Topological Superconductivity with Time-reversal Symmetry

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<u>Abstract</u>

We will talk about (i) the possibility of topological superconductivity (TSC) in bilayer Rashba system and (ii) the proximity effect of metallic quantum nanowire on unconventional superconductor resulting degenerate Majorana bound states on its ends. In the first part, we will propose a theoretical modeling of time reversal invariant TSC by introducing two interacting layers of Rashba systems, which might be available in the interface systems of transition metal oxides. Majorana bound states always appear as pairs by virtue of time reversal symmetry. We will discuss an application of them by using this degeneracy in the setup of nanowire on SC substrate. The spin operators are defined and their correlation can be controlled non-locally by electrical means.

References:

[1] S. Nakosai, Y. Tanaka, and N. Nagaosa, Phys. Rev. Lett. 108, 147003 (2012).

[2] S. Nakosai, J. C. Budich, Y. Tanaka, B. Trauzettel, and N. Nagaosa, arXiv:1211.2307.

About the speaker

Mr Sho Nakosai received his bachelor's degree in physics in 2010, and is now a PhD student in Prof Nagaosa's research group at the University of Tokyo.