

Mesoscopic mechanical non-classicality

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The achievement of non-classical features in systems that are well beyond the paradigm consisting of "small, isolated, and fully controllable" would be a breakthrough of both foundational and technological relevance. Among the most promising settings for such a quest, devices consisting of micro or nano-mechanical oscillators, controlled by light or coupled to simpler ancillae, occupy a prominent position. In this talk I will describe the steps that have been made so far towards the achievement of full quantum control in such scenario, and which are the perspective for the experimental observation of full-fetched quantum effects at the mesoscopic scale. Finally, I will sketch a route for the exploitation of these devices to build super efficient thermo machines.