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Nasa Systems Engineering Handbook - Nasa Sp-2016-6105 Rev2 National Aeronautics and Space Administration 2017-11-03 This handbook, "NASA Systems Engineering Handbook," is intended to provide general guidance and information on systems engineering that will be useful to the NASA community. It provides a generic description of Systems Engineering (SE) as it should be applied throughout NASA. A goal of the handbook is to increase awareness and consis¬tency across the Agency and advance the practice of SE. This handbook provides perspectives relevant to NASA and data particular to NASA. This handbook describes systems engineering best practices that should be incorporated in the development and implementation of large and small NASA programs and projects. The engineering of NASA systems requires a systematic and disciplined set of processes that are applied recursively and iteratively for the design,

development, operation, maintenance, and closeout of systems throughout the life cycle of the programs and projects. The scope of this handbook includes systems engineering functions regardless of whether they are performed by a manager or an engineer, in-house or by a contractor.

Wingless Flight R. Dale Reed 2014-07-15 Most lifting bodies, or "flying bathtubs" as they were called, were so ugly only an engineer could love them, and yet, what an elegant way to keep wings from burning off in supersonic flight between earth and orbit. Working in their spare time (because they couldn't initially get official permission), Dale Reed and his team of engineers demonstrated the potential of the design that led to the Space Shuttle. Wingless Flight takes us behind the scenes with just the right blend of technical information and fascinating detail (the crash of M2-F2 found new life as the opening credit for TV's "The Six Million Dollar Man"). The flying bathtub, itself, is finding new life as the proposed escape-pod for the Space Station.

NASA 50th Anniversary Proceedings: NASA's First 50 Years: Historical Perspectives Steven J. Dick 2010-07-07 On 29 July 1958, President Dwight D. Eisenhower signed the National Aeronautics and Space Act, creating the National Aeronautics and Space Administration (NASA), which became operational on 1 October of that year. Over the next 50 years, NASA achieved a set of spectacular feats, ranging from advancing the well-established field of aeronautics to pioneering the new fields of Earth and space science and human spaceflight. In the midst of the geopolitical context of the Cold War, 12 Americans walked on the Moon, arriving in peace “for all mankind.” Humans saw their home planet from a new perspective, with unforgettable Apollo images of Earthrise and the “Blue Marble,” as well as the “pale blue dot” from the edge of the solar system. A flotilla of spacecraft has studied Earth, while other spacecraft have probed the depths of the solar system and the universe beyond. In the 1980s, the evolution of aeronautics gave us the first winged human spacecraft, the Space Shuttle, and the International Space Station stands as a symbol of human cooperation in space as well as a possible way station to the stars. With the Apollo fire and two Space Shuttle accidents, NASA has also seen the depths of tragedy. In this volume, a wide array of scholars turn a critical eye toward NASA’s first 50 years, probing an institution widely seen as the premier agency for exploration in the world, carrying on a long tradition of exploration by the United States and the human species in general. Fifty years after its founding, NASA finds itself at a crossroads that historical perspectives can only help to illuminate.

NASA Tech Briefs 2016-02

The Dawn Mission to Minor Planets 4 Vesta and 1 Ceres Christopher Russell 2012-09-21 Dawn is the first mission to orbit a main belt asteroid and the first scientific mission to use ion propulsion. Major objectives of this mission include mapping of the surfaces of 4 Vesta and 1 Ceres, determining its topography from stereo measurements, determining its mineralogy, measuring its elemental composition and obtaining gravity data. This book describes the Dawn mission, its exploration and scientific objectives, the instruments that accomplish those objectives, the operations plan and the education and outreach plan. It is directed to those studying asteroids and the evolution of the solar system. This volume will be a valuable reference for anyone who uses data from the instruments of the DAWN mission. Previously published in Space Science Reviews, Vol. 163/1-4, 2012.

