



National Space Society

Ad Astra Downlink

May 27, 2021

CONTINUING
THE **J**OURNEY
The Moon, then Mars ISDC® 2021

International Space Development Conference®

JUNE 24-27, 2021



National Space Society

ISDC2021.nss.org

International Space Development Conference 2021 (ISDC 2021)

Instead of hosting the annual keynote in-person event, the International Space Development Conference® (ISDC®), this year the National Space Society will present ISDC 2021 held virtually on June 24-27, 2021. The four-day virtual conference will focus on key areas of space development: space settlement, space policy, space solar power, Moon, and international space programs and

will include presentations by students from the Space Settlement Design Competition and the NSS Space Settlement Contest. ISDC 2021 will be a virtual event showcasing the technologies, people and organizations that will lead us to develop the final frontier! ISDC 2021 presents the finest minds in this movement to develop space, with experts presenting the latest visions of humanity's migration into space: where we will go, why we will go there, and how we will do so. This virtual event will be simulcast on the ISDC 2021 website and will be available across multiple venues through the e360tv streaming TV network and the NSS Facebook page and YouTube channel, on Roku/AppleTV /Amazon Fire and many other mobile systems, and on Space.com's YouTube channel. For more information go to <https://isdc2021.nss.org>.

Featured speakers will include:

- Isaac Arthur, *Science & Futurism with Isaac Arthur*
- Dr. Scott Bolton, Principal Investigator, NASA's Juno Mission
- Dr. Robert Braun, Director for Planetary Science, NASA Jet Propulsion Laboratory
- Rob Manning, Chief Engineer, NASA Jet Propulsion Laboratory
- Phil Plait, *The Bad Astronomer*
- Gwynne Shotwell, President and Chief Operating Officer, SpaceX
- Dr. Peggy Whitson, retired NASA astronaut and former NASA Chief Astronaut
- Dr. Lorna Jean Edmonds, National Space Society Board of Directors
- Michelle Hanlon, President, National Space Society
- Janet Ivey, President, Explore Mars, CEO, Janet's Planet, National Space Society Board of Governors
- Karlton Johnson, Chairman, National Space Society Board of Governors
- Madhu Thangavelu, Vice President of NSS-India Relationships, National Space Society

And a growing list of other speakers.

ISDC 2021



Ad Astra Magazine Current Issue Is On Newsstands Everywhere

NSS has succeeded in placing our current issue of *Ad Astra* magazine on newsstands everywhere around the U.S. Check your local bookstore and send your friends and family to pick up extra copies. Here is a sighting by Seth Potter in Los Angeles. Congratulations to the *Ad Astra* team!

“We seek teams with the determination and vision to take us into space- not as astronauts, but as a species.”

Among the many goals of the Rothblatt Vision for Space Settlement is the creation of vast habitats in free space where people lead vibrant and productive lives for decades at a time. To learn more about this vision, and that of its founder, Dr. Gerard O'Neill, click below.

Rothblatt Space Settlement in Our Lifetime Prize Business Plan Competition

The National Space Society is proud to announce the **Rothblatt Space Settlement in Our**

Lifetime Prize Business Plan Competition. Entrants can win \$8,000, \$5,000, or \$3,000 for their business plan that enable space settlement based on Rothblatt's vision of the future as presented at ISDC 2019.

What are the requirements?

- You can live anywhere. There are no residency requirements.
- Teams composed of 2 or more team members are required to participate.
- Entrants of all ages are encouraged, but note that all applicants compete against each other in a single pool.
- Watch the Rothblatt Vision video <https://go.nss.org/MartineISDC2019>
- Submit an entry form at <https://spacebizplan.nss.org> no later than 11:59 PM ET on July 6, 2021.
- Upload your business plan to <https://spacebizplan.nss.org> no later than 11:59 PM ET on July 20, 2021.

Three winning teams will be invited to the NSS Space Settlement Summit 2021. The Rothblatt Competition will pay the travel and hotel expenses for one person representing each of the three winning teams to attend the NSS Space Settlement Summit 2021 to receive their awards.

For more information about the Rothblatt Business Plan Competition go to <https://spacebizplan.nss.org>

ROTHBLATT BUSINESS PLAN COMPETITION VIDEO

Did You Know?

A Food and Nutritional Plan
for Space Flight to Mars
CONTEST is underway!

