PROGRAM for JOINT WORKSHOP Frontier 2015 (Nov.29-Dec.3)

November 29th, 2015 Sunday <Sakura Hall 1F>
16:00-20:00 REGISTRATION & WELCOME RECEPTION

November 30th, 2015 Monday <Sakura Hall 2F>

OPENING CEREMONY
Opening
9:00-9:05 Prof. Atsushi MURAMATSU, Director of IMRAM, Tohoku University
Welcome Address
9:05-9:15 Prof. Susumu SATOMI, President of Tohoku University
(Prof. Toshiya UEKI, Executive Vice President, Tohoku University)
Welcome Address
9:15-9:25 Ms. Emiko OKUYAMA, Mayor of Sendai City
(Mr. Michiya UJIIE, Director General, Economic Affairs Bureau, Sendai City)
Message from Rennes City
9:25-9:30 Ms. Jocelyne Bougeard, Vice Mayor of Rennes City

9:30-9:45 MEMORIAL PHOTO

Session I. INTERNATIONAL COLLABORATION
Chair Prof. Shun-Ichiro TANAKA
9:50-10:20 Prof. Yoshitaka KASUKABE, Global Learning Center, Institute for Excellence in Higher Education, Tohoku University
“Study Abroad at Tohoku University, Japan --Research-oriented Programs: JYPE and COLABS—“

10:20-10:45 Profs. Michel BARON and Alain de Ryck, Rapsodee, Mines-Albi
“Institut Mines-Télécom, École des Mines d’Albi & International Collaboration with Tohoku University”

10:45-11:10 Mr. Yvan COADOUR, Deputy-director of International Affairs Office, Univ. Rennes 1
“European program Erasmus + International Credit Mobility”

11:10-11:35 Prof. Eric COLLET, IPR, Univ. Rennes 1
“The France-Japan Impact Dynamics International Laboratory: Seeing real-time dynamics and impacting materials by light and electric fields”

11:35-12:00 Prof. Laurent CARIO, CNRS Director, Institut des Matériaux Jean Rouxel, Univ. Nantes
“An overview of research projects and international relationships at the institut des Matériaux Jean Rouxel (IMN)”
Session II. MOLECULAR-METAL COMPLEXES
Chair Prof. Shinichiro IWAI
13:00-13:25 “Charge Bistability and Unusual Phase Transition Phenomena in Quasi-One-Dimensional Halogen-Bridged Metal Complexes”
Shinya Takaishi  Dept. Chemistry, Graduate School of Science, Tohoku University

13:25-13:50 “3D-ΔPDF investigation at University of Rennes 1 of the Mott to CDW phase transition in a MX crystal designed at Tohoku University”
Laurent Guérin¹, Shinya Takaishi², Edoardo Zatterin¹, Arkadiy Simonov¹, Philippe Rabiller¹, Céline Mariette¹ and Bertrand Toudic¹
¹IPR, Université de Rennes 1
²Dept. Chemistry, Graduate School of Science, Tohoku University

13:50-14:15 “Multistability in switchable metal-organic frameworks”
Céline Mariette¹, Elzbieta Trzop¹, Simon Le Mehaute¹, José Antonio Real², Bertrand Toudic³
¹Institut de Physique de Rennes (IPR), Université de Rennes 1
²Instituto de Ciencia Molecular (ICMol) – Universidad de Valencia

14:15-14:40 “Functional MOFs: Toward the Synergistic Control of Electrons, Spins, Structures, and Chemical Interactions”
Hitoshi Miyasaka  IMR, Tohoku University

14:40-15:05 “Frontier of Quantum Molecular Spintronics Based on Single-Molecule Magnets: Toward Green IT Innovation”
Masahiro Yamashita  Dept. Chemistry, Graduate School of Science, Tohoku University & CREST

Session III. PHOTOINDUCED PHASE TRANSITION
Chair Prof. Herve CAILLEAU
15:20-15:45 “Photo-switchable molecular materials: gold rush revived and tool cart reinvented”
Maciej Lorenc  IPR, Université de Rennes 1

