katsuhiko Fujita (Kyushu Univ.) Kenji Ishida (Kobe Univ.) Keizo Kato (Niigata Univ.) Masahiro Hiramoto (Inst. Mol. Sci.) Olaf Karthaus (Chitose Inst. Tech.) Shuji Okada (Yamagata Univ.) Yutaka Majima (Tokyo Inst. Tech.) Takahiro Seki (Nagoya Univ.) Masatsugu Shimomura (Tohoku Univ.) Tokuji Miyashita (Tohoku Univ.) Yun Chi (National Tsing Hua Univ.) Xuan-Ming Duan (Chinese Acad. Sci.) Jang-Joo Kim (Seoul National Univ.) Changjin Lee (Korea Res. Inst. Chem. Tech.) Jun Young Lee (Sungkyunkwan Univ.) Soo Young Park (Seoul National Univ.) Jeong Weon Wu (Ewha Womans Univ.)
Advisory Committee:	Jung-Il Jin (Korea Univ.) Liyong Sun Pu (Sungkyunkwan Univ.)

KJF2012 Conference Committee

Honorary Chair:	Tokuji Miyashita (Tohoku Univ.)
Conference Chair:	Hidetoshi Oikawa (Tohoku Univ.)
Co-Chair:	Sung-Ho Jin (Pusan National Univ.)
Secretary General:	Masaya Mitsuishi (Tohoku Univ.)
Co-Secretary General:	Han Young Woo (Pusan National Univ.)
Members:	Takashi Kyotani (Tohoku Univ.) Tomoyuki Akutagawa (Tohoku Univ.) Masaru Nakagawa (Tohoku Univ.) Hitoshi Kasai (Tohoku Univ.) Tsunenobu Onodera (Tohoku Univ.) Jun Matsui (Tohoku Univ.) Hiroshi Yabu (Tohoku Univ.) Yasuto Hoshikawa (Tohoku Univ.) Takashi Takeda (Tohoku Univ.) Yuji Hirai (Tohoku Univ.) Cheol Min Yun (Tohoku Univ.)
Advisory Board:	Hachiro Nakanishi (Tohoku Univ.) Toshihiko Nagamura (Kyushu Univ.)

Time Table

Plenary Lecture (HPL, PL)	40 min
Invited Lecture (IL)	30 min
Oral Presentation (O)	20 min

Wednesday 29-Aug		Thursday 30-Aug		Friday 31-Aug		Saturday 1-Sep	
	8:50	Opening		9:00	IL8 Shiyoshi Yokoyama	9:00	IL13 Bumjoon Kim
	9:00	PL1 Kwang-Sup Lee		9:30	IL9 Soo Young Park	9:30	IL14 Jang-Joo Kim
	9:40	IL1 Hisao Ishii		10:00	O7 Nobuhiro Ohta	10:00	O13 Toshihiko Kaji
	10:10	O1 Takashi Isoshima		10:20	O8 Jean-Charles Ribierre	10:20	O14 Yasuto Hoshikawa
	10:30	Coffee Break		10:40	Coffee Break	10:40	Coffee Break
	10:50	IL2 O-Pil Kwon		11:00	IL10 Takanori Fukushima	11:00	IL15 Mitsutoshi Masuda
	11:20	IL3 Yasuchika Hasegawa		11:30	IL11 Dong Hoon Choi	11:30	IL16 Hiroki Ago
	11:50	O2 Shigeaki Obata		12:00	O9 Dai Taguchi	12:00	O15 Han Young Woo
	12:10	O3 Sukon Phanichphant		12:20	O10 Ho-Sung Song	12:20	Closing
	12:30	Lunch		12:40	Lunch		
	14:00	IL4 Kwanghee Lee		14:00	Poster Session (14:00-15:30)		
	14:30	IL5 Shinzaburo Ito					
	15:00	O4 Taiho Park					
	15:20	O5 Hironori Ogata					
	15:40	Coffee Break		15:40	Coffee Break		
	16:00	IL6 Kyungkon Kim		16:00	IL12 Tae-Woo Lee		
	16:30	IL7 Yun Hi Kim		16:30	O11 Seong Il Yoo		
17:00	Registration	17:00	O6 Youngu Lee	16:50	O12 Atsushi Aoki		
18:30	Welcome Party	17:30	Poster Session (17:30-19:00)	17:10	HPL1 Tokuji Miyashita		
				18:45	Banquet, Mixer		

Oral Session

Thursday, August 30

Session chair: **Hidetoshi Oikawa** (Tohoku University, Japan)

9:00 **PL1** Incorporating Silver Nanoparticles and Quantum Dots into Microstructures Fabricated by Two-Photon Lithography

Prem Prabhakaran, Kyung Kook Jang, Sung-Yeoun Park, Su-Min Jeon,
Deepak Chandran, Kwang-Sup Lee
Department of Advanced Materials, Hannam University, Korea

Session chair: **Yun Hi Kim** (Gyeongsang National University, Korea)

9:40 **IL1** High-Sensitivity Photoemission and Photoelectron Yield Spectroscopy of Organic Materials and their Interfaces: Direct Observation of Gap States

Hisao Ishii^{1, 2)}, Shin-ichi Machida²⁾, Hiroumi Kinjo²⁾, Yusuke Ozawa²⁾,
Yutaka Noguchi^{1, 2)}, Yasuo Nakayama¹⁾

¹⁾Center for Frontier Science, Chiba University, ²⁾Graduate School of Advanced Integration Science, Chiba University, Japan

10:10 **O1** Giant Surface Potential and Spontaneous Noncentrosymmetric Molecular Orientation in Vacuum-Evaporated Films of 5-Halogenated Alq₃ Derivatives

Takashi Isoshima¹⁾, Youichi Okabayashi¹⁾, Eisuke Ito¹⁾, Masahiko Hara¹⁾,
Whee Won Chin²⁾, Jin Wook Han²⁾

¹⁾Flucto-Order Functions Research Team, RIKEN-HYU Collaboration Research Center, RIKEN Advanced Science Institute, Japan, ²⁾Department of Chemistry, Hanyang University, Korea

Session chair: **Hisao Ishii** (Chiba University, Japan)

10:50 **IL2** Highly Efficient THz Wave Generators Based on Organic Electro-Optic Single Crystals

