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Nonsymmorphic nodal line and nodal point semimetals[1]

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In this talk, I will introduce two types of three dimensional topological semimetals, where crossing between the conduction and the valence bands are protected by nonsymmorphic symmetries. The first type is a double-nodal line semimetal, where the fourfold degeneracy along the nodal line is protected by a twofold screw axis. The second type is a Dirac point semimetal, the point nodes of which are protected by a glide plane. The key difference between this and the previously proposed Dirac point semimetals is that here the surface arcs are topologically protected. An observation is made on the mapping between the surface dispersion of topological semimetals and non-compact Riemann surfaces of meromorphic functions. The materials realizations of these semimetals are predicted in perovskite iridates as well as in photonic crystals.

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