Raman-scattering evidence for a metal-insulator transition in strongly overdoped cuprates

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We discuss results from inelastic light scattering experiments on electronic excitations in cuprates over a wide range of doping. At high doping well beyond the level optimal for $T_c$, the quasiparticle dynamics are isotropic and similar to those expected for conventional metals. At lower doping strong anisotropies in the quasiparticle relaxation and pronounced discrepancies between single- and many-particle probes develop. The results can be interpreted in terms of an unconventional metal-insulator transition with an anisotropic gap which disappears for doping levels above approximately 0.22 holes/CuO$_2$. We try to make a connection between this phenomenon and various other anomalies in underdoped cuprates such as the pseudogap or charge ordering.