O-Pil Kwon^{1, 4)}, Pil-Joo Kim¹⁾, Jae-Hyeok Jeong¹⁾, Seung-Heon Lee¹⁾, Ji-Soo Kim¹⁾,
Mojca Jazbinsek²⁾, In-Hyung Baek³⁾, Fabian Rotermund³⁾, Hoseop Yun³⁾,
Jongtaek Kim⁴⁾, Yoon Sup Lee⁴⁾

¹⁾Department of Molecular Science and Technology, Ajou University, Korea, ²⁾Rainbow Photonics AG, Switzerland, ³⁾Division of Energy Systems Research, Ajou University, Korea, ⁴⁾Department of Chemistry, Korea Advanced Institute of Science and Technology (KAIST), Korea

11:20 **IL3** Brilliant Red-phosphors Composed of Eu(III) complexes with Asymmetric Coordination Structures

Yasuchika Hasegawa

Graduate School of Engineering, Hokkaido University, Japan

11:50 **O2** Preferable Molecular Orientation of Poly(3-hexylthiophene) on Self-Assembled Monolayers: Molecular Dynamics Simulation

Shigeaki Obata, Yukihiro Shimoi

Nanosystem Research Institute (NRI), National Institute of Advanced Industrial Science and Technology (AIST), Japan

- 12:10 **O3** **Synthesis of Copolymer Thieno[3,4-b]thiophene and Benzodithiophene for Application in Solar Cells**
Chanitpa Khantha¹⁾, Tanisorn Yakhantip¹⁾, C.M. MacNeill²⁾, Philaiwan Aiamsen³⁾, Viruntachar Kruefu⁴⁾, Nawe Kungwan¹⁾, R.C. Coffin⁵⁾, S. Phanichphant⁶⁾, David L. Carroll⁵⁾
¹⁾Department of Chemistry, Faculty of Science, Chiang Mai University, Thailand, ²⁾Department of Chemistry, Wake Forest University, USA, ³⁾Department of Rubber and Polymer Technology, Faculty of Engineering and Agro-Industry, Maejo University, Thailand, ⁴⁾Program in Materials Science, Faculty of Science, Maejo University, Thailand, ⁵⁾Center for Nanotechnology and Molecular Materials, Department of Physics, Wake Forest University, USA, ⁶⁾Materials Science Research Center, Faculty of Science, Chiang Mai University, Thailand

Session chair: Youngu Lee (DGIST, Korea)

- 14:00 **IL4** **High-Efficiency Printed Polymer Solar Cells Introducing Novel Functional Interlayers**
Hongkyu Kang, Guenjin Kim, Junghwan Kim, Kwanghee Lee
Heeger Center for Advanced Materials, Gwangju Institute of Science and Technology, Korea
- 14:30 **IL5** **Near Infrared Dye Sensitization of Polymer/Fullerene and Polymer/Polymer Thin Film Solar Cells**
Shinzaburo Ito, Toshiaki Hirata, Hiroaki Benten, Hideo Ohkita, Satoshi Honda
Department of Polymer Chemistry, Graduate School of Engineering, Kyoto University, Japan
- 15:00 **O4** **Size-selective ion transport in dye-sensitized solar cells**
Taiho Park, Sung-Hae Park, Jongchul Lim
Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), Korea
- 15:20 **O5** **Fabrication and Characterization of Organic Solar Cells with Azaacene Derivatives**
Hironori Ogata¹⁾, Masaki Tanaka¹⁾, Yuta Iida¹⁾, Kazuhiro Hashiguchi¹⁾, Toshiyuki Ito¹⁾, Kyosuke Isoda²⁾, Makoto Tadokoro²⁾
¹⁾Department of Chemical Science and Technology, Hosei University, Japan, ²⁾Department of Chemistry, Faculty of Science, Tokyo University of Science, Japan

Session chair: Atsushi Aoki (Nagoya Institute of Technology, Japan)

- 16:00 **IL6** **Effects of Carrier Recombination at the Bulk Heterojunction Layer/ Electrode on the Performance of Polymer Solar Cells**
Youn-Su Kim¹⁾, Taehee Kim¹⁾, BongSoo Kim¹⁾, KyungKon Kim^{1,2)}
¹⁾Photo-electronic Hybrids Research Center, Korea Institute of Science and Technology (KIST), Korea, ²⁾Department of Chemistry and Nano Science, Ewha Womans University, Korea
- 16:30 **IL7** **New Organic Semiconducting Materials for Electronics and Photonics**
Yun-Hi Kim
Department of Chemistry and RINS, Gyeongsang National University, Korea

- 17:00 **O6** Conjugated *p-n* Junction Materials for Organic Photovoltaic Devices: From Single Molecule to Polymer
Youngu Lee
Department of Energy Systems Engineering, Daegu Gyeongbuk Institute of Science and Technology (DGIST), Korea

Friday, August 31

Session chair: Yasuchika Hasegawa (Hokkaido University, Japan)

- 9:00 **IL8** Organic Material and Silicon Nitride Hybrid Nano-waveguides for Enhanced Optoelectronic Application
Shiyoshi Yokoyama, Yu Feng, Qui Feng, Kazuhiro Yamamoto
Institute for Materials Chemistry and Engineering, Kyushu University, Japan
- 9:30 **IL9** Manipulating Energy Transfer in Luminescent Molecular System
Soo Young Park
Center for Supramolecular Optoelectronic Materials and Department of Materials Science & Engineering, Seoul National University, Korea
- 10:00 **O7** Unprecedented Electrical Conductivity Induced by Photoirradiation and Application of Electric Fields in Organic Materials
Nobuhiro Ohta, Toshifumi Iimori, Farzana Sabeth
Research Institute for Electronic Science, Hokkaido University, Japan
- 10:20 **O8** Non-linear absorption properties and exciton diffusion processes in a quinoidal oligothiophene derivative
Hae-young Shin^{1,2)}, Jae-Heun Woo^{1,2)}, Minji J. Kwon^{1,2)}, Marie Barthelemy³⁾, Mircea Vomir³⁾, T. Muto⁴⁾, K. Takaishi⁴⁾, Masanobu Uchiyama⁴⁾, Tatsuya Aoyama⁴⁾, D.-W. Kim^{1,2)}, S. Yoon^{1,2)}, Jean-Yves Bigot³⁾, Jeong Weon Wu^{1,2)}, Jean-Charles Ribierre^{1,2)}
¹⁾Department of Physics, Ewha Womans University, Korea, ²⁾CNRS Ewha International Research Center, Korea, ³⁾CNRS-IPCMS, University of Strasbourg, France, ⁴⁾RIKEN, Advanced Science Institute, Japan

