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Abstract for an Invited Paper
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Topological insulator route to Weyl fermions

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I will describe one of the possible routes to realizing Weyl fermions in condensed matter, which is based on violating either time reversal or spatial inversion symmetry in a system, tuned near a quantum phase transition between a topological and an ordinary insulator. This route is particularly attractive, since it may lead to the simplest possible realization of a Weyl semimetal, with only two opposite-chirality Weyl nodes in the first Brillouin zone, which is yet to be found experimentally. I will describe some of the most important physical properties of such an elemental Weyl semimetal, in particular a negative longitudinal magnetoresistance due to the chiral anomaly and possible exotic superconducting states.