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**Heat transfer at interfaces with graphene** ZHIPING XU, Tsinghua University — Graphene has an ultrahigh in-plane thermal conductivity (5500 W/mK), but simultaneously a much lower conductivity along the c-axis in graphite or at the interfaces with other materials. As graphene finds more and more applications in nanoelectronics and high-performance composites, these interfaces become critically important in defining their heat dissipation and conduction performance. Unlike conventional interfaces in materials such as grain boundaries, the interfaces with graphene can be tuned by chemically modifying the graphene monolayer or intercalating the interfaces. These nano-engineering proposals require fundamental understanding of the heat transfer mechanisms. In order to obtain some insights on the transfer processes of mechanical and thermal energy across these interfaces, we perform series of molecular dynamics simulations, in combination with theoretical analysis by considering the quasi-ballistic nature of phonon transport at nanoscale. The result shows that heat dissipation or transport can be divided into two stages, beginning with an interface-controlled process. The effects of interface structures and binding properties on the whole process will be covered in this talk, with several examples showing how the interfacial thermal transfer can be engineered.

Zhiping Xu
Tsinghua University

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