



RIMS International Conference: “Mathematical Challenge to a New Phase of Materials Science”

as a part of RIMS International Project Research 2014
Toward a New Fusion Research of Mathematics and Materials Science

Date : August 4th (Mon) – 8th (Fri), 2014

Venue : Masukawa Hall, North Comprehensive Education and Research Building,
Kyoto University
Kitashirakawa Oiwake-cho, Sakyo-ku, Kyoto, Japan

This is a satellite conference of SEOUL ICM 2014

Schedule: August 4th, 2014

- 12:00- Registration
- 13:00-13:15 Opening
- 13:15-14:00 1 : Konstantin Mischaikow (Rutgers, The State University of New Jersey)
Topological Analysis of Time Series of Scalar Functions
- 14:00-14:45 2 : Yasuaki Hiraoka (Kyushu University)
New Geometric Characterizations of Silica Glasses by Persistent Homology
- 14:45-15:30 3 : Shinji Kohara (Japan Synchrotron Radiation Research Institute)
Atomic and electronic structure of functional oxide glasses revealed by a combination of synchrotron x-ray/neutron measurements and large-scale computer simulation
- 15:30-15:45 Coffee break
- 15:45-16:30 4 : Hajime Tanaka (The University of Tokyo)
Transient structural ordering of supercooled liquids and its roles in glass transition and crystallization
- 16:30-17:15 5 : Nobuhisa Fujita (Tohoku University)
Cluster-packing geometry for icosahedral alloys

Schedule: August 5th, 2014

- 09:00-09:45 6 : Tetsuo Mohri (Tohoku University)
Multiscale Materials phenomena
- 09:45-10:30 7 : Masanori Kohyama
(National Institute of Advanced Industrial Science and Technology)
Local Energy and Local Stress in Density-Functional Theory Calculations of Materials
- 10:30-10:45 Coffee break

- 10:45-11:30 **8 : Munekazu Ohno (Hokkaido University)**
Phase-Field Modeling of Solidification Microstructure in Alloys
- 11:30-12:15 **9 : Tomotsugu Shimokawa (Kanazawa University)**
Atomic Simulation of Lattice Defect Interactions in Nanostructured Materials
- 12:15-13:45 **Lunch**
- 13:45-14:30 **10 : Theodore Kolokolnikov (Dalhousie University)**
Predator-swarm interactions
- 14:30-15:15 **11 : Arash Yavari (Georgia Institute of Technology)**
Non-Riemannian Geometries and the Nonlinear Mechanics of Distributed Defects
- 15:15-15:30 **Coffee break**
- 15:30-16:15 **12 : Weiqing Ren (National University of Singapore)**
Modeling and simulation of moving contact lines and wetting transitions on patterned solid surfaces
- 16:15-17:00 **13 : Masato Kimura (Kanazawa University)**
A fracture model on spring-block system with energy gradient structure

Schedule: August 6th, 2014

- 09:30-10:15 **14 : Konrad Polthier (Freie Universität Berlin)**
Construction of discrete minimal surfaces
- 10:15-11:00 **15 : Hisashi Naito (Nagoya University)**
Negatively curved carbon crystal
- 11:00-11:15 **Coffee break**
- 11:15-12:00 **16 : Yoshihito Oshita (Okayama University)**
Motion of droplets driven by curvature and potential
- 12:00-13:30 **Lunch**
- 13:30-14:15 **17 : Arjen Doelman (Leiden University)**
Meander and pearling of functionalized polymer bilayer interfaces
- 14:15-15:00 **18 : Christian Ratsch (University of California, Los Angeles)**
A Computational Method for the Design of New Heterostructures
- 15:00-17:00 **Poster session**
- 18:00-20:00 **Banquet**

Schedule: August 7th 2014

- 09:30-10:15 **19 : Stephen Hyde (Australian National University)**
Toroidal tangles of polyhedral graphs are chiral. A route to chiral synthetic materials?
- 10:15-11:00 **20 : Yoshimi Tanaka (Yokohama National University)**
Solvent effects on fracture of gels

- 11:00-11:15 **Coffee break**
- 11:15-12:00 **21 : Carlos J. Garcia-Cervera (University of California, Santa Barbara)**
Numerical advances in Self-Consistent Field Theory simulations of block copolymers: Applications to polymer lithography and evaporation-driven pattern selection
- 12:00-13:30 **Lunch**
- 13:30-14:15 **22 : Daniel Miles Packwood (Tohoku University)**
Charge transport inside of organic crystals: The crucial role of correlated fluctuations
- 14:15-15:00 **23 : Ryokichi Tanaka (Tohoku University)**
Random walks on groups as random dynamical systems
- 15:00-15:15 **Coffee break**
- 15:15-16:00 **24 : Natsuhiko Yoshinaga (Tohoku University)**
Mechanics of active gels and spontaneous motion of droplets as biologically-motivated systems
- 16:00-16:45 **TBA**

Schedule: August 8th 2014

- 09:30-10:15 **25 : Thomas Wanner (George Mason University)**
Multistability and Long-Term Dynamics of the Diblock Copolymer Model
- 10:15-11:00 **26 : Takeshi Fujita (Tohoku University)**
Nanoporous metal catalysts for exhaust-gas transformation
- 11:00-11:15 **Coffee break**
- 11:15-12:00 **27 : Edgar Knobloch (University of California, Berkeley)**
Solidification fronts in supercooled liquids: how rapid fronts can lead to disordered glassy solids
- 12:00-12:15 **Closing**

Organizing Committee :

Yasumasa Nishiura (Tohoku University), Chair
 Motoko Kotani (Tohoku University), Co-Chair
 Hisashi Okamoto (Kyoto University)
 Nobuaki Obata (Tohoku University)
 Ken Nakajima (Tohoku University)
 Carlos J. Garcia-Cervera (University of California, Santa Barbara)
 Thomas P. Russell (University of Massachusetts)

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