



SPACE FOUNDATION

# 2021 ANNUAL REPORT

Inform.  
Educate.  
Collaborate.

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# A LETTER FROM SPACE FOUNDATION CEO THOMAS E. ZELIBOR



**At the core of all space activities is the ambition to reach farther than ever before.**

This means not only exploring and studying our solar system but reaching for the best of what each vital stakeholder in the global space ecosystem can contribute. We strive to meet the pinnacle of our potential because of the benefits it creates for Earth, but also, to borrow from President Kennedy’s off-quoted remarks, “We reach to do new things not because they are easy but because they are hard.”

That is the bedrock philosophy of the space ecosystem and one Space Foundation was honored to support and foster

throughout 2021 as we created new access and opportunities, connected space stakeholders globally, and sought ways to help all people find their place in the global space ecosystem.

In the history of space, 2021 was a big year, but for all the pioneering activity that happened above the atmosphere, there were essential missions happening on Earth that invigorated the space economy, fueling businesses, delivering innovation, and inspiring generations. For our part, Space Foundation delivered new and innovative programs, engaged more space stakeholders, and convened the space community for essential collaboration.

Charging back after the 2020 hiatus, Space Foundation hosted the 36th Space Symposium in Colorado Springs, CO. Welcoming thousands of people in person from around the world, we also streamed the events and discussions online to allow more people to participate in and learn from the annual event. Yet, convening just once a year is not enough, which is why we expanded our Symposium 365 programming, delivering events, discussions and connections, live and online, every day of the year.

Many of the space community’s future leaders are currently students finding interest and excitement in science, technology, engineering and mathematics (STEM), as well as business, innovation and entrepreneurship. It is why our Center for Innovation and Education is so vital, providing workforce development programs with partners to help students and young professionals embrace life-long learning and access the opportunities that are waiting for them.

As a nonprofit organization, Space Foundation’s capacity to deliver on its mission relies on the generosity of donors. Notably, in 2021, El Pomar Foundation completed a \$4.1 million donation that gave us ownership of a new building at our headquarters and Discovery Center in Colorado Springs. We are deeply thankful for this gift, as we are for all donations that make our work possible.

Looking back on 2021 throughout the pages of this report, one element is most exciting—as a global space community, we have only just lifted off and the best is yet to come.



**Thomas E. Zelibor**

# SPREADING KNOWLEDGE ACROSS THE SPACE ECOSYSTEM

With a range of programming, events and outreach in 2021, Space Foundation delivered on its mission to inform, educate and collaborate across the global space community. Expanded online offerings came with regular analysis from *The Space Report* and the exciting return of the in-person annual Space Symposium. Through these and other programs, Space Foundation continued providing the vital information and awareness that fuels the global space ecosystem.

## Convening the Global Space Community



The COVID-19 public health crisis catalyzed a digital transformation at Space Foundation, and in 2021, the virtual platform Symposium 365 delivered expanded offerings, including analysis on emerging space issues, presentations from space leaders, and digital avenues for the global space community to network and conduct business 365 days a year.

In 2021, some of the content subscribers enjoyed via Symposium 365 included a

panel discussion with journalists covering the space ecosystem and a National Space Day discussion presented in association with the U.S. Space Command. During World Space Week, which in 2021 honored the contributions and achievements of women in the global space ecosystem, Symposium 365 programming included: a panel of women space leaders discussing their work and the value of diversity in the space community; and an interview with artists from the U.S. Mint who worked on quarters honoring Dr. Sally Ride and other celebrated women.

Symposium 365 has also been a platform for supporting and informing the next generation of space professionals. As part of Space Foundation's New Generation Space Leaders series, Symposium 365 programs included a panel on how space innovation can contribute to solving global challenges like poverty and access to education, as well as a discussion on space exploration and survival in extreme environments.



## The Return of the Annual Space Symposium

After a yearlong postponement, given public health concerns, the 36th Annual Space Symposium returned to Colorado Springs, CO. Space Foundation offered the event in person and virtually through the Symposium 365 platform. In 2021, Space Symposium drew more than 8,000 attendees from 25 countries, including more than 15 heads of space agencies and more than 265 exhibitors.