Model Predictive Vibration Control Gergely Takács 2012-03-05 Real-time model predictive controller (MPC) implementation in active vibration control (AVC) is often rendered difficult by fast sampling speeds and extensive actuator-deformation asymmetry. If the control of lightly damped mechanical structures is assumed, the region of attraction containing the set of allowable initial conditions requires a large prediction horizon, making the already computationally demanding on-line

process even more complex. Model Predictive Vibration Control provides insight into the predictive control of lightly damped vibrating structures by exploring computationally efficient algorithms which are capable of low frequency vibration control with guaranteed stability and constraint feasibility. In addition to a theoretical primer on active vibration damping and model predictive control, Model Predictive Vibration Control provides a guide through the necessary steps in understanding the founding ideas of predictive control applied in AVC such as: · the implementation of computationally efficient algorithms · control strategies in simulation and experiment and · typical hardware requirements for piezoceramics actuated smart structures. The use of a simple laboratory model and inclusion of over 170 illustrations provides readers with clear and methodical explanations, making Model Predictive Vibration Control the ideal support material for graduates, researchers and industrial practitioners with an interest in efficient predictive control to be utilized in active vibration attenuation.

NASA's Elementary and Secondary Education Program National Research Council 2008-03-24 The federal role in precollege science, technology, engineering, and mathematics (STEM) education is receiving increasing attention in light of the need to support public understanding of science and to develop a strong scientific and technical workforce in a competitive global economy. Federal science agencies, such as the National Aeronautics and Space Administration (NASA), are being looked to as a resource for enhancing precollege STEM education and bringing more young people to scientific and technical careers. For NASA and other federal science agencies, concerns about workforce and public understanding of science also have an immediate local dimension. The agency faces an aerospace workforce skewed toward those close to retirement and job recruitment competition for those with science and engineering degrees. In addition, public support for the agency's missions stems in part from public understanding of the importance of the agency's contributions in science, engineering, and space exploration. In the NASA authorization act of 2005 (P.L. 109-555 Subtitle B-Education, Sec. 614) Congress directed the agency to support a review and evaluation of its precollege education program to be carried out by the National Research Council (NRC). NASA's Elementary and Secondary Education Program: Review and Critique includes recommendations to improve the effectiveness of the program and addresses these four tasks: 1. an evaluation of the effectiveness of the overall program in meeting its defined goals and objectives; 2. an assessment of the quality and educational effectiveness of the major components of the program, including an evaluation of the adequacy of assessment metrics and data collection requirements available for determining the effectiveness of individual projects; 3. an evaluation of the funding priorities in the program, including a review of the funding level and trend for each major component of the program and an assessment of whether the resources made available are consistent with meeting identified goals and priorities; and 4. a determination of the extent and effectiveness of coordination and collaboration between NASA and other federal agencies that sponsor science, technology, and mathematics education activities.

High Energy Neutron Detector Clyde Edward Wiegand 1949 It is the purpose of this paper to describe a neutron detector suitable for monitoring a flux of neutrons whose energy is greater than about 50 Mev. Detection of the neutrons is accomplished by their ability to induce fission in heavy elements. Kelly and Wiegand studied the neutron fission of Bi, Pb, Ti, Hg, Au, and Pt at various neutron energies and the presently described counter is an application of this work.

Ice Accretions and Icing Effects for Modern Airfoils Harold E. Addy 2000 Icing tests were conducted to document ice shapes formed on three different two-dimensional airfoils and to study the effects of the accreted ice on aerodynamic performance. The models

tested were representative of airfoil designs in current use for each of the commercial transport, business jet, and general aviation categories of aircraft. The models were subjected to a range of icing conditions in an icing wind tunnel. The conditions were selected primarily from the Federal Aviation Administration's Federal Aviation Regulations 25 Appendix C atmospheric icing conditions. A few large droplet icing conditions were included. To verify the aerodynamic performance measurements, molds were made of selected ice shapes formed in the icing tunnel. Castings of the ice were made from the molds and placed on a model in a dry, low-turbulence wind tunnel where precision aerodynamic performance measurements were made. Documentation of all the ice shapes and the aerodynamic performance measurements made during the icing tunnel tests is included in this report. Results from the dry, low-turbulence wind tunnel tests are also presented.

The Art of NASA Piers Bizony 2023-05-23 This special collector's edition of The Art of NASA adds 32 pages of new material, a presentation case, a new cover, a paper model of the Lunar Module, four postcards, and a rolled poster.

