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Space Propulsion Analysis and Design

McGraw-Hill College *The only comprehensive text available on space propulsion for students and professionals in astronautics.*

Space Propulsion Analysis and Design

Learning Solutions *The only comprehensive text available on space propulsion for students and professionals in astronautics.*

LSC Space Propulsion Analysis and Design with Website

Learning Solutions *Written to answer the question of how to design rockets, Space Propulsion Analysis and Design provides readers the ability to complete a basic system configuration, mass estimate, and an estimate of the system's performance. Written by 16 engineers with decades of space design experience, this book offers advice, tested configurations, and historical precedents for rocket performance. The book covers the basics of rocket design, major technology types such as liquids, solids, hybrids, nuclear, and electric, plus a mission design example and discussion of future possibilities for space propulsion. Written for practicing systems and propulsion engineers, managers, and engineering students, this book gives readers a*

practical handbook to the design and configuration of rocket systems.

Introduction to Space Dynamics

Courier Corporation Comprehensive, classic introduction to space-flight engineering for advanced undergraduate and graduate students provides basic tools for quantitative analysis of the motions of satellites and other vehicles in space.

Fundamentals of Rocket Propulsion

CRC Press The book follows a unified approach to present the basic principles of rocket propulsion in concise and lucid form. This textbook comprises of ten chapters ranging from brief introduction and elements of rocket propulsion, aerothermodynamics to solid, liquid and hybrid propellant rocket engines with chapter on electrical propulsion. Worked out examples are also provided at the end of chapter for understanding uncertainty analysis. This book is designed and developed as an introductory text on the fundamental aspects of rocket propulsion for both undergraduate and graduate students. It is also aimed towards practicing engineers in the field of space engineering. This comprehensive guide also provides adequate problems for audience to understand intricate aspects of rocket propulsion enabling them to design and develop rocket engines for peaceful purposes.

Rocket and Spacecraft Propulsion

Principles, Practice and New Developments

Springer Science & Business Media The revised edition of this practical, hands-on book discusses the launch vehicles in use today throughout the world, and includes the latest details on advanced systems being developed, such as electric and nuclear propulsion. The author covers the fundamentals, from the basic principles of rocket propulsion and vehicle dynamics through the theory and practice of liquid and solid propellant motors, to new and future developments. He provides a serious exposition of the principles and practice of rocket propulsion, from the point of view of the user who is not an engineering specialist.

Fundamentals of Electric Propulsion

Ion and Hall Thrusters

John Wiley & Sons Throughout most of the twentieth century, electric propulsion was considered the technology of the future. Now, the future has arrived. This important new book explains the fundamentals of electric propulsion for spacecraft and describes in detail the physics and characteristics of the two major electric thrusters

in use today, ion and Hall thrusters. The authors provide an introduction to plasma physics in order to allow readers to understand the models and derivations used in determining electric thruster performance. They then go on to present detailed explanations of: Thruster principles Ion thruster plasma generators and accelerator grids Hollow cathodes Hall thrusters Ion and Hall thruster plumes Flight ion and Hall thrusters Based largely on research and development performed at the Jet Propulsion Laboratory (JPL) and complemented with scores of tables, figures, homework problems, and references, Fundamentals of Electric Propulsion: Ion and Hall Thrusters is an indispensable textbook for advanced undergraduate and graduate students who are preparing to enter the aerospace industry. It also serves as an equally valuable resource for professional engineers already at work in the field.