## Awarding Space Leaders

**Each year, Space Foundation presents awards to honor people and organizations advancing space use and exploration and delivering the benefits on Earth. In 2021, Space Foundation was proud to award:**

- Lifetime Space Achievement Award to the late Patti Grace Smith for her contributions to supporting and growing the commercial space transportation industry, as well as developing rules for human spaceflight. Her family accepted the award on her behalf.
- John L. "Jack" Swigert, Jr., Award for Space Exploration to the NASA Jet Propulsion Laboratory Mars Ingenuity Helicopter Team for their history-making mission that resulted in the first controlled flight of an aircraft on another planet.
- Douglas S. Morrow Public Outreach Award to Bill Ingalls for his more than 30 years documenting the U.S. space program as a senior contract photographer for NASA.
- Space Achievement Award to the U.S. Space Force for its rapid development of doctrine, processes, leadership, organizational structures and operations of the world's first independent space force.
- Space Technology Hall of Fame Inductees Emissshield, Inc. (for heat-protective coatings now sold commercially) and Fisher Space Pens (for the pen originally created for use in spaceflight and sold worldwide).



# THE SPACE REPORT

## The Authoritative Guide to Global Space Activity



- Commercial Space Products + Services**  
— \$ 219.44B (49.1%)
- Commercial Infrastructure + Support Industries**  
— \$ 137.23B (30.7%)
- U.S. Government Space Budgets**  
— \$ 51.80B (11.6%)
- Non-U.S. Government Space Budgets**  
— \$ 38.40B (8.6%)

The global space community saw a record-breaking year in 2021, and Space Foundation's *The Space Report* delivered access to the people, data and research that explained the dynamic missions and investments taking place around the world.

There were a record 145 orbital launch attempts from 8 nations in 2021, with commercial missions increasing at a faster clip than military and government missions. Some of these launches carried 14 history-making private citizens who flew to space on commercial vehicles (those from Virgin Galactic, Blue Origin and SpaceX).

The activity reflects the growing size of the global space economy, which reached \$423.8 billion in 2021, according to *The Space Report*. In Q4 alone, there were 61 private equity and venture equity financings totaling more than \$3.2 billion.

The civil space sector enjoyed a series of mission successes. The James Webb Space Telescope took flight on its historic mission, NASA's Parker Solar Probe traveled through the sun's atmosphere, and NASA's Perseverance Rover landed safely in the Jezero Crater on Mars. Meanwhile, the United Arab Emirates' Hope orbiter reached the Red Planet as designed, as did China's Tianwen-1 orbiter and rover.

With quarterly releases of *The Space Report*, as well as The Space Report online offering regularly updated and expanded resources and datasets, Space Foundation delivers the critical information that can fuel growth and opportunity in the global space ecosystem.



NASA LAUNCHES ROCKET INTO ACTIVE AURORAS, 2017

## The Space Economy Scorecard

AS OF FEBRUARY 10, 2022

<b>No. of Nations Operating in Space</b>	<b>90</b>	<b>↑ 5% YOY</b>
<b>Size of the Global Space Economy (2020)</b>	<b>\$447 billion</b>	<b>↑ 4.4% YOY</b>
<b>Commercial Space Revenue (2020)</b>	<b>\$357 billion</b>	<b>↑ 6.6% YOY</b>
<b>Global Government Space Program Spending (2020)</b>	<b>\$90 billion</b>	<b>↓ 6.6% YOY</b>
<b>Global Space Investment (since 2012)</b> (Source: Space Capital)	<b>\$252.9 billion</b>	
<b>Avg U.S. Private Space Employment (2020)</b>	<b>148,876</b>	<b>↑ 3.9% YOY</b>
<b>No. of Global Launch Attempts (2021)</b>	<b>145</b> <small>HIGHEST IN HISTORY</small>	<b>↑ 27% YOY</b>
<b>No. of Payloads Deployed (2021)</b>	<b>1,730</b>	<b>↑ 29% YOY</b>
<b>Avg. Number of Payloads per Launch (2021)</b>	<b>11.9</b>	<b>↑ 12% YOY</b> <b>(598% OVER 10 YEARS)</b>
<b>Space Tourists Who Reached the Kármán Line (2021)</b>	<b>22 (8 orbital, 14 suborbital)</b>	

