Statecraft and Spacecraft

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AzurX Tech Ltd | Dubai International Financial Centre (DIFC)
Gate Avenue, PO Box 74777, Dubai UAE | https://www.azurx.com/

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Themes explored in this presentation

- Geopolitics, Diplomacy, and Space
- Who are the players?
- What are the issues?
- Are there possible solutions?
- The future: Astropolitics and Lunapolitics…or Astropolitik and Lunapolitik?

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The Geopolitics of Space

- Space is not ‘beyond’, or exempt from, geopolitics
- Cheaper and smaller space technologies has led to the “democratization” of space
- Space is no longer the sole preserve of Great Powers
- Space is a source – not just enabler – of economic and military power
- 21st century great and regional powers are space powers

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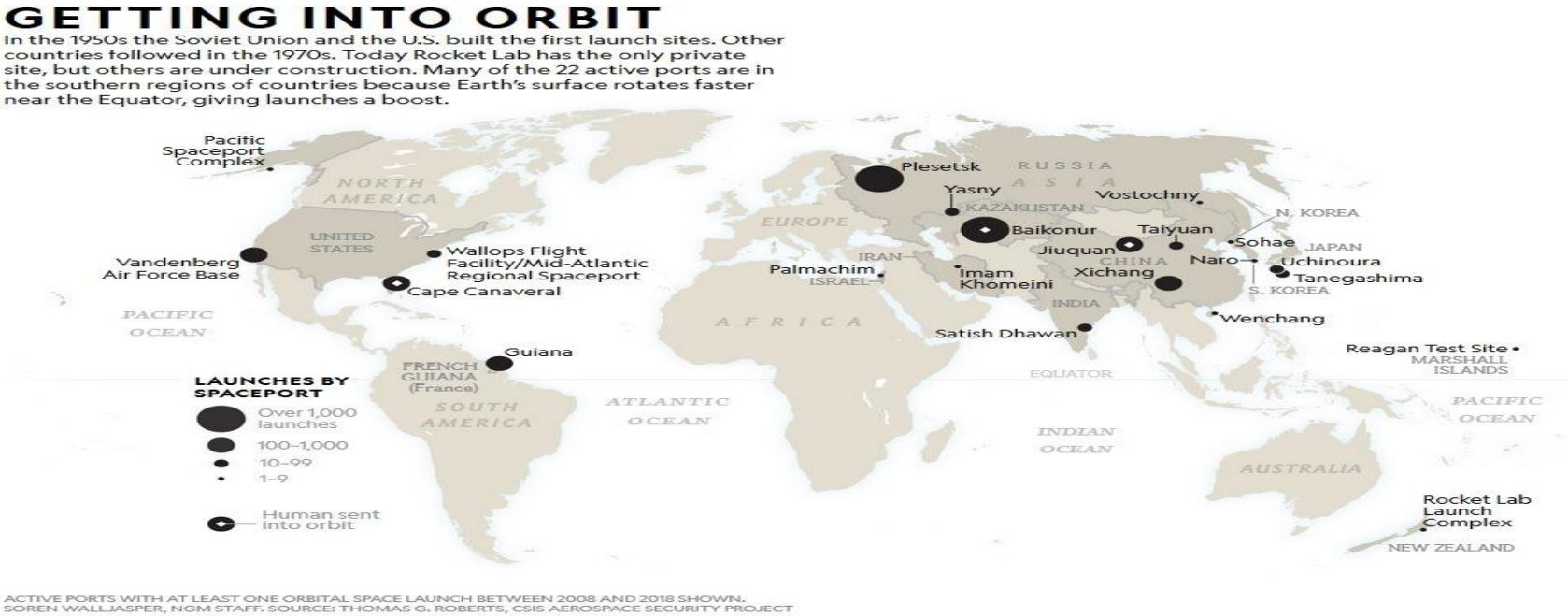
Chokepoints and Space Access



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The Return of Great Power Geopolitics and Space