Session chair: Han Young Woo (Pusan National University, Korea)

- 11:00 **IL10** Stimuli-responsive Soft Materials by Dense Integration of π -Electronic Building Blocks
Takanori Fukushima^{1,2)}
¹⁾Chemical Resources Laboratory, Tokyo Institute of Technology, Japan, ²⁾RIKEN Advanced Science Institute, Japan
- 11:30 **IL11** High-mobility Donor–Acceptor Alternating Conjugated Copolymers and their 1-D Nanostructures
Dong Hoon Choi
Department of Chemistry, College of Science, Research Institute for Natural Science, Korea University, Korea

12:00 **O9** Direct probing of internal electric field in fullerene diode using electric-field-induced second-harmonic generation

Dai Taguchi, Xiangyu Chen, Takaaki Manaka, Mitsumasa Iwamoto
Department of Physical Electronics, Tokyo Institute of Technology, Japan

12:20 **O10** Study on the Low-band gap polymers based on diketopyrrolopyrrole for Organic Photovoltaic Applications

Ho-Sung Song¹⁾, Sung Kwang Ahn¹⁾, Juho Yoon¹⁾, Sung-Ho Jin¹⁾, Jae Wook Lee²⁾
¹⁾Department of Chemistry Education, Interdisciplinary Program of Advanced Information and Display Materials, and Institute for Plastic Information and Energy Materials, Pusan National University, Korea, ²⁾Department of Chemistry, Dong-A University, Korea

Session chair: Ken-ichi Nakayama (Yamagata University, Japan)

16:00 **IL12** Flexible Organic Electroluminescent Devices Using Graphene Anodes

Tae-Hee Han¹⁾, Youngbin Lee²⁾, Mi-Ri Choi¹⁾, Seong-Hoon Woo¹⁾, Sang-Hoon Bae²⁾, Byung Hee Hong³⁾, Jong Hyun Ahn²⁾, Tae-Woo Lee¹⁾

¹⁾Department of Materials Science and Engineering, Pohang University of Science and Technology (POSTECH), Korea, ²⁾School of Advanced Materials Science and Engineering, Sungkyunkwan University, Korea, ³⁾Department of Chemistry, Seoul National University, Korea

16:30 **O11** Energy Transfer in the Hybrid Assemblies of Diblock Copolymer Micelles

Seong Il Yoo¹⁾, Joo Hyun Kim¹⁾, Won-Ki Lee¹⁾, JinHwan Yoon²⁾, Byeong-Hyeok Sohn³⁾

¹⁾Department of Polymer Engineering, Pukyong National University, Korea, ²⁾Department of Chemistry, Dong A University, Korea, ³⁾Department of Chemistry, Seoul National University, Korea

16:50 **O12** Effect of PEDOT/PSS Layer on Light-Emitting Electrochemical Cell based on Trisbipyridine Ruthenium Complex

Atsushi Aoki, Wei-Chen Chen, Takashi Takaki

Materials Science & Engineering, Graduate School of Engineering, Nagoya Institute of Technology, Japan

Session chair: Kwang-Sup Lee (Hannam University, Korea)

17:10 **HPL1** Hybrid Polymer Nano-sheet Assemblies toward Flexible Electronics and Photonics

Tokuji Miyashita, Masaya Mitsuishi, Jun Matsui

Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan

Session chair: **Kyungkon Kim** (Ewha Womans University, Korea)

- 9:00 **IL13** Effects of Solubilizing Group Modification in Fullerene Bis-adducts on Normal and Inverted Type Polymer Solar Cells
Bumjoon J. Kim
Department of Chemical and Biomolecular Engineering, KAIST, Korea
- 9:30 **IL14** Photoconductivity of C60 as an Origin of Bias Dependent Photocurrent in Organic Photovoltaics
Won-Ik Jeong, Yang Eun Lee, Hyun-Sub Shim, Tae-Min Kim, Sei-Yong Kim,
Jang-Joo Kim
WCU Hybrid Materials Program and Dept. Materials Science and Engineering, Seoul National University, Korea
- 10:00 **O13** Effect of co-evaporant induced crystallization on needle growth of phthalocyanine thin films
Toshihiko Kaji, Satoru Nakao, Masahiro Hiramoto
Institute of Molecular Science (IMS), Japan
- 10:20 **O14** Preparation of Enzymatic Electrode Using Carbon-Coated Anodic Aluminum Oxide Film with Vertically Aligned One-Dimensional Nanopores
Yasuto Hoshikawa¹⁾, Wataru Nakayama¹⁾, Alberto Castro-Muñiz¹⁾,
Takashi Kyotani¹⁾, Tetsuji Itoh²⁾
¹⁾Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan,
²⁾National Institute of Advanced Industrial Science and Technology (AIST), Japan

Session chair: **Yukihiro Shimo** (AIST, Japan)

- 11:00 **IL15** Organic nanotubes for intelligent nanocapsules
Mitsutoshi Masuda
Nanotube Research Center (NTRC), National Institute of Advanced Industrial Science and Technology (AIST), Japan
- 11:30 **IL16** Epitaxial CVD Growth of Graphene
Hiroki Ago
Institute for Materials Chemistry and Engineering, Kyushu University, Japan
- 12:00 **O15** Molecular beacon aptamer based ATP detection
Ji-Eun Jeong, Boram Kim, Han Young Woo
Department of Cogno-mechatronics Engineering (WCU), Pusan National University, Korea

Poster session A (17:30-19:00, August 30)