## Space Innovation for Earthly Benefit

In 2021, Space Foundation welcomed several new partners to its Space Certification Program, which recognizes innovations developed for and inspired by space that are adapted and applied to improve life on Earth. The new program partners include:

- Aspen Laser Systems, LLC – Adapted a technology developed for NASA to deliver noninvasive photobiomodulation to treat conditions like arthritis and tendonitis.
- TheraLight, LLC – Adapted a light-emitting diode technology developed for NASA plant growth experiments to be used in medicine for treating pain, inflammation and wound healing.
- Danny's Rocket Ranch – Joining as a partner in the Creative Products category, the company developed a dehydrated "Space Salsa" that can be used and consumed during space missions, as well as on Earth.
- Eulaliaco, LLC – "Rocket Recorder: Volume One" is a space-themed music workbook for children that uses a STEAM (science, technology, engineering, arts and mathematics) approach to music education.

# CREATING OPPORTUNITIES FOR LIFELONG LEARNING

The global space community is made up of people with a range of backgrounds, skills and knowledge, and one thing they share is a passion for learning. In 2021, Space Foundation supported this desire and need for lifelong learning through our Center for Innovation and Education, as well as a variety of programs and events.

## Center for Innovation and Education

In service to the educational needs of the global space workforce, Space Foundation's Center for Innovation and Education is a lifelong learning platform fostering workforce development and economic opportunity. Designed for students, teachers, entrepreneurs and professionals, the Center provides curricula and opportunities not only for current students but for all people of all demographics and skill sets, STEM and non-STEM alike. With a variety of programs offered digitally worldwide or at the Discovery Center in Colorado Springs, the Center empowers the global space ecosystem to address and overcome obstacles to building a sustainable space workforce.

In 2021, Space Foundation was awarded a \$1.5 million grant from the U.S. Department of Defense to expand the STEM education, outreach and workforce initiatives offered through the Center. The grant is provided through the National Defense Education Program (NDEP) in Science, Technology, Engineering and Mathematics (STEM), Biotechnology, and Enhanced Civics Education and delivers funds over three years to scale the Center and reach even more participants and new entrants to the global space ecosystem.



## Reaching Beyond the Classroom

While public health challenges in 2021 continued to complicate a return to the classroom, Space Foundation stepped up its online programming to help students learn, wherever they are. Delivered virtually, the "Small Steps, Giant Leap: STEM Adventures for Little Space Explorers" education series reached pre-K and kindergarten students, using interactive storytelling and hands-on activities with a focus on STEM subjects. Launched in partnership with the Colorado Springs Pikes Peak Library District, and funded by a grant from the Institute of Museum and Library Services, Space Foundation kicked off the series with a featured reading of Sen. Mark Kelly's book, *Mousetronaut*.

While our virtual offerings expanded, we also provided health-conscious programming in-person at the Space Foundation Discovery Center in Colorado Springs. The Discovery Center provides interactive, education-focused space and science activities for people of all ages, including students, teachers and families. In 2021, the Discovery Center delivered a variety of programs and events to engage Colorado communities and visitors from around the world. The Family Star Party events were an opportunity for students and families to explore the telescopes and other space- and astronomy-themed exhibits at the Discovery Center, including the Science On a Sphere® exhibit in the Northrup Grumman Science Center and the space artifacts in the El Pomar Space Gallery.

