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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 16 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



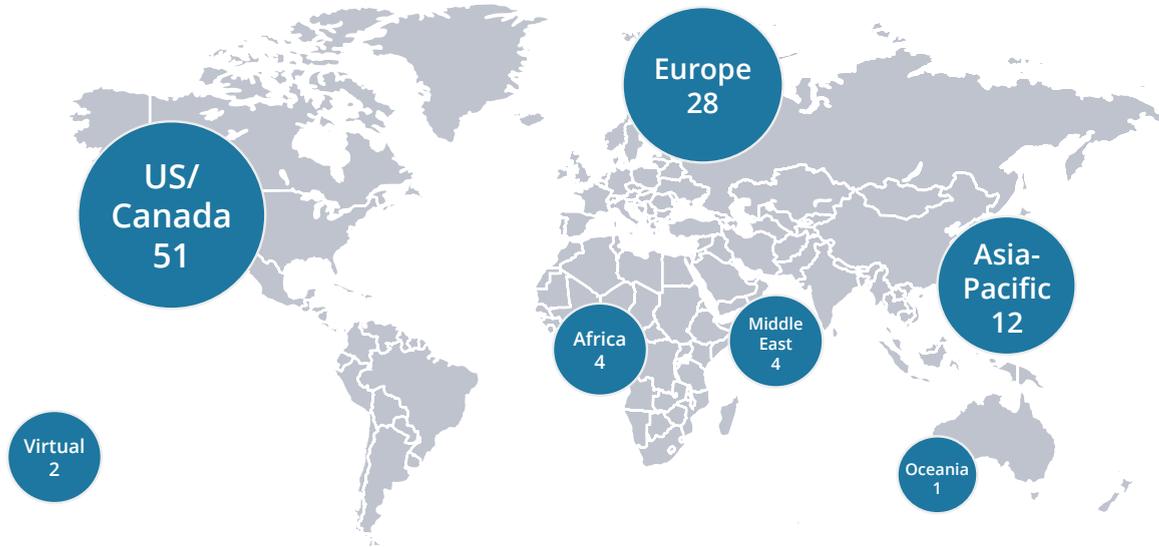
A LETTER FROM PETER MARTINEZ, PHD EXECUTIVE DIRECTOR



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 2019. All told, **SWF completed 102 projects and activities in over 20 countries on six continents.** We hope you will find this report informative and interesting. Looking ahead, the year 2020 promises to be just as exciting.

2019 BY THE NUMBERS



Where SWF's 2019 Activities and Projects Took Place



102 activities/projects
Completed in 2019



124 new resources
Created in 2019



20% increase
In Newsletter Subscribers



\$1.84m
Project-Related Budget



How many of you
met someone new?
How many of you
learned something new?
That's thanks to SWF
bringing us all together.

~ Attendee at SWF Summit

2019 SNAPSHOT

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 2019.



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**SWF is "moving the needle"
towards a broader consensus
on rules of engagement.**

~ Industry Leader

2019 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 2019.

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.

Space Resources Workshop With SDA Bocconi and Space Policy Institute
Commerical Space Transportation Advisory Committee (COMSTAC) Dinner
Roundtable on Value and Benefit Creation in Commercial Space
Sino-U.S. Space Commercialization Workshop I & II
Workshop on Exploring the Hidden Economic Value of Space Applications
International Astronautical Federation (IAF) Spring Meetings
Advanced Maui Optical and Space Surveillance Technologies (AMOS) Dialogue and Policy Forum
Global Space Situational Awareness workshop with Korean Aerospace Research Institute (KARI)
Summit for Space Sustainability
Japanese Ministry of Defense Space Security Symposium
Global Space Congress
Ivy Space Conference
UN Disarmament Commission (UNDC)
Space Weather Workshop (SWW)
Space Weather as Global Challenge
Space Weather Enterprise Forum (SWEF)
12th IAA Symposium on Small Satellites
IAASS Space Safety Conference

European Space Week (EU)
Spacetide Conference
Prague Security Studies Space Security Conference
Organisation for Economic Co-operation and Development (OECD)
Space Security Index Working Group
Cubesat Developers Workshop

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.

