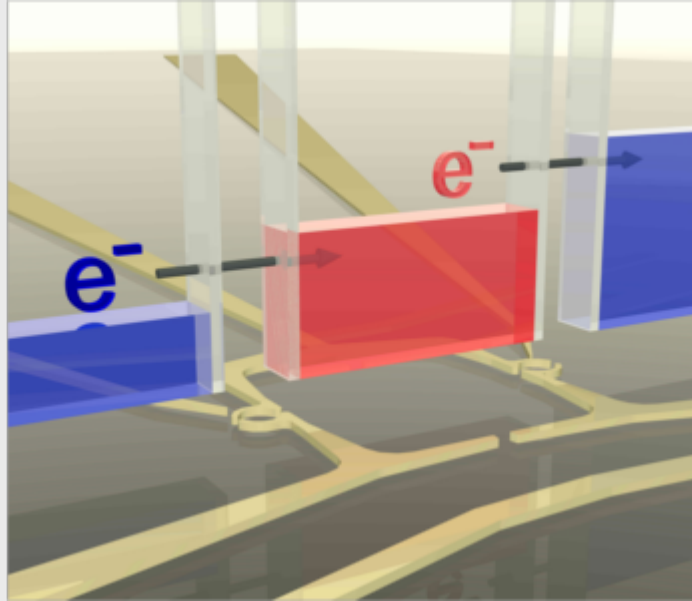


## Experimental Realization of a Quantum Dot Energy Harvester



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

**W**e demonstrate experimentally an autonomous nanoscale energy harvester that utilizes the physics of resonant tunneling quantum dots. Gate-defined quantum dots on GaAs/AlGaAs high-electron-mobility transistors are placed on either side of a hot-electron reservoir. The discrete energy levels of the quantum dots are tuned to be aligned with low energy electrons on one side and high energy electrons on the other side of the hot reservoir. The quantum dots thus act as energy filters and allow for the conversion of heat from the cavity into electrical power. Our energy harvester, measured at an estimated base temperature of 75 mK in a He3/He4 dilution refrigerator, can generate a thermal power of 0.13 fW for a temperature difference across each dot of about 67 mK. [[Full article](#)]