NASA Space Flight Program and Project Management Handbook Nasa 2018-03-21 This handbook is a companion to NPR 7120.5E, NASA Space Flight Program and Project Management Requirements and supports the implementation of the requirements by which NASA formulates and implements space flight programs and projects. Its focus is on what the program or project manager needs to know to accomplish the mission, but it also contains guidance that enhances the understanding of the high-level procedural requirements. (See Appendix C for NPR 7120.5E requirements with rationale.) As such, it starts with the same basic concepts but provides context, rationale, guidance, and a greater depth of detail for the fundamental principles of program and project management. This handbook also explores some of the nuances and implications of applying the procedural requirements, for example, how the Agency Baseline Commitment agreement evolves over time as a program or project moves through its life cycle.

NASA Graphics Standards Manual Jesse Reed 2015-09 The NASA Graphics Standards Manual, by Richard Danne and Bruce Blackburn, is a futuristic vision for an agency at the cutting edge of science and exploration. Housed in a special anti-static package, the book features a foreword by Richard Danne, an essay by Christopher Bonanos, scans of the original manual (from Danne's personal copy), reproductions of the original NASA 35mm slide presentation, and scans of the Managers Guide, a follow-up booklet distributed by NASA.

Challenge to Apollo Asif A. Siddiqi 2000 The book received the Emme Award for Astronautical Literature at the March 20 2000 luncheon of the Goddard Memorial Symposium, sponsored by the American Astronautical Society. Named in honor of the first NASA Historian, Eugene Emme, the Emme award was created in 1982 to annually recognize an outstanding book that increases public understanding of the past and potential impact of the field of astronautics.

Review of NASA's Evidence Reports on Human Health Risks Institute of Medicine 2015-04-23 Review of NASA's Evidence Reports on Human Health Risks 2014 Letter Report is the second in a series of five reports from the Institute of Medicine that will independently review more than 30 evidence reports that the National Aeronautics and Space Administration has compiled on human health risks for long-duration and exploration space flights. This report builds on the 2008 IOM report Review of NASA's Human Research Program Evidence Books: A Letter Report, which provided an initial and brief review of the evidence reports. This letter report reviews seven evidence reports and examines the quality of the evidence, analysis, and overall construction of each report; identifies existing gaps in report content; and provides suggestions for additional sources of expert input. The report analyzes each evidence report's overall quality, which included readability; internal consistency; the source and breadth of cited evidence;

identification of existing knowledge and research gaps; authorship expertise; and, if applicable, response to recommendations from the 2008 IOM letter report.

Fundamentals of Aerospace Medicine Jeffrey Davis 2021-04-14 Encompassing all occupants of aircraft and spacecraft—passengers and crew, military and civilian—Fundamentals of Aerospace Medicine, 5th Edition, addresses all medical and public health issues involved in this unique medical specialty. Comprehensive coverage includes everything from human physiology under flight conditions to the impact of the aviation industry on public health, from an increasingly mobile global populace to numerous clinical specialty considerations, including a variety of common diseases and risks emanating from the aerospace environment. This text is an invaluable reference for all students and practitioners who engage in aeromedical clinical practice, engineering, education, research, mission planning, population health, and operational support.