How Spacecraft Fly

Spaceflight Without Formulae

Springer Science & Business Media *In this popular science book, Graham Swinerd explains, without the use of mathematics and in an informal way, aerodynamic and astrodynamic flight for non-technical readers who are interested in spaceflight and spacecraft.*

Chemical Rockets

Performance Prediction and Internal Ballistics Design

Springer Nature *The purpose of this book is to discuss, at the graduate level, the methods of performance prediction for chemical rocket propulsion. A pedagogical presentation of such methods has been unavailable thus far and this text, based upon lectures, fills this gap. The first part contains the energy-minimization to calculate the propellant-combustion composition and the subsequent computation of rocket performance. While incremental analysis is for high performance solid motors, equilibrium-pressure analysis is for low performance ones. Both are detailed in the book's second part for the prediction of ignition and tail-off transients, and equilibrium operation. Computer codes, adopting the incremental analysis along with erosive burning effect, are included. The material is encouraged to be used and presented at lectures. Senior undergraduate and graduate students in universities, as well as practicing engineers and scientists in rocket industries, form the readership.*

Microsatellites as Research Tools

Elsevier *In order to reflect the increasing importance and interest of the microsatellites in high technology and scientific applications in space, the Colloquium on Microsatellites as Research Tools was organized to promote its usage and technology development and to foster the international cooperation, especially in the area of the Asia pacific region. Attended by 150 participants from 18 countries the colloquium was organized into five major themes: regional development, lessons learned, innovations, scientific applications, and education. A special session was organized as well by the organizing committee and supported by the National Space Program Office to present its development of the Taiwan's satellite program and the current status of ROCSAT-1 which is scheduled to be launched at the beginning of 1999. Two main conclusions were drawn from the material presented: microsatellite in general is a very good means for doing space research and technology development, and a suitable vehicle to promote international collaborations.*

Rocket Propulsion

Cambridge University Press *A modern pedagogical treatment of the latest industry trends in rocket propulsion, developed from the authors' extensive experience in both industry and academia. Students are guided along a step-by-step journey through modern rocket propulsion, beginning with the historical context and an introduction to top-level performance measures, and progressing on to in-depth discussions of the chemical aspects of fluid flow combustion thermochemistry and chemical equilibrium, solid, liquid, and hybrid rocket propellants, mission requirements, and an overview of electric propulsion. With a wealth of homework problems (and a solutions manual for instructors online), real-life case studies and examples throughout, and an appendix detailing key numerical methods and links to additional online resources, this is a must-have guide for senior and first year graduate students looking to gain a thorough understanding of the topic along with practical tools that can be applied in industry.*

Design of Rockets and Space Launch Vehicles

American Institute of Aeronautics and Astronautics Incorporated *With growing interest in space activity and numerous new launchers in development, this book is a timely, comprehensive survey of important concepts and applications. It enhances understanding and provides exposure to practical aspects of design, manufacturing, testing, and engineering associated with these topics.*

Blazing the Trail

The Early History of Spacecraft and Rocketry

AIAA Winner of the Luigi Napolitano Award (2006) from the International Academy of Astronautics This book presents the fascinating story of the events that paved the way to space. It introduces the reader to the history of early rocketry and the subsequent developments that led into the space age. People of various nations and from various lands contributed to the breakthrough to space, and the book takes the reader to faraway places on five continents. It also includes many quotes to give readers a flavor of how the participants viewed the developments. Most publications on the topic either target narrow aspects of rocket history or are popular books that scratch the surface, with minimal and sometimes inaccurate technical details. This book bridges the gap. It contains numerous technical details usually unavailable in popular publications. The details are not overbearing and anyone interested in rocketry and space exploration will navigate through the book without difficulty. There are 340 figures and photographs, many appearing for the first time.

Chemical Rocket Propulsion

A Comprehensive Survey of Energetic Materials

Springer Developed and expanded from the work presented at the New Energetic Materials and Propulsion Techniques for Space Exploration workshop in June 2014, this book contains new scientific results, up-to-date reviews, and inspiring perspectives in a number of areas related to the energetic aspects of chemical rocket propulsion. This collection covers the entire life of energetic materials from their conceptual formulation to practical manufacturing; it includes coverage of theoretical and experimental ballistics, performance properties, as well as laboratory-scale and full system-scale, handling, hazards, environment, ageing, and disposal. Chemical Rocket Propulsion is a unique work, where a selection of accomplished experts from the pioneering era of space propulsion and current technologists from the most advanced international laboratories discuss the future of chemical rocket propulsion for access to, and exploration of, space. It will be of interest to both postgraduate and final-year undergraduate students in aerospace engineering, and practicing aeronautical engineers and designers, especially those with an interest in propulsion, as well as researchers in energetic materials.

