1. Record Nr.   UNINA9910913781003321

   Autore   Ono Seishiro

   Titolo   Topology of Superconductors : Theory of Symmetry Indicators, Classifications of Superconducting Nodes, and High-Throughput Investigations / / by Seishiro Ono

   Pubbl/distr/stampa   Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2024

   ISBN   9789819773992
                        9819773997

   Edizione   [1st ed. 2024.]

   Descrizione fisica   1 online resource (132 pages)

   Collana   Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5061

   Disciplina   620.112973

   Soggetti   Superconductivity
                        Superconductors
                        Topological insulators
                        Mathematical physics
                        Quantum statistics
                        Topological Material
                        Theoretical, Mathematical and Computational Physics
                        Quantum Fluids and Solids

   Lingua di pubblicazione   Inglese

   Formato   Materiale a stampa

   Livello bibliografico   Monografia

   Nota di contenuto   Introduction -- Review of Symmetry and Representations in Band Theory -- Review of Symmetry and Representations in Band Theory -- Classifications of Superconducting Nodes -- High-throughput Investigation.

   Sommario/riassunto   This book develops a symmetry-based approach to superconductors, which enables us to efficiently diagnose topological and nodal superconductivity. Superconductivity has fascinated physicists since its first discovery. In particular, unconventional superconductivity, which arises from unusual attractive interactions between electrons, has been intensively studied for the last few decades. More recently, it turns out that topological nature of superconductivity is closely related to how electrons pair up. After reviewing the basic concepts of the symmetry-based analysis of band topology, the first part of this book discusses a

generalization of symmetry-based indicators—an efficient way to diagnose topological insulating phases without full information on wave functions—to superconducting phases. The second part of this book develops a novel scheme to extensively classify superconducting nodes—geometry of gapless regions in the Bogoliubov quasiparticle spectrum—based on band topology.Finally, combining these two parts, this book proposes a systematic scheme to predict topological and nodal properties of the superconducting phase by considering various possible pairing symmetries.