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SECURE WORLD FOUNDATION
ANNUAL REPORT



Promoting Cooperative Solutions
For Space Sustainability

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A LETTER FROM CYNDA COLLINS ARSENAULT PRESIDENT AND FOUNDER

We all want a better world for our children and their children. What does that look like? We can imagine a greater understanding of our environment, access to information and knowledge, connectedness to others, economic opportunity, and freedom from fear. At Secure World Foundation, we understand how space can contribute towards each of these goals. We also understand the challenges we face as we rely more and more on our space assets. At SWF, we work to build relationships across networks, finding the common goals that strengthen us and promoting cooperative solutions to the challenges that face us.

The transformative view of the Earth from space shows our fragility as a planet and our connectedness as a species across a borderless world. Today we face challenges in the space environment arising from increased use, debris, lack of governance structures, and political unrest. For the last 15 years, SWF has worked to increase the salience of these issues and we are pleased that today more people and institutions understand the importance of this work.

OVERVIEW OF SWF



A LETTER FROM PETER MARTINEZ, PHD EXECUTIVE DIRECTOR

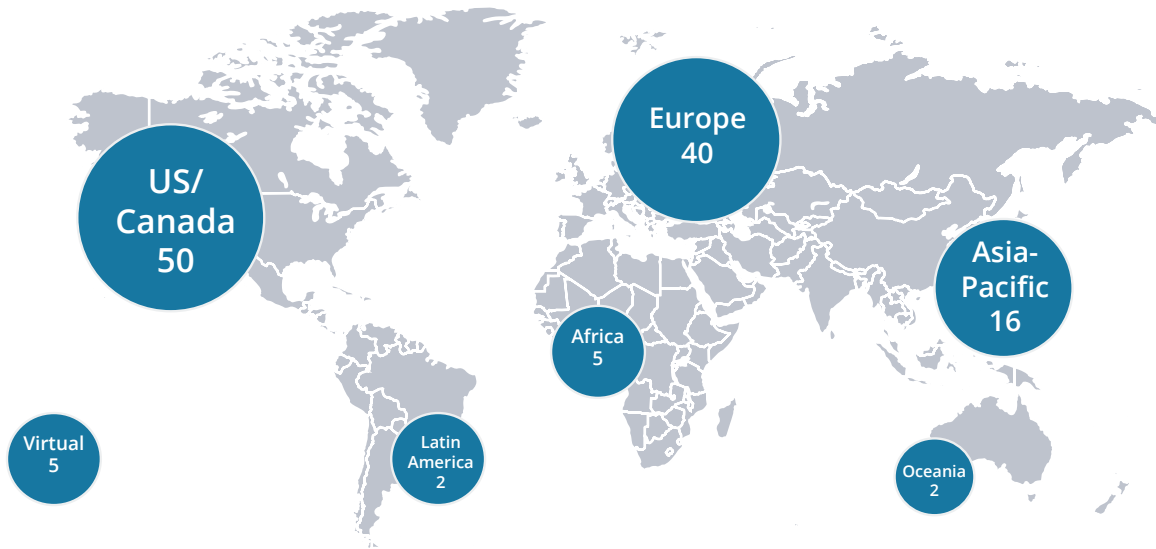


We are currently living in a time of amazing opportunities, but also a time of daunting challenges for humanity. At Secure World Foundation, we understand that space lies at the nexus of realizing the opportunities as well as addressing the challenges. We also understand that international cooperation and partnerships are key to preserving outer space as an environment for peaceful use and exploration for the benefit of all nations. In a world that is becoming increasingly reliant on space systems, the challenges of space security, safety, and sustainability are inextricably interwoven and require a cooperative approach to governance, one that involves both State and non-State actors with experience in the conduct of space activities.

The mission of the Secure World Foundation is to work with governments, industry, international organizations, and civil society to develop and promote ideas and actions for international collaboration that achieve the secure, sustainable, and peaceful uses of outer space benefitting Earth and all its peoples. Secure World Foundation's programs translate this mission into actions aimed at raising the salience of space sustainability, building common understandings of complex issues, facilitating dialogue, and promoting cooperative governance of space activities at the national and international level. This Annual Report provides an overview of Secure World Foundation's work during 2018. All told, SWF completed 120 projects and activities in over 20 countries on six continents. We hope you will find this report informative and interesting. Looking ahead, the year 2019 promises to be just as exciting.

