

# **Thermodynamics as a resource theory**

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We will outline an approach to thermodynamics as a resource theory. Resource theory consists of the set of "free states" and class of operations. Any state that is not free is viewed as a resource, and the class of operations cannot create such a state, but can only manipulate. We will show how to use such approach to obtain thermodynamics for microscopic systems, being in contact with macroscopic heat bath. Analogues of the traditional notions such as work, heat or free energy and the laws of thermodynamics in such regime will be presented. It will be also shown how the resource theory approach leads to generalization of fluctuation theorems.