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From Terminal to Terminal with Atoms

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We study fundamental concepts of particle and heat transport in a model system using ultracold atoms. It consists of a channel connecting two macroscopic reservoirs of fermionic lithium atoms. The channel can be switched from ballistic to diffusive, and it can be structured to form a quantum point contact or a quantum wire. Measurements of the thermoelectric effect and particle transport in the quantum regime will be presented. Our measurements find an ideal description in the Landauer-Buttiker formalism, which views conduction as the transport of carriers from one terminal to another.