5th Observer Research Foundation (ORF) Kalpana Chawla Conference
Geopolitics and Global Futures Symposium
Space Law in a Networked World Conference
Hague International Space Resources Governance Working Group
Advisory Committee for the World Economic Forum's Space Sustainability Rating (SSR)
North American Round of the Manfred Lachs Space Law Moot Court
International Symposium on the Stable Use of Outer Space

SPACE POLICY & LAW (CONT'D)

Space Symposium

UN Institute for Disarmament Research (UNIDIR)

Space Security Conference

Workshop on SocioEconomic Benefits of Space

Resources Utilization - African Perspectives (SASR)

COPUOS STSC Participation

COPUOS 58th Legal Subcommittee 2019

2019 COPUOS Plenary

Woomera Plenaries

MILAMOS Workshop VI

MILAMOS Workshop VII

MILAMOS Workshop VIII

UN GGE on PAROS Intersessional meeting

United Nations / Jordan Workshop: Global Partnership
in Space Exploration and Innovation

UNOOSA Legal Advisory Project on Space Law
For New Space Actors

Wilton Park Discussion on Space Norms of Behavior

ISU SHSSP White Paper Support

Center for Strategic and International Studies (CSIS)
update Counterspace Report

Chamber of Commerce US-Indo Pacific cooperation

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.

Global Conference on Space for
Emerging Countries (GLEC)

AIAA/USU Conference on Small Satellites

8th African Space Leadership Congress on Space Science
and Technology for Sustainable Development

AI for Good Summit

GEO Programme Board Meetings

American Meteorological Society (AMS)
Joint Satellite Conference

GEO Ministerial Summit

Data.Space 2019 Conference

Geospatial World Forum

IAA Planetary Defense Conference

2019 PROGRAM SPOTLIGHTS

In 2019, 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 2019 to spotlight below.

SUMMIT FOR SPACE SUSTAINABILITY

FOCUS AREA: SPACE SUSTAINABILITY

PROGRAM MANAGER: KRYSTAL WILSON

The space sector is currently experiencing rapid growth in both the number and diversity of space actors. This occurrence has exposed the challenges that existing legal, policy, technical and operational regimes face in ensuring the long-term sustainability of the space environment. Space sustainability has greatly increased in salience as a highly discussed policy topic over the past decade. However, this growth in awareness has not always translated into definitive action to address some of the most important issues related to space sustainability. Additionally, the linkages across a variety of space sustainability issues and initiatives are not always clear, even to those focused on this field.

To address this, Secure World Foundation held the first Summit for Space Sustainability on June 25-26 at the National Press Club in Washington, DC. This event was a high-level multi-day event focused on developing solutions for space sustainability and encompassed a cross-section of issue areas, including space debris, space situational awareness, space law and policy, space governance, national and international space security, and the use of space for human and environmental security on Earth. The event explored current trends, highlighted complementarities, and promoted next steps in these specific areas. With the aim of stimulating fresh ideas and dialogue, the Summit combined thought-provoking and diverse perspectives, including international viewpoints not often heard in the United States, with innovative programming to encourage thinking, participation, and solution-building. Keynote speakers included NASA Administrator Jim Bridenstine, Director of the Office of Space Commerce Kevin O'Connell, and CEOs Dan Hart and Matt Desch of Virgin Orbit and Iridium respectively.



SWF'S HANDBOOK FOR NEW ACTORS IN SPACE SPANISH TRANSLATION

FOCUS AREA: SPACE SUSTAINABILITY

PROGRAM MANAGER: KRYSTAL WILSON

In 2017, SWF published the *Handbook for New Actors in Space*, a resource intended to provide nations, established satellite operators, start-up companies, universities, and other space actors with a broad overview of the fundamental principles, laws, norms, and best practices for peaceful, safe, and responsible activities in space.

In 2019, SWF collaborated with the Agencia Espacial Mexicana (AEM) to develop a Spanish translation of the *Handbook for New Actors in Space*. This translation will enable greater dialogue on space sustainability issues in Spanish-speaking regions of the world. The PDF version is available on the [SWF website](#), free of charge.