15:45-16:10 “Exotic electronic properties of the Mott insulators AM₄Q₈”
E. Janod, B. Corraze, L. Cario  Institut de Matériaux Jean Rouxel, Université de Nantes

16:10-16:35 “Strong field effect induced by nearly single-cycle 7fs, 10 MV/cm infrared light in correlated organic conductors”
Shinichiro Iwai  Dept. Physics, Graduate School of Science, Tohoku University

16:35-17:00 “Ultrafast Optical Control of Correlated Electron Systems”
Sumio Ishihara¹, A. Ono¹, H. Hashimoto¹, H. Matsueda², and H. Seo³,⁴
¹Dept. Physics, Graduate School of Science, Tohoku University,
²Sendai National College of Technology,
³Condensed Matter Theory Labo., RIKEN,
⁴RIKEN Center for Emergent Matter Science
Session IV. APERIODIC MATERIALS

Chair Prof. An-Pang TSAI
9:00-9:20 “Aperiodicity in Spin Crossover Crystals”
   Bertrand Toudic and Eric Collet  IPR, Université de Rennes 1

9:20-9:40 “Possibility of Phase Transition in Quasicrystal at Low Temperature”
   Tunetomo. Yamada¹, Laurent Guérin², Olivier Perez³, Bertrand Toudic²,
   Marc de Boisieu⁴,⁵, A.P.Tsai¹
   ¹IMRAM, Tohoku University, ²IPR, University de Rennes 1
   ³CRISMAT, UMR, Caen CNRS, ⁴Univ. Grenoble Alpes, SIMaP, Grenoble
   ⁵CNRS, SIMaP, Grenoble

9:40-10:00 67Zn NMR investigation of 1/1 Zn₆Sc approximant and quasicrystal”
   Christophe Odin¹, L. Guérin¹, B. Toudic¹, L. Le Pollès², Claire Roiland²,
   Julien Trebosc³, T. Yamada⁴, A. P. Tsai⁴
   ¹UMR 6251 IPR, Université de Rennes 1, ²UMR 6226 SCR, Université de Rennes 1
   ³UMR8181, “Ecole Nationale Supérieure de Chimie de Lille”, ⁴IMRAM, Tohoku University

Session V. GLASSES

Chair Prof. Hiroyuki SHIBATA
10:20-10:40 “Origin of Long-range Disorder in Metallic Glasses”
   Akihiko Hirata¹, Takeshi Fujita¹ and Mingwei Chen¹,²
   ¹WPI-Advanced Institute for Materials Research, Tohoku University
   ²School of Materials Science and Engineering, Shanghai Jiao Tong University

10:40-11:00 “Mechanical properties of glasses: an experimental investigation (tenacity,
   viscosity and elastic moduli)”
   Fabrice Célarié, Y. Gueguen, P. Houizot, T. Rouxel
   Mechanics and Glasses, Institute of Physics of Rennes-CNRS

11:00-11:20 “Viscosity of Alkali and Alkaline-earth Aluminosilicate Liquids”
   Sohei Sukenaga¹, Yann Gueguen², Tetsuya Nagahisa³, Koji Kancheishi⁴, Noritaka Saito³
   Kunihiko Nakashima³, Fabrice Célarié², Tanguy Rouxel², and Hiroyuki Shibata¹
   ¹IMRAM, Tohoku University, ²IPR, Université de Rennes 1
   ³Dep. Mater. Sci. and Eng., Kyushu Univ. ⁴Nippon Steel & Sumitomo Metal Corporation

11:20-11:40 “Mechanoluminescence in a transparent glass composite”
   Yann Gueguen, Marion Dubernet, Patrick Houizot, Fabrice Célarié, Tanguy Rouxel
   IPR, Université de Rennes 1

11:40-12:00 “Perfect surface crystallization of fresnoite phase: Morphology and physical
   properties”
   Yoshihiro Takahashi, Nobuaki Terakado, Takumi Fujiwara
   Graduate School of Engineering, Tohoku University
Session VI. NANOMATERIALS

