

New Trends in Topological Phases: More, Better and Higher

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In this talk, we will give a brief review on the very recent developments of the research of topological phases. Inarguably, the research field of topological quantum phases has been a central pillar of modern condensed matter physics. Several remarkable breakthroughs of the field have drastically changed our general view on nature. To name a few, the examples include quantum Hall effects, spin liquids, and topological insulators. The impacts of the discovery of those topological phases are not only restricted to the field of condensed matter physics, but have also influenced other related fields of theoretical physics. These days, the research of topological states is rapidly evolving and making a series of new surprises going beyond the previous ancestors. A particular theme emerging in the field is the effect of geometric data on topological states. Outstanding examples of this theme include the geometry in quantum Hall wavefunction, higher-order topology, and fractons. In this talk, we will attempt to review this rising theme of topological phases.