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The precision science of extreme mass-ratio inspirals

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Extreme mass-ratio inspirals (EMRIs) of a stellar-mass compact object into a massive black hole are a unique science target of LISA. As a consequence of their mass ratios, these systems complete tens of thousands of orbits, and have intricate gravitational-wave signals. This means that we can make precision measurements of EMRI sources. Using these precise measurements, we can probe the strong-field spacetime around massive black holes, and study the astrophysics of the evolution of the source population. In this talk, we will review some of the scientific potential of EMRIs, and highlight some of the challenges in analysing these gravitational-wave signals.

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