- Rise of geopolitical tensions between U.S., China, and Russia is increasingly being felt in space
- Small window when global governance regimes seemed possible has closed
- Access to space increasingly viewed as a vital interest for many countries
- Ability (or perception of ability) to control space and derive military and economic power spurs counterspace initiatives by others to deny access
- These geopolitical imperatives drive perceptions that space has strategic utility and attributes

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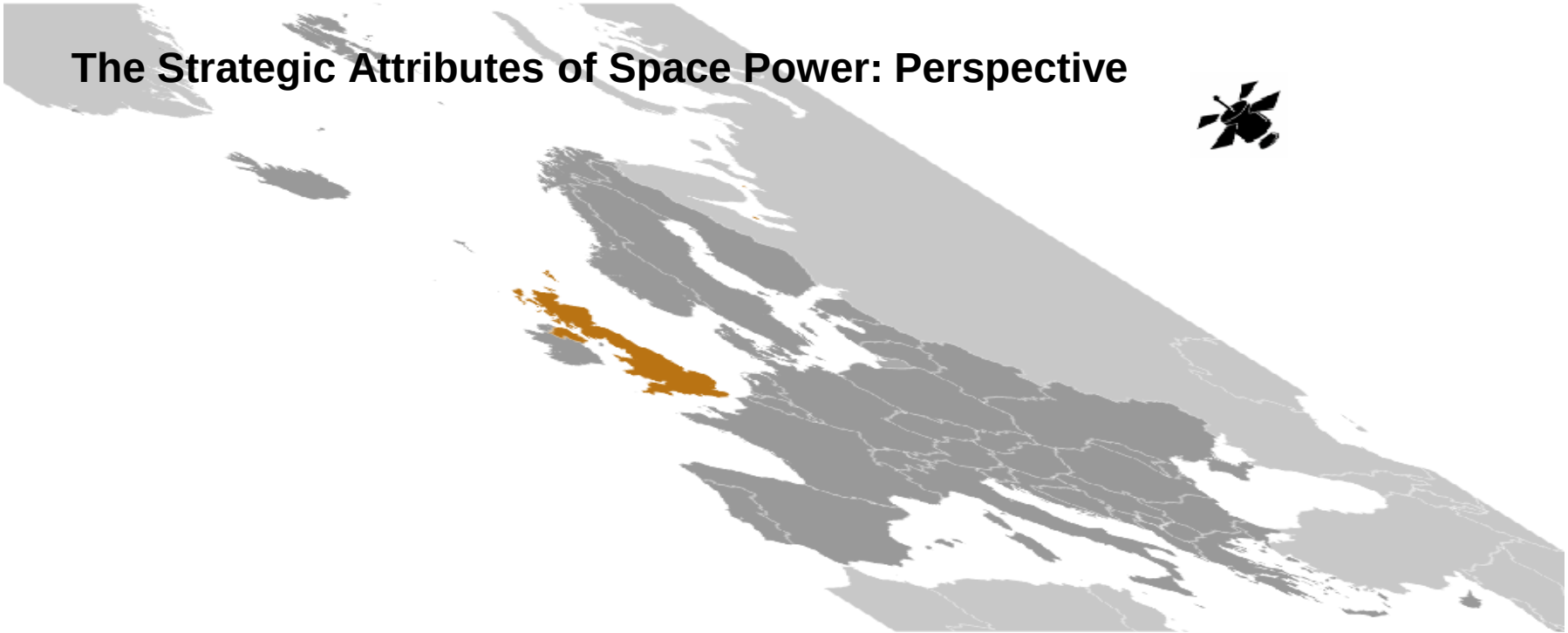
The Strategic Attributes of Space Power: Perspective



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The Strategic Attributes of Space Power: Perspective

- The ability to see and communicate at great distances both within and from your borders
- Perspective comes from wider view of Earth’s surface
- Strategic benefits of the high ground long recognized