Chair Prof. Shigeru SUZUKI

13:00-13:20 “Giant Zn deficiency and impact on carrier type in “ZnO” nanoparticles”
Laurent Cario, A. Renaud, B. Chavillon, X. Rocquefelte, E. Faulques, P. Deniard,
F. Cheviré, F. Tessier, S. Jobic
a Institut des Matériaux Jean Rouxel, Univ. Nantes
b Sciences Chimiques de Rennes, équipe Verres et Céramiques, Université de Rennes 1

13:20-13:40 “Synthesis of Ni carbide nanoparticles with Ni3C-type structure and their spin glass behavior”
Shun Fujieda, Kozo Shinoda, Shigeru Suzuki, Balachandran Jeyadevan
IMRAM, Tohoku University
School of Engineering, The University of Shiga Prefecture

13:40-14:00 “Active Gap SERS for the Sensitive Detection of Biomacromolecules with Gold Nanoparticles on Hydrogels”
Kuniharu Ijiro, Hideyuki Mitomo, Kenta Horige, Yasutaka Matsuo, Kenichi Niikura
Research Institute for Electric Science, Hokkaido University
Graduate School of Chemical and Sciences and Engineering, Hokkaido University

14:00-14:20 “Fabrication of Fine Sodium Titanate Nanowires with Remarkable Sr Ion-Exchange Properties”
Naoki Asao
WPI-Advanced Institute for Materials Research, Tohoku University

Session VII. POWDER PROCESSING

Chair Prof. Junya KANO

14:20-14:40 “Recent Advances In Mehanosynthesis of Condensed 1-4 Diazines”
P F M Oliveira, A B Chamayou, B Guidetti, M Baltas, N. Haruta, T. Sato,
Michel Baron
Centre RAPSODEE, CNRS UMR 5302, Université de Toulouse, Mines-Albi
LSPCMIB, CNRS UMR 5068, Université de Toulouse, UPS
Graduate School of Engineering, Kyoto University

14:40-15:00 “Modeling and simulation of irregular-shaped particle breakage using ADEM”
Shingo Ishihara, Junya Kano
IMRAM, Tohoku University

15:00-15:20 “Steady-state shear behaviour of partially wet granular media”
H. Louati, D. Oulahna, C. Hare, M. Ghadiri, Alain de Ryck
1 RAPSODEE Center-UMR CNRS 5302, Mines-Albi, Université de Toulouse,
2 Institute of Particle Science and Engineering, University of Leeds, UK

15:30-17:30 POSTER SESSION + (Coffee) <Sakura Hall 1F>

18:00-20:00 BANQUET <Sakura Hall 1F>
Session VIII. IONIC DEVICES
Chair Prof. Junichi KAWAMURA
9:00-9:20 “Operando micro X-ray absorption spectroscopy measurements for investigating reaction distribution in solid oxide fuel cell electrodes”
Koji Amezawa1, Yoshinobu Fujimaki2, Yusuke Shindo2, Takashi Nakamura1, Tatsuya Kawada1
1IMRAM, Tohoku University 2Graduate School of Engineering, Tohoku University
9:20-9:40 “Supercritical fluid process of metal polyanion compound nanocrystals for Li-ion battery cathode applications”
Itaru Honma, Quang Duc Truong, M. K. Devaraju, Takaaki Tomai
IMRAM, Tohoku University

Session IX. INTERFACE ORAL HEALTH SCIENCE
“Satellite Symposium for 2nd Biosis-abiosis Intelligent Interface Symposium and 6th International Symposium for Interface Oral Health Science”
Chair Profs. Keiichi SASAKI and Osamu SUZUKI
10:00-10:25 “Innovative Research for Biosis-Abiosis Intelligent Interface”
Keiichi Sasaki, N.Takahashi, O.Suzuki  Graduate School of Dentistry, Tohoku University
10:25-10:50 “Current strategies for bone regeneration therapy in the treatment of periodontal disease”
K. Handa, V. Suresh, M. Ishikawa and Masahiro Saito
Div. Operative Dentistry, Graduate School of Dentistry, Tohoku University
10:50-11:15 “Hydrolysis of hydroxyapatite precursors and its biological relevance in hard tissue formation”
Osamu Suzuki, T. Anada, K. Kobayashi, Y. Shiwaku
Div. Craniofacial Function Engineering, Graduate School of Dentistry, Tohoku University
11:15-11:40 “Medical Applications of new Ni-free Shape Memory Alloys for Orthodontic and Orthopedic Treatment”
Hiroyasu Kanetaka1 and H. Hosoda2
1Liaison Center for Innovative Dentistry, Graduate School of Dentistry, Tohoku University
2Precision and Intelligence Laboratory, Tokyo Institute of Technology

