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Gravitational-wave observations of extreme mass ratio inspirals (EMRIs) hold incredible potential to probe gravity, astrophysical and exotic environments. On the astrophysical side, the gas disks of active galactic nuclei can induce detectable “migration” torques on the binary. Within a Bayesian framework, we find that LISA could detect migration for a wide range of disk viscosities and accretion rates, and could distinguish between different disk models. In ongoing work, we are testing whether these results are robust against fluctuations in the disk torques and modelling uncertainties. On the exotic side, EMRIs can interact with clouds of bosonic fields supported by the central black hole. We use novel perturbation theory tools to model these interactions, going beyond the non-relativistic approximation.