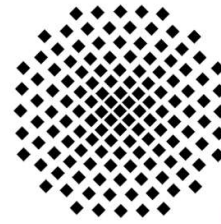


# Stuttgarter Physikalisches Kolloquium

Fachbereich Physik, Universität Stuttgart  
Max-Planck-Institut für Festkörperforschung  
Max-Planck-Institut für Intelligente Systeme

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Dienstag, 15. Oktober 2019

16:15 Uhr

Hörsaal V 57.01

Universität Stuttgart, Pfaffenwaldring 57, 70569 Stuttgart-Vaihingen

Gastgeber: Prof. Dr. Martin Dressel, Universität Stuttgart, Telefon: 0711 - 685-64946

## Topological Insulators and Superconductors

**Yoichi Ando**

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### Abstract

Topological insulators and superconductors are new quantum states of matter that are characterized by nontrivial topological structures of the Hilbert space. Recently, they attract a lot of attention because of the appearance of exotic quasiparticles such as spin-momentum-locked Dirac fermions or Majorana fermions on their edge/surface, which hold promise for various novel applications. In particular, localized zero-energy Majorana mode is expected to obey non-Abelian statistics and enable topological quantum computing. In this colloquium, I will introduce the basics of these materials and present some of the key contributions we have made in this new frontier. In addition, I will discuss how one can conceive to build a Majorana qubit based on topological insulators.