2018 SNAPSHOT

2018 BY THE NUMBERS



Where SWF's 2018 Activities and Projects Took Place



120 activities/projects
Completed in 2018



47 new resources
Created in 2018



20% increase
In Newsletter Subscribers



\$1.47m
Project-Related Budget



Everywhere there are important conversations being held, [SWF] is always there. You're like the Marines for space policy, you're first on the beach, and you're dragging the rest of us along. - VP at Large Commercial Space Company



2018 SNAPSHOT

“

SWF is always at the frontlines of the major issues in space. - Partner at

Law Firm

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The breadth of Secure World Foundation’s work, and the extensive network we engage with, means that you may know some of our projects, but not all. Some may know us best for our work developing norms of responsible behavior for commercial actors breaking into new areas like space resource utilization or on-orbit satellite servicing. Others may be more familiar with our work maximizing the use of space applications for socioeconomic benefit on Earth. Still others may interact the most with SWF in

multilateral discussions focused on ensuring strategic stability in the space domain, and fostering transparency and confidence among space powers. All of these efforts are united in their focus on addressing the many challenges that threaten our collective ability to access, use, and benefit from space far into the future, while making those benefits available to all humanity now. This mission is what drives SWF and we are proud to share the work we accomplished toward that mission in 2018.

2018 ACTIVITIES BY FOCUS AREA

The following is a list of activities or projects, organized by focus area, that SWF hosted, co-organized, supported, partnered with, or presented at in 2018.

SPACE SUSTAINABILITY

Our primary focus is on space sustainability: the ability of all humanity to continue to use outer space for peaceful purposes and socioeconomic benefit over the long term.

12th European Space Policy Institute (ESPI) Autumn Conference

“Tomorrow’s Battlefield: Emerging Areas of Military Competition” Event at Pell Center

American Institute of Aeronautics and Astronautics (AIAA) Space Commercialization Executive Summit

Advanced Maui Optical and Space Surveillance Technologies (AMOS) Dialogue and Policy Forum

Asia-Pacific Regional Space Agency Forum (APRSAF)

CabSat Conference

Canadian Space Commerce Association SmallSat Symposium

Center for Orbital Debris Education and Research (CODER) Workshop

Commercial Space Transportation Advisory Committee (COMSTAC) Dinner

Consortium for Execution of Rendezvous and Servicing Operations (CONFERS) Workshops

Counterspace Report

Cubesat Developers Conference

Embry-Riddle Aeronautical University Space Traffic Management Conference

Global Space and Technology Convention (GSTC)

International Space University (ISU) Space Studies Program

International Astronautical Federation (IAF) Spring Meetings

Institut français des relations internationales (Ifri) Conference

Indian Space Situational Awareness Workshop

International Symposium for Personal and Commercial Spaceflight

Lawrence Livermore National Laboratory Symposium on Space and Deterrence

Lecture at Charles University, Prague

Military Space Situational Awareness Conference

National Academy of Sciences U.S.-Russia Dialogue on Full-Scope Strategic Stability

NewSpace Conference

NewSpace Europe Conference

Politicon

Roundtable on Benefit and Value Creation in Commercial Space

SDA Bocconi Conference on The New Space Economy Space 2.0

Space Weather as a Global Challenge (SWGEC)

Space Weather Enterprise Forum (SWEF)

SpaceWatchGlobal Media Partnership

United Nations High Level Forum in Bonn

U.S.-Vietnam Space Bilateral

U.S. Strategic Command (USSTRATCOM) Advanced Operational Law Conference

Workshop on Insurance and Responsible Behavior

World Economic Forum (WEF) Space Council Meetings

SPACE POLICY & LAW

To achieve sustainability, space activities need sound policies and clearly formulated international agreements, laws, and codes. States also need to develop national laws in order to foster responsible behavior by government agencies and private sector entities.

