

SOLAR POWER SATELLITES the emerging energy option

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Solar Power Satellites The Emerging Energy Option

Lingsheng Yao

Solar Power Satellites The Emerging Energy Option:

Solar power satellites. , During energy crisis at the end of the Sixties a new idea to exploit solar energy arose Solar Power Satellites These satellites need a huge surface to collect enough solar energy to be beamed on Earth by means of a microwave power transfer system Different concepts appeared during last forty years and a lot of studies addressing the SPS economical feasibility have been published In this work a particular concept is considered the JAXA Reference Concept 2003 It is a formation flying SPS composed by two reflectors and a central array panel The objective of the work is to study two major problems this concept presents Due to its dimensions the satellite orbit will suffer from important orbital perturbations and since formation flying satellites need a tight orbit control the first task is to derive an analytical approximation to perform relative perturbed orbit propagation for formation flying satellite This objective is pursued starting from a H Schaub s formulation in which formation flying satellites unperturbed orbit is described by means of an approximated relation function of orbital element differences This formulation is merged with another approach developed in a previous work which gives analytically orbital parameters variation when a perturbation acts on the spacecraft The result is a very interesting algorithm able to perform the assigned task with a relative error lower than 3% over one simulated orbit The second objective concerns structural control It is not possible to consider these huge satellites as rigid bodies first natural frequencies will be certainly excited during operations So that the second task is the study of actuator placement optimization for flexible satellites very useful for tight pointing requirements A FEM model is developed modeling the SPS as a frame of beams and a global controllability index is obtained combining modal controllability and component cost analysis The maximization of this parameter

Solar Power Satellites Peter E. Glaser, Frank P. Davidson, Katinka I.

Csigi, 1995-07-25 Provides a comprehensive review of current state of the art in this important and rapidly growing area Presents a framework for the developments needed to decrease reliance upon nonrenewable energy sources Describes an approach to mitigate global warming and ecological degradation Addresses technical economic and social issues

Solar Power Satellites

Don M. Flournoy, 2011-12-02 Communication satellites are a 144 billion industry Is there any space based industry that could possibly beat that market Solar Power Satellites shows why and how the space satellite industry will soon begin expanding its market from relaying signals to Earth to generating energy in space and delivering it to the ground as electricity In all industrialized nations energy demand is growing exponentially In the developing world the need for energy is as basic as food and water The Sun s energy is available everywhere and it is non polluting As business plans demonstrate its technical feasibility commercial potential and environmental acceptability every country on Earth will look to space for the power it needs

[ECOS 2012 The 25th International Conference on Efficiency, Cost, Optimization and Simulation of Energy Conversion Systems and Processes \(Perugia, June 26th-June 29th, 2012\)](#) Umberto Desideri, Enrico Sciubba, Giampaolo Manfrida, 2012 The 8 volume set contains the Proceedings of the 25th ECOS 2012 International Conference Perugia Italy

June 26th to June 29th 2012 ECOS is an acronym for Efficiency Cost Optimization and Simulation of energy conversion systems and processes summarizing the topics covered in ECOS Thermodynamics Heat and Mass Transfer Exergy and Second Law Analysis Process Integration and Heat Exchanger Networks Fluid Dynamics and Power Plant Components Fuel Cells Simulation of Energy Conversion Systems Renewable Energies Thermo Economic Analysis and Optimisation Combustion Chemical Reactors Carbon Capture and Sequestration Building Urban Complex Energy Systems Water Desalination and Use of Water Resources Energy Systems Environmental and Sustainability Issues System Operation Control Diagnosis and Prognosis Industrial Ecology

The Ethics of Nanotechnology, Geoengineering, and Clean Energy

Andrew Maynard,Jack Stilgoe,2020-07-26 Nanotechnology clean technology and geoengineering span the scale of human ingenuity from the imperceptibly small to the unimaginably large Yet they are united by a commonality of ethics that permeates how and why they are developed and how the resulting consequences are managed The articles in this volume provide a comprehensive account of current thinking around the ethics of development and use within each of the technological domains and addresses challenges and opportunities that cut across all three In particular the collection provides unique insights into the ethics of noumenal technologies technologies that are impossible to see or detect or conceive of with human senses or conventional tools This collection will be of relevance to anyone who is actively involved with ensuring the responsible and sustainable development of nanotechnology geoengineering or clean technology

Solar

Power Satellites Peter E. Glaser,Frank P. Davidson,Katinka I. Csigi,1998 Discusses technologies involved in the development of a solar power satellite network as well as economic and societal issues relevant to the development of solar power satellites both as an alternative energy supply and as a stimulus for the exploration and use of space Fifty three contributors cover such topics as wireless power transmission

Defining NASA's Mission and America's Vision for the Future of Space Exploration

United States. Congress. House. Committee on Government Reform and Oversight.