CONTRIBUTING TO PROJECTS DEFINING THE LAW OF ARMED CONFLICT IN OUTER SPACE

FOCUS AREA: SPACE POLICY & LAW

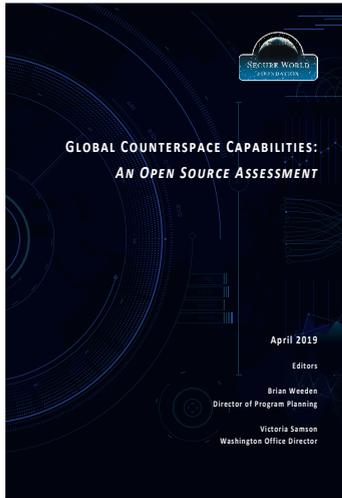
PROGRAM MANAGERS: CHRIS JOHNSON AND BRIAN WEEDEN

Concerns about potential conflict in space, and the lack of agreement or understanding on the application of existing legal principles has emerged as a critical issue in space security. While large bodies of legal knowledge and interpretation exist for the land, maritime, and air domains, no such body exists for space. SWF staff are participating in two ongoing projects clarifying the existing legal principles applicable to military uses in space, including during times of peace, rising tension, and armed conflict.

SWF Space Law Advisor Christopher Johnson serves as a Core Expert and Rule Drafter in the Manual on International Law Applicable to Military Activities in Outer Space (MILAMOS) project, aimed at restating and clarifying relevant and applicable sources of law during times of peace and rising tension in outer space. The MILAMOS project is headed by the Centre for Research in Air and Space Law at McGill University in Montreal, Canada, and includes partner universities from Australia, China, Germany, India, Russia, and the United States. The MILAMOS project expects to finalize its manual in 2020.

SWF Director of Program Planning Dr. Brian Weeden serves as a Technical Expert on the Woomera Manual project, aimed at restating and clarifying relevant and applicable sources of law during armed conflict in outer space. The Woomera Manual project is led by Universities in Australia, the United Kingdom, and the United States.

2019 PROGRAM SPOTLIGHTS



COUNTERSPACE RESEARCH AND OUTREACH

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. In order to increase transparency and dialogue about these capabilities, SWF was proud to publish in April 2019 the second annual edition of its Global Counterspace Capabilities threat assessment. This version added information about new issue areas and major events that happened in 2018 through early 2019, including new rendezvous and proximity operations being conducted in the geosynchronous Earth orbit region by the United States, Russia, and China, and preliminary details about the March 2019 Indian ASAT test. As well, in June 2019, SWF was a co-organizer of the 5th Prague Security Studies Institute space security conference. "Evolution of the Counterspace Threat and Strengthening of International Space Partnerships," held in Prague, Czechia, focused on the rapidly advancing threats to space operations and the role of space partnerships in addressing – and, hopefully, mitigating – this higher risk environment.

SPACE SITUATIONAL AWARENESS

FOCUS AREA: SPACE SUSTAINABILITY

PROGRAM MANAGER: BRIAN WEEDEN

Space Situational Awareness (SSA) – information about the space environment and human activities in space – has grown in salience in recent years. In 2019, SWF saw strong interest from some countries in establishing their initial SSA capabilities as well as others such as the United States and Russia in improving their existing SSA capabilities. In January 2019, SWF partnered with the Korean Space Agency (KARI) to hold a workshop in Seoul, South Korea, to help establish dialogue with international experts and inform potential future Korean SSA policy and capabilities. In September, we continued our work with the Advanced Maui Optical and Space Surveillance Technologies (AMOS) Conference by once again helping to organize a set of international policy discussions relevant to SSA. The 2019 AMOS Policy Forum topics included discussions of potential future options for space traffic management, norms of behavior and licensing for large satellite constellations, and the role of open access data repositories to improve SSA data sharing. We also held our annual invite-only AMOS Policy Dialogue to discuss open access data repositories and SSA data sharing with key stakeholders from industry, governments, and academia.

COMMERCIAL SPACE ENGAGEMENT

FOCUS AREA: SPACE SUSTAINABILITY

PROGRAM MANAGER: IAN CHRISTENSEN

SWF continues to engage with the growing and diversifying commercial space sector – focusing on both the policy context for new commercial space applications areas and on how to encourage responsible space behavior in commercial activities. Since 2015, the topic of private sector access to, development, and utilization of space resources has attracted considerable attention in national and multilateral space policy fora. Our involvement is driven not only by the near-term legal and policy questions of space resources utilization, but also in recognition of the long-term potential of space resources as a key enabler of an expanding space economy and the need to provide a stable and responsible legal regime to enable such an economy. Accordingly, in many of the multilateral policy discussions surrounding development of space resources, the question of socioeconomic benefits has emerged as a key theme. In May 2019, SWF partnered with the South African National Space Agency to organize a Workshop on “SocioEconomic Benefits of Space Resources Utilization - African Perspectives.” The workshop, which took place in Pretoria, South Africa, brought together diplomats and space agency representatives from several African countries (including Algeria, Ethiopia, Kenya, Nigeria, South Africa and the African Union) and experts from the terrestrial mining, space agency, space industry and academia to discuss questions of space resources benefits in the developing/emerging space nation context.



