

RIKEN iTHES - Tohoku AIMR - Tokyo IIS Joint Symposium

New Horizon of Mathematical Sciences

web page: <http://indico2.riken.jp/indico/event/ithes-math>

April 28 (Thursday) 10am-6pm

@ RIKEN Wako Campus, Suzuki Umetaro Hall

Purpose

This is a symposium to celebrate the establishment of the Mathematical Sciences Team in interdisciplinary Theoretical Science (iTHES) Research Group at RIKEN. The symposium is organized jointly with Advanced Institute for Materials Research (AIMR) at Tohoku Univ. and Institute of Industrial Science (IIS) at The Univ. of Tokyo.

At this symposium, researchers from various branches of mathematical sciences are invited, including pure mathematics, applied mathematics, theoretical physics and theoretical biology. We will also have a keynote lecture and panel discussions to exchange ideas about the future role of mathematics to intertwine different fields and disciplines.

Program

Opening

10:00 - 10:15 **Tetsuo HATSUDA** (RIKEN iTHES)

Keynote Lecture (Chair: Sigefumi MORI (IAS, Kyoto))

10:15 - 11:00 **Reiko MIYAOKA** (Tohoku Univ.) "Math is Everywhere"

Coffee Break 11:00 - 11:15

Morning Session (Chair: Kazuyuki AIHARA (IIS, Tokyo))

11:15 - 11:45 **Masato TAKI** (RIKEN iTHES)

"String theory as an attempt of polymathematics"

11:45 - 12:15 **Takahiro OMI** (IIS, The University of Tokyo)

"Probabilistic aftershock forecasting: A Bayesian statistical approach"

Lunch 12:15 - 13:30

Afternoon Session I (Chair: Motoko KOTANI (AIMR, Tohoku))

- 13:30 - 14:00 **Shinichiroh MATSUO** (Graduate School of Mathematics, Nagoya Univ.)
"Topological phases and K-theory"
- 14:00 - 14:30 **Yuki YOKOKURA** (RIKEN iTHES)
"Thermodynamic entropy as a Noether invariant"
- 14:30 - 15:00 **Yasuaki HIRAOKA** (AIMR, Tohoku University)
"Topological data analysis in materials science"

Coffee Break 15:00 - 15:15

Afternoon Session II (Chair: Tetsuo HATSUDA (RIKEN iTHES))

- 15:15 - 15:45 **Takuya KANAZAWA** (RIKEN iTHES)
"Renormalization group for physics with multiple scales"
- 15:45 - 16:15 **Tomoya TAKEUCHI** (IIS, The University of Tokyo)
"Augmented Lagrangian methods for Convex Optimization"
- 16:15 - 16:45 **Takashi OKADA** (RIKEN)
"Response-perturbation relation and network topology in chemical reaction systems"

Coffee Break 16:45 - 17:00

Afternoon Session III

- 17:00 - 18:00 **Panel Discussion** "Future Collaborations in Mathematical Sciences"
Tetsuo HATSUDA (RIKEN iTHES) Moderator
Motoko KOTANI (AIMR, Tohoku) from pure mathematics
Kazuyuki AIHARA (IIS, Tokyo) from applied mathematics
Akita TAKADA (Asashi Glass) from industries
Atsushi MOCHIZUKI (RIKEN iTHES) from biological sciences
Tatsuhiko TSUNODA (RIKEN IMS) from medical sciences
Takemasa MIYOSHI (RIKEN AICS) from computational sciences

Informal discussions 18:30 - 20:00

Hirosawa Club in RIKEN Wako Campus