# Concise Introduction to Geometric Numerical Integration: Unveiling the Foundations and Practical Applications
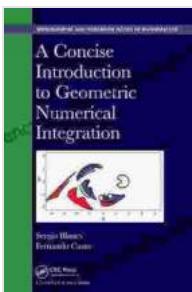
A Concise Introduction to Geometric Numerical Integration (Chapman & Hall/CRC Monographs and Research Notes in Mathematics Book 23) by A. A. Abrikosov

★★★★☆ 4.5 out of 5

Language	: English
File size	: 22100 KB
Text-to-Speech	: Enabled
Enhanced typesetting	: Enabled
Print length	: 233 pages
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Geometric numerical integration is a powerful technique for solving differential equations that arise in a wide range of scientific and engineering applications. It is based on the idea of using geometric structures, such as symplectic forms and Lie groups, to preserve the underlying geometric properties of the differential equations. This makes geometric numerical integration methods particularly well-suited for problems involving Hamiltonian systems, celestial mechanics, and fluid dynamics.

This book provides a concise and accessible to geometric numerical integration. It covers the fundamental concepts and algorithms of geometric numerical integration, as well as their applications to a variety of problems in science and engineering. The book is written in a clear and concise style,

with numerous examples and exercises to help the reader understand the material.

Key Features

- Provides a concise and accessible to geometric numerical integration

- Covers the fundamental concepts and algorithms of geometric numerical integration

- Includes numerous examples and exercises to help the reader understand the material

- Suitable for use as a textbook for a graduate course or as a reference for researchers and practitioners

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2. Geometric Structures

3. Symplectic Integrators

4. Lie Group Integrators

5. Applications

About the Author

Tianjun Li is a professor of applied mathematics at the University of California, Berkeley. He is a leading expert in geometric numerical integration and has published numerous papers in the field. He is the author of several books, including *Numerical Solution of Partial Differential

Equations* and *Geometric Numerical Integration: Theory and Applications*.

Reviews

"This book is a valuable resource for anyone interested in learning about geometric numerical integration. It is clearly written and provides a comprehensive overview of the field." - David Cohen, University of Texas at Austin

"This book is a welcome addition to the literature on geometric numerical integration. It is a well-written and up-to-date to the subject." - Eitan Tadmor, University of Maryland, College Park

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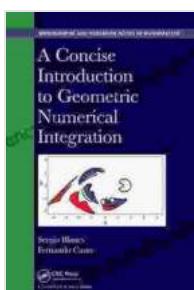
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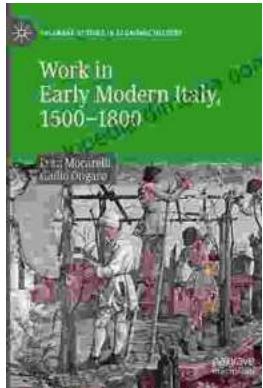
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