1.	Record Nr.	UNINA9910349504203321
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	Titolo	Quantitative Mapping of Nanothermal Transport via Scanning Thermal Microscopy / / by Jean Spièce
	Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2019
	ISBN	3-030-30813-8
	Edizione	[1st ed. 2019.]
	Descrizione fisica	1 online resource (xix, 153 pages) : illustrations
	Collana	Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5061
	Disciplina	621.4022 536.2
	Soggetti	Surfaces (Physics) Nanotechnology Electronic circuits Microtechnology Microelectromechanical systems Surface and Interface and Thin Film Electronic Circuits and Systems Microsystems and MEMS
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di contenuto	Outline and motivations -- Background Review -- SThM Experimental Models and Setups for Exploring Nanoscale Heat Transport -- Quantitative Thermal Transport Measurements in Nanostructures -- Three Dimensional Mapping of Thermal Properties -- Nanoscale Thermal Transport in Low Dimensional Materials -- Thermoelectric Phenomena in Graphene Constrictions -- Conclusion and Perspectives -- Appendices.
	Sommario/riassunto	The thesis tackles one of the most difficult problems of modern nanoscale science and technology - exploring what governs thermal phenomena at the nanoscale, how to measure the temperatures in devices just a few atoms across, and how to manage heat transport on these length scales. Nanoscale heat generated in microprocessor components of only a few tens of nanometres across cannot be

effectively fed away, thus stalling the famous Moore's law of increasing computer speed, valid now for more than a decade. In this thesis, Jean Spièce develops a novel comprehensive experimental and analytical framework for high precision measurement of heat flows at the nanoscale using advanced scanning thermal microscopy (SThM) operating in ambient and vacuum environment, and reports the world's first operation of cryogenic SThM. He applies the methodology described in the thesis to novel carbon-nanotube-based effective heat conductors, uncovers new phenomena of thermal transport in two-dimensional (2D) materials such as graphene and boron nitride, thereby discovering an entirely new paradigm of thermoelectric cooling and energy production using geometrical modification of 2D materials.