

ΣΕΜΙΝΑΡΙΟ ΚΕΝΤΡΟΥ ΚΒΑΝΤΙΚΗΣ ΠΟΛΥΠΛΟΚΟΤΗΤΑΣ &
NANOTEΧΝΟΛΟΓΙΑΣ/ CCQCN SEMINAR

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11:00-12:00

3rd Floor Seminar Room

Phononic heat transport and thermal rectification

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Abstract

Recent progresses in manufacturing nanoscale electrical and mechanical devices have motivated deep understanding of heat transport in low dimensional systems and introducing new mechanisms for heat managements. More interestingly, it has been shown that thermal transport in many cases, e.g. carbon based nanostructures, is phonon dominated, indicating that phonons can be manipulated similarly to electrons for controlling heat transport at all temperatures. Thermal rectification, the thermal counterpart of electrical diodes corresponding a better thermal conductance in one direction rather than the opposite one, can also play an important role in nanoscale heat management. Here, utilizing either molecular dynamics simulations and/or density functional theory calculations, we investigate heat transport in different low dimensional systems. Phononic thermal transport in different nanostructures, the effect of functionalization on thermal rectification in graphene and carbon nanotubes, the importance of anisotropy in phosphorene and arsenene as well as the effect of strain on heat transport in silicene, will be discussed

