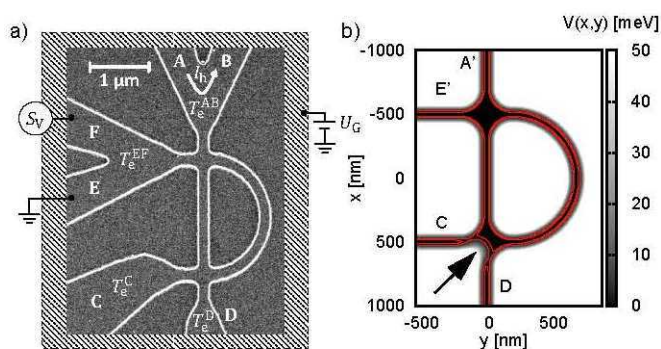


## Energy and charge currents in multi-terminal nanorings

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### Short Abstract

We study the thermal energy and charge transfer close to the quantum limit in a ballistic nanodevice consisting of multiply connected one-dimensional waveguides. The fabricated device is based on an AlGaAs/GaAs heterostructure and is covered by a global top-gate to steer the energy and charge transfer in the presence of a temperature gradient, which is established by a heating current. The evaluation of the heat transfer using thermal noise measurements shows the device acting as a switch for charge and energy transfer. A mode-dependent redistribution of the energy current was also found if a scatterer breaks the device symmetry.



**Above.** Device geometry. a) Scanning electron micrograph of an identically processed sample. The 1D waveguides with a lithographical width of 170 nm form a half-ring connected to reservoirs A-F. b) Device potential for the ballistic transport model.