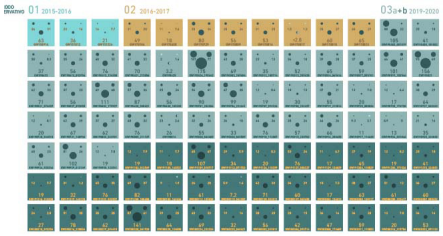

RESEARCH

GROWING NUMBER OF GRAVITATIONAL EVENTS OBSERVED BY LIGO AND VIRGO

The total number of observed spacetime perturbations has increased. Certifying this is the updated gravitational wave transient catalogue (GWTC-3) published by the Virgo, LIGO and Kagra scientific collaborations on 8 November in the ArXiv online archive. The publication includes the data acquired between November 2019 and March 2020 by Virgo and LIGO and describes 35 new events associated with the merger of black hole pairs and neutron stars, bringing the total number of signals identified during the second part of the third observational campaign (O3b) to 90. GWTC-3 provides unprecedented insight into a new landscape of extreme cosmic events and outlines the characteristics of black hole populations, setting new records and limits on the masses of black holes and neutron stars and providing clues to the astrophysical environments where the observed extreme cosmic events are most likely to occur. GWTC-3 also highlights the problems related to the estimation of the masses of some of the sources of gravitational waves detected, not currently attributable to black holes or neutron stars. The increase in the number of events recorded in recent years has been possible thanks to continuous technological updates. The interventions are still in progress and the next observation period, in the second half of 2022, will also be facilitated by the Japanese interferometer Kagra joining the network of gravitational observatories. ■