- PA1** Flexible Organic Solar Cells based on Solution-Processable Silver Nanowire Transparent Electrode
Youngjun Jeong, Yumi Ahn, Youngu Lee
Department of Energy Systems Engineering, Daegu Gyeongbuk Institute of Science and Technology (DGIST), Korea
- PA2** Improvement of Operation Lifetime for Organic Solar Cell by Introducing Transparent Zn-doped In₂O₃ Electrode
Jinju Bae, Dongcheul Han, Gyuseok Choi, Sanghoon Jung, Hanjae Shin, Myungchan An, Samsu Kim, Wanghoon Lee, Yongbae Kim
Gumi Electronics and Information Technology Research Institute, Korea
- PA3** Exciton Dynamics of P3HT:PCBM Blend Films with Different Regio-regularities of the Polymer using Transient Absorption Spectroscopy
Sunae Lee¹⁾, Myounghee Lee¹⁾, Jongdeok An²⁾, Helene Ahme³⁾, Chan Im^{1,2)}
¹⁾Konkuk University-Fraunhofer ISE Next Generation Solar Cell Research Center, Korea, ²⁾Department of Chemistry, Konkuk University, Korea, ³⁾Fraunhofer Institute for Solar Energy Systems (ISE), Germany
- PA4** The Effect of Side-Chain Structure on Copolymer-Based Bulk Heterojunction Solar Cells
Chanitpa Khantha^{1,4)}, Viruntachar Kruefu²⁾, Robert C. Coffin³⁾, David L. Carroll³⁾, Sukon Phanichphant⁴⁾
¹⁾Department of Chemistry, Faculty of Science, Chiang Mai University, Thailand, ²⁾Program in Materials Science, Faculty of Science, Maejo University, Thailand, ³⁾The center for Nanotechnology and Molecular Materials, Wake Forest University, USA, ⁴⁾Materials Science Research Center, Faculty of Science, Chiang Mai University, Thailand
- PA5** Flexible Organic Solar Cells based on the spin-coated blend films of a Phenylene–Thiophene Oligomer Derivative and PCBM
Zong-Fan Duan^{1,2)}, Shunjiro Fujii³⁾, Takanori Okukawa²⁾, Yuichiro Yanagi²⁾, Akira Yoshida²⁾, Hiromichi Kataura³⁾, Gaoyang Zhao¹⁾, Yasuhiro Nishioka²⁾
¹⁾Xi'an University of Technology, China, ²⁾College of Science and Technology (CST), Nihon University, Japan, ³⁾Nanosystem Research Institute, AIST, Japan
- PA6** Control of the energetic structure of *n*-type Schottky junctions in photovoltaic co-deposited films
Norihiro Ishiyama^{1,2,3)}, Tadashi Yoshioka^{2,3)}, Toshihiko Kaji^{1,2,3)}, Masahiro Hiramoto^{1,2,3)}
¹⁾The Graduate University for Advanced Studies (SOKENDAI), Japan, ²⁾Institute for Molecular Science (IMS), Japan, ³⁾CREST/JST, Japan
- PA7** Doping effect of CBP in bulkhetero junction photovoltaic devices composed of P3HT and soluble perylene bisimide
Yuki Tani^{1,3)}, Tomohiro Seki^{2,3)}, Shiki Yagai^{2,3)}, Ken-ichi Nakayama^{1,3,4)}
¹⁾Yamagata University, Japan, ²⁾Chiba University, Japan, ³⁾CREST/JST, Japan, ⁴⁾Research Center for Organic Electronics (ROEL), Yamagata University, Japan

- PA8** **Synthesis of New Carbazole Substituted Phenylquinoline Based Fullerene Derivatives as an Electron Acceptor for Bulk Heterojunction Photovoltaic Cell Applications**
Pachagounder Sakthivel, Sung-Ho Jin
Department of Chemistry Education, Interdisciplinary Program of Advanced Information and Display Materials, and Institute for Plastic Information and Energy Materials, Pusan National University, Korea
- PA9** **Synthesis and Photovoltaic Properties of Low-Band Gap Copolymers Containing Perylene Diimide Derivative**
Sung-Ho Jin¹⁾, Taewon Ban¹⁾, Juhyeon Park¹⁾, Yeong-Soon Gal²⁾
¹⁾Department of Chemistry Education, Interdisciplinary Program of Advanced Information and Display Materials, and Institute for Plastic Information and Energy Materials, Pusan National University, Korea, ²⁾Polymer Chemistry Laboratory, Kyungil University, Korea
- PA10** **Heteroleptic ruthenium complexes with terpyridine derivatives for DSSCs**
Dong Min Chang,¹⁾ Dong Yuel Kwon²⁾, Young Sik Kim^{1,3)}
¹⁾Department of Information Display, Hongik University, Korea, ²⁾Department of Chemical Engineering, Hongik University, Korea, ³⁾Department of Science, Hongik University, Korea
- PA11** **Synthesis and Characterization of Y-Shape Electron Donor-Acceptor Type Organic Dyes for Dye-Sensitized Solar Cells**
Taewon Ban, Sung-Ho Jin
Department of Chemistry Education, Department of Frontier Materials Chemistry, and Institute for Plastic Information and Energy Materials, Pusan National University, Korea
- PA12** **Synthesis and properties of organic semiconducting polymers containing dithienylfluorenone for organic photovoltaic cells**
Fei Xu, Yun-Sun Byun, Ji-Hoon Kim, Jong Baek Park, Do-Hoon Hwang
Department of Chemistry, and Chemistry Institute for Functional Materials, Pusan National University, Korea
- PA13** **Novel D- π -A Structured Zn(II)-Porphyrin Dyes Bearing Various Electron Donating Groups for Dye-Sensitized Solar Cells**
Sung Ho Kang, Min Soo Kang, Hwan Kyu Kim
Department of Advanced Materials Chemistry, Korea University, Korea
- PA14** **High Efficiency Dye-sensitized Solar Cells by (Hf/N) Codoping Treatment**
Hirokazu Yamane¹⁾, Issei Ohtani¹⁾, Hiroyuki Nakamura²⁾, Kenji Yamada¹⁾
¹⁾Department of Materials Science and Chemical Engineering, Kitakyushu National College of Technology, Japan, ²⁾Department of Integrated Arts and Science, Kitakyushu National College of Technology, Japan
- PA15** **High Efficiency Dye-sensitized Solar Cells using Polymer-grafted TiO₂ Nanoparticles**
Hirokazu Yamane¹⁾, Mitsuru Tateishi¹⁾, Hiroyuki Nakamura²⁾, Kenji Yamada¹⁾
¹⁾Department of Materials Science and Chemical Engineering, Kitakyushu National College of Technology, Japan, ²⁾Department of Integrated Arts and Science, Kitakyushu National College of Technology, Japan
- PA16** **Thermally crosslinked polyvinyl alcohol (PVA) layers for the passivation of pentacene thin-film transistors**
Hye Jung Suk¹⁾, Mi Hye Yi¹⁾, Taek Ahn²⁾
¹⁾Advanced Materials Division, Korea Research Institute of Chemical Technology, Korea, ²⁾Department of Chemistry, Kyungsoong University, Korea