<https://go.nss.org/spacefoodcontest>

SUBMIT BY JULY 15

SPACEDGE
CENTERS FOR EXCELLENCE

National Space Society

A Food and Nutritional Plan for Space Flight to Mars

By Frances Dellutri, Deputy Director, SpacEdge Education; Member NSS Board of Directors

Here's a question for you: How can we get healthy enough to go to Mars OR stay on

Earth? NSS in collaboration with MMAARS (Mars-Moon Astronautics Academy and Research Science) offer an intriguing contest to consider how to pit your passion about the journey to Mars and your joy of eating against the challenges of spaceflight. Are you ready to figure out what and when to eat during our next great adventures in outer space? Click below for more information about the contest.

[SPACE FOOD CONTEST](#)



Space Elevator Talk Given by Dr. Peter Swan

A key driver for Dr. Swan's interest in space elevators is his dream to enable the visions of Peter Glaser (space-based solar power) and Gerard O'Neill (cislunar space settlements) and further the NSS Vision of "People living and working in thriving communities beyond the Earth, and the use of the vast resources of space for the dramatic betterment of humanity." In our May 20 virtual space forum, Dr. Swan explored these topics, discussed the latest advances in space elevator technology and gave us a hint of what will come next.

[VIEW SPACE FORUM ON YOUTUBE](#)



**NSS Members receive a 20%
Discount to Certificate Program**

**Mars Settlement and Exploration
Online, August 2021**

4 Courses, 20 Speakers, Workshops

**Apply today
www.Mars.University**

Discount for Mars University Summer Program

By Bruce Mackenzie, NSS Chapters Committee, former NSS Board of Directors, founder Mars Foundation affiliated with NSS

Mars University is offering NSS members a 20% discount for the online summer program and certificate Program in Mars Settlement and Exploration in August 2021. You may take a single course, or four courses for the certificate. For details and tuition, see <https://www.MarsU.space/mars-settlement-and-exploration>

To receive the discount, preferably apply now, or email us within five days of this newsletter and include the Voucher Code 'NSS-5'. Apply here: <https://www.MarsU.space/apply-mse-2021>

Online Program in August 2021: You would be immersed in four real-time, interactive courses from faculty, multiple guest lecturers, team projects, workshops, and more; alongside peers in the first academic program dedicated to Mars. The initial courses and instructors are:

- Mars Geology, with Jon Clarke, PhD
- Mars Astrobiology, with Graham Lau, PhD
- Mars Agriculture, with Daniel Tompkins, DMP
- Human Factors in Space Operations, with Ilaria Cinelli, PhD

A limited number of additional scholarships are available, on top of the discount to NSS members who apply now. There are other ways to be involved, such as research positions and teaching associates, depending on your experience.

Join the first class of student pioneers to develop the mindset, research, and knowledge to live on planet Mars and make life multiplanetary.

See website: MarsU.space or e-mail to: Info@Mars.University

MARS UNIVERSITY WEBSITE



Embedded Teacher Program

By Frances Dellutri, Deputy Director, SpacEdge Education; Member NSS Board of Directors

The Wisconsin Space Grant Consortium (WSGC) is partnering with NSS to offer a Fall, 2021 workshop on microgravity flight basics and curriculum module development. The Embedded Teacher Program supports an annual workshop for Wisconsin STEAM teachers to develop small flight experiments to conduct onboard a parabolic aircraft. 2-3 teachers will then be selected to perform their experiments in an actual flight. WSGC and the NASA Flight Opportunities Program are supporting the design and fabrication of teacher-devised experiments, the flight on ZERO-G's G-Force One, and the videography of the teacher's experience. Teachers return to their classrooms with data and video of the experience. The experiments are developed in a hands-on workshop conducted by Master Teachers from the National Space Society.

