

# **Strong electron dephasing in highly disordered $\text{Cu}_{93}\text{Ge}_4\text{Au}_3$ thin films and other conductors**

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We report the observation of strong electron dephasing in a series of disordered  $\text{Cu}_{93}\text{Ge}_4\text{Au}_3$  thin films. A very short electron dephasing time possessing very weak temperature dependence around 6 K, followed by an upturn with further decrease in temperature below 4 K, is found. The upturn is progressively more pronounced in more disordered samples. Moreover, a  $\ln T$  dependent, but high-magnetic-field-insensitive, resistance rise persisting from above 10 K down to 30 mK is observed in the films. These results suggest a nonmagnetic dephasing process which is stronger than any known mechanism and may originate from the coupling of conduction electrons to dynamic defects. We will also address the issue in highly disordered metal alloys as well as granular conductors, where the electron dephasing time is often found to be very weakly dependent on temperature and is very short.