CANONICAL GRAVITY AND APPLICATIONS

Canonical methods are a powerful mathematical tool within the field of gravitational research, both theoretical and observational, and have contributed to a number of recent developments in physics. Providing mathematical foundations as well as physical applications, this is the first systematic explanation of canonical methods in gravity. The book discusses the mathematical and geometrical notions underlying canonical tools, highlighting their applications in all aspects of gravitational research, from advanced mathematical foundations to modern applications in cosmology and black-hole physics. The main canonical formulations, including the Arnowitt–Deser–Misner (ADM) formalism and Ashtekar variables, are derived and discussed.

Ideal for both graduate students and researchers, this book provides a link between standard introductions to general relativity and advanced expositions of black hole physics, theoretical cosmology, or quantum gravity.

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Cosmology, black holes, quantum gravity

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