

Jet Single-Time Lagrange Geometry and Its Applications



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Develops the theory of jet single-time Lagrange geometry and presents modern-day applications

Jet Single-Time Lagrange Geometry and Its Applications guides readers through the advantages of jet single-time Lagrange geometry for geometrical modeling. With comprehensive chapters that outline topics ranging in complexity from basic to advanced, the book explores current and emerging applications across a broad range of fields, including mathematics, theoretical and atmospheric physics, economics, and theoretical biology.

The authors begin by presenting basic theoretical concepts that serve as the foundation for understanding how and why the discussed theory works. Subsequent chapters compare the geometrical and physical aspects of jet relativistic time-dependent Lagrange geometry to the classical time-dependent Lagrange geometry. A collection of jet geometrical objects are also examined such as d -tensors, relativistic time-dependent semisprays, harmonic curves, and nonlinear connections. Numerous applications, including the gravitational theory based on both the Berwald-Moór metric and the Chernov metric, are also presented.

Throughout the book, the authors offer numerous examples that illustrate how the theory is put into practice, and they also present numerous applications in which the solutions of first-order ordinary differential equation systems are regarded as harmonic curves on 1-jet spaces. In addition, numerous opportunities are provided for readers to gain skill in applying jet single-time Lagrange geometry to solve a wide range of problems.

Extensively classroom-tested to ensure an accessible presentation, *Jet Single-Time Lagrange Geometry and Its Applications* is an excellent book for courses on differential geometry, relativity theory, and mathematical models at the graduate level. The book also serves as an excellent reference for researchers, professionals, and academics in physics, biology, mathematics, and economics who would like to learn more about model-providing geometric structures.

VLADIMIR BALAN, PhD, is Professor in the Department of Mathematics and Informatics at the University Politehnica of Bucharest, Romania. He has published extensively in his areas of research interest, which include harmonic maps, variational problems in fiber bundles, and generalized gauge theory and its applications in mechanics and mathematical physics.

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