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Elastic and inelastic scattering in $SrTiO_{3-\delta}$ KAMRAN BEHNIA, XIAO LIN, BENOIT FAUQU, ESPCI — Scattering among electrons generates a distinct contribution to electrical resistivity that follows a quadratic temperature dependence. We show that the prefactor of this T^2 resistivity can be tuned by four orders of magnitude in metallic $SrTiO_3$ by tuning the concentration of the carriers and consequently, the Fermi energy. The T^2 behavior persists in the single-band dilute limit despite the absence of two known mechanisms for T^2 behavior, distinct electron reservoirs and Umklapp processes. The ultimate origin of the small residual resistivity is the long Bohr radius, which, in a shallow Fermi sea caused by a random distribution of dopants, sets the zero-temperature mobility.

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