NTML(BRL)-APCTP SEMINAR SERIES

Topological Matter Out of Equilibrium

Period April 2022 ~ June 2022

Venue Online (ZOOM)

Overview

Recently, a small but ambitious research group, funded by National Research Foundation (NRF) for three years, Nonlinear Topological Matter Laboratory (NTML) has been launched to investigate dynamical phase transitions in topological matter driven by electromagnetic fields including light. Our research group consists of three experimentalists (Prof. Heon-Jung Kim, Prof. Jong-Soo Rhyee, and Prof. Jungkil Kim) and one theorist (Prof. Ki-Seok Kim), which cover material preparation, electrical and thermal transport, light-matter interaction, device, and anomaly and transport theory. Additionally, the Junior Research Group "Non-equilibrium many-body physics" (Ryo Hanai) started in April 2021 with a broad interest in collective phenomena out of equilibrium. To promote this research direction in Korean Physical Society, we open NTML-APCTP seminar series on topological matter out of equilibrium, inviting several well-known experts in this direction mentioned above.

Invited Speakers (Tentative)

- Mark S. Rudner (University of Washington) 15th April
- Alexey Gorshkov (University of Maryland and NIST) 6th May
- Liang Wu (University of Pennsylvania) 20th May
- Takahiro Morimoto (University of Tokyo) 3rd June
- Hai-Zhou Lu
  (Southern University of Science and Technology) 24th June

Organizers

- Heonjung Kim (Daegu Univ.)
- Jongsoo Rhyee (Kyung Hee Univ.),
- Jungkil Kim (Jeju Nat. Univ.)
- Kiseok Kim (POSTECH)
- Ryo Hanai (APCTP)

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The APCTP is supported by the Korean Government through the Science and Technology Promotion Fund and Lottery Fund and strives to maximize social value through its various activities.
아시아태평양이론물리센터는 정부의 과학기술진흥기금 및 복권기금 지원으로 사회적 가치 제고에 힘쓰고 있습니다.

NTML(BRL)-APCTP SEMINAR SERIES

Dynamical Quantum Materials

Prof. Mark S. Rudner

University of Washington

April 15th (Fri.) 10:00

Online via ZOOM

Recent advances open new possibilities to probe and control quantum materials on time and length scales that would have seemed the realm of science fiction just a few decades ago. In this talk I will begin by reviewing the key principles that govern the electronic properties of materials. I will then discuss how, by going beyond the traditional world of equilibrium physics, a wide range of new collective phenomena and opportunities for dynamical control of material properties become possible. As an illustration, I will demonstrate a novel route to spontaneous magnetism that occurs through symmetry breaking in the collective (plasmon) modes of a driven metallic system. The mechanism is general, and results from feedback of internal fields of the nonequilibrium system onto its own electronic structure. Estimates indicate that experimental realization should be within reach in present day high quality graphene devices. The approaches I will describe provide fertile ground for new fundamental studies of quantum many-body dynamics, as well as potential applications for example in electronics and information processing.

■ **ZOOM Webinar**

1) Please register through this ZOOM link (password 0)
https://us06web.zoom.us/meeting/register/tZcuf-2rpjotG9H4NEBA1tDqNnggTwxuAZEY
2) Join the webinar with a link generated after the registration
3) Please rename your profile - E.g. **Full name (affiliation)**

■ **Contact information**

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