

1. Record Nr.	UNINA9910812637403321
Autore	Borisov A. V (Aleksei Vladimirovich)
Titolo	Rigid body dynamics // Alexey V. Borisov, Ivan S. Mamaev
Pubbl/distr/stampa	Berlin ; ; Boston : , : De Gruyter : , : Higher Education Press, , 2019
ISBN	3-11-054297-8 3-11-054444-X
Descrizione fisica	1 online resource (530 pages)
Collana	De Gruyter Studies in Mathematical Physics
Classificazione	UF 1950
Disciplina	531.3
Soggetti	Dynamics, Rigid
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Frontmatter -- Contents -- Introduction -- The Creators of Rigid Body Dynamics -- 1. Rigid Body Equations of Motion and Their Integration -- 2. The Euler - Poisson Equations and Their Generalizations -- 3. The Kirchhoff Equations and Related Problems of Rigid Body Dynamics -- 4. Linear Integrals and Reduction -- 5. Generalizations of Integrability Cases. Explicit Integration -- 6. Periodic Solutions, Nonintegrability, and Transition to Chaos -- A. Derivation of the Kirchhoff, Poincaré - Zhukovskii, and Four-Dimensional Top Equations -- B. The Lie Algebra $e(4)$ and Its Orbits -- C. Quaternion Equations and L-A Pair for the Generalized Goryachev - Chaplygin Top -- D. The Hess Case and Quantization of the Rotation Number -- E. Ferromagnetic Dynamics in a Magnetic Field -- F. The Landau - Lifshitz Equation, Discrete Systems, and the Neumann Problem -- G. Dynamics of Tops and Material Points on Spheres and Ellipsoids -- H. On the Motion of a Heavy Rigid Body in an Ideal Fluid with Circulation -- I. The Hamiltonian Dynamics of Self-gravitating Fluid and Gas Ellipsoids -- Bibliography -- Index of Names -- Index
Sommario/riassunto	This book provides an up-to-date overview of results in rigid body dynamics, including material concerned with the analysis of nonintegrability and chaotic behavior in various related problems. The wealth of topics covered makes it a practical reference for researchers and graduate students in mathematics, physics and mechanics. Contents Rigid Body Equations of Motion and Their Integration The

Euler - Poisson Equations and Their Generalizations The Kirchhoff Equations and Related Problems of Rigid Body Dynamics Linear Integrals and Reduction Generalizations of Integrability Cases. Explicit Integration Periodic Solutions, Nonintegrability, and Transition to Chaos Appendix A : Derivation of the Kirchhoff, Poincaré - Zhukovskii, and Four-Dimensional Top Equations Appendix B: The Lie Algebra $e(4)$ and Its Orbits Appendix C: Quaternion Equations and L-A Pair for the Generalized Goryachev - Chaplygin Top Appendix D: The Hess Case and Quantization of the Rotation Number Appendix E: Ferromagnetic Dynamics in a Magnetic Field Appendix F: The Landau - Lifshitz Equation, Discrete Systems, and the Neumann Problem Appendix G: Dynamics of Tops and Material Points on Spheres and Ellipsoids Appendix H: On the Motion of a Heavy Rigid Body in an Ideal Fluid with Circulation Appendix I: The Hamiltonian Dynamics of Self-gravitating Fluid and Gas Ellipsoids
