Special Issue

The Evolution of Gravitational Wave Detectors

Message from the Guest Editors

The study of gravitational waves has experienced remarkable development in the past few years. Through observations runs O3 (2017-2020) and O4 (2023-2025), hundreds of events have been detected, providing not only a rich repository of data about these phenomena but also a confirmation that gravitational wave astronomy has become an integral tool in our investigation of the cosmos. In this Special Issue of *Galaxies*, titled “The Evolution of Gravitational Wave Detectors”, we focus on the outcomes of the works performed to face the limitations of the current detectors and on the future of these machines. Our collection of papers delves into the incremental upgrades in existing detector technology and the innovation anticipated for the third generation of detectors that looms on the horizon. Contributions from experts in a variety of topics, including optics, mechanics, control theory, and noise reduction, expand the reader’s understanding of the technology of gravitational wave detectors, of its technical challenges, and of its scientific rewards.

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About the Journal

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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