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## Transforming ultra-compact binary modelling with LGWA

The decihertz gravitational wave window enabled by LGWA will provide a unique view of the shortest-period compact binaries and their immediate outcomes, otherwise inaccessible with current instruments. For double white dwarfs and white dwarf-neutron star binaries, LGWA will constrain the physics of the late pre-merger evolution and, through multi-messenger observations, provide the first connection between progenitors and the transients they produce. For stellar mass binary black holes, it will provide the first multi-band observations, together with other gravitational wave observatories, setting unique constraints on their merger environments. In this talk, I will summarise the science enabled by LGWA, including merger rates, pre-merger populations, and the evolution and physics of transients they produce.

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