TEACHERS APPLY HERE

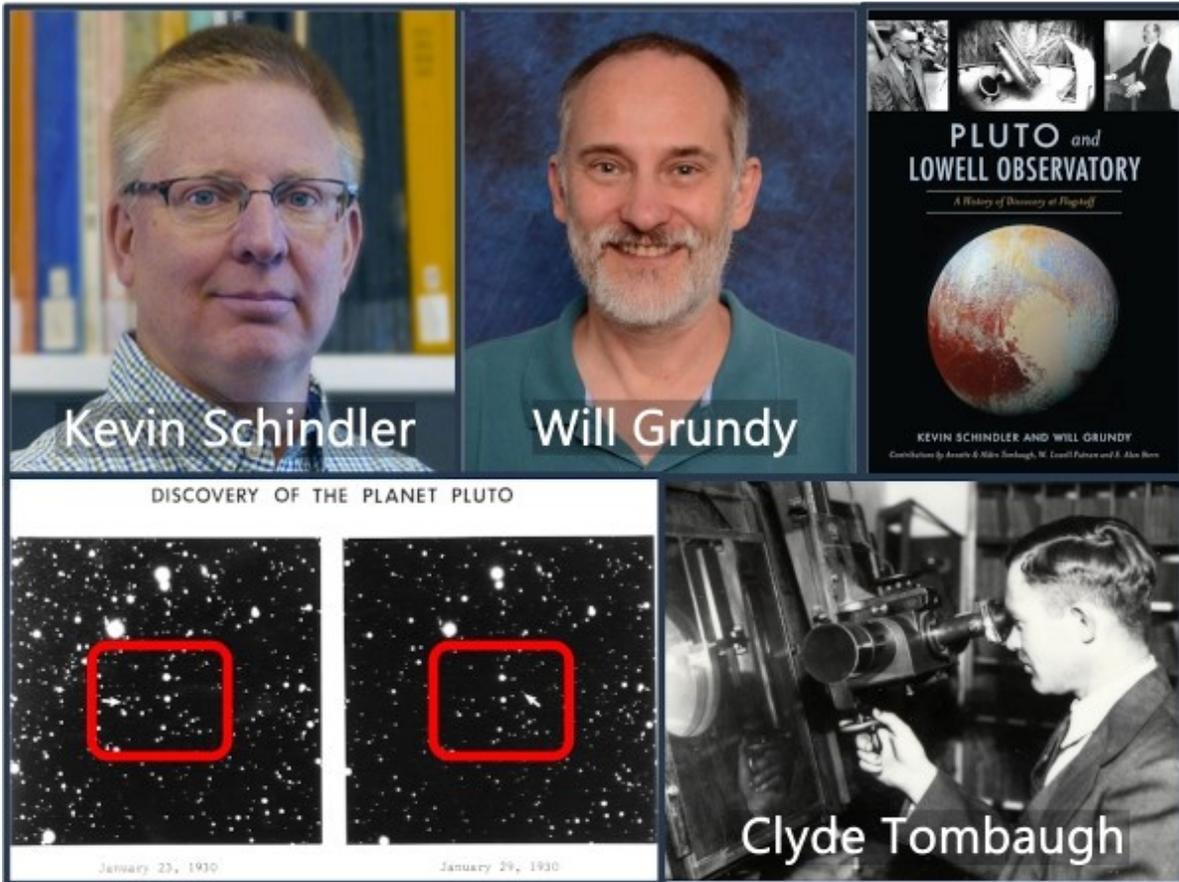
Report on National Space Society Chapter Events

By Robin Scott, NSS Member

Phoenix Chapter of the National Space Society (NSS)

On March 20, 2021, the [Phoenix chapter of the NSS](#) hosted [Lowell Observatory's](#) Historian Kevin Schindler and Lowell Observatory's Astronomer Dr. Will Grundy as they gave a historic and scientific presentation on the Lowell Observatory, Pluto, and the New Horizons mission. Mr. Schindler led off the meeting as he described Percival Lowell, who initially built the Lowell Observatory to study Mars. Mr. Schindler clarified that later, after Lowell discovered irregularities in the orbit of Uranus, he utilized his mathematical skills and computers (i.e., humans who performed computations) as he looked for a ninth planet. However, before Lowell could discover this ninth planet, he died in 1916, and thus, Percival's brother, the President of Harvard University Abbott Lowell, funded the building of a new picture taking telescope to continue his brother's research. In 1929, Clyde Tombaugh was brought to the Lowell Observatory where he renewed the search for and discovered this ninth planet on photographic plates in 1930. This discovery was announced on what would have been Percival Lowell's 75th birthday (research shows that the Lowell Observatory had captured Pluto's existence on photographic plates before the death of Percival Lowell).

