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LIGO observations and future with LIGO India

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We are in the era of gravitational-wave and multi-messenger astronomy. The latest catalog of transient events from LIGO-Virgo-KAGRA contains 90 high-confidence detections from the first three observing runs. The ongoing fourth observing run is yielding a steady stream of events, with public alerts being issued at a rate of approximately 2-3 per week. All observations are believed to originate from merging neutron stars and/ or black holes, and are providing new insights into the properties and origins of compact objects and binaries. In this talk, I will provide a summary of the key observations to date, highlighting what we can learn about the astrophysics of compact objects. I will also discuss what these observations mean for the future when LIGO India comes online, expanding the global detector network and ushering in an even brighter era of gravitational-wave astronomy.

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