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	Soggetti	Thermodynamics
		Heat engineering
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		Materials science
		Surfaces (Physics)
		Interfaces (Physical sciences)
		Thin films
		Materials—Surfaces
		Engineering Thermodynamics, Heat and Mass Transfer
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	Note generali	"Doctoral Thesis accepted by the Tsinghua University, Beijing, China."
	Nota di bibliografia	Includes bibliographical references at the end of each chapters.
	Nota di contenuto	Introduction -- Thermomass theory for non-Fourier heat conduction -- Experimental investigation of thermal wave and temperature wave -- Experimental proof of steady-state non-Fourier heat conduction -- Conclusions.
	Sommario/riassunto	This book mainly focuses on the theoretical and experimental study of non-Fourier heat conduction behavior. A novel thermomass theory is used as the theoretical basis, which provides a general heat conduction equation for the accurate prediction of non-Fourier heat conduction. In

order to prove the validity of this thermomass theory, a large current was used to heat the metallic nanofilm at the minimum temperature of 3 K. The measured average temperature of the nanofilm was notably higher than the prediction of Fourier's heat diffusion equation, while matching well with the general heat conduction equation. This is the first time that steady non-Fourier heat conduction has been observed. Moreover, this book concerns the role of electron-phonon interaction in metallic nanofilms, which involves the breakdown of the Wiedemann-Franz law at low temperatures and interfacial thermal resistance at femtosecond timescales. Readers will find useful information on non-Fourier heat conduction and the latest advances in the study of charge and heat transport in metallic nanofilms.