Board Committee Meeting

Session X. DISASTER SCIENCE
UTMA+IRIDeS Session “Complex decisions in emergency response in large scale disaster”
Chair Prof. Fumihiko IMAMURA
1300-1305 Session Opening; Makoto Okumura  IRIDeS, Tohoku University
1305-1330 “Disaster logistics: Lessons from Nepal earthquake field experience”
Rubel Das IRIDeS, Tohoku University

1330-1355 “Towards More Resilient and Efficient Humanitarian Supply Chains”
Matthieu Lauras, L. Dupont, J. Lamothe
Industrial Eng. Centr, Univ. Toulouse, Mines-Albi

1355-1420 “Crisis management through a service-oriented mediation system”
Frédéric Benaben, S. Truptil, M. Lauras, N. Salatge
Industrial Eng. Centr, Univ. Toulouse, Mines-Albi

1420-1445 “MAGS: A Simulation Platform for Disaster Response Management”
Makoto Okumura, Rubel Das IRIDeS, Tohoku University

1445-1500 Overall discussion

15:00-15:30 CLOSING CEREMONY

16:00-17:30 LABORATORY TOUR (IRIDeS, others)
Session I. MOLECULAR-METAL COMPLEXES

P-1 “Slow magnetic relaxation of dysprosium ions bridged by bipyridine DTE ligand”
Mritunjoy KAMILA,1 Goulven COSQUER,1,2 Masahiro YAMASHITA1,2
1 Department of Chemistry, Graduate School of Science, Tohoku University,
2 CREST, JST

Session II. PHOTOINDUCED PHASE TRANSITION

P-2 “Photoinduced Phase Transition in Charge-Frustrated Systems”
Hiroshi Hashimoto1, H. Matsueda2, H. Seo3,4, S. Ishihara1.
1 Department of Physics, Tohoku University,
2 Sendai National College of Technology,
3 Condensed Matter Theory Laboratory, RIKEN,
4 RIKEN Center for Emergent Matter Science

P-3 “Photoinduced Dynamics in One-dimensional Correlated Electron Model”
Atsushi ONO, Hiroshi HASHIMOTO, and Sumio ISHIHARA
Department of Physics, Graduate School of Science, Tohoku University

P-4 “Resistive switching in Mott insulators: From memory to neuromorphic application”
Institut des Matériaux Jean Rouxel, Université de Nantes

P-5 “Charge-vibration dynamics driven by 6 fs, 1.3-cycle infrared pulses in dimer-Mott insulators”
Y. Kawakami1, T. Ishikawa1, Y. Naitoh1, H. Itoh1, N. Yoneyama2, T. Sasaki3, and S. Iwai1
1 Department of Physics, Graduate School of Science, Tohoku University
2 Department of Applied Chemistry, University of Yamanashi
3 Institute for Materials Research, Tohoku University

P-6 “Ultrafast optical modulation of efficiently generation THz wave in charge ordered organic ferroelectrics”
H. Itoh1, K. Itoh1, K. Goto1, J. Ichimura1, Y. Naitoh1, K. Yamamoto2, K. Yakushi3, H. Kishida4, and S. Iwai1
1 Department of Physics, Graduate School of Science, Tohoku University
2 Department of Applied Physics, Okayama Science University, Okayama
3 Toyota Physical and Chemical Research Institute, Nagakute, Aichi
4 Department of Applied Physics, Nagoya University
Session III. GLASS and SLAG

