

## To Deter in Space, the US Needs On-Orbit Parity

By

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Space forms an infinite supranational common, which, as ultimate high ground, envelops the Earth and offers significant opportunity positive or negative use. Whoever can achieve on-orbit military superiority has the potential to surround their adversary. Earth's orbit is already littered with too much [debris](#) from a handful of [anti-satellite tests](#) and debris-generating events and has the potential to become close to unusable if Russia or China were to employ offensive capabilities against American and allied satellites.

Russia's [coercive but indiscriminate](#) "Sputnuker" concept lies at one end of a spectrum of potential space-based nuclear weapons. The remainder of the spectrum also offers significant offensive capabilities that could make space a very difficult place for the United States.

Positioning nuclear weapons in space would violate the [Outer Space Treaty](#) (1967). However, Moscow or Beijing gain significant coercive capability against the United States should they move forward with such a capability.

At least three classes of nuclear weapons could, potentially, be based in orbit. Any such weapon is likely to be disguised as some non-military type of spacecraft.

The first class of nuclear weapons in space are those in low Earth orbit. They are detonated from a position where they can disable adversary satellites. One or a small number of devices could create a wide-ranging electromagnetic pulse, which, by disabling satellites, could also cause an immense zone of debris along with a longer-lasting cloud of high-energy charged particles.

The combined effects would likely degrade this region of space for an extended duration. Spacecraft transiting low Earth orbit would also face the risk of a collision with orbiting debris.

Moscow or Beijing, if at a serious disadvantage to the United States during a conflict, may "escalate to win," setting off nuclear weapons to wreak as much havoc in space as possible. This "scorched space" tactic would seek to level the playing field and slow American efforts to both mobilize force and command and control those forces.

The second class of nuclear weapons in space are those used for ground attacks. If, for example, intercontinental ballistic missile reentry vehicle-like weapons were covertly stationed on-orbit, their launch would be difficult to track. Such a weapon placed in low Earth orbit would strike a ground target in a matter of minutes.

Third are fission reactors based in orbit to power directed-energy weapons firing microwave, infrared, or optical laser beams. These travel at the speed of light, simplifying fire control. Out in the vacuum of space, a directed-energy beam would not suffer blocking or bending due to smoke, clouds, or atmospheric refraction.

With their reactors generating power, they do not need conspicuous and vulnerable solar panels. Firing energy pulses, they do not use chemical propellants or kinetic projectiles, and so do not run out of ammunition. Their fissionable fuel can last decades.

Their pinpoint, medium-power beams could at least temporarily blind or cripple soft or semi-hardened satellites over tremendous engagement ranges, and with much less collateral damage than a nuclear blast or conventional anti-satellite weapon. A small constellation of these

systems could give Russia or China offensive and defensive coverage. Fortunately, there is no evidence either adversary is developing such a weapon at present.

Current and future American presidents are unwise to dismiss the dangers posed by these different classes of space-based nuclear weapons. To deter adversaries, in some cases, rough parity via on-orbit basing may be required.

For spaced-based nuclear weapons targeting American and allied satellites, the United States' dominance in space-based surveillance, reconnaissance, and communications make space-attack attractive. Should the United States perfect ballistic missile defenses and integrated air and missile, launching nuclear weapons from space toward ground targets may also prove an attractive option.

In many respects, the above discussion is prospective in contemplating how Russia and/or China might use nuclear weapons in space, but it is far from science fiction. For Western defense analysts, playing the part of futurist is a proactive approach to protecting American vital interests. Congressman Mike Turner's [open concern](#) over intelligence suggesting that Russia may place nuclear weapons in space is only one example of Russian interest in weaponizing the domain.

The United States understands Chinese capabilities less well than those of Russia and their plans are even more difficult to predict. This leaves President Biden and his successors in a difficult position in the years ahead. Space is certainly a domain that will see weaponization sooner rather than later. For Americans, the question remains, who will dominate space?

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