4th Observer Research Foundation (ORF) Kalpana Chawla Conference
Dawn of Private Space Science Event
European Space Forum
Hague International Space Resources Governance Working Group
International Astronautical Congress (IAC)
International Space Exploration Forum-2 (ISEF-2)
Lecture at European Centre for Space Law (ECSL)
Lecture at Geneva Centre for Security Policy (GCSP)
Manual on International Law Applicable to Military Uses of Outer Space
Securing Space: Ethical Governance For Outer Space Security
Space Generation Advisory Council Forum 2.0
Space Security Index Panel at UN
Space Security Index Working Group
Space Symposium
ISU Southern Hemisphere Space Studies Program
UN Group of Governmental Experts (GGE) on the Prevention of an Arms Race in Outer Space
UN/Russia Space Law and Policy Workshop
UN Committee on the Peaceful Uses of Outer Space (COPUOS) Meetings
UN Institute for Disarmament Research (UNIDIR) Space Security Conference
UNISPACE+50

HUMAN & ENVIRONMENTAL SECURITY

We focus on ensuring the sustainable use of the space environment, so that we can continue to maximize our ability to use space for the benefit of humankind.

12th International Conference of the African Association of Remote Sensing and the Environment
9th Asia-Oceania Meteorological Satellite Users' Conference
African Leadership Conference (ALC)
Citizen Science & Earth Observation Research
Digital Earth Summit
Free and Open Source Software for Geospatial (FOSS4G) Conference
Group on Earth Observations (GEO) Plenary
Global Space Applications Conference
GEO Programme Board Meetings
Paris Peace Forum
SatSummit
Small Sat Symposium
UN World Geospatial Information Congress
UN Global Geospatial Information Management (UN-GGIM) Meeting

2018 PROGRAM SPOTLIGHTS

In 2018, SWF engaged in activities across 29 unique programs aligned to our three focus areas: Space Sustainability, Space Law & Policy, and Human & Environmental Security. Each program manager on the SWF staff oversees a portfolio of projects that advance specific goals under these focus areas, and has chosen one of their projects from 2018 to spotlight below.



UNITED NATIONS ENGAGEMENT

FOCUS AREA: SPACE POLICY & LAW

PROGRAM MANAGER: CHRISTOPHER JOHNSON

The space domain is inherently multilateral and space sustainability topics are discussed in various fora throughout the United Nations system. Since 2010, SWF has enjoyed Special Observer Status with the United Nations Economic and Social Council, which enables participation in UN meetings.

SWF regularly participates in the UN Committee on the Peaceful Uses of Outer Space (COPUOS) and its two subcommittees, the Scientific and Technical Subcommittee and the Legal Subcommittee, which meet annually in Vienna, Austria. At COPUOS, we make statements and technical presentations on various agenda items, as well as respond to requests for information and comments from COPUOS Working Groups. Our staff also participated in expert groups convened by the Working Group on the Long-term Sustainability (LTS) of Outer Space Activities.

SWF also participates in space security discussions in Geneva, Switzerland, home of the Conference on Disarmament and the United Nations Institute for Disarmament Research (UNIDIR). Since 2010, we have partnered with UNIDIR to organize an annual space security conference, which is one of the few fora where norms for space security are concretely and frankly discussed. SWF has also provided inputs to and participated as an observer in the UN Group of Governmental Experts (GGE) on the Prevention of an Arms Race in Outer Space (PAROS).

“

[SWF] has been a thought leader on [robotic servicing of satellites] for many years. - NASA Administrator Jim Bridenstine (on Twitter)

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CONFERS

FOCUS AREA: SPACE SUSTAINABILITY

PROGRAM MANAGER: BRIAN WEEDEN

A number of space actors are developing capabilities to approach, grasp, manipulate, modify, repair, refuel, integrate, and build completely new platforms on orbit. These new on-orbit satellite servicing (OOS) and rendezvous and proximity operations (RPO) vehicles and experiments could underpin the next step in space applications, market creation, and exploration. However, there is no common set of standards or norms for safe and secure OOS/RPO, which could lead to misperceptions or mistakes that undermine space safety, security, and sustainability.

