

凝縮系物理学ゼミナール

Condensed Matter Seminar

Location: **Room 413**, School of Science Bldg. 5 (理学 5 号館 413 号室)

Date: **13:30-15:00**, Wednesday, 18 May 2016

“Study of topological Mott insulators in two dimensions”

Speaker:

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Abstract:

After discovery of topological insulators, topological properties of condensed matter systems have been extensively studied. One of the important issues of this field is to understand correlation effects on topological systems because correlation effects under topological properties are expected to trigger off novel phenomena. In particular, it became clear that the correlations can destroy edge modes in non-interacting topological insulators without symmetry breaking[1]. Unfortunately, however, this instability of gapless modes has not been sufficiently explored yet. Especially, there are few systematic analyses in bulk and edges.

In this study, we address this issue by making use of the real-space dynamical mean field theory with continuous-time quantum Monte Carlo method. Our numerical data indicate emergence of a topological Mott insulator in two dimensions. In the presentation, we also discuss finite temperature effects which are relevant for experiments[2].

References:

[1] Y.-M. Lu and A. Vishwanath, Phys. Rev. B 86, 125119 (2012); M. Levin and A. Stern, Phys. Rev. B 86, 115131 (2012)etc.

[2] T. Yoshida and N. Kawakami, arXiv:1604.00122.