As the meeting moved forward, Dr. Grundy gave immense insights to the Pluto and New Horizons mission. He informatively described the cause of Charon's dark spot and Pluto's elemental composition, geography, geology, methane sand, subsurface ice, cryovolcanic deposits, and global air circulation models. He demonstrated comparative planetology (e.g., Titan, Pluto, and Triton) and shared laboratory (e.g., spectral and thermodynamic properties), photometry, stellar occultations, telescopic studies, and spectrometry studies with detailed charts. In conclusion, Dr. Grundy illuminated expectations of future telescope capabilities and spacecraft missions. For further interest and to capture an in-depth account of the Lowell Observatory and the discovery of Pluto see Mr. Schindler and Dr. Grundy's book [Pluto and Lowell Observatory: A History of Discovery at Flagstaff](#).



Images of the Discovery of Planet Pluto and Clyde Tombaugh: Courtesy of the Lowell Observatory

NSS of North Texas hosts NASA Flight Director Brandon Lloyd who spoke on "Explore: Humans in Space."

On April 11, 2021, on the eve of two important space anniversaries, NSS of North Texas President Ken Ruffin opened their meeting with a timely presentation on the "60th and 40th Anniversaries of Crewed Spaceflight" including the launch of the first person into space, Yuri Gagarin, on Vostok 1 and the first space shuttle launch of STS 1 Columbia. Ruffin artfully detailed more space history including aspects of the space race with the launch of Sputnik 1 by the U.S.S.R. on October 4, 1957, and then the launch of the Jupiter-C rocket by the U.S. on Jan 31, 1958.

NASA VIP Flight Director of Johnson Space Center Brandon Lloyd then transported meeting attendees to new levels of understanding when he presented "EXPLORE: HUMANS in SPACE." Starting with a slide of a view from his office in the Christopher C. Kraft Jr. Mission Control Center in Houston, Lloyd mentioned that around the world there are many other mission control centers for the International Space Station (ISS): Huntsville, Alabama; Montreal, Canada; Moscow, Russia; Oberpfaffenhofen, Germany; Toulouse, France; and Tsukuba, Japan.



Brandon Lloyd, part of NASA's flight director class of 2021 (courtesy NASA).

[READ MORE AT THE NSS BLOG](#)

NSS of North Houston

At 2 p.m. CDT, Saturday, June 5, 2021, NSS of North Houston will host Mahsa Esfandabadi as she presents "Sasakawa International Center for Space Architecture (SICSA)."

[NSS OF NORTH HOUSTON MEETING LINK - JUNE 5](#)

Oklahoma Space Alliance (OSA)

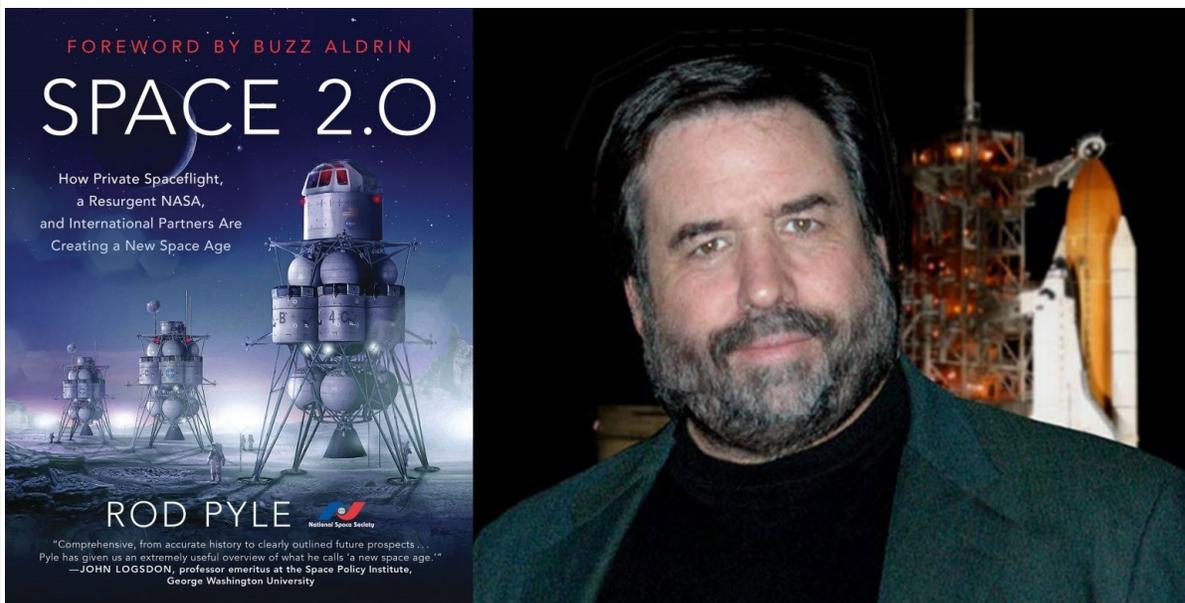
[OSA](#) is looking forward to celebrating their long-delayed Christmas party at Cliff and Claire McMurray's home at 2 p.m. CDT, Saturday, June 12, 2021. Bring your favorite dish and drink where Cliff will provide a movie on Russia's space program. If you have not received