Developing and encouraging responsible commercial space operations practices includes more than the regulatory and operator community. In July 2019, Secure World Foundation, in partnership with Japan's Spacetime Foundation, organized a “Workshop on the Role of the Investor and Lender Sector in Incentivizing Responsible Space Behavior” in Tokyo. Participants included a range of public and private sector investors from Japan, Europe, and the United States; government agencies involved in Japanese commercial space related policy; and a mix of early stage space companies from both Japan and the U.S. A key theme that emerged from the discussion was the importance of establishing responsible behavior early in the culture of a company, and the role investors and existing companies can play in spreading that operations culture across a growing and diversifying space community. This event was part of a continuing series SWF is organizing with local partners to capture perspectives on the topic of the investors’ role in encouraging responsible behavior from varied communities around the globe.



2019 PROGRAM SPOTLIGHTS

YOUNG PROFESSIONAL SUPPORT

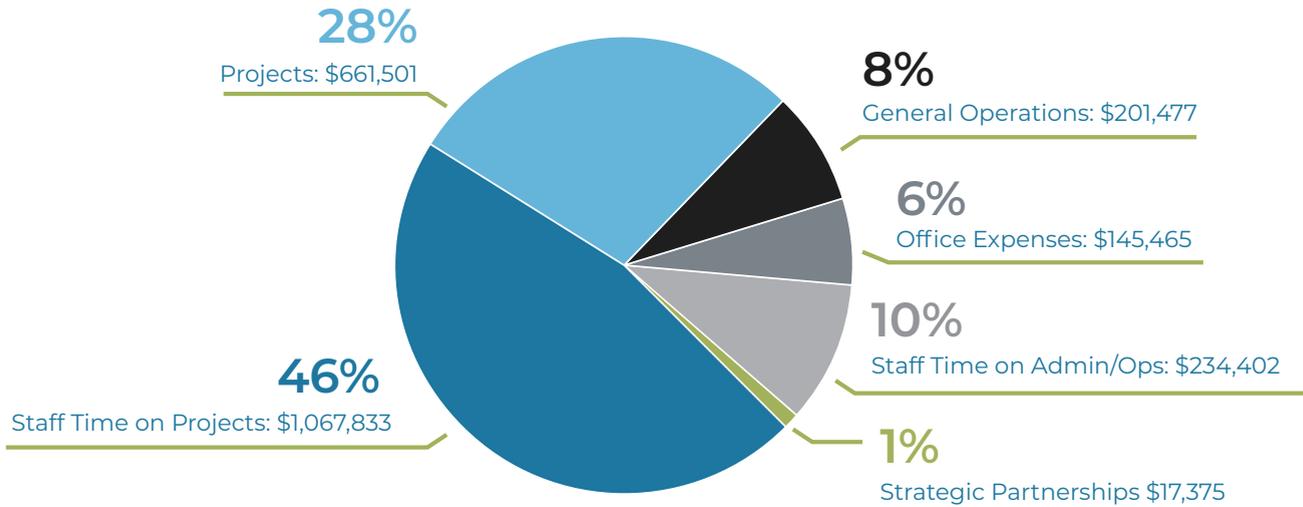
FOCUS AREA: OUTREACH

PROGRAM MANAGER: JOSH WOLNY

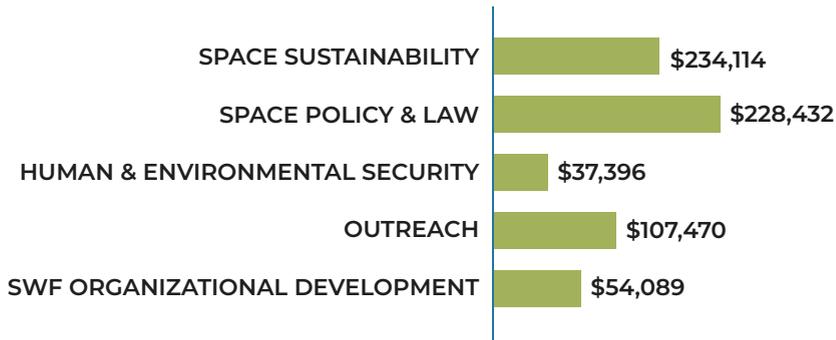
SWF seeks to engage with students and young professionals to encourage the next generation of leaders to value and act on space sustainability. The Space Generation Advisory Council (SGAC) is our most substantial partner in this effort. SGAC maintains a global network of more than 15,000 members across more than 150 countries and organizes multiple events across globe and year. SWF directly sponsors, helps plan, and participates in SGAC's Space Generation Fusion Forum (SGFF) and Space Generation Congress (SGC), both held on the side of the Space Symposium and International Astronautical Congress, respectively. At SGFF, SWF