

# 学术讲座



同济大学  
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物理科学与工程学院  
声子学与热能科学中心

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**时间:** 11月27日 (周二), 上午10:00-11:00

**地点:** 南校区第一实验楼423会议室



## Non-Fourier Heat Conduction: From Lévy Walk to Diffusons

### 报告摘要:

In a first period, heat transport in nanostructures -a key factor in the thermal management of nano-microsystems and in the optimization of energy conversion materials- will be investigated more specifically in 2D materials and structured silicon [1] in the situations where non-Fourier effects occur. Those latter are mostly related to surface or defect scattering and we will show how they lead, in some cases, to the apparition of Quasi-Ballistic heat transport even at room temperature.

Secondly, heat conduction in ionic materials –a crucial physical mechanism in the battery burning- will be analysed at room to high temperatures [2]. Insight in the phase change, happening in the battery overheating, will be provided by analysing heat flux as a function of temperature in terms of vibrational vs convective contributions as well as in terms of mode decomposition.

[1] Roman Anufriev, Sergei Gluchko, Sebastian Volz and Masahiro Nomura, Quasi-Ballistic Heat Conduction due to Lévy, Phonon Flights in Silicon Nanowires, ACS Nano, 2018, DOI: 10.1021/acsnano.8b07597.

[2] Y. Zhou, S. Xiong, X.L. Zhang, S. Volz, M. Hu, Thermal Transport Crossover from Crystalline to Partial-crystalline Partial-liquid State, Nat. Comm., 9 : 4712, 2018. DOI: 10.1038/s41467-018-0702

### 个人简介:

Professor Volz obtained his Ph.D. from University of Poitiers in 1996. After working at University of California Los Angeles as a postdoctoral fellow with Professor Gang Chen (now at MIT), he became an associate Professor at the National Engineering School of Mechanics and Aerotechnics (ENSMA) in 1998. He joined CNRS in 2002 as a research fellow at Ecole Centrale Paris, and became senior research fellow in 2008. He is the winner of the Bronze Medal of CNRS in 2004 and was the head of the CNRS European Network “Thermal Nanosciences and Nanoengineering” during 17 years. He now leads the University of Tokyo/CNRS joint Laboratory for Integrated Micro-Mechatronic Systems. In addition, he has served as the chairman in numerous international conferences related to nanoscale heat transport and belongs to the editorial board of three journals. So far, he has authored over 460 communications, including 11 chapters, 160 articles in peer-reviewer journals, and 60 invited conferences. He is cited 5800 times and his current H-index is 41.