your COVID-19 shots, please wear a mask and socially distance yourself from others who have not received their COVID-19 shots.

Philadelphia Area Space Alliance (PASA)

PASA will host its [next online meeting](#) via Zoom at 1:00 p.m. EDT, on Saturday, June 12, 2021. Join in on their shared space information.

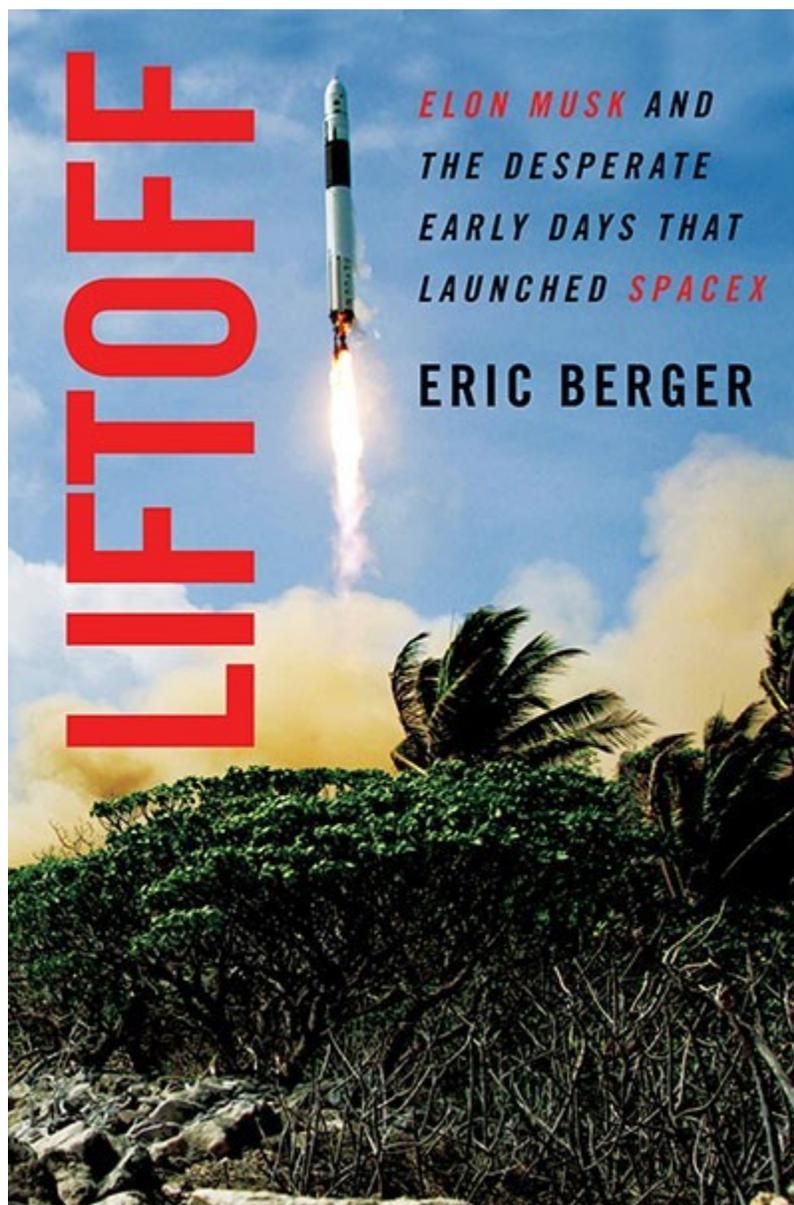
PASA MEETING LINK - JUNE 12



BOOK REVIEWS

By David Brandt-Erichsen, NSS Director

Space books keep us informed, stimulate our imaginations of the future of human space travel, and make excellent gifts. Your purchases through the [NSS link to Amazon](#) (of books or anything else!) also provide a credit to NSS to use for our educational programs, at no cost to you. Check out these new titles at [NSS Reading Space](#):



