

Topological matter: the tenfold way

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It was recently discovered that condensed matter with an excitation gap can be in different phases that are not distinguished by a broken symmetry, but by the value of a topological invariant. Some of these topological superconductors and insulators have been realized in the laboratory, many others are being searched for. In this lecture we will introduce these new states of matter from the perspective of the theory of random matrices. This approach can describe the universal properties of disordered metals and superconductors, dependent only on the presence or absence of fundamental symmetries in 10 symmetry classes, the so-called ten-fold way.