- PA17** Low-temperature processable, photosensitive polyimide as a gate insulator for pentacene thin-film transistors
 Hye Jung Suk¹⁾, Mi Hye Yi¹⁾, Taek Ahn²⁾
¹⁾Advanced Materials Division, Korea Research Institute of Chemical Technology, Korea, ²⁾Department of Chemistry, Kyungsoong University, Korea
- PA18** High-Performance n-Type OTFT Devices Fabricated by Using Solution-Processable Fullerene Derivatives
Yi-Seul Han¹⁾, Sun-Young Nam¹⁾, Shinuk Cho²⁾, Tea-Dong Kim¹⁾, Kwang-Sup Lee¹⁾
¹⁾Department of Advanced Materials, Hannam University, Korea, ²⁾Department of Physics and EHSRC, University of Ulsan, Korea
- PA19** Synthesis and characterization of organic semiconductor for solution processing technology
Jong-A Hong¹⁾, Hye Jin Koh¹⁾, Jong-Jin Ha¹⁾, Soon-Ki Kwon¹⁾, Yun-Hi Kim²⁾
¹⁾School of Materials Science and Engineering and Engineering Research Institute (ERI), Gyeongsang National University, Korea, ²⁾Department of Chemistry and RINS, Gyeongsang National University, Korea
- PA20** Solution-processed OTFT Based on Polythiophene Derivatives Containing Vinyl Group
Il Kang¹⁾, Hui-Jun Yun¹⁾, Jung-A Hong¹⁾, Yun-Hi Kim²⁾, Soon-Ki Kwon¹⁾
¹⁾School of Materials Science and Engineering and ERI, Gyeongsang National University, Korea, ²⁾Department of Chemistry, Gyeongsang National University, Korea
- PA21** Doping Effect of Silole Derivative on Green-Sensitive Organic Photoconductive Device
Takeshi Fukuda, Sho Kimura, Zentaro Honda, Norihiko Kamata, Keita Mori, Ken Hatano
 Department of Functional Materials Science, Graduate School of Science and Engineering, Saitama University, Japan
- PA22** Evaluation of Carrier Concentration by C-V Measurements for p,n-Controlled C₆₀ Films
Tadashi Yoshioka^{1,2)}, Masayuki Kubo^{1,2)}, Norihiro Ishiyama^{1,2,3)}, Toshihiko Kaji^{1,2,3)}, Masahiro Hiramoto^{1,2,3)}
¹⁾Institute for Molecular Science (IMS), Japan, ²⁾CREST/JST, Japan, ³⁾The Graduate University for Advanced Studies (SOKENDAI), Japan
- PA23** Preparation of Vinylferrocene-terminated Si(111) in Dibutyl Ether Medium
Marvin U. Herrera, Takashi Ichii, Kuniaki Murase, Hiroyuki Sugimura
 Department of Materials Science and Engineering, Kyoto University, Japan
- PA24** Hydrogenation Effect on Hole-Transport Properties of Fullerene C₇₀: A Density Functional Theory Study on C₇₀H₄ and C₇₀H₆
Ken Tokunaga¹⁾, Shigekazu Ohmori²⁾, Hiroshi Kawabata³⁾
¹⁾Division of Liberal Arts, Kogakuin University, Japan, ²⁾Venture Business Laboratory, Kyoto University, Japan, ³⁾Young Researchers Education Center, Hiroshima University, Japan
- PA25** Organic-Quantum Dot Hybrid Materials for Memory Applications
Su-Min Jeon¹⁾, Sung-Yeon Park¹⁾, Tea-Dong Kim¹⁾, Yong-Baek Lee²⁾, Jin-Soo Joo²⁾, Kwang-Sup Lee¹⁾
¹⁾Department of Advanced Materials, Hannam University, Korea, ²⁾Department of Physics, Korea University, Korea