Subcommittee on National Security, International Affairs, and Criminal Justice,1998

The Moon

David Schrunk,Burton Sharpe,Bonnie L. Cooper,Madhu Thangavelu,2007-11-27 This extraordinary book details how the Moon could be used as a springboard for Solar System exploration It presents a realistic plan for placing and servicing telescopes on the Moon and highlights the use of the Moon as a base for an early warning system from which to combat threats of near Earth objects A realistic vision of human development and settlement of the Moon over the next one hundred years is presented and the author explains how global living standards for the Earth can be enhanced through the use of lunar based generated solar power From that beginning the people of the Earth would evolve into a spacefaring civilisation

Solar Power Satellite

United States. Congress. House. Committee on Science and Technology. Subcommittee on Space Science and

Applications,1979

Space Photovoltaic Research and Technology

1995 ,1996

Solar Power Satellites

,1981

The

Concept of the Common Heritage of Mankind in International Law Kemal Baslar,2024-02-06 The concept of the

common heritage of mankind is one of the most extraordinary developments in recent intellectual history and one of the most revolutionary and radical legal concepts to have emerged in recent decades The year 1997 marks the thirtieth anniversary of the advent of the concept in the domain of public international law Ever since its emergence it has become evident that no other concept notion principle or doctrine has brought as much intensive debate controversy confrontation and speculation as the common heritage phenomenon did This is because it is a philosophical idea that questions the regimes of globally important resources regardless of their situation and requires major changes in the world to apply its provisions In other words the application and enforcement of the common heritage of mankind require a critical reexamination of many well established principles and doctrines of classical international law such as acquisition of territory consent based sources of international law sovereignty equality resource allocation and international personality This book aims to explore the legal theory and implications of the concept of the common heritage of mankind It addresses almost all aspects of the concept in the light of the experience of three decades The author takes into account the elements of the common heritage concept in the fields of jurisprudence outer space law the law of the sea the law of Antarctica international environmental law human rights and general principles of public international law It tries to develop a normative framework through which the concept may offer alternatives for the governance of the global commons

Solar Power from Satellites Committee on Aeronautical and Space Sciences,Committee on Aeronautical and Space Scie,United States Senate,2001-12 A look at ways to collect solar power in space with satellites and beam that power down to Earth to supplement our other sources of electricity In addition this is a look at novel ways to say the least to construct those satellites The witnesses at these Senate hearings envision a time when space will be the scene of bustling activity They foresee construction of gigantic facilities that will provide the world with energy which is an essential and increasingly costly part of our industrial society

Threats, Risks and Sustainability - Answers by Space Kai-Uwe Schrogli,Charlotte Mathieu,Agnieszka Lukaszczky,2009-07-24

Development is challenged by at least until 2050 a strong population more severe environmental strains growing mobility and dwindling energy resources All these factors will lead to serious consequences for humankind Inadequate agricultural resources water supply and non renewable energy sources epidemics climate change and natural disasters will further heavily impact human life The European Space Policy Institute ESPI sheds a new light on threats risks and sustainability by combining approaches from various disciplines It analyzes what could be the contribution of space tools to predict manage and mitigate those threats It aims at demonstrating that space is not a niche but has become an overarching tool in solving today s problems

NASA and the Space Industry Joan Lisa Bromberg,1999-05-04 A timely exploration of the relationships between NASA and the private sector An interesting read Spaceflight Few federal agencies have more extensive ties to the private sector than NASA NASA s relationships with its many aerospace industry suppliers of rocket engines computers electronics gauges valves O rings and other materials have often been described as partnerships These

have produced a few memorable catastrophes but mostly technical achievements of the highest order Until now no one has written extensively about them In NASA and the Space Industry Joan Lisa Bromberg explores how NASA s relationship with the private sector developed and how it works She outlines the various kinds of expertise public and private sectors brought to the tasks NASA took on describing how this division of labor changed over time She explains why NASA sometimes encouraged and sometimes thwarted the privatization of space projects and describes the agency s role in the rise of such new space industries as launch vehicles and communications satellites Solar Power from Satellites United States.

Congress. Senate. Committee on Aeronautical and Space Sciences. Subcommittee on Aerospace Technology and National Needs,1976 **Technology for Large Space Systems** ,1985 Engineering Response to Global Climate Change Robert G. Watts,1997-07-30 This book goes beyond the analysis offered by typical works on this subject to propose real solutions to problems caused by changes in the earth s climate From new ways to cut energy consumption and reduce carbon dioxide emissions to discussions of the possibilities of sea walls and climate altering technologies Engineering Response to Global Climate Change presents new conceptual tools and suggests research necessary for correcting and alleviating problems caused by global warming Engineers are just now being asked to consider the problems of climate change and the possible technological responses This complete reference covers the whole range of potential impacts of climate change and their engineering solutions Of special interest is the chapter on geoengineering which suggests how engineers may someday be able to intervene in planetary processes to reduce the effects of global warming Edited by a regional director of the National Institute for Global Environmental Change and offering the collective expertise of a team of expert authors each renowned in his or her field this book offers thorough coverage of this important topic from an engineering and technology perspective

Energy Abstracts for Policy Analysis ,1983 **Energy: a Continuing Bibliography with Indexes** ,1978

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