

## Download Free Space Station Paper Model

# *Space Station Paper Model*

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information

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system and announced in Scientific and technical aerospace reports (STAR) and International aerospace abstracts (IAA).

The first U.S. power module on International Space Station (ISS) was activated in December 2000.

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Comprised of solar arrays, nickel-hydrogen (NiH<sub>2</sub>) batteries, and a direct current power management and distribution (PMAD) system, the electric power system (EPS) supplies power to housekeeping and user electrical loads. Modeling EPS

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performance is needed for several reasons, but primarily to assess near-term planned and off-nominal operations and because the EPS configuration changes over the life of the ISS. The System Power Analysis for Capability Evaluation (SPACE)

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computer code is used to assess the ISS EPS performance. This paper describes the process of validating the SPACE EPS model via ISS on-orbit telemetry. To accomplish this goal, telemetry was first used to correct assumptions and component models in SPACE. Then on-

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orbit data was directly input to SPACE to facilitate comparing model predictions to telemetry. It will be shown that SPACE accurately predicts on-orbit component and system performance. For example, battery state-of-charge was predicted to within

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0.6 percentage points over a 0 to 100 percent scale and solar array current was predicted to within a root mean square (RMS) error of 5.1 Amps out of a typical maximum of 220 Amps. First, SPACE model predictions are compared to telemetry for the ISS EPS

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components: solar arrays, NiH<sub>2</sub> batteries, and the PMAD system. Second, SPACE predictions for the overall performance of the ISS EPS are compared to telemetry and again demonstrate model accuracy. Jannette, Anthony G. and Hojnicky, Jeffrey S.



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and McKissock, David B. and  
Fincannon, James and Kerslake,  
Thomas W. and Rodriguez, Carlos D.  
Glenn Research Center  
NASA/TM-2002-211803, E-13498,  
NAS 1.15:211803, IECEC-2002-20007  
Interior Space: a Visual Exploration of

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the International Space Station  
Early Docking Technologies from  
Concept to Implementation  
Simulation  
Management, a Bibliography for  
NASA Managers  
Large Space Structures & Systems in

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the Space Station Era

Space Station Freedom Restructure

Impacts on Technology Experiment

Accommodation

Looks at the operations of the  
International Space Station from  
the perspective of the Houston

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flight control team, under the leadership of NASA's flight directors, who authored the book. The book provides insight into the vast amount of time and energy that these teams devote to the development, planning

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and integration of a mission before it is executed. The passion and attention to detail of the flight control team members, who are always ready to step up when things do not go well, is a hallmark of NASA human

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spaceflight operations. With tremendous support from the ISS program office and engineering community, the flight control team has made the International Space Station and the programs before it a success.

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With the first United States (U.S.) photovoltaic array (PVA) activated on International Space Station (ISS) in December 2000, on-orbit data can now be compared to analytical predictions. Due to ISS

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operational constraints, it is not always possible to point the front side of the arrays at the Sun. Thus, in many cases, sunlight directly illuminates the backside of the PVA as well as albedo illumination on either the front or



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the back. During this time, appreciable power is produced since the solar cells are mounted on a thin, solar transparent substrate. It is important to present accurate predictions for both front and backside power

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generation for mission planning, certification of flight readiness for a given mission, and on-orbit mission support. To provide a more detailed assessment of the ISS power production capability, the authors developed a PVA

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electrical performance model applicable to generalized bifacial illumination conditions. On-orbit PVA performance data were also collected and analyzed. This paper describes the ISS PVA performance model, and the

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methods used to reduce orbital performance data. Analyses were performed using SPACE, a NASA-GRC developed computer code for the ISS program office. Results showed an excellent comparison of on-orbit

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performance data and analytical  
results. Delleur, Ann M. and  
Kerlake, Thomas W. Glenn  
Research Center  
NASA/TM-2002-211724, NAS  
1.15:211724, E-13476,  
IECE-2002-2004

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A Bibliography with Indexes  
Space Station Systems  
NASA SP.

Validation of International Space  
Station Electrical Performance  
Model Via On-Orbit Telemetry  
The Space Shuttle, Its Story and

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how to Make a Flying Paper  
Model

International Space Year in the  
Pacific Basin

Step-by-step instructions and exploded  
diagrams provide simple directions for  
cutting, folding, gluing and assembling this

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full-color 7" x 7 1/2" x 8 1/2" model of a classic Victorian seaside cottage. Model based on actual design from 1880 sourcebook of residential designs. 4 diagrams. 6 full-color plates. Introduction. Instructions.

An introduction to the space shuttle -- its history, the construction of its major



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systems, a typical mission, and what it means in terms of future space travel.

