AIMR Workshop on Quantum Materials and Spintronics:
Spin, Topology and Superconductivity

Date: 11-12th July 2019.

Advanced Institute for Materials Research (AIMR),
Tohoku University
Sendai, Japan

This workshop is sponsored by AIMR (Tohoku University), and partially by Tohoku University-Tsinghua University Collaborative Research Fund and MathAM-OIL (AIST) .
AIMR Workshop on Quantum Materials and Spintronics:
Spin, Topology and Superconductivity

Date: 11-12th July, 2019.
Location: 5th floor Combination Room and 1st floor Meeting Room, Advanced Institute for Materials Research (AIMR), Tohoku University

Address: 2-1-1 Katahira, Aoba-ku, Sendai, 980-8577 Japan
Phone: +81-22-217-5922 / FAX: +81-22-217-5129
SCIENTIFIC PROGRAM

Program: DAY 1 (11th July 2019)  LOCATION:  5F Combination Room, AIMR

14:05-14:15  Welcome Remarks by Yong P. Chen (Purdue University and AIMR, Tohoku University)

Session 1  “Novel Topological States”
Session Chair: Andreas Dechant (AIMR, Tohoku University)

14:15-14:50  Takeshi Nakanishi, MathAM-OIL, AIST
“Hinge shape and electronic states in higher-order topological insulator”

14:50-15:10  Ryo Okugawa, AIMR, Tohoku University
“Topological non-Hermitian nodal phases with parity-time and parity-particle-hole symmetries”

15:10-15:30  Yong P. Chen, Purdue University and AIMR, Tohoku University
“Realization of a symmetry protected bosonic topological state in a synthetic space”

[15 min break]

Session 2  “Topological Wave Transport”
Session Chair: Guanghui Cheng (AIMR, Tohoku University)

15:45-16:20  Qian Niu, Department of Physics, University of Texas at Austin
“Towards a geometric theory of magnetization dynamics”

16:20-16:40  Max Lein, AIMR, Tohoku University
“Topological origin of electromagnetic waves at interfaces between two media”

16:40-17:00  Koji Sato, IMR, Tohoku University
“Krein-Schrödinger formalism for topological classification of magnonic BdG systems”
Session 3  “Topological Insulators and Superconductors”

Session Chair: Hiroshi Idzuchi (AIMR, Tohoku University)

9:00-9:35  Katsumi Tanigaki, AIMR and Department of Physics, Tohoku University

"High Quality Single Crystal Thin Films of Three-Dimensional Topological Insulators and Applications“

9:35-10:10  Takafumi Sato, AIMR and Department of Physics, Tohoku University

"Search for topological superconductivity through band-structure engineering“

10:10-10:30  Takuya Aoyama, Department of Physics, Tohoku University

“Fe-based ladder materials”

[15 min break]

Session 4  “Topological Superconductors and Majoranas”

Session Chair: Koji Sato (IMR, Tohoku University)

10:45-11:20  Tetsuo Hanaguri, CEMS, RIKEN

“Zero-energy vortex bound state in Fe(Se,Te) and its relevance to the Majorana zero mode”

11:20-11:40  Kosuke Nakayama, Department of Physics, Tohoku University

"Possible topological superconductivity in a hybrid of non-superconducting Bi$_2$Te$_3$ and FeTe“

11:40-12:00  Yong P. Chen, Purdue University and AIMR, Tohoku University

“Topological Josephson Junction”

12:00-12:20  Chen-Hsuan Hsu, CEMS, RIKEN

“Majorana Kramers pairs in higher-order topological insulators”

[Lunch break]
Session 5  “Novel Topological States and Materials”

Session Chair: Stephane Yu Matsushita (Department of Physics, Tohoku University)

13:30-13:50  Seigo Souma, CSRN and AIMR, Tohoku University
"New topological phases protected by $\Theta T$ symmetry"

13:50-14:10  Khuong Kim Huynh, AIMR, Tohoku University
"Negative and positive magnetoresistance in the itinerant antiferromagnet $\text{BaMn}_2\text{Pn}_2$ ($\text{Pn} = \text{P}, \text{As}, \text{Sb}, \text{and Bi}$) with PT symmetry"

14:10-14:30  Xing-Chen Pan, AIMR, Tohoku University
"Tuning band structure and Fermi surface in Tungsten ditelluride"

[15 min break]

Session 6  “Novel Spin Systems”

Session Chair: Akichika Kumatani (AIMR, Tohoku University)

14:45-15:05  Hiroshi Idzuchi, AIMR, Tohoku University
"Hetero-interface effect in two-dimensional van der Waals Ferromagent and Superconductor"

15:05-15:25  Yoshinori Imai, Department of Physics, Tohoku University
"Hydrated alkali metal intercalation into Kitaev spin liquid candidate material $\alpha$-$\text{RuCl}_3$"

15:25-15:45  Jana Lustikova, CSIS, Tohoku University
"Vortex rectenna powered by environmental fluctuations"

Joint Session with Friday Tea Time in AIMR  LOCATION:  5F Combination Room, AIMR

16:00-17:00  Tea Time Talk by Prof. Qian Niu, Department of Physics, University of Texas at Austin
"Topology and Geometry of Bloch Electrons"