Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

The maximum efficiency of nano heat engines depends on more than temperature[1] MISCHA WOODS, Uni Coll London, TU Delft, Netherlands National Uni Singapore, NELLY NG, TU Delft, Netherlands National Uni Singapore, STEPHANIE WEHNER, TU Delft, Netherlands — Sadi Carnots theorem regarding the maximum efficiency of heat engines is considered to be of fundamental importance in the theory of heat engines and thermodynamics. Here, we show that at the nano and quantum scale, this law needs to be revised in the sense that more information about the bath other than its temperature is required to decide whether maximum efficiency can be achieved. In particular, we derive new fundamental limitations of the efficiency of heat engines at the nano and quantum scale that show that the Carnot efficiency can only be achieved under special circumstances, and we derive a new maximum efficiency for others. A preprint can be found here arXiv:1506.02322 [quant-ph]

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Date submitted: 06 Nov 2015 Electronic form version 1.4