

## **Topological quantum numbers and Dirac fermions**

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Topological quantum numbers play important role in contemporary quantum many-body problem. This was first recognized in the context of the (integer) quantum Hall effect by Thouless, Kohmoto, Nightingale, and den Nijs. Recently, more variety of topological quantum numbers are found with respect to topological insulators and topological superconductors. On the other hand, Dirac fermions can describe fermions in condensed matter physics at or near quantum criticality. Computations of the topological quantum numbers in terms of Dirac fermions have been often useful in motivating interesting studies. However, the meaning of such calculations is not so obvious since the Dirac fermions refer to a gap-closing point or its neighbourhood. I will give a pedagogical discussion to clarify the relation between the topological quantum numbers and Dirac fermions.