1. Record Nr. UNINA9910300401303321

Autore	Kanazawa Naoya
Titolo	Charge and Heat Transport Phenomena in Electronic and Spin Structures in B20-type Compounds / / by Naoya Kanazawa
Pubbl/distr/stampa	Tokyo : , : Springer Japan : , : Imprint : Springer, , 2015
ISBN	4-431-55660-5
Edizione	[1st ed. 2015.]
Descrizione fisica	1 online resource (96 p.)
Collana	Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5053
Disciplina	621.4022
Soggetti	Superconductivity Superconductors Surfaces (Physics) Interfaces (Physical sciences) Thin films Phase transformations (Statistical physics) Condensed matter Materials—Surfaces Strongly Correlated Systems, Superconductivity Surface and Interface Science, Thin Films Quantum Gases and Condensates Surfaces and Interfaces, Thin Films
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Introduction -- Experimental methods -- Magnetic and transport properties in B20-type germanides -- 3D skyrmion-lattice and topological Hall effect in MnGe -- Skyrmion formation in epitaxial FeGe thin films -- 3D Dirac electrons and large thermoelectric properties in CoGe -- Conclusion.
Sommario/riassunto	This thesis presents systematic experimental research on chiral-lattice crystals referred to as B20-type germanium compounds, especially focusing on skyrmion spin textures and Dirac electrons. An emergent electromagnetic field observed in MnGe demonstrates a formation of three-dimensional skyrmion crystals. Detection of skyrmions in

nanoscale Hall bar devices made of FeGe is realized by measuring the topological Hall effect, a transport property reflecting emergent fields produced by skyrmions. By measuring the electron-filling dependence of thermopower in CoGe, a pronounced thermoelectric property in this compound is revealed to stem from the asymmetric density of states appearing at certain levels of Fermi energy in the Dirac electron state. The three main results named above will contribute to enriching a variety of novel electromagnetic responses of emergent gauge fields in solids, to realizing high-performance skyrmion-based magnetic memory, and to designing high-efficiency thermoelectric materials, respectively.