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The quest for low frequency gravitational waves

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I will review the status of the space-based Laser Interferometer Space Antenna (LISA) and its science goals. LISA will detect gravitational waves in the frequency range $10^{-4}\text{Hz} < f < 1\text{Hz}$, a region of the spectrum populated by a large variety of astrophysical sources. Among these, a major role will be played by the mergers of massive black holes, which LISA will detect up to very large redshifts $z \sim 10 - 20$. I will focus on the physics of these sources, as well as on how their detection by LISA will shape our understanding of astrophysics, cosmology and fundamental physics.