



Challenges For Third-Generation Gravitational Wave Detectors and Beyond

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Message from the Guest Editors

The purpose of this Special Issue is to provide an overview of the technological challenges that need to be addressed and overcome to reduce the contribution of noise that limits the sensitivity band of current ground-based GW detectors, and to demonstrate how the Cosmic Explorer and Einstein Telescope projects will overcome these challenges. However, considering GWs as a united scientific community, the aim of this review is to present the solutions implemented by the two 3G detectors to handle fundamental and technical noise sources. These approaches can be both similar and complementary, but their application will lead to the development of the most sensitive GW detectors on Earth.

Moreover, given the strong interest this field of research has received in recent years, there is growing interest in the frequency bands outside those of terrestrial detectors. Therefore, part of this Special Issue will be devoted to space-based detectors, whose sensitivity will extend to the sub-Hz band, and to those projects aimed at detecting signals at frequencies above tens of kHz, the so-called ultra-high-frequency gravitational waves.





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Message from the Editorial Board

Galaxies provides an advanced forum for studies related to astronomy, astrophysics, and cosmology, including all of their subfields. Different formats, such as specialized research articles, reviews, communications and technical notes are welcomed. Manuscripts containing original and creative research proposals and ideas are especially appreciated.

We encourage scientists to publish their astronomical observations and theoretical results in as much detail as possible. There is no restriction on the paper length and full experimental and methodological details, as applicable, should be provided. All papers will be peer reviewed promptly. On behalf of the distinguished members of the editorial board, I extend my welcome to all researchers working on these subjects to contribute to *Galaxies*.

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