



# Forum Math-for-Industry 2012

**Information Recovery and Discovery**  
Venue: Fukuoka International Congress Center  
Date: October 22(Mon) - 26(Fri), 2012

## Invited Lectures

- |                        |  |
|------------------------|--|
| <b>Kathy Horadam</b>   | School of Mathematical and Geospatial Sciences, RMIT University, Australia<br><b>Biometrics, Information Networks and Points Between</b>   |
| <b>Alejandro Jofré</b> | CMM & DIM, Universidad de Chile<br><b>Optimization and Game Theory in Energy Markets</b>   |
| <b>Robert McKibbin</b> | Centre for Mathematics in Industry, Massey University, New Zealand<br><b>Industrial Mathematics Adventures in the South-West Pacific</b>   |
| <b>Junji Nakano</b>    | School of Statistical Thinking and Department of Statistical Modeling,<br>The Institute of Statistical Mathematics, Japan<br><b>Some Topics in Computational Statistics and Statistical Training</b> |
| <b>Konrad Polthier</b> | Freie Universität Berlin and Matheon Research Center, Germany<br><b>Applications of Integrable Discrete Geometric Structures</b>   |
| <b>Zuwei Shen</b>      | Department of Mathematics, National University of Singapore<br><b>MRA based Wavelet Frame and Applications</b>   |
| <b>Moti Yung</b>       | Google Inc., / Columbia University, U.S.A.<br><b>Cryptography: From Mathematics to Industrial Solutions</b>  |

## Scientific Committee

- |                          |   |
|--------------------------|---|
| <b>Bob Anderssen</b>     | Mathematics, Informatics and Statistics, CSIRO, Australia   |
| <b>Ken Anjyo</b>         | OLM Digital, Inc., Japan                                    |
| <b>Jonathan Hosking</b>  | IBM T. J. Watson Research Center, U.S.A.                    |
| <b>Yoshimasa Kadooka</b> | Fujitsu Limited, Japan                                      |
| <b>Junichi Nakagawa</b>  | Nippon Steel Corporation, Japan                             |
| <b>Jos Stam</b>          | Autodesk Research, Canada                                   |
| <b>Kim-Chuan Toh</b>     | Department of Mathematics, National University of Singapore |
| <b>Evgeny Verbitskiy</b> | Mathematical Institute, Leiden University, Netherlands      |

## Organizing Committee

**Yasuhide Fukumoto**  
**Tim Hoffmann**  
**Ryuei Nishii**  
**Osamu Saeki**  
**Tsuyoshi Takagi**  
**Masato Wakayama**



## Supported by

Global COE Program "Education-and-Research Hub for Mathematics-for-Industry", Kyushu University and Kobe University  
Institute of Mathematics for Industry, Faculty of Mathematics, Graduate School of Mathematics, Kyushu University

## FMI2012 Organizing Office

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# Forum Math-for-Industry 2012

Information Recovery and Discovery

**Koichiro Akiyama (Toshiba Corporation, Japan)**

A Survey on Algebraic Surface Cryptosystems

**Noel Barton (Sunoba Pty Ltd., Australia)**

Mathematical Simulation Answers Investor Questions on New Concepts for Solar Power

**Andreas Binder (MathConsult GmbH, Austria)**

Model Uncertainty in Computational Finance

**Hayato Chiba (IMI, Kyushu University, Japan)**

A Spectral Theory of Linear Operators on Gelfand Triplets and its Applications to Infinite-dim Dynamical Systems

**Xavier Dahan (FM, Kyushu University, Japan)**

An Application of Height Theory to "Modular Methods" for Exact Computations

**Jonathan Hosking (IBM Research Division, T. J. Watson Research Center, U.S.A.)**

Short-term Forecasting of Demand for Electricity in the Smart Grid

**Naoyuki Kamiyama (IMI, Kyushu University, Japan)**

Pareto Stability in a Two-sided Matching Market with Indifferences

**Sei Kato (IBM Global Business Services, Japan)**

Big Data, Big Simulation, and Deep Learning

**Atsushi Kawamoto (TOYOTA CENTRAL R&D LABS., INC., Japan)**

Topology Optimization in Multiphysics Problems

**Frank Lutz (Technische Universität Berlin, Germany)**

Discrete Topology of Grains and Periodic Foams

**Osamu Maruyama (IMI, Kyushu University, Japan)**

Protein Complex Prediction

**Yoshihiro Mizoguchi (IMI, Kyushu University, Japan)**

Mathematical Aspects of Interpolation Technique for Computer Graphics

**Junichi Nakagawa (Nippon Steel Corporation, Japan)**

Mathematical Core Technology for a Traffic Flow System Using the Model Predictive Control of Large and Complex Networks

**Yoshiyuki Ninomiya (IMI, Kyushu University, Japan)**

Model Selection for Irregular Statistical Models

**Wayne Rossman (Kobe University, Japan)**

Comparison of Smooth, Discrete and Semi-discrete Surfaces

**Taizo Shirai (Sony Corporation, Japan)**

Mathematics Used in Recent Cryptographic Technologies

**Jos Stam (Autodesk Research, Canada)**

Fluid Dynamics for Entertainment

**Tamon Suwa (FUJITSU LIMITED, Japan)**

A Tsumani Simulator: Combination of the Particle-based Method and the Nonlinear Wave Model

**Daisuke Tagami (IMI, Kyushu University, Japan)**

Efforts to Establish a Disaster Assessment with the High Performance Computings

**Koichiro Takayama (FUJITSU LABORATORIES LTD., Japan)**

A Survey of Formal Methods for Hardware Design and Verification, and Expectations for Mathematics

**Jun'ichi Takeuchi (Kyushu University, Japan)**

Sparse Learning and Some Applications

**Paul Urbach (Delft University of Technology, The Netherlands)**

Mathematical Optimization for Applied Optical Problems

**Hayato Waki (IMI, Kyushu University, Japan)**

Degeneracy in Semidefinite Programming

**Masahiro Yamamoto (The University of Tokyo, Japan)**

Industrial Mathematics by Inverse Problems: expectations for Innovation by Mathematics