

Program

Bulk-Edge/Boundary Correspondence 2022 (BE/BC2022)

International workshop

**”Variety and universality of bulk-edge correspondence in
topological phases:
From solid state physics to transdisciplinary concepts”**

February 11-13, (2022)

Online (Zoom) & University of Tsukuba

All times of the schedule are Japan Standard Time (UTC+9)

(as of February 10, 2022)

Feb. 11 (Fri.), 2022
All times are Japan Standard Time (UTC+9)

Session 1, Chair : Akio Kimura

- 9:00 – 9:20 Yasuhiro Hatsugai (University of Tsukuba)
 (Welcome) “Bulk-edge correspondence :From quantum Hall effect”
- 9:20 – 9:50 Satoshi Iwamoto (University of Tokyo)
 “Topological photonics in integrated photonic platforms”
- 9:50 – 10:30 Kyogo Kawaguchi (RIKEN)
 “Topology and anomalous density fluctuations in collective cell dynamics”

10:30 – 10:45 Coffee (self :-))

Session 2, Chair : Hideo Aoki

- 10:45 – 11:25 Bohm-Jung Yang (Seoul National University)
 “Topology of acoustic phonons”
- 11:25 – 11:45 Tiantian Zhang (Tokyo Institute of Technology)
 “Local and global topology for Z_2 Dirac points”
- 11:45 – 12:25 Mario Novak (University of Zagreb)
 “Optical and thermodynamic signatures of 3D Dirac semimetals systems”

12:25 – 13:25 Photo & Lunch

Session 3, Chair : Tomonari Mizoguchi

- 13:25 – 14:05 Ren-Min Ma (Peking University)
 “Topological bulk and vortex lasers”
- 14:05 – 14:35 Kazuya Yamashita (Kyoto University)
 “Topological atom laser in synthetic dimensions”

14:35 – 14:50 Coffee (self :-))

Session 4, Chair : Takahiro Fukui

- 14:50 – 15:10 Seishiro Ono (University of Tokyo)
 “Symmetry-based approach to superconductors: symmetry indicators,
 superconducting nodes, and material investigation”
- 15:10 – 15:40 Sota Kitamura (University of Tokyo)
 “Nonreciprocal transport in noncentrosymmetric insulators”

(Continued)

15:40 – 15:55 Coffee (self :-))

Session 5, Chair : Yoshihito Kuno

15:55 – 16:15 Takahiro Misawa (Beijing Academy of Quantum Information
Sciences)

“Zeros of Green functions in topological insulators”

16:15 – 16:40 Tomonari Mizoguchi (University of Tsukuba)

“Square-root topological phases in two and three dimensions”

16:40 – 17:20 Sebastian Huber (ETH Zurich)

“Fragile topology in classical waves and strongly correlated superconductors”

Feb. 12 (Sat.), 2022
All times are Japan Standard Time (UTC+9)

Session 6, Chair : Tsuneya Yoshida

- 9:00 – 9:40 Jinkyu Yang (University of Washington)
 “Topological guiding of stress waves in bolted plate structures”
- 9:40 – 10:20 Kenji Tsuruta (Okayama University)
 “Design of Topological and Non-reciprocal Waveguide by Phononic Crystals”
- 10:20 – 10:50 Shun Takahashi (Kyoto Inst. Tech.)
 “Microwave measurements on three-dimensional topological photonic crystals”

10:50 – 11:05 Coffee (self :-))

Session 7, Chair : Yasuhiro Hatsugai

- 11:05 – 11:35 Yoshiro Takahashi (Kyoto University)
 “Study of topological phenomena using ultracold atoms in an optical lattice”
- 11:35 – 12:05 Akio Kimura (Hiroshima University)
 “Bulk-edge correspondence in topological materials from ARPES perspectives”
- 12:05 – 12:35 Tohru Kawarabayashi (Toho University)
 “An extension of chiral symmetry and exact edge modes in finite systems”

12:35 – 13:35 Photo & Lunch

Session 8, Chair : Yasuhiro Hatsugai

- 13:35 – 14:35 Posters (Breakout rooms)
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Session 9, Chair : Yoshiro Takahashi

