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The Einstein Telescope project: a third generation of Gravitational Wave detector on the Earth.

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In the field of gravitational wave (GW) detection, groundbreaking discoveries like those made by the LIGO, Virgo, and KAGRA collaborations signify the culmination of extensive interdisciplinary efforts spanning various research fields. These detectors grapple with numerous noise sources that undermine their sensitivity. To surmount these challenges, we are exploring strategies that harness novel technologies and innovative approaches. The development of third-generation GW interferometers, epitomised by the Einstein Telescope (ET) project, underscores a monumental experimental endeavour.

In this talk, we will offer an overview of the new experimental challenges facing ET and the strategies proposed to achieve the ambitious advancements in sensitivity. By overcoming these challenges, we aim to unlock unparalleled opportunities to explore the Universe through gravitational waves.

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