

Abstract Submitted  
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**Probing Heat Transfer in the Nanoscale Using Optomechanical Sensors.** BRIAN BURG, JONATHAN TONG, POETRO SAMBEGORO, ANASTASSIOS MAVROKEFALOS, GANG CHEN, Massachusetts Institute of Technology — The transition from heat conduction to radiation at extremely small gaps cannot be captured by current theories. Experimentally researchers are only slowly starting to learn how to approach this domain. To this end, the development of a measurement platform based on the picowatt sensitivity of optomechanical sensors will be presented. The bending of a custom designed bimorph cantilever accurately allows the absolute amount of transferred heat to be extracted and temperature to be determined based on the response from thermal inputs. The versatility of the platform permits thermal radiation and conduction measurements, as well as the characterization of material thermal conductivities and absorptivities in nearly identical configurations. Results of this measurement platform for fundamental heat transfer measurements will considerably improve the current understanding of nanoscale energy transport and conversion, as well as lead to advanced design guidelines for energy capture and conversion devices, in particular thermophotovoltaic cells, (solar) thermoelectric generators and waste heat recovery heat exchangers.

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