- 14:35 – 15:15 Ching Hua Lee (National University of Singapore)
 “New developments and realizations of non-Hermitian and topological boundary states”
- 15:15 – 15:40 Tsuneya Yoshida (University of Tsukuba)
 “Correlation effects on non-Hermitian topology”
- 15:40 – 16:05 Ken-ichiro Imura (Hiroshima University)
 “Pseudo-diffusive wave-packet dynamics in a non-Hermitian system with non-reciprocal hopping”

(Continued)

16:05 – 16:20 Coffee (self :-))

Session 10, Chair : Satoshi Iwamoto

16:20 – 16:40 Ken Mochizuki (Tohoku University)

“Topological edge states in open or nonlinear optical systems”

16:40 – 17:05 Toshikaze Kariyado (National Institute for Materials Science)

“In-gap transport with pi-flux lattices in topological metamaterials”

17:05 – 17:45 Pierre Delplace (CNRS, Ecole Normale Supérieure de Lyon)

“Anomalous chiral modes in 2D scattering networks”

Feb. 13 (Sun), 2022
 All times are Japan Standard Time (UTC+9)

Session 11, Chair : Ken-ichiro Imura

9:00 – 9:30 Hideo Aoki (AIST/University of Tokyo)

“Designing topological systems in and out of equilibrium: a perspective”

9:30 – 10:10 Hidenori Fukaya (Osaka University)

“Bulk-edge correspondence of anomaly and a physicist-friendly reformulation of the APS index”

10:10 – 10:50 Tomoki Ozawa (Tohoku University)

“Quantum metric and topology”

10:50 – 11:05 Coffee (self :-))

Session 12, Chair : Tohru Kawarabayashi

11:05 – 11:35 Takahiro Fukui (Ibaraki University)

“Moiré Landau levels in a C_4 symmetric twisted system”

11:35 – 12:05 Shin Hayashi (Tohoku University)

“On a topological invariant related to corner states via index theory and matrix factorizations”

12:05 – 12:30 Yoshihito Kuno (Akita University)

“Topological pump from SPT phases and its bulk-edge-correspondence in interacting systems”

12:30 – 12:35 Yasuhiro Hatsugai (University of Tsukuba)

(Ending remark) “Bulk-edge correspondence : Today and future”

POSTERS

Chair: Y. Hatsugai

Zoom (Breakout rooms)

13:35-14:35, Feb. 12, Japan Standard Time (UTC+9).

- P 1. Katsumi Aoyagi (Toho University)
 “Quantum Monte Carlo Study of Quantized Berry’s Phase in Two-Dimensional Anisotropic Spin Systems”
- P 2. Kohei Hayakawa (Toho University)
 “Edge States in a Deformed Topological System in Two Dimensions”
- P 3. Chengkun Zhang (University of Tokyo)
 “Theretical analysis on photonic analog of quantum spin Hall effect in a square-lattice based photonic topological insulator”
- P 4. Koichi Asaga (Ibaraki University)
 “Diophantine equation for the Rice-Mele model and the associated topological pump”
- P 5. Koji Kudo (Penn State University)
 “Generalized Streda formula of the spinful quantum Hall systems”
- P 6. Gen Najima (University of Tsukuba)
 “Dynamics governed by symmetry-protected exceptional ring for mechanical graphene”
- P 7. Ryoichiro Tamotsu (Toho University)
 “Numerical Study of Irrational Charges in Multi-layered Fermion-Vortex Systems”
- P 8. Yuri Fukaya (CNR-SPIN, c/o University of Salerno)
 “Unconventional Josephson effects with spin-triplet pairing textures in noncentrosymmetric superconductors”
- P 9. Hiomasa Wakao (University of Tsukuba)
 “Discriminant indicators with generalized four- and six-fold rotational symmetry and their applications to toy models”
- P 10. Takuma Isobe (University of Tsukuba)
 “Non-hermitian topology in the generalized eigenvalue problem with indefinite Hermitian matrices”
- P 11. Daiki Matsumoto (University of Tsukuba)
 “Square-root higher-order topology on a honeycomb lattice with two-sites decoration.”
- P 12. Takumi Kuroda (University of Tsukuba)
 “Characteristic feature of flat-band wavefunction detected by machine learning”
- P 13. Yuki Soeda (Ibaraki Univ.)
 “Landau levels of a C_4 symmetric twisted bilayer system”
- P 14. Takahiro Orito (Hiroshima University)
 “Many-body and boundary effects in non-Hermitian topological systems”
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