1. Record Nr. UNINA9910143679603321

Titolo	Deep space optical communications [[electronic resource] /] / edited by Hamid Hemmati
Pubbl/distr/stampa	Hoboken, N.J., : Wiley-Interscience, c2006
ISBN	1-280-44999-3 9786610449996 0-470-04241-9 0-470-04240-0
Descrizione fisica	1 online resource (735 p.)
Collana	Deep-space communications and navigation series
Altri autori (Persone)	HemmatiHamid <1954->
Disciplina	629.47/43 629.4743
Soggetti	Astronautics - Optical communication systems Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Deep Space Optical Communications; Table of Contents; Foreword; Preface; Acknowledgments; Contributors; Chapter 1 : Introduction; 1.1 Motivation for Increased Communications; 1.2 History of JPL Optical Communications Activities; 1.3 Component/Subsystem Technologies; 1.3.1 Laser Transmitters; 1.3.2 Spacecraft Telescopes; 1.3.3 Acquisition, Tracking, and Pointing; 1.3.4 Detectors; 1.3.5 Filters; 1.3.6 Error Correction Coding; 1.4 Flight Terminal Developments; 1.4.1 Optical Transceiver Package (OPTRANSPAC); 1.4.2 Optical Communications Demonstrator (OCD) 1.4.3 Lasercom Test and Evaluation Station (LTES)1.4.4 X2000 Flight Terminal; 1.4.5 International Space Station Flight Terminal; 1.5 Reception System and Network Studies; 1.5.1 Ground Telescope Cost Model; 1.5.2 Deep Space Optical Reception Antenna (DSORA); 1.5.3 Deep Space Relay Satellite System (DSRSS) Studies; 1.5.4 Ground-Based Antenna Technology Study (GBATS); 1.5.5 Advanced Communications Benefits Study (ACBS); 1.5.6 Earth Orbit Optical Reception Terminal (EOORT) Study; 1.5.7 EOORT Hybrid Study; 1.5.8 Spherical Primary Ground Telescope

1.5.9 Space-Based versus Ground-Based Reception Trades1.6 Atmospheric Transmission; 1.7 Background Studies; 1.8 Analysis Tools; 1.9 System-Level Studies; 1.9.1 Venus Radar Mapping (VRM) Mission Study; 1.9.2 Synthetic Aperture Radar-C (SIR-C) Freeflyer; 1.9.3 ER-2 to Ground Study; 1.9.4 Thousand Astronomical Unit (TAU) Mission and Interstellar Mission Studies; 1.10 System-Level Demonstrations; 1.10.1 Galileo Optical Experiment (GOPEX); 1.10.2 Compensated Earth-Moon-Earth Retro-Reflector Laser Link (CEMERLL); 1.10.3 Ground/Orbiter Lasercomm Demonstration (GOLD)
1.10.4 Ground-Ground Demonstrations1.11 Other Telecommunication Functions; 1.11.1 Opto-Metric Navigation; 1.11.2 Light Science; 1.12 The Future; 1.12.1 Optical Communications Telescope Facility (OCTL); 1.12.2 Unmanned Arial Vehicle (UAV)-Ground Demonstration; 1.12.3 Adaptive Optics; 1.12.4 Optical Receiver and Dynamic Detector Array; 1.12.5 Alternate Ground-Reception Systems; 1.13 Mars Laser Communication Demonstration; 1.14 Summary of Following Chapters; References; Chapter 2: Link and System Design; 2.1 Overview of Deep-Space Lasercom Link; 2.2 Communications Link Design
2.2.1 Link Equation and Receive Signal Power2.2.2 Optical-Receiver Sensitivity; 2.2.2.1 Photon Detection Sensitivity; 2.2.2.2 Modulation Format; 2.2.2.3 Background Noise Control; 2.2.3 Link Design Trades; 2.2.3.1 Operating Wavelength; 2.2.3.2 Transmit Power and Size of Transmit and Receive Apertures; 2.2.3.3 Receiver Optical Bandwidth and Field of View versus Signal Throughput; 2.2.3.4 Modulation and Coding; 2.2.4 Communications Link Budget; 2.2.5 Link Availability Considerations; 2.2.5.1 Short-Term Data Outages; 2.2.5.2 Weather-Induced Outages; 2.2.5.3 Other Long-Term Outages
2.2.5.4 Critical-Mission-Phase Coverage

Sommario/riassunto

A quarter century of research into deep space and near Earth optical communicationsThis book captures a quarter century of research and development in deep space optical communications from the Jet Propulsion Laboratory (JPL). Additionally, it presents findings from other optical communications research groups from around the world for a full perspective. Readers are brought up to date with the latest developments in optical communications technology, as well as the state of the art in component and subsystem technologies, fundamental limitations, and approaches to develop and fully ex