## Helping Students Discover New Ideas

**A sustainable space workforce requires a robust educational foundation for today's students, and Space Foundation delivers the programs and opportunities young people need to work toward their interests in space subject matter.**



Thanks to philanthropic funding from Lockheed Martin, in 2021, Space Foundation offered its renowned Space in the Community Program to schools in Huntsville, AL. Space in the Community brings educational activities to regional communities to help students discover a passion for learning and a desire to explore the many fields with a nexus to space. Longer term, the result is a stronger local space-ready workforce that can fuel economic development for the community and contribute to space activities on Earth and beyond it.

## Supporting Education Worldwide

A thriving space ecosystem requires skilled talent from around the world, and Space Foundation offers its Teacher Liaison program to support educators globally, so they can in turn inspire and empower new generations of space professionals. Made possible through generous funding from Lockheed Martin and the Miller-Wood Foundation, Teacher Liaisons receive knowledge, lesson plans and other assets to help their peers in their home country use space as a vehicle for exciting students about STEM subjects.

In 2021, Space Foundation welcomed 27 outstanding educators to the Teacher Liaison program, including 13 teachers hailing from Australia, Canada, India, Indonesia, Mexico, Nigeria, Serbia, South Africa and Taiwan. With the new participants, there are more than 300 Teacher Liaisons worldwide bringing space into the classroom so students can imagine and pursue their place in the global space ecosystem.



## Using Art to Reach Space

The imagination is the first vehicle to space, and to foster the excitement and wonder that space activities create, Space Foundation hosts its annual International Student Art Contest, inviting submissions from students around the world. Sponsored by Noosphere Ventures, the 11th annual contest asked students ages 3-18 to submit original artwork on the theme, "How Space Technology Helps Improve Life on Earth." In 2021, more than 4,500 students from 36 U.S. states and 88 countries submitted artwork, resulting in 25 winners as well as one student whose entry received the Space Achievement Award.

## FOSTERING CONNECTIONS FOR GREATER COLLABORATION

Whether they be commercial ventures, civil exploration missions, or ensuring access to space, the essential ingredient in success in space is collaboration. As a nonprofit advocate organization, Space Foundation is proud to foster collaboration between programs and nations worldwide. From discussions with space leaders in the Middle East to engagements at the International Astronautical Congress to domestic activities with U.S. space stakeholders, in 2021, Space Foundation was a steward for helping space leaders come together to reach for new opportunities and rewards for life on Earth.



## Engaging Stakeholders in Washington

With offices in Washington, DC, Space Foundation engages government and industry leaders to promote knowledge and information sharing, as well as access to opportunities throughout the global space ecosystem. In 2021, with funding from the Abrams Endowment, Space Foundation co-hosted a briefing with the Congressional Career and Technical Education Caucus to discuss the importance of space-based education in K-12 curricula. Space Foundation also held monthly stakeholder calls as a regular opportunity for the space community to gather and hear remarks from space leaders.



## Covering the National Security Space

Space is an increasingly contested domain with national security implications for spacefaring nations and their allies. Space Foundation worked with professional services firm KPMG to interview thought leaders from industry, think tanks, and military organizations and probe the future of space defense. The resulting report, "Navigating Space: A Vision for Space in Defense," identified four predictions, including that space will define the future of national security, innovation will accelerate, relationships and collaboration will be critical for long-term success, and driving consensus on global norms will help promote safety and security in space and on Earth.

## A Global Reach for International Connection



For Space Foundation, 2021 was an opportunity to engage the space community around the world. At the 36th Space Symposium, Space Foundation and the Islamic World Education, Scientific and Cultural Organization (ICESCO) signed a joint public partnership agreement, expanding efforts to offer more events and programming that promote the benefits of space science and technology to economic development worldwide.

Space Foundation COO Shelli Brunswick took part in Expo 2020 Dubai's Space Week programming in the United Arab Emirates (UAE). Brunswick also delivered more than 100 speeches and presentations in 2021 championing diversity and opportunities in the global space ecosystem, including at events in Doha, Qatar and Cairo, Egypt. Brunswick serves as chair of the Women in Aerospace Foundation and as a mentor for the United Nations Space4Women Network, and in 2021, she received the WomenTech Network Global Technology Leadership Award.