Monthly Catalogue, United States Public Documents 1994

Benefits Stemming from Space Exploration Isecg 2013-10-24

Three Sigma Leadership Steven R Hirshorn 2020-03-04 As a technical organization, charged with performing groundbreaking and pathfinding challenges on a daily basis, NASA has long valued the role of its Chief Engineers and Lead Systems Engineers. Although it takes a team to accomplish our missions and no members are unimportant, the Chief Engineers and Lead Systems Engineers who we look to lead our technical teams are critical to the success of our endeavors. It is this corps of dedicated, experienced, and passionate problem solvers and leaders who battle the technical headwinds that face every project, finding often hidden solutions and overcoming seemingly insurmountable obstacles to create paths to success. Furthermore, it is that indomitable spirit of ingenuity and perseverance that defines the Agency. Developing our Chief Engineers and Lead Systems Engineers is a commitment of the NASA engineering community, and one of our tenets for excellence. This development ensures our corps of engineers obtain the depth of technical acumen that they require, first as discipline engineers and then as Chief Engineers and Lead Systems Engineers, but also the associated management skills and experience to ensure they can interact with the rest of the project team and with program, Center, and Agency leadership. What's more, this development also ensures that NASA Chief Engineers and Lead Systems Engineers proficiently serve as leaders of their own technical teams, and that's what this book is all about. These technical leaders are critical to successfully implementing the three safety tenets we inherited from the Apollo program. These include the following: Strong in-line checks and balances. This means that engineers check their fellow engineers, and that no one checks their own homework. 1. Healthy tension between responsible organizations. In NASA today that is the programs and the three Technical Authorities (Engineering, Safety, and Health and Medical). Each organization has to be on equal footing with separate but equal chains of command to allow issues to be raised independently and provide the healthy tension to create organizational checks and balances. 2. "Value-added" independent assessment. "Value-added" means you bring in outside technical experts to peer review critical issues. Having a fresh set of eyes on a problem can provide a different perspective, leverage different experiences and result in more robust solutions. 3. NASA arrived at these three tenets through considerable blood, sweat, and loss, and our commitment to them is now inscribed in our Agency governance. As Chief Engineers and Lead Systems Engineers, your role in this is paramount, and achieving excellence in this is an expectation of your job. Serving in this role is not an easy task, but it is a tremendously reward¬ing one. You are the leaders of your technical teams, owners of the technical baseline, standard bearers of engineering best practices, decision makers, risk mitigators and problem solvers. You are Chief Engineers and Lead Systems Engineers, the title of

which should say it all.
Limiting Future Collision Risk to Spacecraft National Research Council 2011-11-16 Derelict satellites, equipment and other debris orbiting Earth (aka space junk) have been accumulating for many decades and could damage or even possibly destroy satellites and human spacecraft if they collide. During the past 50 years, various National Aeronautics and Space Administration (NASA) communities have contributed significantly to maturing meteoroid and orbital debris (MMOD) programs to their current state. Satellites have been redesigned to protect critical components from MMOD damage by moving critical components from exterior surfaces to deep inside a satellite's structure. Orbits are monitored and altered to minimize the risk of collision with tracked orbital debris. MMOD shielding added to the International Space Station (ISS) protects critical components and astronauts from potentially catastrophic damage that might result from smaller, untracked debris and meteoroid impacts. Limiting Future Collision Risk to Spacecraft: An Assessment of NASA's Meteoroid and Orbital Debris Program examines NASA's efforts to understand the meteoroid and orbital debris environment, identifies what NASA is and is not doing to mitigate the risks posed by this threat, and makes recommendations as to how they can improve their programs. While the report identified many positive aspects of NASA's MMOD programs and efforts including responsible use of resources, it recommends that the agency develop a formal strategic plan that provides the basis for prioritizing the allocation of funds and effort over various MMOD program needs. Other necessary steps include improvements in long-term modeling, better measurements, more regular updates of the debris environmental models, and other actions to better characterize the long-term evolution of the debris environment.
Taming Liquid Hydrogen Virginia Parker Dawson 2004
Mission to Jupiter National Aeronautics Administration 2013-11 The Galileo mission to Jupiter explored an exciting new frontier, had a major impact on planetary science, and provided invaluable lessons for the design of spacecraft. This mission amassed so many scientific firsts and key discoveries that it can truly be called one of the most impressive feats of exploration of the 20th century. In the words of John Casani, the original project manager of the mission, "Galileo was a way of demonstrating . . . just what U.S. technology was capable of doing." An engineer on the Galileo team expressed more personal sentiments when she said, "I had never been a part of something with such great scope . . . . To know that the whole world was watching and hoping with us that this would work. We were doing something for all mankind." When Galileo lifted off from Kennedy Space Center on 18 October 1989, it began an interplanetary voyage that took it to Venus, to two asteroids, back to Earth, and finally on to Jupiter. The craft's instruments studied Jupiter's enormous magnetosphere and its belts of intense radiation. The spacecraft also sent off a planetary probe that accomplished the most difficult atmospheric entry ever attempted. After this, the craft spent years visiting Jupiter's moons and delving into their structures and properties. This book attempts to convey the creativity, leadership, and vision that were necessary for the mission's success. It is a book about dedicated people and their scientific and engineering achievements. The Galileo mission faced many significant problems. Some of the most brilliant accomplishments and "work-arounds" of the Galileo staff occurred precisely when these challenges arose. Throughout the mission, engineers and scientists found ways to keep the spacecraft operational from a distance of nearly half a billion miles, enabling one of the most impressive voyages of scientific discovery.
Managing Online Risk Deborah Gonzalez 2014-09-25 In recent years, building a corporate online presence has become nonnegotiable for businesses, as consumers expect to connect with them in as many ways as possible. There are benefits to companies that use online technology, but there are risks as well. Managing Online Risk