staff served as moderator and subject matter experts in the breakout groups where they discussed the confluence of space sustainability and space security with students and young professionals. At the SGC, SWF organized and moderated a working group on Space and Global Health. Outside experts joined to discuss the use of space data for epidemiology and other space assets for impacting health outcomes around the world. Finally, SWF also organizes a yearly scholarship competition for students and young professionals with accepted abstracts to the IAC. The 2019 winners hailed from Austria, Brazil, Canada, Denmark, India, Italy, Kenya, the Netherlands, Nigeria, Peru, Romania, and the United States.



2019 FINANCES



2019 PROJECT EXPENDITURE





Seated (from left): Dr. Xavier Pasco, Dr. Peter Martinez, Ms. Laura Delgado Lopez, Ms. Tiffany Chow, Ms. Krystal Wilson, Mr. Josh Wolny, Maj. Gen. Jay Santee, Ms. Elizabeth Blevins
 Standing: Dr. Mazlan Othman, Mr. Richard DalBello, Ms. Jihan Asher, Mr. Ian Christensen, Mr. Chris Johnson, Dr. Raji Rajagopalan, Ms. Victoria Samson, Dr. Brian Weeden, Ms. Cynda Collins Arsenault, Ms. Lisa Croy, Ms. Adrian Pasco
 Not pictured: Mr. Marcel Arsenault, Dr. Andrew Aldrin, Dr. Angie Buckley, Ms. Tanja Masson-Zwaan, Mr. William V. Parker, Mr. Chris Ludwig, and Ms. Nicole Nir.

OUR TEAM 2019

PETER MARTINEZ, PhD • EXECUTIVE DIRECTOR

- BRIAN WEEDEN, PhD
DIRECTOR OF PROGRAM PLANNING
- VICTORIA SAMSON
WASHINGTON OFFICE DIRECTOR
- CHRISTOPHER JOHNSON
SPACE LAW ADVISOR
- IAN CHRISTENSEN
DIRECTOR OF PRIVATE SECTOR PROGRAMS
- KRYSTAL WILSON
DIRECTOR OF SPACE APPLICATIONS PROGRAMS
- JOSH WOLNY
PROJECT MANAGER
- LISA CROY
OPERATIONS DIRECTOR
- TIFFANY CHOW
DIRECTOR OF STRATEGIC PARTNERSHIPS
- ELIZABETH BLEVINS
ASSISTANT TO THE EXECUTIVE DIRECTOR
- JIHAN ASHER
OPERATIONS AND COMMUNICATIONS ASSOCIATE
- NICOLE NIR
HUMAN RESOURCES MANAGER
- CHRISTOPHER LUDWIG
ACCOUNTANT