Space Foundation meanwhile enriched and expanded relationships in the Middle East and elsewhere. At the 72nd International Astronautical Congress held in Dubai, UAE, Space Foundation's Senior Vice President of Strategic & International Affairs Steve Eisenhart was elected as one of the new vice presidents of the International Astronautical Federation.

## Thought Leaders in the News

As part of its mission to connect and inform the space community, Space Foundation leaders regularly publish analysis and perspectives on trends and events in the space ecosystem. In 2021:

- Space Foundation CEO Tom Zelibor joined BBC World News to discuss the global space economy and workforce development in the space industry.
- Zelibor also wrote in *The Hill* about accomplishments in the space industry during the COVID-19 pandemic.
- COO Shelli Brunswick published a series of in-depth articles exploring the developing space programs and organizations around the world, including in African nations, the UAE, India, Japan and Australia.



## 2021 FINANCIALS AT A GLANCE

As a 501(c)(3), Space Foundation preserves a sustainable balance between earned program income, contributions and grants, and other investments. Our annual expenses are focused exclusively on our mission to be the preeminent advocate and gateway for trusted information, lifelong education, and seamless collaboration for all people and organizations engaging in space exploration and space-inspired industries that define the global space ecosystem.

### Total Net Assets: \$ 6,296,430\*

#### Revenue \$ 8,858,018

- Contributions and grants . . . . . \$ 5,315,912
- Earned program income . . . . . \$ 2,030,517
- Investment and other . . . . . \$ 1,511,589

#### Expenses \$ 9,356,978

- Programming . . . . . \$ 4,192,888
- Management + Operations . . . . . \$ 4,840,215
- Fundraising . . . . . \$ 323,875



\* While we could not perform all of our programming due to COVID-19 restrictions, we were able to maintain a healthy net asset balance as a financial foundation for our organization.

# YOUR GENEROSITY CREATES OPPORTUNITIES AND IMPROVES LIVES

As a nonprofit, Space Foundation relies on the generous donations and gifts you provide in support of helping all people find their place in the global space ecosystem. Thanks to you, more than 25,000 students and teachers have received hands-on STEM education, and more than 300 minority business and entrepreneurs have been introduced to new opportunities in space commerce. Thousands of people from around the world are engaging with Space Foundation to access the opportunities that grow the space ecosystem while delivering the benefits it generates to improve daily life on Earth.

In 2021, Space Foundation was honored and grateful for the generous contribution from El Pomar Foundation. The forgiveness of the \$4.1 million loan by El Pomar allowed Space Foundation to acquire full ownership of a new building at our headquarters.



## ALEX, KANSAS

"The endless possibilities that education and knowledge create for kids inspired me to give today."

## ALEC, CALIFORNIA

"My parents immigrated to the US in the 80s and worked hard to afford a good education for my brother and me. I promised them that one day I will do my best to do the same for our future generation. Thank you for all your work! Looking forward to supporting you again in the future."

## WHAT INSPIRED DONORS TO GIVE?

### DANIEL, SWEDEN

"A gift from The Association of Foreign Affairs in Lund as a thank you for the fabulous seminar held on space security!"

### TOM, CONNECTICUT

"This gift is in memory of a very good friend who had great passion for space exploration."

## BOB & GEORGI, NEW YORK

My husband and I are making this donation in honor of our son-in-law, Matt. You both are doing important work for the future of the world. We want Matt as well as our daughter, Laura and his children to feel proud of his being honored as well as to realize that this donation will provide children with knowledge of the world of space."

## BRENDA, COLORADO

"This donation is dedicated to Emerson. His study of space is an inspiration!"





Offering a gateway to **information, education** and **collaboration** for space exploration since 1983.

Space Foundation  
Headquarters & Discovery Center  
4425 ARROWSWEST DRIVE  
COLORADO SPRINGS, CO 80907, USA  
719.576.8000 | 800.691.4000

Space Foundation  
Washington, D.C., Office  
1700 NORTH MOORE STREET, STE. 1105  
ARLINGTON, VA 22209, USA  
202.618.3060 | 800.691.4000