Rocket Propulsion Elements

An Introduction to the Engineering of Rockets

Democracy and Education

An Introduction to the Philosophy of Education,

John Dewey's Democracy and Education addresses the challenge of providing quality public education in a democratic society. In this classic work Dewey calls for the complete renewal of public education, arguing for the fusion of vocational and contemplative studies in education and for the necessity of universal education for the advancement of self and society. First published in 1916, Democracy and Education is regarded as the seminal work on public education by one of the most important scholars of the century.

Rise of the Rocket Girls

The Women Who Propelled Us, from Missiles to the Moon to Mars

Little, Brown *The riveting true story of the women who launched America into space. In the 1940s and 50s, when the newly minted Jet Propulsion Laboratory needed quick-thinking mathematicians to calculate velocities and plot trajectories, they didn't turn to male graduates. Rather, they recruited an elite group of young women who, with only pencil, paper, and mathematical prowess, transformed rocket design, helped bring about the first American satellites, and made the exploration of the solar system possible. For the first time, Rise of the Rocket Girls tells the stories of these women -- known as "human computers" -- who broke the boundaries of both gender and science. Based on extensive research and interviews with all the living members of the team, Rise of the Rocket Girls offers a unique perspective on the role of women in science: both where we've been, and the far reaches of space to which we're heading. "If Hidden Figures has you itching to learn more about the women who worked in the space program, pick up Nathalia Holt's lively, immensely readable history, Rise of the Rocket Girls." -- Entertainment Weekly*

Von Braun

Dreamer of Space, Engineer of War

Vintage Curator and space historian at the Smithsonian's National Air and Space Museum delivers a brilliantly nuanced biography of controversial space pioneer Wernher von Braun. Chief rocket engineer of the Third Reich and one of the fathers of the U.S. space program, Wernher von Braun is a source of consistent fascination. Glorified as a visionary and vilified as a war criminal, he was a man of profound moral complexities, whose intelligence and charisma were coupled with an enormous and, some would say, blinding ambition. Based on new sources, Neufeld's biography delivers a meticulously researched and authoritative portrait of the creator of the V-2 rocket and his times, detailing how he was a man caught between morality and progress, between his dreams of the heavens and the earthbound realities of his life.

Modern Engineering for Design of Liquid-Propellant Rocket Engines

AIAA

Human Spaceflight

Mission Analysis and Design

McGraw-Hill College "Human spaceflight: mission analysis and design" is for you if you manage, design, or operate systems for human spaceflight! It provides end-to-end coverage of designing human space systems for Earth, Moon, and Mars. If you are like many others, this will become the dog-eared book that is always on your desk -and used. The book includes over 800 rules of thumb and sanity checks that will enable you to identify key issues and errors early in the design processes. This book was written by group of 67 professional engineers, managers, and educators from industry, government, and academia that collectively share over 600 years of space-related experience! The team from the United States, Austria, Canada, France, Germany, Japan, and Russia worked for four-and-one-half years to capture industry and government best practices and lessons-learned from industry and government in an effort to baseline global conceptual design experience for human spaceflight. "Human spaceflight: mission analysis and design" provides a much-needed big-picture perspective that can be used by managers, engineers and students to integrate the myriad of elements associated with human spaceflight.