Includes instructions for making a simple flying paper model of the spacecraft.

Exploring Creation with Astronomy

Photographs by Paolo Nespoli and Roland Miller

Meeting Paper Archive

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The International Space Station

Human Life Sciences Research Aboard the  
International Space Station and the Space  
Shuttle

Operating an Outpost in the New Frontier

This book begins with a lesson on the  
nature of astronomy, and then it  
covers the major structures of our

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solar system. Starting with the sun and working towards Pluto, the student will learn details about all nine planets (or is it eight? - your student will have to decide) in the solar system. Along the way, the student will also learn about Earth's

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moon, the asteroid belt, and the Kuiper belt. After that, the student will move outside our solar system and learn about the stars and galaxies that make up God's incredible universe. Finally, the student will learn about space travel and what it takes to be an

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astronaut! The activities and projects use easy-to-find household items and truly make the lessons come alive! They include making a solar eclipse, simulating the use of radar to determine a hidden landscape, and making a telescope. We recommend

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that you spend the entire school year covering this book, devoting approximately two sessions per week to the course.

Unseen images of the International Space Station, untenanted and eerie: the legacy of humanity's fragile

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foothold in space On November 2 2020, NASA celebrates the 20th anniversary of continuous human habitation in space of the International Space Station. In Interior Space, American photographer Roland Miller and

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Italian astronaut and photographer Paolo Nespoli offer an in-depth portrait of the ISS, creating amazing unpeopled images of the interior of the ISS for the first time. As internationally acclaimed scholars of space archaeology Alice Gorman and



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Justin St. P. Walsh write in their essays, the ISS speaks not only of who we are and will be, but also of who we were. In 2024 the ISS will be abandoned; in 2028 it will be destroyed. This book provides us with an eerie account of what will remain

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in the space after our passing. Italian-born astronaut Paolo Nespoli (born 1957) spent 313 days in space. After a career in the military, he earned a M.Sc. in Aerospace Engineering, then joined the European Space Agency spending time in Europe, the US and

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Russia. In 2007 he flew on the Space Shuttle and then, in 2010 to 2011 and 2017, he flew again to the International Space Station with the Russian Soyuz. He retired in 2018 from the astronaut corps launching a career as an international public

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speaker. Chicago-born photographer Roland Miller (born 1958) taught photography at Brevard Community College in Cocoa, Florida, for 14 years, where he visited many nearby NASA launch sites. He is the author of the acclaimed book *Abandoned in*

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Place: Preserving America's Space History, documenting deactivated and repurposed space launch and test facilities around the US. In 2017 he started the project Interior Space. His work is held at the Museum of Contemporary Photography, Chicago

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and at the NASA Art Collection in  
Washington, DC.

Supplement

Technology for Large Space Systems:  
A Bibliography with Indexes  
(supplement 18)

Alternatives to the ISS Plasma

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Contacting Units

SAE Technical Paper Series

NASA Conference Publication

January 15-18, 1996/Reno, NV.

**From the creator of Paper  
Pilot and Paper Captain,  
Paper Astronaut is a**

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**beautifully illustrated voyage  
into deep space, combining  
stunning archival  
photographs and colorful  
technical drawings with  
expertly designed die-cut  
models that readers can**



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**actually cut out and  
assemble. Published for the  
fortieth anniversary of the  
moon landing in 1969—and  
introduced by Buzz  
Aldrin—the book includes  
histories of twenty feats of**

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**aeronautic engineering  
drawn from half a century of  
space programs around the  
world, from Apollo 11 to the  
Soviet space station Mir and  
China's Shenzhou 7 capsule,  
and featuring the most**

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spacecraft is accompanied  
by amazing stories,  
fascinating facts and  
statistics about the universe  
around them, and**

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**mesmerizing photographs of the vessels in space. Sixty-four pages of the book are devoted to finely crafted die-cut paper models of the featured rockets, presented with clear instructions for**

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**assembly and helpful advice  
for deploying your galactic  
fleet.**

**Many microgravity space  
science experiments require  
vibratory acceleration levels  
unachievable without active**

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**isolation. The Boeing Corporation's Active Rack Isolation System (ARIS) employs a novel combination of magnetic actuation and mechanical linkages to address these isolation**

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**requirements on the  
International Space Station  
(ISS). ARIS provides  
isolation at the rack  
(International Standard  
Payload Rack (ISPR)) level.  
Effective model-based**

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**vibration isolation requires:  
(1) an appropriate isolation  
device, (2) an adequate  
dynamic (i.e., mathematical)  
model of that isolator, and  
(3) a suitable, corresponding  
controller. ARIS provides the**