SWF is helping address this challenge through the Consortium for Execution of Rendezvous and Servicing Operations (CONFERS). Initially funded by the Defense Applied Research Projects Agency (DARPA), the goal of CONFERS is to develop standards for safe and sustainable OOS/RPO. SWF is under contract to DARPA to serve on the CONFERS Secretariat and is responsible for technical operations and industry engagement. The vision for CONFERS is to transition to an independent, privately funded organization over the next few years. Over the course of 2018, CONFERS grew to include 24 industry members, who can count among their early achievements the Guiding Principles for Commercial OOS and RPO, released in November 2018.



2018 PROGRAM SPOTLIGHTS

SPACE WEATHER

FOCUS AREA: HUMAN & ENVIRONMENTAL SECURITY

PROGRAM MANAGER: KRYSTAL WILSON

In 2018, SWF partnered with the Embassy of Japan and the U.S. Department of State to convene the third annual international dialogue, “Space Weather as a Global Challenge.” This full-day event focused on international measures needed to protect aircraft and satellite operations, communication networks, navigation systems, and the terrestrial power grid from solar flare, solar energetic particle, and coronal mass ejection risks. SWF also co-sponsored the 2018 Space Weather Enterprise Forum, which convened a meeting of senior government officials, researchers, private sector service providers, end users, media, legislators, and Congressional staff to share ideas and raise awareness of space weather and its societal effects. The discussion in 2018 focused on critical infrastructure protection.



COUNTERSPACE RESEARCH

FOCUS AREA: SPACE POLICY & LAW

PROGRAM MANAGER: VICTORIA SAMSON

There has been a growing concern over the reliance on vulnerable space capabilities for national security, and the corresponding proliferation of counterspace capabilities. To support an urgently needed open debate, SWF developed an assessment of global counterspace capabilities based on open source information and published the first edition in April 2018. With a group of international experts, we compiled and analyzed publicly available information on various countries’ counterspace capabilities across several categories: direct ascent, co-orbital, directed energy, electronic warfare, and cyber. We assessed the potential military utility of each and, when possible, also examined policy, doctrine, and budget to support the development of these capabilities. The analysis is intended to foster transparent and informed dialogue by providing a more holistic picture of what each country is working on and how these capabilities might be used.



SPACE RESOURCES

FOCUS AREA: SPACE POLICY & LAW

PROGRAM MANAGER: IAN CHRISTENSEN

Since 2015, the topic of private sector access to, development of, and utilization of space resources has attracted considerable attention in national and multilateral space policy fora. While countries such as the United States and Luxembourg implemented domestic legislation to enable commercial space resources activities, at the international level, States and legal experts discussed the relationship of space resources development to core space governance principles such as freedom of use, non-appropriation, authorization and supervision, and benefit to all. Commercial space resources utilization is best understood in the context of a broadening and diversifying set of private sector space activities. Developing effective legal and policy regimes for these activities requires the coordination of multiple stakeholder groups and the identification of enhanced mechanisms for dialogue that improve understanding between the private sector and multilateral fora.

SWF is contributing through our membership in and support of the Hague International Space Resources Governance Working Group. The Working Group, which has more than 30 members representing government, academia, and civil society from across the globe, will propose a set of Building Blocks for an international framework on space resource activities by the end of 2019. These Building Blocks set out the basic principles and issues that should be considered in developing adaptive governance for space resources utilization. In 2018, the Working Group closed a period of public comment on the Building Blocks, and established a Socioeconomic Panel to advise the Working Group on the Building Blocks' potential socioeconomic impacts. SWF serves as Chair of this panel.



2018 PROGRAM SPOTLIGHTS

YOUNG PROFESSIONAL SUPPORT

PROGRAM MANAGER: JOSH WOLNY

Throughout 2018, SWF promoted development, inclusion, and engagement of young professionals across a number of events and activities. In partnership with the Space Generation Advisory Council (SGAC), SWF co-sponsored and participated in two of SGAC's largest annual events: Fusion Forum and Space Generation Congress (SGC). At Fusion Forum, SWF co-organized a working group on national security and delivered a keynote address on SWF's Global Counterspace Capabilities Report. At SGC, SWF served as subject matter expert in the Space Policy working group and rapporteured the Space Logistics working group.