Nonfiction Books: [Liftoff: Elon Musk and the Desperate Early Days That Launched SpaceX](#) by Eric Berger, reviewed by Casey Suire. Homer Hickam, author of *Rocket Boys* which became the movie *October Sky*, summed it up this way: "This is as important a book on space as has ever been written and it's a riveting page-turner, too." The book has it all: hard work, determination, humor, disappointment, and eventually celebration. Required reading for understanding what is currently going on in space. The road to Mars begins here!

Don't forget to check the archives for books you may have missed, including some classics. Check the links at [NSS Reading Space](#) to read over 350 reviews, listed alphabetically and by author, of nonfiction, fiction, and children's space books.

National Space Society Blog

Blogging for the creation of a spacefaring civilization

LATEST ITEMS FROM THE NSS BLOG

- [Book Review: Liftoff, Elon Musk and the Desperate Early Days That Launched SpaceX](#)
- [Virgin Galactic Successfully Resumes Flights to Space](#)
- [NSS Legal Fellows Program Accepting Applications](#)
- [NSS Chapter News from Texas](#)
- [NSS Space Forum May 20: A Modern Day Space Elevator](#)
- [Icebergs Ahead: The 1970 Letter That Predicted NASA's Future in Human Spaceflight](#)

NSS BLOG



The Space Show® focuses on timely and important issues influencing the development of outer-space commerce and space tourism, as well as other related subjects of interest to us all.

Upcoming Shows:

May 28, 12:30 p.m. ET

[Dr. Matt Caplan](#)

Supernova and Cooling White Dwarf Stars

Recent Shows:

26 May 2021 [Hotel Mars with Marcia Smith](#)

25 May 2021 [Lisa La Bonte](#)

23 May 2021 [Dr. Shawna Pandya](#)

21 May 2021 [Dr. Namrata Goswami](#)

18 May 2021 [Chris Carberry](#)

18 May 2021 [Hotel Mars with Doug Messier](#)

16 May 2021 [OPEN LINES](#)

14 May 2021 [John Jossy](#)

THE SPACE SHOW



*inside*NSS

Sign In to insideNSS

INSIDE.NSS.ORG is a new NSS website that takes our member services to a new level. Using this platform, current NSS members who are logged in will be able to:

- manage their own profile
- update their contact information
- access the online version of Ad Astra magazine
- access the online version of Ad Astra Downlink, the NSS e-newsletter
- connect and communicate with other NSS members
- have their own news feed where they can share their thoughts on space-related issues
- join special interest groups
- participate in forum discussions

[Click here for a tutorial on signing in to insideNSS](#)



Ad Astra ("To the Stars") is the [award-winning](#) magazine of the National Space Society, featuring the latest news in space exploration and stunning full-color photography. It is published quarterly and provided to all National Space Society members as part of their membership benefits, as well as to subscriber libraries, schools, and businesses. Public back issue pages include book reviews, selected articles, table of contents, and more. Complete online electronic editions of issues from 2009 onward are available for members only with a one-time registration (using the link on any issue page).

SPACE QUOTES TO PONDER

*What famous people (and some not famous) have said
about why humankind must expand into space*

Collected by Author [Sylvia Engdahl](#)

"Interplanetary and interstellar colonists would be motivated by a desire for new living space away from the rapidly-filling earth, or in later times, the rapidly-filling solar system-- new sources of energy, material resources, new beauty and new knowledge... As the total human population increased ... the number of scientists, musicians, artists and philosophers would increase proportionally. And as the knowledge and power of the race increased, so would the knowledge and power of the individual human being."--Dandridge Cole and Donald Cox, *Islands in Space*, 1964



VOLUNTEER

NSS seeks people who share our vision of people living and working in thriving communities beyond the Earth, and the use of the vast resources of space for the dramatic betterment of humanity.

[BE AN NSS VOLUNTEER](#)

[DONATE TO NSS](#)



National Space Society
P.O. Box 98106, Washington, DC 20090-8106
(202) 424-2899
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