

Gravitational Wave Physics and Astronomy

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This special issue devoted to “Gravitational Wave Physics and Astronomy”, contains research work presented at the 2021 edition of the GWPAW workshop, held in Hannover, Germany. This was one of the first in-person meetings for the gravitational wave community coming out of the Covid pandemic, which I had the honour to organise.

At the time of the workshop, December 2021, the LIGO-Virgo-Kagra detectors had completed the third observing run and the most of the data had been analysed internally by the Collaborations, so the works collected here represent a good snapshot of the state of the field. They showcase milestone observational results and data analysis techniques [Poggiani (andp.202200215), Sakai et al. (andp.202200140), Klinger and Agathos (andp.202200271), Baghi et al. (andp.202200447)]

and some of the most relevant astrophysical inferences that can be made based on the gravitational wave observations. These include the study of neutron star and black hole populations, their formation history and mechanisms [Lopez (andp.202200142), Chruślińska (andp.202200170), Rosswog and Korobkin (andp.202200306), Berretta et al. (andp.202200144)] and the measurement of the Hubble parameter [Mastrogiovanni et al. (andp.202200180)]. Beyond the direct observations, theoretical works relating to the prediction of gravitational waves in alternative theories of gravity were also discussed [Verma (andp.202100600), Gushima and Hayama (andp.202200139)].

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