In conjunction with the International Astronautical Congress (IAC), SWF provided scholarships to young professionals with accepted presentations. In a competitive process, SWF received over 60 applications and selected 11 award recipients from Chile, China, Greece, India, Italy, the Netherlands, Nigeria, Pakistan, the United States, and Venezuela. The scholarship winners' research covered areas ranging across space law, national space policy, de-orbiting technology, debris population sampling, and utilization of space resources.

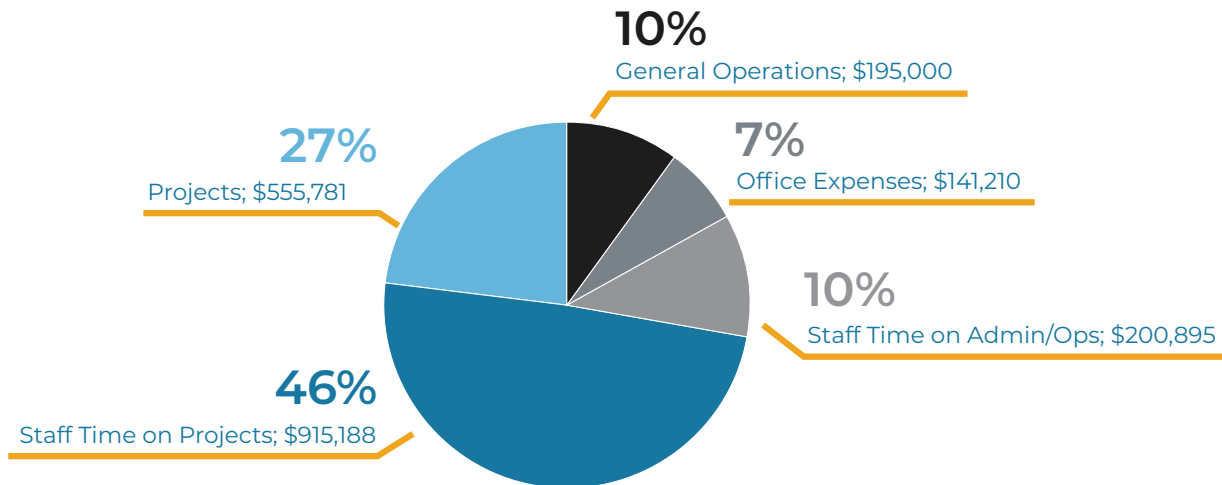


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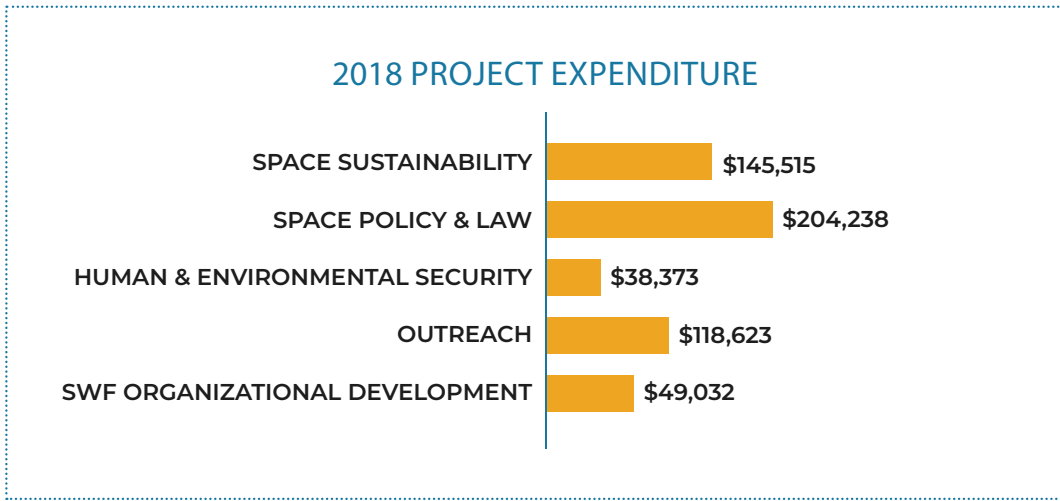
If any organization would be aware of the best governance models for international space policy, it would be Secure World Foundation. - Senior Officer in European Space Agency Strategy Department

