Contribution ID: **18** Type: **not specified**

Thermalization via scattering events

Thursday, August 29, 2024 4:45 PM (30 minutes)

The equilibration of physical systems in contact to a thermal environment is one of the core assumptions of thermodynamics and has a variety of useful physical implications. While consequences of thermalization can be observed frequently in our everyday life, the dynamical processes behind this phenomenon have yet not been fully explored. In my talk i will consider the internal degrees of freedom (dofs) of a quantum system subjected to a diluted gas of ancilla particles, consisting of motional and internal dofs. I treat the interactions with full quantum mechanical, inelastic scattering theory and discuss the conceptional hurdles in order to derive a master equation for the internal dofs. Finally, i argue that the system will eventually thermalize under very general conditions.

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