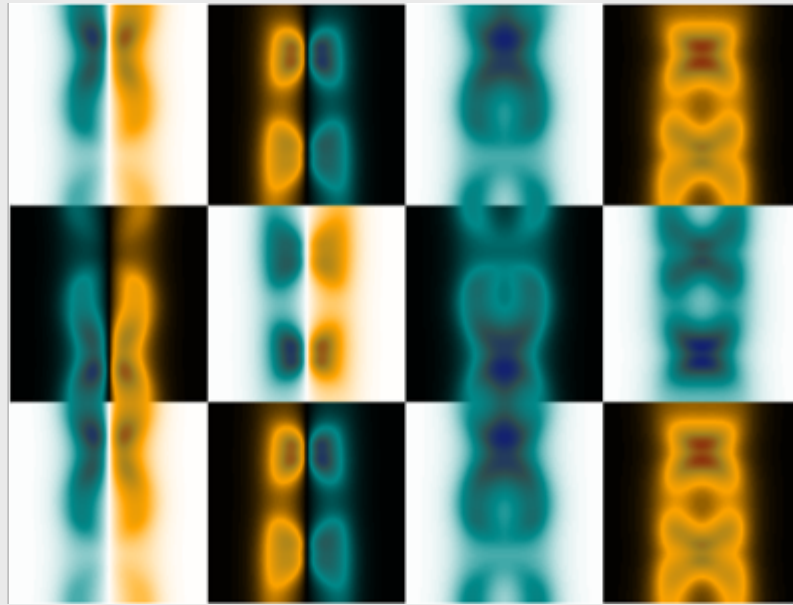


## Reversible Thermal Diode and Energy Harvester with a Superconducting Quantum Interference Single-electron Transistor



Articles: published in [Applied Physics Letters](#) by [Rafael Sánchez](#), IFIMAC researcher and member of Department of Theoretical Condensed Matter Physics.

**T**he density of states of proximitized normal nanowires interrupting superconducting rings can be tuned by the magnetic flux piercing the loop. Using these as the contacts of a single-electron transistor allows us to control the energetic mirror asymmetry of the conductor, thus introducing rectification properties. In particular, we show that the system works as a diode that rectifies both charge and heat currents and whose polarity can be reversed by the magnetic field and a gate voltage. We emphasize the role of dissipation at the island. The coupling to substrate phonons enhances the effect and furthermore introduces a channel for phase tunable conversion of heat exchanged with the environment into electrical current.

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