

**[Talk 13] Nonequilibrium matter exchange between finite quantum systems**

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In physics, heat and particle exchange is a subject of great importance. Immense research has been performed to study transport and thermoelectric properties within the picture of the Landauer-Büttiker theory. In this talk, we discuss nonequilibrium matter exchange between large but finite quantum system, which is beyond what the Landauer-Büttiker theory predicts. The currents undergo stepwise evolution in time, and their magnitude and direction dramatically change according to system size differences. Despite those characteristics distinct from the steady state of traditional concept, Onsager's reciprocal relation remains universally valid. We present physical picture to explain such behaviors.