

The Impact of Space on Nuclear Deterrence

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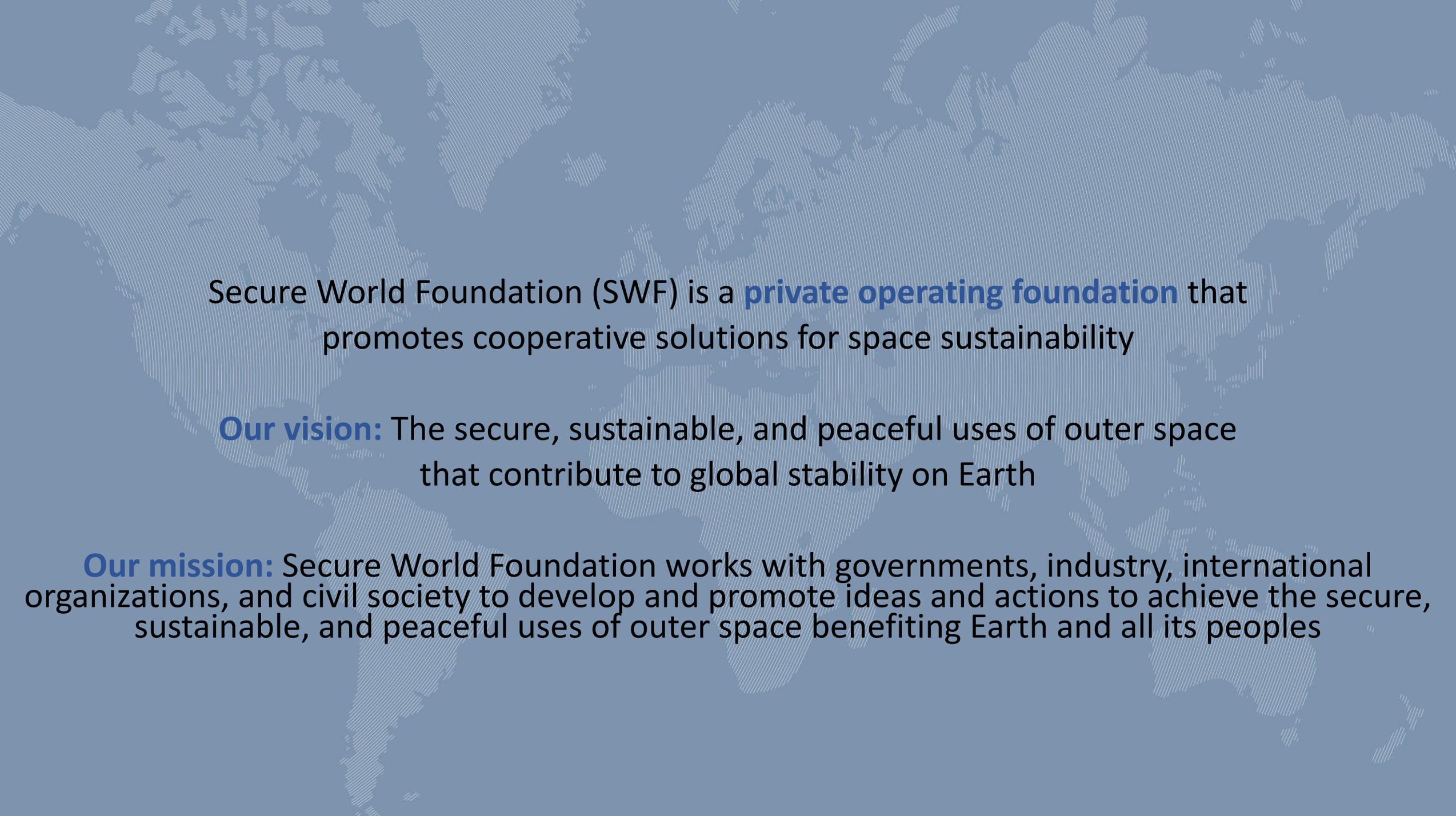
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Secure World Foundation (SWF) is a **private operating foundation** that promotes cooperative solutions for space sustainability