Interactive Aerospace Engineering and Design

McGraw-Hill Companies *This text contains an integrated bound-in CD-ROM, and has a strong emphasis on design. Its active visual approach and inclusion of space-orientated engineering make it an interesting examination of the aerospace engineering field.*

Building an Aquaponics System

Createspace Independent Pub *Comprehensive guide to building and caring for an aquaponic garden, and raising organic fish and vegetables together.*

Life of Pi

Vintage Canada *Life of Pi is a masterful and utterly original novel that is at once the story of a young castaway who faces immeasurable hardships on the high seas, and a meditation on religion, faith, art and life that is as witty as it is profound. Using the threads of all of our best stories, Yann Martel has woven a glorious spiritual adventure that makes us question what it means to be alive, and to believe.*

The Power for Flight

NASA's Contributions to Aircraft Propulsion

Government Printing Office *The NACA and aircraft propulsion, 1915-1958 -- NASA gets to work, 1958-1975 -- The shift toward commercial aviation, 1966-1975 -- The quest for propulsive efficiency, 1976-1989 -- Propulsion control enters the computer era, 1976-1998 -- Transiting to a new century, 1990-2008 -- Toward the future*

The Reality of Our Global Future

How Five Unstoppable High-Tech Trends Will Dominate Our Lives and

Transform Our World

CreateSpace *Where are we heading? Stripped of all the hype and fantasy - where really is the world economy set to take us by 2040? Those of us alive today are on an extraordinary course: For several decades our future has largely been determined by a handful of relatively-obscure trends that together generate the awesome propulsion of a High-Tech engine that is launching the international community on a voyage into completely unfamiliar territory. But where will we all end up? Based on unparalleled insights into what organizations across the globe are actually doing, for the first time the world's foremost expert on the hidden inner-workings of society explains in simple and accessible language exactly where the most deeply-established trends are taking us. How, despite claims that its accelerating progress is not sustainable for much longer, Digitization is on an inexorable course to a mind-blowing society of virtual-assistants, robot cars, cyborgs and everything on-the-record. And how Networking will combine with Digitization to lead by 2040 to computers capable of human-like interaction and an internet a billion times more powerful than today's. Dr. Scott-Morgan reveals how the Miniaturization trend offers nanotech breakthroughs ranging from cancer treatments to quantum computing - but not, as has often been claimed, Star-Trek Replicators or the threat of 'grey goo'. And he shows how exponential Simulation will support fundamental and sweeping advances that lead to almost limitless electricity and maybe almost limitless life-extension. Our world is set for a Global Renaissance. However, the backdraft of the High-Tech launch engine is also stirring up a turbulence of unintended consequences that threaten to disrupt our trajectory. Rather than Global Renaissance, we would then enter Global Chaos. Yet these are not ordinary times. In the startling conclusion to his book, Dr. Scott-Morgan reveals how in only the last couple of years a brand new exponential trend has begun to emerge out of the turbulence. In terms of influencing our destination - whether we end up in a Global Renaissance or in Global Chaos - it is that trend that will be the most important one of all. NOTE: This is the companion volume to 'The Reality of Global Crises' by the same author.*

The Psychosocial Implications of Disney Movies

MDPI *In this volume of 15 articles, contributors from a wide range of disciplines present their analyses of Disney movies and Disney music, which are mainstays of popular culture. The power of the Disney brand has heightened the need for academics to question whether Disney's films and music function as a tool of the Western elite that shapes the views of those less empowered. Given its global reach, how the Walt Disney Company handles the role of race, gender, and sexuality in social structural inequality merits serious reflection according to a number of the articles in the volume. On the other hand, other authors argue that Disney productions can help individuals cope with difficult situations or embrace progressive thinking. The different approaches to the assessment of Disney films as cultural*

artifacts also vary according to the theoretical perspectives guiding the interpretation of both overt and latent symbolic meaning in the movies. The authors of the 15 articles encourage readers to engage with the material, showcasing a variety of views about the good, the bad, and the best way forward.