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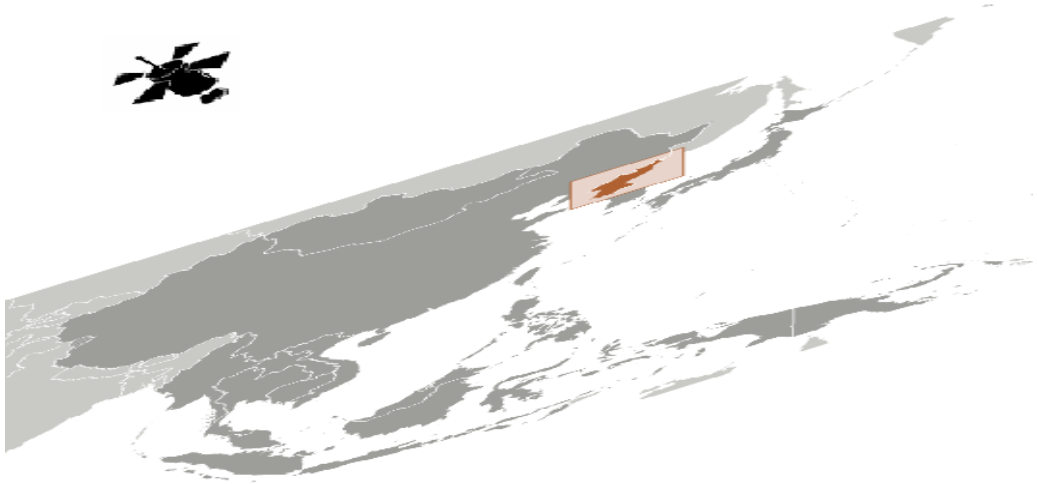
The Strategic Attributes of Space Power: Global Access



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The Strategic Attributes of Space Power: Global Access

- Flows directly from Perspective.
- Orbital mechanics, Earth’s rotation, & 1968 Outer Space Treaty legal regime combine to enable access from space to any point on Earth.
- Sovereignty cannot be claimed in space, but this has yet to be tested under duress.

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The Strategic Attributes of Space Power: Global Presence

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The Strategic Attributes of Space Power: Global Presence

- Flows directly from Perspective & Access
- Satellites in various orbits confer presence that sea and air power provide intermittently
- Satellites are ‘first on the scene’
- Satellites provide a global ‘eyes and ears’ to those who possess them.

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The Strategic Attributes of Space Power: Strategic Depth

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The Strategic Attributes of Space Power: Strategic Depth

- Flows from previous three attributes
- Space provides strategic depth on vertical flank
- This, in turn enhances horizontal strategic depth
- Trades physical space for time (preparation)
- Allows for qualitatively and quantitatively improved contingency planning and preparation

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The Strategic Attributes of Space Power: Technical Aspects

- **Versatility**: Satellites can be used for various functions – communications, PNT, strategic early warning, weather monitoring, damage assessment, surveillance, etc.
- **Ubiquity**: when linked to large constellations satellites can provide ubiquitous coverage.
- **Continuity**: Airplanes, ships, even uncrewed systems need replenishment – satellites operate 24/7/365 for many years.

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Global and Regional Space Powers: United States

- By far the most powerful and advanced space power
- By far the biggest spender on space
- The most militarily advanced space power
- Complacent yes, but not done for
- Competent across all aspects of space power
- Is still able to provide international leadership (e.g. Artemis)

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Global and Regional Space Powers: China

- Fastest growing space power, but still a long way to go
- Growing competencies across all aspects of space power
- Uses space to showcase its political and economic agendas
- Large international profile, rotten at space partnerships
- Increasingly reliant on space for military and economic power
- Huge ambitions but not ten feet tall

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Global and Regional Space Powers: Russia

- Proud heritage and legacy in space, a political touchstone in Russia
- Civil and military space programs plagued by corruption and quality control issues
- Until very recently Russian military had not integrated space deeply into its force structure
- Increasing boastfulness masks hollowed out programs
- Transactional partner, soon to be junior partner to China
- Still capable of causing trouble, diminished capacity is not a sufficient reason to underestimate Moscow

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Global and Regional Space Powers: France, India, Japan, Israel

- France is preeminent civil and military space power in Europe
- India on the cusp of becoming top four space power when human spaceflight program begins
- Japan is a robust space power, powerful industry, and big influence in Asian space geopolitics
- Israel still preeminent space power in Middle East, but losing ground to Arab programs and commercial sector is struggling