- PA26** Computer-Aided Molecular Design of Single Molecule Electronic Devices
Hiroto Tachikawa¹⁾, Mugiho Aiso²⁾, Hiroshi Kawabata¹⁾, Tetsuji Iyama¹⁾,
Tomoya Takada²⁾
¹⁾Division of Materials Chemistry, Graduate School of Engineering, Hokkaido University, Japan,
²⁾Department of Material Chemistry, Asahikawa National College of Technology, Japan
- PA27** Density Functional Theory Study on the Interaction of Carbon Materials with Radicals
Tetsuji Iyama, Hiroto Tachikawa
Division of Materials Chemistry, Graduate School of Engineering, Hokkaido University, Japan
- PA28** Photoconversion of Pentacene Diketone Microcrystals
Sadahiro Masuo^{1,3)}, Katsuki Tanaka¹⁾, Hiroko Yamada^{2,3)}
¹⁾Department of Chemistry, Kwansei Gakuin University, Japan, ²⁾Graduate School of Materials Science,
Nara Institute of Technology, Japan, ³⁾CREST/JST, Japan
- PA29** Morphology Study of Well-defined Regioregular Poly(3-octylthiophene) with Different
Molecular Weights
Hyeonyeol Jeon^{1,2)}, Seung Sang Hwang^{1,2)}, Hoichang Yang³⁾, Kyung-Youl Baek^{1,2)}
¹⁾Center for Materials Architecturing, Korea Institute of Science Technology, Korea, ²⁾Nanomaterials
Science and Engineering, University of Science and Technology, Korea, ³⁾Department of Advanced Fiber
Engineering, Inha University, Korea
- PA30** Fabrication of ion conductive polymer nanosheet assemblies for the isotropic conductive
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Yuta Hayasaka, Jun Matsui, Tokuji Miyashita
Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Japan
- PA31** Behaviors of MNG-3 in different subphase conditions at the air-water interface
Jisun Lee^{1,2)}, Pilseok Chae²⁾, Daewon Shon¹⁾
¹⁾Department of Chemistry, Hanyang University, Korea, ²⁾Department of Chemistry, University of
Wisconsin–Madison, USA
- PA32** Photophysical properties of self-assembled cyanine-dye aggregates formation assisted
by cyclodextrin inclusion complexation
Shigeaki Abe¹⁾, Takayuki Kiba²⁾, Takashi Hirota³⁾, Naoyuki Miyakawa³⁾,
Fumio Watari¹⁾, Akihiro Murayama²⁾, Shin-ichiro Sato³⁾
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Science and Technology, Hokkaido University, Japan, ³⁾Graduate School of Engineering, Hokkaido
University, Japan
- PA33** Controlled Synthesis and Optoelectronic Properties of Carbazole-Containing Block
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Yohei Abiko, Kazuhiro Nakabayashi, Hideharu Mori
Graduate School of Science and Engineering, Yamagata University, Japan
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Rei Taguchi¹⁾, Shoichi Kubo¹⁾, Shingo Hadano²⁾, Tomokazu Iyoda²⁾, Masaru Nakagawa¹⁾
¹⁾Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Japan,
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- PA35** Film Preparation of Siloxane-Based Polymers Containing Anthracene Group
Ali Demirci, Jun Matsui, Masaya Mitsuishi, Akira Watanabe, Tokuji Miyashita
Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Japan
- PA36** Analysis of Herbal Medicine Coptis by Surface Enhanced Raman Scattering Spectroscopy
Kyouji Honma¹⁾, Yasutaka Matsuo²⁾, Kuniharu Ijiro²⁾, Hiromi Kimura-Suda¹⁾
¹⁾Department of Bio-and Material Photonics, Chitose Institute of Science and Technology, Japan, ²⁾ Reseach Institute for Electronic Science, Hokkaido University, Japan
- PA37** Cure Properties of Naphthalene-Based Epoxy Resin Systems with Hardeners and Latent Catalysts for Semiconductor Packaging Materials
Whan Gun Kim¹⁾, Hyunaee Chun²⁾
¹⁾Department of Chemical and Biological Engineering, Seokyeong University, Korea, ²⁾Gyeonggi Technology Application Center, Korea Institute of Industrial Technology, Korea
- PA38** Terahertz and solid-state NMR spectroscopies of an endohedral metallofullerene
Eunsang Kwon¹⁾, Yasuhiko Kasama²⁾, Tomoaki Endo³⁾
¹⁾Research and Analytical Center for Giant Molecules, Graduate School of Science, Tohoku University, Japan, ²⁾Idea International Inc., Japan, ³⁾Sendai National College of Technology, Japan
- PA39** Characterization of Heart Disease in Rats with Chronic Kidney Disease by FTIR imaging
Kyousuke Kanazawa¹⁾, Mieko Kuwahara²⁾, Kousuke Hidaka¹⁾, Hidetoshi Ueno¹⁾, Kenji Bannai²⁾, Hideyuki Yamato²⁾, Hiromi Kimura-Suda¹⁾
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- PA40** Synthese and Surface Characterization of Fluorinated Poly(imide siloxane) Copolymers
Won-Ki Lee¹⁾, Sin Hye Jung²⁾
¹⁾Department of Polymer Engineering, Pukyong National University, Korea, ²⁾Kunyang Co. Ltd, Korea
- PA41** Impact Optimized Performance of Epoxy / Polyamide / CSR (Core Shell Rubber) / DDS (4,4-Diaminodiphenyl Sulfone) Blends at Low Temperature
Sunseong Ok, Jungrae Lee, Hyomin Kim, Yiseul Kwon, Youngson Choe
Department of Chemical Engineering, Pusan National University, Korea
- PA42** Enhanced Mechanical Properties of Nanoporous Ultralow Dielectrics by Ozone & UV Treatment
Seung-Hyun Song, Won-Ki Kim, Hee-Woo Rhee
Department of Chemical & Biomolecuar Engineering, Sogang University, Korea
- PA43** Density Functional Theory Study on the Reaction between Finite-sized Graphene and CH Radical
Tomoya Takada, Yosuke Komatsu, Tsukasa Takagi
Department of Materials Chemistry, Asahikawa National College of Technology, Japan