Future Spacecraft Propulsion Systems

Enabling Technologies for Space Exploration

Springer Science & Business Media *An understandable perspective on the types of space propulsion systems necessary to enable low-cost space flights to Earth orbit and to the Moon and the future developments necessary for exploration of the solar system and beyond to the stars.*

Recapturing a Future for Space Exploration

Life and Physical Sciences Research for a New Era

National Academies Press *More than four decades have passed since a human first set foot on the Moon. Great strides have been made in our understanding of what is required to support an enduring human presence in space, as evidenced by progressively more advanced orbiting human outposts, culminating in the current International Space Station (ISS). However, of the more than 500 humans who have so far ventured into space, most have gone only as far as near-Earth orbit, and none have traveled beyond the orbit of the Moon. Achieving humans' further progress into the solar system had proved far more difficult than imagined in the heady days of the Apollo missions, but the potential rewards remain substantial. During its more than 50-year history, NASA's success in human space exploration has depended on the agency's ability to effectively address a wide range of biomedical, engineering, physical science, and related obstacles--an achievement made possible by NASA's strong and productive commitments to life and physical sciences research for human space exploration, and by its use of human space exploration infrastructures for scientific discovery. The Committee for the Decadal Survey of Biological and Physical Sciences acknowledges the many achievements of NASA, which are all the more remarkable given budgetary challenges and changing directions within the agency.*

In the past decade, however, a consequence of those challenges has been a life and physical sciences research program that was dramatically reduced in both scale and scope, with the result that the agency is poorly positioned to take full advantage of the scientific opportunities offered by the now fully equipped and staffed ISS laboratory, or to effectively pursue the scientific research needed to support the development of advanced human exploration capabilities. Although its review has left it deeply concerned about the current state of NASA's life and physical sciences research, the Committee for the Decadal Survey on Biological and Physical Sciences in Space is nevertheless convinced that a focused science and engineering program can achieve successes that will bring the space community, the U.S. public, and policymakers to an understanding that we are ready for the next significant phase of human space exploration. The goal of this report is to lay out steps and develop a forward-looking portfolio of research that will provide the basis for recapturing the excitement and value of human spaceflight--thereby enabling the U.S. space program to deliver on new exploration initiatives that serve the nation, excite the public, and place the United States again at the forefront of space exploration for the global good.

Jet Pioneer

A Fighter Pilot's Memoir

Jet Pioneer: A Fighter Pilot's Memoir is the remarkable story of Major General Carl G. Schneider's thirty-two year U.S. Air Force career. Beginning in 1946 as a newly enlisted AAF private, he rose through the ranks to become a two star general--an accomplishment very few men in American history have ever achieved. This book is a fascinating look into the unprecedented career of a jet fighter pilot who flew one hundred combat missions in Korea and served in Vietnam flying combat missions with the VNAF. Filled with personal stories, Jet Pioneer: A Fighter Pilot's Memoir takes the reader along as the author recounts riveting combat missions, often humorous accounts of his Air Force career as well as the "gut-wrenching moments" of learning close friends were shot down by the enemy and killed or captured.

Shadows of Forgotten Ancestors

Ballantine Books NATIONAL BESTSELLER • "Exciting and provocative . . . A tour de force of a book that begs to be seen as well as to be read."—*The Washington Post Book World* World renowned scientist Carl Sagan and acclaimed author Ann Druyan have written a *Roots for the human species*, a lucid and riveting account of how humans got to be the way we are. *Shadows of Forgotten Ancestors* is a thrilling saga that starts with the origin of the Earth. It shows with humor and drama that many of our key traits—self-awareness, technology, family ties, submission to authority, hatred for those a little different from ourselves, reason, and ethics—are rooted in the deep past, and illuminated by our kinship with other animals. Sagan and Druyan conduct a breathtaking journey through space and time, zeroing in on critical turning

points in evolutionary history, and tracing the origins of sex, altruism, violence, rape, and dominance. Their book culminates in a stunningly original examination of the connection between primate and human traits. Astonishing in its scope, brilliant in its insights, and an absolutely compelling read, *Shadows of Forgotten Ancestors* is a triumph of popular science.

The Rocket into Planetary Space

Walter de Gruyter GmbH & Co KG For all being interested in astronautics, this translation of Hermann Oberth's classic work is a truly historic event. Readers will be impressed with this extraordinary pioneer and his incredible achievement. In a relatively short work of 1923, Hermann Oberth laid down the mathematical laws governing rocketry and spaceflight, and he offered practical design considerations based on those laws.

