

Seminarium Astrofizyczne

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Searching for (exceptional) gravitational-wave sources using model-independent method

Gravitational Wave Astronomy has already demonstrated its potential to explore the Universe, but we are still at the beginning of this journey. While we regularly observe gravitational waves from compact binaries, we do not know what we may discover next. It could be new astrophysical source populations, multi-messenger events, or sources with special properties. Such exceptional astrophysical events might play an important role in our exploration of the Universe.

In the first part of my talk, I will describe the status of the ongoing fourth observing run that has already provided almost two hundred new gravitational-wave candidates. I will discuss the role of model-independent searches (also known as gravitational-wave burst searches) in this exploration. I will focus on the coherent WaveBurst, the types of searches, the latest developments, and future prospects. As it uses minimal assumptions about the signal models, it can detect compact binaries with special properties. It can also detect sources where exact signal models are not available, such as core-collapse supernovae, which will be the focus of the second part of my presentation. The next nearby event will be one of the most exciting astronomical events of the century. I will discuss the current search status and future prospects. Finally, I will announce an upcoming LIGO-Virgo-KAGRA workshop on core-collapse supernovae in Warsaw.

Serdecznie zapraszam,

Sreekanth Harikumar, on behalf of the SOC