- PA44** Crystal Structures and CO₂ Adsorption-Desorption Properties of One-Dimensional Paddle-Wheel Type Cu(II) Coordination Polymers
Kiyonori Takahashi¹⁾, Norihisa Hoshino^{1,2)}, Tomoyuki Akutagawa^{1,2)}
¹⁾Graduate School of Engineering, Tohoku University, Japan, ²⁾Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Japan
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Shunsaku Tamura¹⁾, Norihisa Hoshino^{1,2)}, Tomoyuki Akutagawa^{1,2)}
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Ayumi Tsuda, Kazuhiro Nakabayashi, Hideharu Mori
 Graduate School of Science and Engineering, Yamagata University, Japan
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Yuuya Yoshii¹⁾, Norihisa Hoshino^{1,2)}, Tomoyuki Akutagawa^{1,2)}
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Norihisa Hoshino, Tomoyuki Akutagawa
 Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Japan
- PA49** EuS Nano-assemblies Linked with Photo-functional Naphthalenedithiols
Akira Kawashima, Takayuki Nakanishi, Koji Fushimi, Yasuchika Hasegawa
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Keisuke Araki, Yusuke Aoki
 Graduate School of Engineering, Mie University, Japan
- PA51** Efficiency Characteristics of Dye-Sensitized Solar Cells (DSSCs) by Incorporation of TiO₂-Reduced Graphene Oxide Composite Electrodes
Hyun-Seok Ko¹⁾, Hye-Jin Han¹⁾, Gil Na¹⁾, Jae-Jung Yun²⁾, A-Ri Lee³⁾, Eun-Mi Han⁴⁾
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- PA52** Synthesis and Characterization of Poly[N-(2-ethylpyrrolyl)-2-ethynylpyridinium bromide]
Yeong-Soon Gal¹⁾, Sung-Ho Jin²⁾, Jong-Wook Park³⁾, Kwon Taek Lim⁴⁾
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- PA53** Synthesis and Characterization of a Polyacetylene by Double Cyclopolymerization of Triyne Monomer
Yeong-Soon Gal¹⁾, Jong Wook Park²⁾, Sung-Ho Jin³⁾, Kwon Taek Lim⁴⁾
¹⁾Polymer Chemistry Laboratory, College of Engineering, Kyungil University, Korea, ²⁾Department of Chemistry, The Catholic University of Korea, Korea, ³⁾Department of Chemistry Education, Pusan National University, Korea, ⁴⁾Division of Image and Information Technology, Pukyong National University, Korea
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Kenji Takehara, Takanori Sajima, Toshihiko Nagamura, Takeshi Maeda, Chisato Tanoue, Kazuaki Isomura
Department of Materials Science and Chemical Engineering, Kitakyushu National College of Technology, Japan
- PA55** Structure and intermolecular dynamics of carbon disulfide/alcohols binary solution
Takayuki Kiba¹⁾, Takashi Hirota²⁾, Akihiro Murayama¹⁾, Shin-ichiro Sato²⁾
¹⁾Graduate School of Information Science and Technology, Hokkaido University, Japan, ²⁾Graduate School of Engineering, Hokkaido University, Japan
- PA56** Efficient Light Harvesting Patterns for Solar Cells by Direct Nanopatterning
Jongbeom Na, Chihyun Park, Kyoungsoon Shin, Jeonghun Kim, Byeonggwon Kim, Eunkyong Kim
Active Polymer Center for pattern Integration, Department of Chemical and Biomolecular Engineering, Yonsei University, Korea
- PA57** Dual-functional diffraction grating based on a change of glass transition temperature of photochromic diarylethene
Naoya Matsui, Tsuyoshi Tsujioka
Osaka Kyoiku University, Japan
- PA58** Synthesis of New Dye Compounds Based on Anthraquinone Derivatives for Color Filter Colorants
Junghyo Park, Suyeoun Park, Jiwon Lee, Jongwook Park
Department of Chemistry, The Catholic University of Korea, Korea
- PA59** Effects of silver nanoparticles on photocurrents of zinc porphyrin-viologen linked compounds-silver nanoparticle composite films
Ryuji Matsumoto, Sunao Yamada, Hiroaki Yonemura
¹⁾Department of Applied Chemistry, Faculty of Engineering, Kyushu University, Japan, ²⁾Department of Materials Physics and Chemistry, Graduate School of Engineering, Kyushu University, Japan
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Feng Qiu, Feng Yu, Kazuhiro Yamamoto, Shiyoshi Yokoyama
Institute for Materials Chemistry and Engineering, Kyushu University, Japan
- PA61** Athermal Resonant Control of Silicon Nitride Slot Ring Resonators by Overlaying a Polymer Cladding
Feng Yu, Yue Jia, Shiyoshi Yokoyama
Institute for Materials Chemistry and Engineering, Kyushu University, Japan

- PA62** Multi-Layer Thin Film Filter Using High Refractive Index Hybrid Material
Okihiro Sugihara, Yu Kurata, Masaru Nakagawa
 Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Japan
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 Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Japan
- PA64** Thin-Film μ -Fuse Prepared by Selective Pb Deposition with Photochromic Diarylethene
Megumi Dohi, Tsuyoshi Tsujioka
 Osaka Kyoiku University, Japan
- PA65** Magnetic Field Effects on Photocurrents of Electrodes Modified with Poly(3-hexylthiophene) Nanowires
Masayuki Takata, Sunao Yamada, Hiroaki Yonemura
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- PA66** Preparation of Photo-Crosslinked Films of New Polymaleimides with Chalcone Side Chains and Alignment Behavior of Liquid Crystals
Ju Hui Kang, Si Yeol Yang, Mi Im An, Seung Yong Jeong, Sangkug Lee, Kyung Ho Choi, Gyo jic Shin
 Korea Institute of Industrial Technology (KITECH), Korea
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Si Yeol Yang, Ju Hui Kang, Mi Im An, Seung Yong Jeong, Sangkug Lee, Kyung Ho Choi, Gyo jic Shin
 Korea Institute of Industrial Technology (KITECH), Korea
- PA68** Near-infrared Laser Diode System of Fluorescence Imaging for Laparoscopy Diagnosis in Gastric Cancer
Liming Li¹, Rei Shirogane¹, Yuma Ebihara²
¹Department of Bio-Material, Chitose Institute of Science and Technology, Japan, ²Department of Surgical Oncology, Graduate School of Medicine, Hokkaido University, Japan
- PA69** Fabrication of Thin Film from Conducting Polymer–Single Wall Carbon Nanotube Composites for the Detection of Uric acid
Sopis Chuekachang^{1, 2)}, Rapihun Janmanee^{1, 2)}, Akira Baba¹⁾, Sukon Phanichphant³⁾, Saengrawee Sriwichai²⁾, Kazunari Shinbo¹⁾, Keizo Kato¹⁾, Futao Kaneko¹⁾, Nobuko Fukuda⁴⁾, Hirobumi Ushijima⁴⁾
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- PA70** Luminescent Polymer Nanosheets Based Fiber Optic Oxygen Sensor Enhanced by Surface Plasmon Resonance
Tao Chen, Masaya Mitsuishi, Tokuji Miyashita
 Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Japan