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2018 FINANCES



2018 PROJECT EXPENDITURE



OUR TEAM

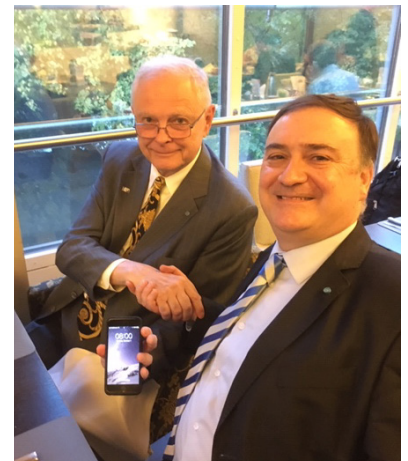


From left: Tiffany Chow (Director of Strategic Partnerships), Lisa Croy (Operations Director), Christopher Johnson (Space Law Advisor), Nicole Nir (Communications and Operations Manager), Victoria Samson (Washington Office Director), Cynda Collins Arsenault (President and Founder), Ian Christensen (Director of Private Sector Programs), Brian Weeden (Director of Program Planning), Jihan Asher (Washington Office Coordinator), Peter Martinez (Executive Director from Oct 1), Krystal Wilson (Director of Space Applications Programs) | Not pictured: Chris Ludwig (Accountant), Michael Simpson (Executive Director through Sept 30, Executive Director Emeritus through Dec 31), Josh Wolny (Project Manager)

TEAM CHANGES 2018

In 2018, we bid a fond farewell to Michael Simpson, PhD, who served as Executive Director through September 30 and Executive Director Emeritus through December 31. Mike passed the torch to Peter Martinez, PhD, at precisely 08:00 on October 1 (see photo). We are honored to welcome Peter to the team.

We welcomed back Tiffany Chow, who rejoined the team in January as Director of Strategic Partnerships. Congratulations are due to Josh Wolny, who was promoted to full-time Project Manager in June. We are also pleased to be joined by a new Washington Office Coordinator, Jihan Asher, who started in November. Finally, many thanks to Rachel Yates, who served on the SWF Board for six years, before stepping down in December.



OUR BOARD 2018

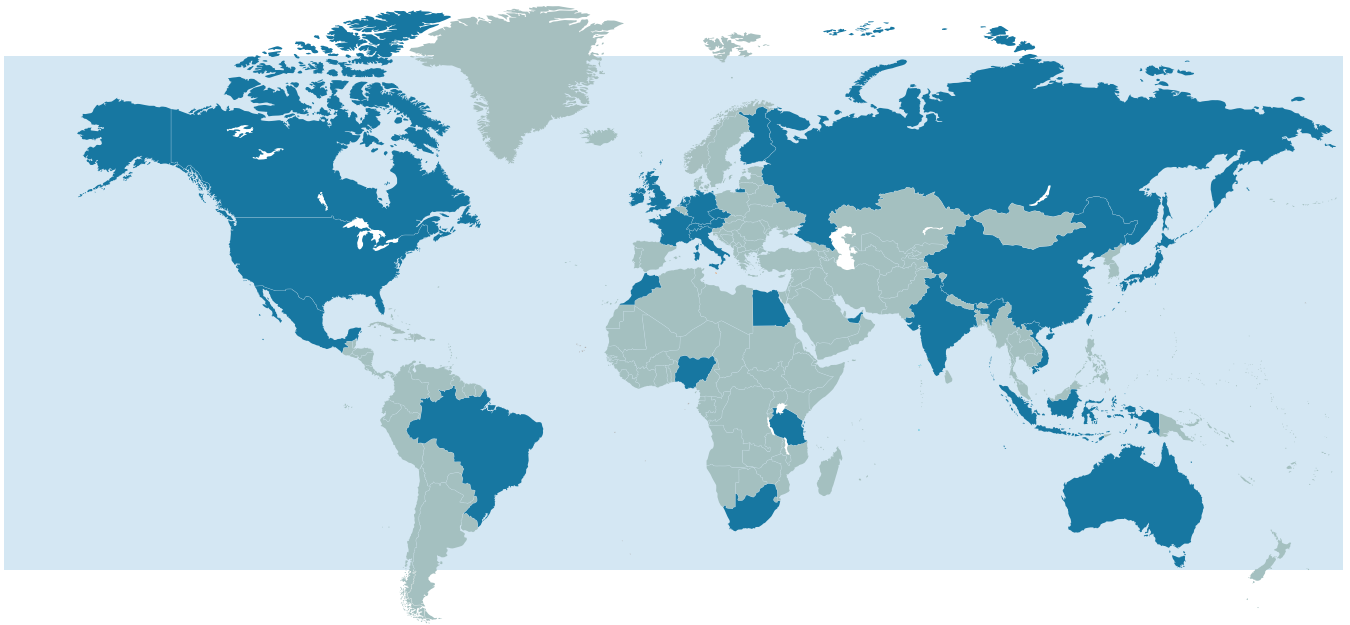
- CYNDA COLLINS ARSENAULT
CO-FOUNDER, BOARD PRESIDENT
- MARCEL ARSENAULT
CO-FOUNDER,
BOARD VICE PRESIDENT,
TREASURER
- RACHEL YATES
COMMUNITY BOARD MEMBER, SECRETARY
- ANDREW ALDRIN, PHD
COMMUNITY BOARD MEMBER