P-7 “Surface analysis and defect introduction in TiO₂-precipitated glass-ceramics”  
Kazuki Yoshida,1 Hirokazu Masai,2 Nobuaki Terakado,1 Yoshihiro Takahashi,1  
Takumi Fujiwara,1 Kazuyoshi Sato,3 Hideki Kato,4 and Masato Kakihana4  
1 Department of Applied Physics, Graduate School of Engineering, Tohoku University,  
2 Kyoto University,  
3 Gunma University,  
4 IMRAM Tohoku University

P-8 “Crystallization of vanadium borate glass for new heat-storagematerial”  
Kei Muramoto, Nobuaki Terakado, Yoshihiro Takahashi, Takumi Fujiwara  
Department of Applied Physics, Graduate School of Engineering, Tohoku University

P-9 “Photo-induced synthesis of spin-chain compound SrCuO₂ in rf-sputtered Sr-Cu-O films”  
Ryosuke Takahashi, Nobuaki Terakado, Yoshihiro Takahashi, Takumi Fujiwara  
Department of Applied Physics, Graduate School of Engineering, Tohoku University

P-10 “Laser-induced structure change in silicate glasses: Deformation and Raman study”  
Shohei Uchida, Nobuaki Terakado, Yoshihiro Takahashi, Takumi Fujiwara  
Department of Applied Physics, Graduate School of Engineering, Tohoku University

P-11 “Effect of MgO/CaO ratio on thermal conductivity of Al₂O₃-SiO₂-CaO-MgO glasses”  
Kyung-Ho Kim1, Koji Kanehashi2, Sohei Sukenaga1 and Hiroyuki Shibata1  
1 IMRAM, Tohoku University,  
2 Nippon Steel & Sumitomo Metal Corporation

P-12 “Metal Emulsion by gas injection in Molten Metal/Oxides System”  
Jiang LIU1, Sun-joong KIM2, Xu GAO2, Shigeru UEDA2, Shin-ya KITAMURA2  
1 Graduate School of Engineering, Tohoku University,  
2 IMRAM, Tohoku University

P-13 “Dissolution mechanism of Fe from steelmaking slag in aqueous solution in terms of soil amendment”  
Shohei Koizumi1, Xu Gao2, Sun-joong Kim2, Shigeru Ueda2, Shin-ya Kitamura2  
1 Graduate School of Engineering, Tohoku University,  
2 IMRAM, Tohoku University

Session IV. NANOMATERIALS

P-14 “Core-shell Pd-P@Pt Nanoparticles as Efficient Catalysts for Electro-oxidation of Formic Acid”  
Jing Xu,1 Ming Zhao,2 Katsuhiro Abe,3 Shin-ichi Yamaura,3 Naoki Asao1  
1 WPI-Advanced Institute for Materials Research, Tohoku University,  
2 School of Chemical Engineering, China University of Mining and Technology, China,  
3 Institute for Materials Research, Tohoku University
P-15 “Fabrication of Ceria Nanorods with Unprecedented Low-Temperature Oxygen Storage Capacity”
Yoshifumi Ishikawa, Maiki Takeda, Susumu Tsukimoto, Koji S. Nakayama, Naoki Asao
WPI-Advanced Institute for Materials Research, Tohoku University

P-16 “Developing the Optimum Dispersion for UV- or IR-Shielding Films”
Mikihiko Kobayashi, Xiaoyong Wu, Shu Yin, Tsugio Sato
IMRAM, Tohoku University

P-17 “Composition controlled Rh–Pd–Pt ternary alloy nanoparticles synthesized through femtosecond laser irradiation of solution”
Md. Samiul Islam Sarker, Takahiro Nakamura and Shunichi Sato
IMRAM, Tohoku University

P-18 “Nucleation and Growth of Nano/Micro-Protrusion on Ag plate by keV Ar Ion Irradiation”
Masaki Chiba, Shigeru Suzuki and Shun-Ichiro Tanaka
1 IMRAM, Tohoku University, 2 NICHe, Tohoku University

P-19 “A Facile Bottom-up Approach toward Cellulose Nanofiber Nanosheets”
M. Mahbubul Bashar, Huie Zhu, Shunsuke Yamamoto, Tokuji Miyashita and Masaya Mitsuishi
IMRAM, Tohoku University

