

# **Classification of Nodal Topological Superconductors and Their Flat-band Surface States**

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Topological superconductors have become a subject of intense research due to their potential use for technical applications in device fabrication and quantum information. Besides fully gapped superconductors, unconventional superconductors with point or line nodes in their order parameter can also exhibit nontrivial topological characteristics. In this talk, I review recent progress in the theoretical understanding of nodal topological superconductors, with a focus on their flat-band surface states. These surface states give rise to an extensive ground-state entropy, which is in violation of the third law of thermodynamics. Therefore, even infinitesimally small interactions lead to spontaneous symmetry breaking at the surface, thereby lifting the ground-state degeneracy. I will discuss this phenomenon by considering the surface states of non-centrosymmetric superconductors as a representative example. Furthermore, I will examine implications for experiments and survey some candidate materials for topological superconductivity, such as CePt<sub>3</sub>Si.