presents the tools and resources needed to better understand the security and reputational risks of online and digital activity, and how to mitigate those risks to minimize potential losses. Managing Online Risk highlights security and risk management best practices that address concerns such as data collection and storage, liability, recruitment, employee communications, compliance violations, security of devices (in contexts like mobile, apps, and cloud computing), and more. Additionally, this book offers a companion website that was developed in parallel with the book and includes the latest updates and resources for topics covered in the book. Explores the risks associated with online and digital activity and covers the latest technologies, such as social media and mobile devices Includes interviews with risk management experts and company executives, case studies, checklists, and policy samples A website with related content and updates (including video) is also available

Human Health and Performance Risks of Space Exploration Missions Jancy C. McPhee 2009

The Challenger Launch Decision Diane Vaughan 2016-01-04 “An in-depth account of the events and personal actions which led to a great tragedy in the history of America’s space program.” —James D. Smith, former Solid Rocket Booster Chief, NASA, Marshall Space Flight Center When the Space Shuttle Challenger exploded on January 28, 1986, millions of Americans became bound together in a single, historic moment. Many still vividly remember exactly where they were and what they were doing when they heard about the tragedy. Diane Vaughan recreates the steps leading up to that fateful decision, contradicting conventional interpretations to prove that what occurred at NASA was not skullduggery or misconduct but a disastrous mistake. Why did NASA managers, who not only had all the information prior to the launch but also were warned against it, decide to proceed? In retelling how the decision unfolded through the eyes of the managers and the engineers, Vaughan uncovers an incremental descent into poor judgment, supported by a culture of high-risk technology. She reveals how and why NASA insiders, when repeatedly faced with evidence that something was wrong, normalized the deviance so that it became acceptable to them. In a new preface, Vaughan reveals the ramifications for this book and for her when a similar decision-making process brought down NASA’s Space Shuttle Columbia in 2003. “Vaughn finds the traditional explanation of the [Challenger] accident to be profoundly unsatisfactory . . . One by one, she unravels the conclusions of the Rogers Commission.” —The New York Times “A landmark study.” —Atlantic “Vaughn gives us a rare view into the working level realities of NASA . . . The cumulative force of her argument and evidence is compelling.” —Scientific American

NASA Langley Scientific and Technical Information Output: 1999 2000

Scientific and Technical Aerospace Reports 1994

When Biospheres Collide: A History of NASA's Planetary Protection Programs Michael Meltzer 2012-01-27 PRINT FORMAT ONLY NOTE: NO FURTHER DISCOUNT FOR THIS PRINT PRODUCT- OVERSTOCK SALE -- Significantly reduced list price This new book from the NASA History Series tackles an interesting duo of biological problems that will be familiar to anybody who has seen photos of Apollo astronauts quarantined after their return to Earth. Namely, how do we avoid contaminating celestial bodies with Earthly germs when we send spacecraft to study these bodies, and how do we avoid spreading foreign biological matter from space when our robotic and human spacefarers return to Earth? Biological matter from an external system could potentially cause an unchecked epidemic either on Earth or in space so strict precautions are necessary. Each time a space vehicle visits another world it runs the risk of forever changing that extraterrestrial environment. We are surrounded on Earth by a mélange of different microorganisms, and if some of these hitchhike onboard a space mission, they could contaminate and start colonies on a different planet. Such an occurrence would irrevocably alter the nature of that world, compromise