Deep Space Propulsion

A Roadmap to Interstellar Flight

Springer Science & Business Media The technology of the next few decades could possibly allow us to explore with robotic probes the closest stars outside our Solar System, and maybe even observe some of the recently discovered planets circling these stars. This book looks at the reasons for exploring our stellar neighbors and at the technologies we are developing to build space probes that can traverse the enormous distances between the stars. In order to reach the nearest stars, we must first develop a propulsion technology that would take our robotic probes there in a reasonable time. Such propulsion technology has radically different requirements from conventional chemical rockets, because of the enormous distances that must be crossed. Surprisingly, many propulsion schemes for interstellar travel have been suggested and await only practical engineering solutions and the political will to make them a reality. This is a result of the tremendous advances in astrophysics that have been made in recent decades and the perseverance and imagination of tenacious theoretical physicists. This book explores these different propulsion schemes - all based on current physics - and the challenges they present to physicists, engineers, and space exploration entrepreneurs. This book will be helpful to anyone who really wants to understand the principles behind and likely future course of interstellar travel and who wants to recognize the distinctions between pure fantasy (such as *Star Trek's* 'warp drive') and methods that are grounded in real physics and offer practical technological solutions for exploring the stars in the decades to come.

Structures or Why things don't fall

down

Springer Science & Business Media I am very much aware that it is an act of extreme rashness to attempt to write an elementary book about structures. Indeed it is only when the subject is stripped of its mathematics that one begins to realize how difficult it is to pin down and describe those structural concepts which are often called 'elementary'; by which I suppose we mean 'basic' or 'fundamental'. Some of the omissions and oversimplifications are intentional but no doubt some of them are due to my own brute ignorance and lack of understanding of the subject. Although this volume is more or less a sequel to *The New Science of Strong Materials* it can be read as an entirely separate book in its own right. For this reason a certain amount of repetition has been unavoidable in the earlier chapters. I have to thank a great many people for factual information, suggestions and for stimulating and sometimes heated discussions. Among the living, my colleagues at Reading University have been generous with help, notably Professor W. D. Biggs (Professor of Building Technology), Dr Richard Chaplin, Dr Giorgio Jeronimidis, Dr Julian Vincent and Dr Henry Blyth; Professor Anthony Flew, Professor of Philosophy, made useful suggestions about the last chapter. I am also grateful to Mr John Bartlett, Consultant Neurosurgeon at the Brook Hospital. Professor T. P. Hughes of the University of the West Indies has been helpful about rockets and many other things besides. My secretary, Mrs Jean Collins, was a great help in times of trouble. Mrs Nethercot of Vogue was kind to me about dressmaking. Mr Gerald Leach and also many of the editorial staff of Penguins have exercised their accustomed patience and helpfulness. Among the dead, I owe a great deal to Dr Mark Pryor - lately of Trinity College, Cambridge - especially for discussions about biomechanics which extended over a period of nearly thirty years. Lastly, for reasons which must surely be obvious, I owe a humble oblation to Herodotus, once a citizen of Halicamassus.

Progress in Astronautics and Aeronautics

An American Institute of Aeronautics and Astronautics Series Spacewalker

My Journey in Space and Faith as

NASA's Record-setting Frequent Flyer

Purdue University Press *The most launched astronaut in history discusses his childhood growing up in rural Indiana, his career in the Air Force, and his time working at NASA, while offering an insider's account of the U.S. Space Shuttle program.*

The Rocket Company

AIAA "A fictionalized account of the challenges faced by a group of seven investors and their engineering team in developing a low-cost, reusable, Earth-to orbit launch vehicle. The marketing, regulatory, and technical problems are explored ... "cover p. [4].

High Power Microwaves

CRC Press *The first edition of High Power Microwaves was considered to be the defining book for this field. Not merely updated but completely revised and rewritten, the second edition continues this tradition. Written from a systems perspective, the book provides a unified, coherent presentation of the fundamentals in this rapidly changing field. The p*

The DevOps Handbook

How to Create World-Class Agility, Reliability, and Security in Technology Organizations