Our vision: The secure, sustainable, and peaceful uses of outer space that contribute to global stability on Earth

Our mission: Secure World Foundation works with governments, industry, international organizations, and civil society to develop and promote ideas and actions to achieve the secure, sustainable, and peaceful uses of outer space benefiting Earth and all its peoples



2022 Global Assessment

	U.S.	Russia	China	India	Aus.	France	Iran	Japan	North Korea	South Korea	U.K.
LEO Co-Orbital	■	▲	■	●	●	●	●	●	●	●	●
MEO/GEO Co-Orbital	■	▲	■	●	●	●	●	●	●	●	●
LEO Direct Ascent	■	▲	▲	■	●	●	●	●	●	●	●
MEO/GEO Direct Ascent	■	▲	■	●	●	●	●	●	●	●	●
Directed Energy	■	▲	■	●	●	■	●	●	●	●	●
Electronic Warfare	▲	▲	▲	■	●	■	■	●	■	●	●
Space Situational Awareness	▲	▲	▲	■	■	■	■	■	●	■	■

Legend: none ● some ■ significant ▲

TABLE 5-1 – ORBITAL DEBRIS CREATED BY ASAT TESTS IN SPACE



DATE	COUNTRY	ASAT SYSTEM	TARGET	INTERCEPT ALTITUDE	TRACKED DEBRIS	DEBRIS STILL ON ORBIT	TOTAL DEBRIS LIFESPAN
Oct. 20, 1968	Russia	IS	Cosmos 248		253	79	50+ years
Oct. 23, 1970	Russia	IS	Cosmos 373		147	35	50+ years
Feb. 25, 1971	Russia	IS	Cosmos 394		117	52	50+ years
Dec. 3, 1971	Russia	IS	Cosmos 459		28	0	3.3 years
Dec. 17, 1976	Russia	IS	Cosmos 880		127	58	45+ years
May 19, 1978	Russia	IS-M	Cosmos 970		72	64	40+ years
Apr. 18, 1980	Russia	IS-M	Cosmos 1171		48	5	40+ years
Jun. 19, 1982	Russia	IS-M	Cosmos 1375		62	59	35+ years
Sept. 13, 1985	U.S.	ASM-135	Solwind	530 km	285	0	18+ years
Sept. 5, 1986	U.S.	Delta 180 PAS	Delta 2 R/B		16	0	< 1 year
Dec. 26, 1994	Russia	IS-M	Unknown		27	24	25+ years
Jan. 11, 2007	China	SC-19	FengYun 1C	880 km	3527	2763	15+ years
Feb. 20, 2008	U.S.	SM-3	USA 193	220 km	174	0	1+ year
Mar. 27, 2019	India	PDV-MK II	Microsat-R	300 km	128	1	2+ years
Aug.-Dec. 2019	Russia	Cosmos 2535	Cosmos 2536		27	14	3+ years
Nov. 15, 2021	Russia	Nudol	Cosmos 1408	470 km	1402	1225	Unknown
Total					6349	4379	



Norms in Space Governance

- Much of the existing space governance framework is based on norms
 - Example: Freedom of overflight for satellite reconnaissance
 - Launch of Sputnik in 1957 helped set the norm that satellite overflight did not breach territorial sovereignty
 - By mid-1960s, freedom of overflight was a generally accepted norm
 - Was not codified into “hard law” until Outer Space Treaty of 1967
- For the moment, space governance discussions focus on establishing new norms of behavior, not binding agreements/treaties
 - Far more space actors than ever before, with diverse interests and goals
 - Increasingly challenging to get global consensus on new “hard law”
 - Several major space powers (including United States) resistant to any discussion of binding agreements

Questions?

Thanks.

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