The Growing Significance of Outer Space

Victoria Samson, Chief Director, Space Security and Stability, Secure World Foundation

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"The Evolution of Outer Space Security in an Era of Growing Insecurity"

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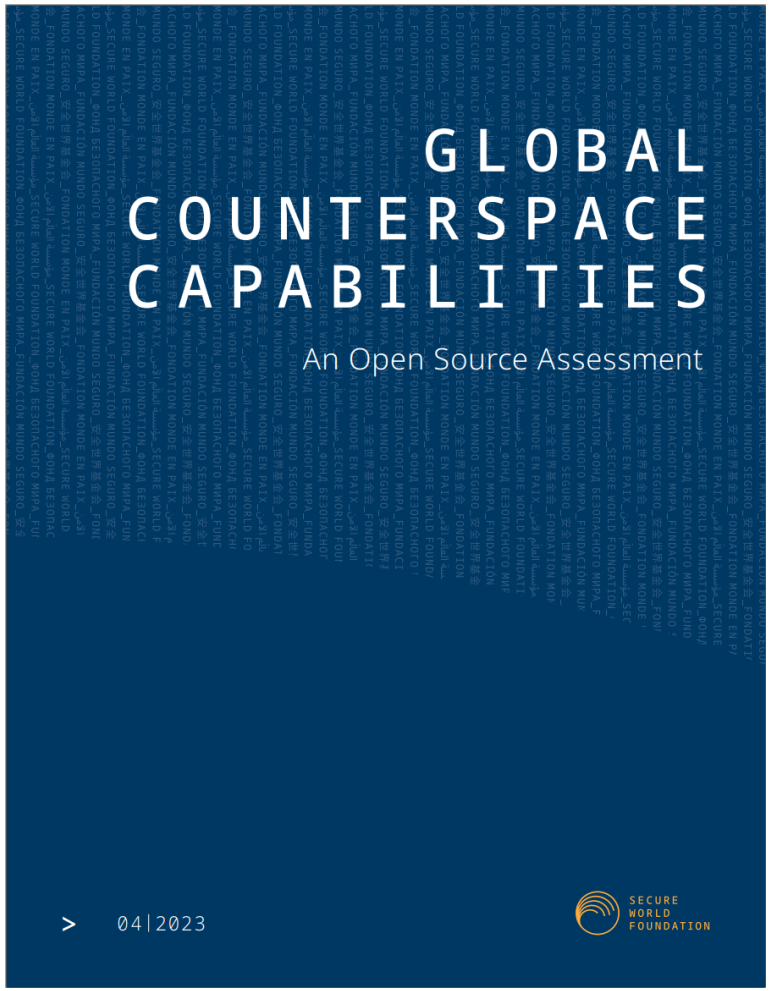
SECURE WORLD FOUNDATION

Space Security Portal (https://spacesecurityportal.org/): an interactive map of global space governance landscape

SWF's Global Counterspace Capabilities: An Open Source Assessment: examines counterspace capabilities for a dozen countries across five different categories, plus space situational awareness capabilities, and includes information about space security policies/strategies/budgets



https://swfound.org/counterspace

- Space has always been a part of strategic stability
  - Satellites for verification of national technical means
  - Space for national prestige – geopolitical competition

- What has changed is the incorporation of space into a broad variety of capabilities
  - Key national security enabler for increasing number of countries
  - Part of how economies function – driver of socioeconomic development
  - Infrastructure provides resiliency independent of disasters

- Democratization of access to space

- Do not need to have a space program to be affected by strategic security issues

- Not just nuclear C2 satellites in GEO that can shape strategic stability

Counterspace Capabilities

Co-orbital: systems that are placed into orbit and then maneuver to approach the target to attack it by various means, including destructive and non-destructive

Direct-Ascent: systems that use ground, air-, or sea-launched missiles with interceptors that are used to kinetically destroy satellites through force of impact, but are not placed into orbit themselves

Directed Energy: systems that use focused energy, such as laser, particle, or microwave beams to interfere or destroy space systems

Electronic Warfare: systems that use radiofrequency energy to interfere with or jam the communications to or from satellites

Cyber: systems that use software and network techniques to compromise, control, interfere, or destroy computer systems

Space Situational Awareness: knowledge about the space environment and human space activities that enables both offensive and defense counterspace operations

2025 Global Assessment

	US	RUSSIA	CHINA	INDIA	AUS.	FRANCE	IRAN	ISRAEL	JAPAN	N. KOREA	S. KOREA	UK
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 ▲ UNCERTAIN ? NO DATA –

RPOs and effects on space security

- Rendezvous and proximity operations (RPOs): potential for (inadvertent) escalation
  - Unclear as to intention, hence SWF's inclusion of it as a co-orbital counterspace capability
- Not as easy to make hard and fast requirements about
  - Other domains can make rules about how close is too close, but due to orbital dynamics, this doesn't always translate into space issues
- Different risk assessments by different actors in space
- Very few hard "rules" about what is and isn't allowed
  - Helpful to have an understanding about what types of RPOs various actors deem concerning, possible situations where notifications could be given and how to go about doing this
  - Coming storm: very large constellations

Very large constellations and strategic stability

- Make up most of the current and future satellites in orbit
  - SpaceX's Starlink: 9100, 15,000 planned (+ 30,000 more?)
  - China: Guowang: roughly around 104, 13,000 planned
  - China: Thousand Sails (Qianfan) around 108, 15,000 planned

- Possibility for an incident between two operators to escalate to the point where it affects strategic stability

- Concern about these constellations hampering access to certain orbits; seeing effectively spectrum grab
  - Carrying capacity not as helpful a metric for this – risk tolerance is what guides this

SSA as a transparency mechanism

- Space situational awareness (SSA): monitor and characterize the space environment and human activities
  - Key factor in verifying activities in orbit and limiting how escalatory they are perceived
  - Can help establish what is anomalous behavior

- SSA is helpful for identifying certain kinds of threats in orbit but not all
  - Strongest in terms of helping determine whether or not an action occurred in orbit
  - Does not help in identifying *why* an action occurred

- No single universally agreed-upon pool of SSA data/catalogue
  - More catalogues means more options for objective confirmation of activities (and this is where the commercial sector fits in) but also more room for different assessments
  - Complicated by different maturity of users of SSA data plus hazards like space weather

Changing nature of activities and actors on the Moon is potentially destabilizing

- Seeing an increase in the number of actors on the Moon
  - Many of the actors' landing sites and areas of interest overlap
- Seeing commercial actors and activities
  - Possibility of misunderstanding government intentions and plans
- Artemis Accords vs International Lunar Research Station?
  - Seeing two governance regimes rising – still TBD to see if they will be competing or complementary
- No place in multilateral fora for discussion of cislunar security issues – but there should be

Questions?

Thanks.

Victoria Samson,
vsamson@swfound.org

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