OUR BOARD 2019

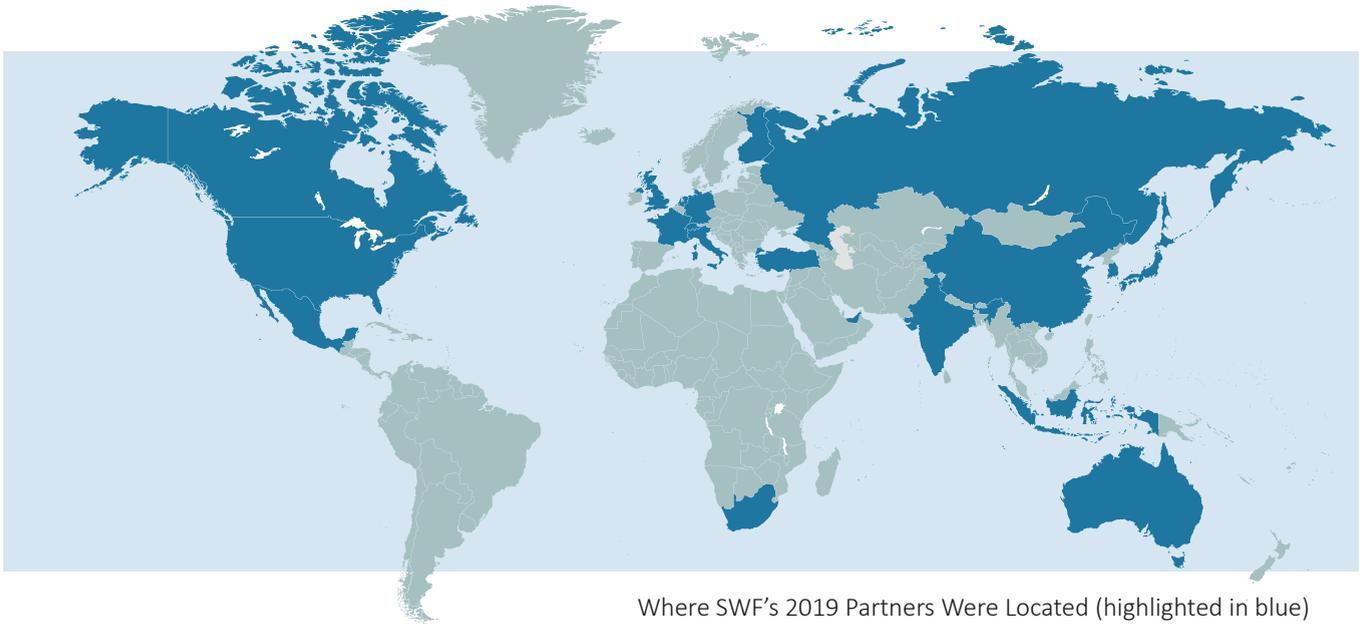
- CYNDA COLLINS ARSENAULT
CO-FOUNDER,
BOARD PRESIDENT
- MARCEL ARSENAULT
CO-FOUNDER,
BOARD VICE PRESIDENT, TREASURER
- ANGIE BUKLEY, PhD
COMMUNITY BOARD MEMBER
- ANDREW ALDRIN
BOARD SECRETARY

OUR ADVISORY COMMITTEE 2019

- RICHARD DALBELLO
VIRGIN GALACTIC
VIRGIN ORBIT
- MAZLAN OTHMAN, PhD
ACADEMY OF SCIENCES,
MALAYSIA
- RAJESWARI PILLAI
RAJAGOPALAN, PhD
OBSERVER RESEARCH
FOUNDATION
- LAURA DELGADO LOPEZ
NASA SCIENCE MISSION
DIRECTORATE
- XAVIER PASCO, PhD
FONDATION POUR
LA RECHERCHE
STRATÉGIQUE
- GUOYU WANG, PhD
BEIJING INSTITUTE OF
TECHNOLOGY
- TANJA MASSON-ZWAAN
LEIDEN UNIVERSITY
- MAJ. GEN. JAY SANTEE
(RETIRED)
AEROSPACE
CORPORATION
- 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 2019 we partnered with over 100 entities from around the world.



Where SWF's 2019 Partners Were Located (highlighted in blue)



Secure World Foundation has been a great partner and ally of the space weather community.

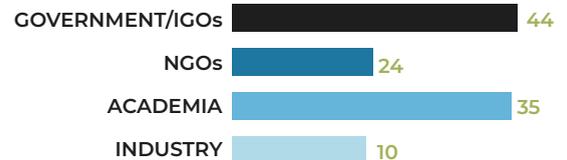
- Director at NOAA

2019 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 Advisory Committee Member Mazlan Othman took the Secure World Foundation Logo on a 10-day hike to summit Gokyo Peak at 5360m (17,600 ft) in the Himalayas.



SWF's 2019 Partners by Major Sectors



swfound.org

CO Headquarters

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