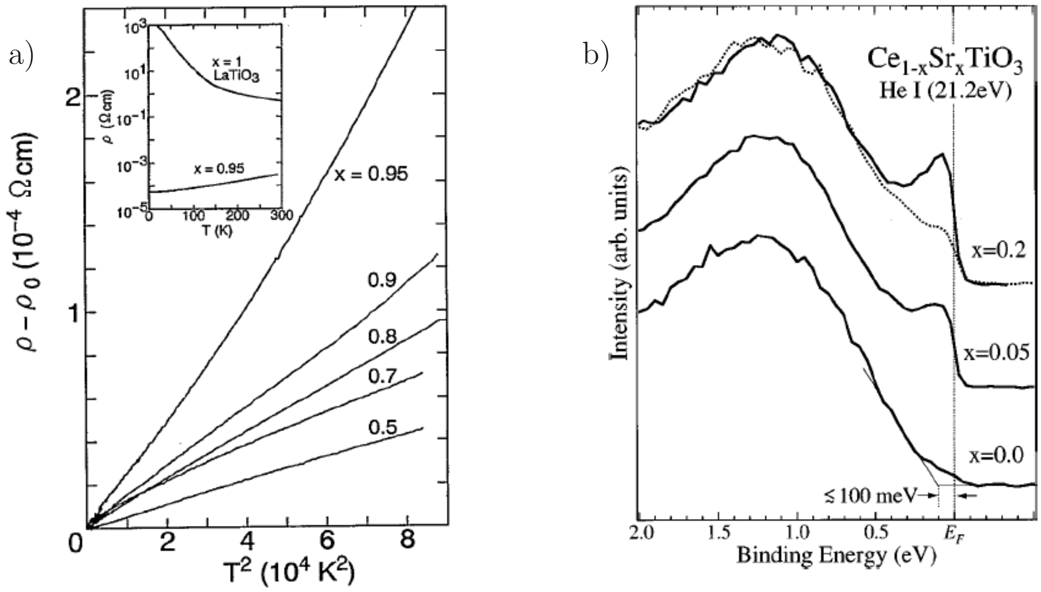

Figure 5.22: **a)** Resistivity of $Sr_{1-x}La_xTiO_3$ (Tokura et al., 1993). **b)** PES for $Ce_{1-x}Sr_xTiO_3$ (Yokoya et al., 1999).

trapolated (dashed lines) towards independently measured data points for the dc conductivity (circles). Katsufuji and Tokura's (1999) claim that their data was taken for $La_{1-x}Ca_xTiO_3$ is very likely erroneous, even though Ca doping might in general have effects similar to doping with Sr. In the relevant doping range $\delta \approx 0.06$, these measurements indicate an almost constant function $\sigma(\omega)$ which is clearly incompatible with our data and points to the presence of strong disorder.

One limitation inherent in our results is the high temperature of $T \approx 1160$ K used in the QMC calculations. This might not be such a bad approximation, e.g., for room temperature systems, as it first appears. On the one hand, due to the restriction to purely electronic degrees of freedom and to the neglect of spatial fluctuations in the DMFT, the effect of high temperatures is likely to be reduced compared to a full calculation. Furthermore, the qualitative electronic properties of $La_{1\text{-}x}Sr_xTiO_3$ appear to be unchanged over an extremely wide temperature range as illustrated in Fig. 5.22 a: For this material, the resistivity is nearly linear as a function of T^2 both in the correlated ($x \approx 0.95$, i.e., $\delta \approx 0.05$) and in the strongly doped regime ($0.5 \lesssim x \lesssim 0.9$) (Tokura et al., 1993). Similar results have recently been obtained by Hays et al. (1999) for powder samples and by Gariglio, Seo, Fompeyrine, Locquet, and Triscone (2001) for epitaxial films.[29] Thus, at least the coefficient of the low-temperature resistivity can be measured at and above room temperature.

Figure 5.22 b shows PES for $Ce_{1-x}Sr_xTiO_3$ (Yokoya et al., 1999) which are sur-

[29] Gariglio et al. (2001) concentrated on the strongly doped case ($\delta \approx 0.5$) and attributed the behavior of the resistivity to a polaronic mechanism. The relevant lattice distortion is here the dynamic tilting of the oxygen octahedra which gives rise to an optical phonon mode at $\hbar\omega_0 \approx 80$ K.