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**Colloid diffusion on phospholipid membranes is anomalous** BO WANG, STEPHEN ANTHONY, SUNG CHUL BAE, STEVE GRANICK, University of Illinois, Urbana-Champaign — We demonstrate experimentally a simple system in which mean-squared displacement is proportional to time yet the distribution function of displacement probability is exponential, not Gaussian as expected for a classical random walk. This is the case of fluorescent submicron-sized beads that diffuse in one dimension in the smooth potential presented by tubes composed of phospholipid bilayer. A discussion of possible physical origins suggests that a family of physical systems whose few degrees of freedom couple to slow environmental fluctuations may behave analogously.

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