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| Nota di contenuto | Frontmatter -- Foreword / Efroimsky, Michael -- Contents -- 1. Introduction. Current challenges in space exploration -- Part I: Regularization -- 2. Theoretical aspects of regularization -- 3. The Kustaanheimo-Stiefel space and the Hopf fibration -- 4. The Dromo formulation -- 5. Dedicated formulation: Propagating hyperbolic orbits -- 6. Evaluating the numerical performance -- Part II: Applications -- 7. The theory of asynchronous relative motion -- 8. Universal and regular solutions to relative motion -- 9. Generalized logarithmic spirals: A new analytic solution with continuous thrust -- 10. Lambert's problem with generalized logarithmic spirals -- 11. Low-thrust trajectory design with controlled generalized logarithmic spirals -- 12. Nonconservative extension of Keplerian integrals and new families of orbits -- 13. Conclusions -- Part III: Appendices -- A. Hypercomplex numbers -- B. Formulations in PERFORM -- C. Stumpff functions -- E. Elliptic integrals and elliptic functions -- F. Controlled generalized logarithmic spirals -- G. Dynamics in Seiffert's spherical spirals -- List of Figures -- Bibliography -- Index |
| Sommario/riassunto | Regularized equations of motion can improve numerical integration for the propagation of orbits, and simplify the treatment of mission design problems. This monograph discusses standard techniques and recent research in the area. While each scheme is derived analytically, its |

accuracy is investigated numerically. Algebraic and topological aspects of the formulations are studied, as well as their application to practical scenarios such as spacecraft relative motion and new low-thrust trajectories.