- PA71** Electrochemical Cholesterol Sensor based on Pt nanoparticles and Layer-by-Layer Assembled CNT Thin Film
Misuk Cho, Jiao Yang, Youngkwan Lee
 School of Chemical Engineering, Sungkyunkwan University, Korea
- PA72** Fabrication of Carboxylated Conducting Polymer/CNTs Composites Thin films for Immunosensor Application
Paphawadee Netsuwan¹⁾, Saengrawee Sriwichai²⁾, Sukon Phanichphant²⁾, Akira Baba³⁾, Kazunari Shinbo³⁾, Keizo Kato³⁾, Futao Kaneko³⁾
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- PA73** Theoretical study of intramolecular charge transfer turn-off switching of N-(4-Dimethylaminobenzoyl)thiourea induced by anion recognition
Kazuma Yanai¹⁾, Shin-ichiro Sato²⁾
¹⁾Graduate School of Chemical sciences and Engineering Hokkaido University, Japan, ²⁾Graduate School of Engineering Hokkaido University, Japan
- PA74** Direct electron transfer of glucose oxidase promoted by PEDOT and its glucose sensing properties
Haiming Zhao, Myong Soo Choi, Seong Hun Yu, Sung Hee Kim, So Yun Jeon, Xiaoxue Song, Ryun Woo Lim, Jun Young Lee
 Department of Chemical Engineering, Sungkyunkwan University, Korea
- PA75** Electrochemically Fabricated and Properties of Functionalized Pyrrole Copolymers
Rapiphun Janmanee^{1,2)}, Akira Baba²⁾, Sukon Phanichphant³⁾, Saengrawee Sriwichai¹⁾, Kazunari Shinbo²⁾, Keizo Kato²⁾, Futao Kaneko²⁾
¹⁾Department of Chemistry, Faculty of Science, Chiang Mai University, Thailand, ²⁾Center for Transdisciplinary Research and Graduate School of Science and Technology, Niigata University, Japan, ³⁾Materials Science Center, Faculty of Science, Chiang Mai University, Thailand
- PA76** Electric properties of nonamphiphilic poly(vinylidene fluoride) Langmuir-Blodgett nanofilm with dominant β crystals
Huie Zhu, Masaya Mitsuishi, Jun Matsui, Tokuji Miyashita
 Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Japan
- PA77** Dielectric property and structure evaluation of porous polyimide film using different sized silica nanoparticles as template
Takeru Hayashi¹⁾, Tsunenobu Onodera¹⁾, Takayuki Ishizaka²⁾, Hitoshi Kasai¹⁾, Hidetoshi Oikawa¹⁾
¹⁾Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Japan, ²⁾National Institute of Advanced Industrial Science and Technology (AIST) Tohoku, Japan
- PA78** Flexible and Durable Substrates prepared by using the Layer-by-layer Self-assembly Technique on Porous Polymer Films for Flexible Electronics
Yuta Saito¹⁾, Yuji Hirai^{2,3)}, Hiroshi Yabu²⁾, Masatugu Shimomura^{2,3,4)}
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- PA79** 2 nm Nanogap Electrodes by Molecular Ruler Electroless Gold Plating (MoREP) with Decamethonium Bromide
Shuhei Takeshita^{1,3)}, Victor M. Serdio V.^{1,3)}, Toshiharu Teranishi^{2,3)}, Yutaka Majima^{1,3,4)}
¹⁾Materials and Structures Laboratory, Tokyo Institute of Technology, Japan, ²⁾Institute for Chemical Research, Kyoto University, Japan, ³⁾CREST-JST, Japan, ⁴⁾Department of Printed Electronics Engineering, Suncheon National University, Korea
- PA80** Organic co-evaporation from single effusion cell: pentacene and perfluoropentacene
Takuya Hosokai¹⁾, Shouta Watanabe¹⁾, Masaki Saito¹⁾, Tomoyuki Koganezawa²⁾, Noriyuki Yoshimoto¹⁾
¹⁾Iwate University, Japan, ²⁾Japan Synchrotron Radiation Research Institute, Japan
- PA81** Ionic-Liquid/Electrode Interfaces Investigated by Electrochemical Atomic Force Microscopy
Takashi Ichii, Masahiro Negami, Kuniaki Murase, Hiroyuki Sugimura
Department of Material science and engineering, Kyoto University, Japan
- PA82** High Optical Density and Low Dielectric Constant Black Matrix Containing Graphene Oxide and Carbon Black on Color Filters
EnJu Jung¹⁾, JooSung Kim²⁾, Bui Thanh Son¹⁾, Byung Ho Ra¹⁾, GyuCheol Sin²⁾, SeongHun Yuk²⁾, Jin-Young Bae¹⁾
¹⁾Department of Polymer Science and Engineering, Sungkyunkwan University, Korea, ²⁾Dongwoo Fine-Chem CO.LTD. Research & Technology Division, Korea
- PA83** Gas Permeability of Patterned PDMS-grafted Polyimide Membranes Fabricated by Nanocasting Method
Cheol Min Yun¹⁾, Yu Nagase²⁾, Masaru Nakagawa¹⁾
¹⁾Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University, Japan, ²⁾Graduate School of Engineering, Tokai University, Japan
- PA84** Gas Adsorption Studies of Variously Modified Imogolites
Yangjun Jeon, Daewon Sohn
Department of Chemistry, Hanyang University, Korea

Oral session

Hybrid Polymer Nano-sheet Assemblies toward Flexible Electronics and Photonics

Tokuji Miyashita, Masaya Mitsuishi, and Jun Matsui

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Recently, bottom-up approaches for constructing ordered nanoscale structures in organic molecular assemblies have been of interest and various techniques for preparation of organic ultrathin films have been studied. We have tried to prepare various polymer thin films with Langmuir-Blodgett technique. It is found that poly(*N*-dodecylacrylamide) (pDDA) forms a polymer nano-sheet with a thickness of 1.7 nm and well-defined molecular orientation caused by two-dimensional hydrogen bonding network, and can be transferred onto solid supports. Moreover, various functional groups have been incorporated into the polymer sheets and soft nano-devices based on their integrated assemblies have also been developed. In this presentation, we would like to talk about a recent topic related to photoelectric conversion, optical logic operation, organic FET, surface modification toward printable electronics and preparation of novel hybrid polymer thin films with silsesquioxane derivatives.

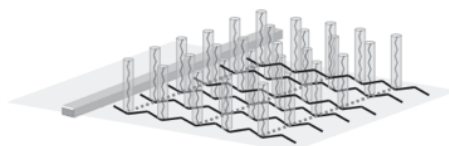


Fig. 1 Polymer monolayer formation based on 2D hydrobonding

Incorporating silver nanoparticles and quantum dots into microstructures fabricated by two-photon lithography

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Noble metals and semiconducting nanoparticles show very interesting optical properties like surface plasmon resonance and highly efficient fluorescence owing to their unique electronic structure. These material when incorporated into polymeric microstructures in specific order can give raise effects like waveguiding. Many two- and fewer three-dimensional optoelectronic components have been demonstrated by incorporating such materials. Two-photon lithography (TPL) is a maskless lithographic technique that facilitate the fast fabrication of microstructures through chemical reactions initiated by two-photon absorption. Here we summarize a host of approaches for incorporation of noble metals nanoparticles and semiconductors in microstructures fabricated by TPL. For incorporating silver we have worked on both insitu generation of silver through a combined photo-thermal process as well as chemical post modification of fabricated microstructures. To incorporate quantum dots we stabilized them with photocrosslinkable ligands which allow their facile dispersion in polymerizable resins. This resins can then be easily used to fabricate complex microstructures.



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