P-20 “An Effective SERS Sensor System Inspired by Bio-mimic Self-Assembly Film”
Yida Liu, Demirci Ali, Jinguang Cai, Huie Zhu, Shunsuke Yamamoto, Akira Watanabe, Tokuji Miyashita and Masaya Mitsuishi
IMRAM, Tohoku University

P-21 “Preparation and Characterization of Photocatalyst Materials using Titanium Base Nonoxide Powders”
Jun-ichi Matsushita, Naoya Iwamoto, Koichi Morozumi, Xiaoyong Wu, Shu Yin and Tsugio Sato
1 Department of Materials Science, Tokai University
2 IMRAM, Tohoku University

Session V. MATERIAL PROCESSING AND ANALYSIS

P-22 “Steam-thermolysis: a new process applied to carbon fibre composites waste treatment (recovered carbon fibres reintroduce into new thermoplastics matrices)”
Maxime Boulanghien, Serge Da Silva, Florentin Berthet, Gérard Bernhart, Yannick Soudais
1 Alpha Recyclage Composites, France
2 Université de Toulouse, Mines Albi

P-23 “Fabrication of Cu2ZnSn(S,Se)4 thin films via simultaneous supercritical fluid chalcogenization”
Yuta Nakayasu, Takaaki Tomai, Nobuto Oka, Masatomo Sumiya and Itaru Honma
1 IMRAM, Tohoku University
2 NIMS, Tsukuba
P-24 “Low-temperature synthesis of transition metal borides by using sodium”
Haruhiko Morito, Kenjiro Koshiji, and Hisanori Yamane
IMRAM, Tohoku University

P-25 “Preparation and crystal structure analysis of BaLaSi2 and Ba5LaSi6”
Hisanori Yamane1, Takayuki Hashimoto1, Takahiro Yamada1, and Takashi Sekiguchi2
1Institute of Multidisciplinary Research for Advanced Materials, Tohoku University,
2National Institute for Materials Science, Tsukuba

P-26 “Low Temperature Synthesis of Group III-Nitride Powders by the Ammonothermal Method”
Daisuke Tomida, Junhyeong Choi, Kun Qiao and Chiaki Yokoyama
IMRAM, Tohoku University

P-27 “Heterogeneous Microscopic Plastic Deformation in Duplex Stainless Steel Analyzed by EBSD and Phase Stress Measurement”
Kengo Matsuda1, Shun Fujieda1, Shigeru Suzuki1, Shun-Ichiro Tanaka1, Yusuke Onuki2, Shigeo Sato3, Hidekazu Todoroki4
1 IMRAM, Tohoku University, 2 Frontier Nuclear Science Center, Ibaragi University
3 Dept. Science and Engineering, Ibaragi University, 4 Nippon Yakin Kogyo Co., Ltd.

Session VI. IONIC DEVICES

P-28 “Degradation mechanism of quinone-based organic electrode in aqueous redox capacitor”
Takaaki Tomai, Hiroshi Hyodo, Daiki Komatsu, Itaru Honma
IMRAM, Tohoku University

P-29 “Defect chemistry and thermodynamic properties of proton dissolution into BaZr1-xYxO3-δ”
Genki Imai1, Takashi Nakamura2, Koji Amezawa2
1Graduate School of Engineering, Tohoku University
2IMRAM, Tohoku University

P-30 “Influence of cation nonstoichiometry to oxygen nonstoichiometry in mixed ionic and electronic conducting perovskite oxides: an experimental and DFT calculation study”
Yusuke Okamoto1, Akihide Kuwabara2, Takashi Nakamura3, Tatsuya Kawada1, and Koji Amezawa3
1Graduate School of Environmental Studies, Tohoku University
2Japan Fine Ceramic Center, Nagoya
3IMRAM, Tohoku University
Session VII. DISASTER SCIENCE

P-31 “Influence of oxidizing atmosphere in nuclear reactor on reaction between B₄C and austenitic stainless steel”
Ryosuke Sasaki¹, Shigeru Ueda², Sun-Joong Kim², Xu Gao², Shin-ya Kitamura²
¹Department of Metallurgy, Graduate School of Engineering, Tohoku University
²IMRAM, Tohoku University