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**ISS response to the first requirement. This paper presents one response to the second, in a state space framework intended to facilitate an optimal-controls approach to the third. The**

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**authors use "Kane's  
Dynamics" to develop a state-  
space, analytical (algebraic)  
set of linearized equations of  
motion for ARIS. Hampton,  
R. D. and Beech, G. S. and  
Rao, N. N. S. and Rupert, J.**

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**K. and Kim, Y. K. Marshall  
Space Flight  
Center MATHEMATICAL  
MODELS; MICROGRAVITY;  
VIBRATION ISOLATORS;  
SPACEBORNE  
EXPERIMENTS; ISOLATION;**

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**VIBRATION; PAYLOADS;  
LINKAGES; ISOLATORS;  
INTERNATIONAL SPACE  
STATION; EQUATIONS OF  
MOTION; CONTROLLERS;  
ALGEBRA; ADVANCED  
RANGE INSTRUMENTATION**

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### **A Kane's Dynamics Model for the Active Rack Isolation System**

### **The Politics of Space Security**

### **Recapturing a Future for**

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**Space Exploration  
Paper  
Intelligent Autonomous  
Control in Aerospace  
1992 Goddard Conference on  
Space Applications of  
Artificial Intelligence**

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As the most obvious man-made object in the night sky, clearly visible to the naked eye, the International Space Station is of interest to almost everyone. This book describes the technical aspects of its design and

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construction and details of its day-to-day operation. 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



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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

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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

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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

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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

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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

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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

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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

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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



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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

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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

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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

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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

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public, and place the United States again at the forefront of space exploration for the global good.

An Easy-to-Make Paper Model  
A Proceedings Volume from  
the IFAC Conference,

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Beijing, PRC, 14-16 August  
1995

Technology for Large Space  
Systems: A Bibliography with  
Indexes (supplement 19)

International Aerospace  
Abstracts

Strategic Restraint and the

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Pursuit of National  
Interests, Second Edition  
Linking the Space Shuttle  
and Space Stations

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*systems, noise, engines, materials, lighting, and more. Your SAE service includes detailed summaries, complete documents in PDF, plus document storage and maintenance*

*How could the newly authorized space shuttle help in the U.S. quest to build a*

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*large research station in Earth orbit? As a means of transporting goods, the shuttle could help supply the parts to the station. But how would the two entities be physically linked? Docking technologies had to constantly evolve as the designs of the early space*

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*stations changed. It was hoped the shuttle would make missions to the Russian Salyut and American Skylab stations, but these were postponed until the Mir station became available, while plans for getting a new U. S. space station underway were stalled. In*

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*Linking the Space Shuttle and Space Stations, the author delves into the rich history of the Space Shuttle and its connection to these early space stations, culminating in the nine missions to dock the shuttle to Mir. By 1998, after nearly three decades of*

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*planning and operations, shuttle missions to Mir had resulted in:*

- A proven system to link up the space shuttle to a space station
- Equipment and hands-on experience in handling tons of materials
- An infrastructure to support space station assembly and

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*resupply Each of these played a pivotal role in developing the skills and procedures crucial to the creation of the later, much larger and far more complex International Space Station, as described in the companion volume Assembling and Supplying the ISS: The*

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*Space Shuttle Fulfills Its Mission.*

*Life and Physical Sciences Research  
for a New Era*

*A White Paper*

*A Bibliography with Indexes.*

*Supplement*

*Technology for Large Space Systems:*

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*A Bibliography with Indexes  
(supplement 22)*

*Creating the International Space  
Station*

*Space Station Policy Planning and  
Utilization*

The past five decades have witnessed



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often fierce international rivalry in space, but also surprising military restraint. Now, with an increasing number of countries capable of harming U.S. space assets, experts and officials have renewed a long-standing debate over the best route to space

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security. Some argue that space defenses will be needed to protect critical military and civilian satellites. Others argue that space should be a "sanctuary" from deployed weapons and military conflict, particularly given the worsening threat posed by orbital

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space debris. Moltz puts this debate into historical context by explaining the main trends in military space developments since Sputnik, their underlying causes, and the factors that are likely to influence their future course. This new edition provides

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analysis of the Obama administration's space policy and the rise of new actors, including China, India, and Iran. His conclusion offers a unique perspective on the mutual risks militaries face in space and the need for all countries to commit to interdependent,

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environmentally focused space  
security.

34th Aerospace Sciences Meeting &  
Exhibit

Cut & Assemble a Victorian Cottage  
Management: A Bibliography for  
NASA Managers

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Technology for Large Space Systems  
Electrical Performance of the  
International Space Station U. S.  
Photovoltaic Array During Bifacial  
Illumination  
Becoming a Secondary School Science  
Teacher