1. Record Nr. UNINA9910366612103321 Autore Huang Panfeng Titolo Theory and Applications of Multi-Tethers in Space / / by Panfeng Huang, Fan Zhang Pubbl/distr/stampa Singapore:,: Springer Singapore:,: Imprint: Springer,, 2020 981-15-0387-7 **ISBN** Edizione [1st ed. 2020.] Descrizione fisica 1 online resource (XII, 281 p. 191 illus., 137 illus. in color.) Collana Springer Tracts in Mechanical Engineering, , 2195-9862 Disciplina 629.1 Soggetti Aerospace engineering **Astronautics** Automatic control Mechanics Mechanics, Applied Aerospace Technology and Astronautics Control and Systems Theory Theoretical and Applied Mechanics Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Nota di contenuto Introduction -- Dynamics Modeling and Analysis -- Folding Pattern and Releasing Characteristics -- Centralized Deployment Control --Distributed Deployment Control -- Dynamics Modeling -- Formationkeeping Control of the Close-chain -- Deployment and Retrieval Control of the Hub-spoke System System -- Formation-keeping Control of the Hub-spoke System. . This book offers a comprehensive overview of recently developed space Sommario/riassunto multi-tethers, such as maneuverable space tethered nets and space tethered formation. For each application, it provides detailed derivatives to describe and analyze the mathematical model of the system, and then discusses the design and proof of different control schemes for various problems. The dynamics modeling presented is based on Newton and Lagrangian mechanics, and the book also introduces Hamilton mechanics and Poincaré surface of section for dynamics analysis, and employs both centralized and distributed

controllers to derive the formation question of the multi-tethered

system. In addition to the equations and text, it includes 3D design drawings, schematic diagrams, control scheme blocks and tables to make it easy to understand. This book is intended for researchers and graduate students in the fields of astronautics, control science, and engineering.