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“Unexpectedly slow two particle decay of dense excitons in cuprous oxide”

The search for bulk collective quantum behavior in excitons has been frustrated by short exciton lifetimes, even in materials where exciton decay is suppressed by band parity. We report anomalously long exciton lifetimes in an ultradense exciton gas in cuprous oxide, where exciton interactions are the dominant cause of decay. This indicates the breakdown of the Auger model of exciton decay under extreme excitation.