all future scientific exploration of the body, and possibly damage any extant life on it. By inadvertently carrying exotic organisms back to Earth on our spacecraft, we also risk the release of biohazardous materials into our own ecosystem. Such concerns were recognized by scientists even before the 1957 launch of Sputnik. This book presents the history of planetary protection by tracing the responses to the above concerns on NASA's missions to the Moon, Mars, Venus, Jupiter, Saturn, and many smaller bodies of our solar system. The book relates the extensive efforts put forth by NASA to plan operations and prepare space vehicles that return exemplary science without contaminating the biospheres of other worlds or our own. To protect irreplaceable environments, NASA has committed to conducting space exploration in a manner that is protective of the bodies visited, as well as of our own planet.

Living Aloft Mary M. Connors 2005-01-01 CONTENTS Acknowledgments Chapter I. Living in Space Background A Framework for Forecasting Guiding Assumptions Theoretical Orientation The Available Data Space Environments The Physical Environment The Social Environment Basic Reactions to Space-like Environments Temporal Fluctuations Summary and Conclusions Chapter II. Behavioral and Selection Implications of Biomedical Changes Physiological Deconditioning Simulation Studies Resistance to Deconditioning Countermeasures Vestibular Alterations Manifestations and Theory Resistance to Vestibular Effects Countermeasures Visual Changes Summary and Conclusions Chapter III. Habitability Background The Physical Environment Interior Space Food Hygiene Temperature and Humidity Decor and Lighting Odor Noise Health and Leisure Recreation Exercise Privacy Meaning and Functions Theory Bases of Needs Mechanisms Crowding Territoriality Privacy in Space Complex Effects Multiple Stressors Aftereffects Summary and Conclusions Chapter IV. Performance Describing Performance Work Requirements in Space Human Performance Abilities Assessment of Human Performance Discrete-task Assessment Techniques Multiple-task Batteries Partial- and Full-scale Simulation In-flight Performance Assessment Future Focus of Research on Performance Assessment Issues in Astronaut Work Regimes Factors Affecting Work Capacity Factors Affecting Work Schedules Factors Affecting Workload The Effects of Desynchronosis Sleep Disturbances Summary and Conclusions Chapter V. Small Groups Introduction Individual Characteristics and Crew Compatibility Gender Age Culture Personal Attractiveness Emotional Stability Competence Cooperativeness Social Versatility Similarities and ComplementaritiesGroup Homeostasis Crew Size and Social Compatibility Assembling Groups Interpersonal Dynamics Leadership Cohesiveness Compliance, Conformity, and Independence Group Performance Temporal Dynamics Summary and Conclusions Chapter VI. Communication Introduction Direct Interpersonal Communication Verbal Communication Nonverbal Communication Mediated Communication Planning Considerations Systems Requirements Systems Effects Application to Space Communication Networks Internal Communication External Communication Summary and Conclusions Chapter VII. Crises Introduction Externally Precipitated Crises Experience in Space Individual Response to Threat Group Processes Implications for Space Internally Precipitated Crises Psychological Episodes Transcendant Experiences Substance Abuse Grief Crisis Intervention Implications for Space Summary and Conclusions Chapter VIII. Organization and Management Introduction Spacecrew Structure Power Structures Work Roles Normative Structures Motivation Rewards Sanctions External Relations Boundary Roles Interorganizational Conflict Models of Conflict Management Reassimilation Summary and Conclusions Chapter IX. Summary and Recommendations Purpose Chapter Summaries Directions for Future Research General Research Issues Extended Spaceflight Variables Competing Perspectives Neglected Research Areas Research Opportunities Situations and Environments Methods and Approaches Conclusions References Author Index Subject Index

Orbital Debris National Research Council 1995-07-07

Since the beginning of space flight, the collision hazard in Earth orbit has increased as the number of artificial objects orbiting the Earth has grown. Spacecraft performing communications, navigation, scientific, and other missions now share Earth orbit with spent rocket bodies, nonfunctional spacecraft, fragments from spacecraft breakups, and other debris created as a byproduct of space operations. Orbital Debris examines the methods we can use to characterize orbital debris, estimates the magnitude of the debris population, and assesses the hazard that this population poses to spacecraft. Potential methods to protect spacecraft are explored. The report also takes a close look at the projected future growth in the debris population and evaluates approaches to reducing that growth. Orbital Debris offers clear recommendations for targeted research on the debris population, for methods to improve the protection of spacecraft, on methods to reduce the creation of debris in the future, and much more.