OUR ADVISORY COMMITTEE 2018

- ANGIE BUKLEY, PHD
AEROSPACE CORPORATION
- RICHARD DALBELLO
VIRGIN GALACTIC
VIRGIN ORBIT
- XAVIER PASCO, PHD
FONDATION POUR LA RECHERCHE STRATÉGIQUE
- TANJA MASSON-ZWAAN
LEIDEN UNIVERSITY
- MAZLAN OTHMAN,
PHD
ACADEMY OF SCIENCES, MALAYSIA
- MAJ. GEN. JAY SANTEE (RETIRED)
AEROSPACE CORPORATION
- RAJESWARI PILLAI
RAJAGOPALAN, PHD
OBSERVER RESEARCH FOUNDATION
- PETER MARQUEZ
ANDART GLOBAL
- WILLIAM PARKER
GLOBAL ENGAGEMENT SOLUTIONS, LLC

OUR PARTNERS

Almost all of the work SWF pursues and conducts is done in partnership with other organizations. We work with governments, academia, civil society, intergovernmental organizations, and companies to marshal the voices, perspectives, and resources that are critical to achieve our vision and mission. Partnership is at the heart of SWF's way of doing business and in 2018 we partnered with over 100 entities from around the world.



Where SWF's 2018 Partners Were Located
(highlighted in blue)

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Secure World Foundation has been a great partner and ally of the space weather community and we are grateful for your support. - Director at NOAA

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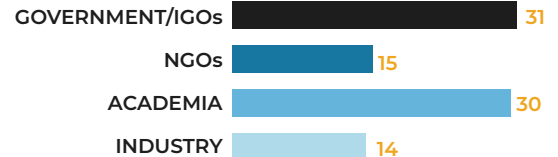
No one has the rolodex that Secure World does. - Staff at U.S. State Department

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2018 PARTNERSHIPS

In 2018, SWF launched a dedicated Strategic Partnerships program and appointed a full-time Director of Strategic Partnerships. The motivation behind these decisions was to be more strategic about the way we work with our trusted and valued partners, and to ask questions like “Is SWF bringing as much to this collaboration as possible? Are we working with, and reaching out to, a representative mix of partners? Can we find more meaningful ways to partner?” SWF also firmly believes that our mission of sustaining the space environment can only be accomplished through collaboration. We look forward to expanding how we work with others, and continuing to build on the substantive relationships already in place, in the year to come.



SWF's 2018 Partners by Major Sectors



swfound.org

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525 Zang Street, Suite D
Broomfield, CO 80021, USA
+1-303-554-1560

DC Office
1779 Massachusetts Ave NW, Suite 720
Washington, DC 20036, USA
+1-202-568-6212