Fundamentals of Electric Propulsion Dan M. Goebel 2008-12-22 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.

Aeronautics, an educator's guide with activities in science, mathematics, and technology education

Earth and Space Coloring Book Chronicle Books 2017-03-21 With more than 35 magnificent images of outer space from NASA, this coloring book will capture the imagination of anyone interested in science, astronomy, and space exploration. Each spread features a full-color photograph from NASA's archives to inspire coloring on the adjacent page.

NASA Technical Paper United States. National Aeronautics and Space Administration 1983

NASA Technical Paper 1979

EOS Science Plan 1999

Digital Human Modeling Vincent G. Duffy 2009-07-14 The 13th International Conference on Human-Computer Interaction, HCI Inter- tional 2009, was held in San Diego, California, USA, July 19-24, 2009, jointly with the Symposium on Human Interface (Japan) 2009, the 8th International Conference on Engineering Psychology and Cognitive Ergonomics, the 5th International Conference on Universal Access in Human-Computer Interaction, the Third International Conf- ence on Virtual and Mixed Reality, the Third International Conference on Internati- alization, Design and Global Development, the Third International Conference on Online Communities and Social Computing, the 5th International Conference on Augmented Cognition, the Second International Conference on Digital Human Mod- ing, and the First International Conference on Human Centered Design. A total of 4,348 individuals from academia, research institutes, industry and gove- mental agencies from 73 countries submitted contributions, and 1,397 papers that were judged to be of high scientific quality were included in the program. These papers - dress the latest research and development efforts and highlight the human aspects of the design and use of computing systems. The papers accepted for

presentation thoroughly cover the entire field of human-computer interaction, addressing major advances in knowledge and effective use of computers in a variety of application areas.

Materials and Process Modeling of Aerospace Composites Charles Lu 2019-04-30 Since the successful production of carbon fibers in early 1960s, composite materials have emerged as the materials of choice for general aviation aircraft, military aircraft, space launch vehicles, and unmanned air vehicles. This has revolutionized the aerospace industry due to their excellent mechanical and physical properties, as well as weight-reducing ability. The next- generation material development model should operate in an integrated computational environment, where new material development, manufacturability, and product design practice are seamlessly interconnected. Materials and Process Modeling of Aerospace Composites reports recent developments on materials and processes of aerospace composites by using computational modeling, covering the following aspects: • The historical uses of composites in aerospace industry, documenting in detail the early usage of composite materials on Premier I by Raytheon to recent full-scale applications of composites on large commercial aircraft by Boeing and Airbus. • An overview on the classifications of composites used in aerospace industry, ranging from conventional glass-fiber reinforced composites to advanced graphene nanocomposites. • The recent work on computational material engineering on aerospace composite materials, including fundamental computational frame work and case studies on the modeling of materials and processes

NASA's Great Observatories 1993

Computational Fluid Dynamics 2006 Herman Deconinck 2009-08-04 The International Conference on Computational Fluid Dynamics (ICCFD) is the merger of the International Conference on Numerical Methods in Fluid Dynamics, ICNMFD (since 1969) and International Symposium on Computational Fluid Dynamics, ISCFD (since 1985). It is held every two years and brings together physicists, mathematicians and engineers to review and share recent advances in mathematical and computational techniques for modeling fluid dynamics. The proceedings of the 2006 conference (ICCFD4) held in Gent, Belgium, contain a selection of refereed contributions and are meant to serve as a source of reference for all those interested in the state of the art in computational fluid mechanics.

Management, a Bibliography for NASA Managers 1985