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Global and Regional Space Powers: Emerging Space Powers

- New Space is recasting space programs and activities in North American, European, and some Asian countries
- Democratization of space is leading to growing number of national space programs in developing world
- Africa: South Africa, Nigeria, Kenya, Rwanda, Ghana, Zimbabwe – many with help from China
- Middle East: UAE, Egypt, Algeria, Morocco, Qatar, Oman, Bahrain, Iran, and Saudi Arabia
- Also Bhutan, Nepal, Azerbaijan, Thailand, Taiwan and many others

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Contemporary Issues: Space Security and Space Weaponization

- Most high-profile issue but not necessarily most pressing
- Many countries have military space programs but most have no intention to weaponize
- United States, China, Russia, and India all have counterspace programs, but most focus on space denial rather than control
- Space weapons issue stuck in UN Conference on Disarmament for many years
- Direct-ascent ASAT’s appear to be political rather than useful weapons

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Contemporary Issues: Space Debris and Sustainability

- Arguably the most pressing issue
- Space debris caused by wasteful launch and satellite operational practices, collisions, and ASAT tests
- Emerging standards and national regulations necessary but not sufficient to curb problem
- Megaconstellations seen to compound problems, increase risk of collisions
- Current use of space not a sustainable path for future generations

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Contemporary Issues: Space Congestion

- Related to sustainability, Earth orbits are becoming congested
- Growing number of space actors and megaconsellations prime cause
- Space resource depletion such as less GEO orbital slots growing issue and cause for diplomatic contention
- Megaconstellations endanger astronomy and space science
- Could lead to potential test of existing space overflight rights in future conflicts

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Contemporary Issues: Spectrum Management and Allocation

- Related to congestion issue, spectrum is a pressured resource at national, regional, and global levels
- Spectrum governed by International Telecommunications Union at global level: more developing countries view ITU process as unfair and unreformable
- Spectrum often poorly understood and neglected by politicians, affecting ability to regulate effectively domestically and internationally
- One of several incentives to develop optical communication methods as well as methods to compress and parse existing spectrum

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Possible Solutions: Arms Control

- Seen by some as solution for space security issues and space weapons
- China-Russia PPWT proposal seen as a non-starter by U.S. and allies
- Historically, defining a space weapon has been impossible
- Skeptics argue that space weapons do not exist, also cite Colin Gray's paradox: when most needed arms control is impossible
- Even if successful, arms control regimes may drive counterspace innovation in unexpected ways and directions

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Possible Solutions: Space Norms

- Seen by some as practical alternative to arms control, though China and Russia are skeptical
- Proposed norms based on decades of space best practices by civil and commercial space activities
- Many iterations: EU Code of Conduct, U.S. proposals, in recent years; effort now led by the UK
- Critics argue norms cannot prevent spoilers and hard cases, and are not legally binding

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Possible Solutions: Regulatory Pressure

- Others argue commercial best practices, insurance criteria, and influential national regulations (a la EU's GDPR) can better manage global space issues
- Satellite companies accustomed to competing while tacitly cooperating with each other
- Space insurance companies only provide coverage contingent on debris mitigation, other best practices
- Similarly, FAA space launch regulation seen as international standard, requires operators to meet higher standards, contributes to sustainability over long term
- Critics unconvinced that actors such as China, Russia, and Iran will be constrained by this approach

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Possible Solutions: Technological Paths to Sustainability

- Still others believe that many space issues can be resolved through new and better technologies
- Modular satellites capable of being refueled can reduce congestions and sustain longer operational lifetimes
- Development of ‘green’ propulsion for launch and orbital station-keeping
- Better launch and satellite disposal methods reduce debris
- Critics point out that while laudable, such approach does not disincentivize space warfare

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The Future: Astropolitics

- Most space activities today are Earth-centric (brown water), but cislunar and deep space activities (blue water) are increasing
- Will mark shift from geopolitical to astropolitical focus
- Will not be a Star Trek moment: the human condition will not change as we expand human activity beyond Earth. We'll take our problems with this.
- States will compete just as fiercely in space as on Earth

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The Future: Lunapolitics

- In next decade there will be at least a dozen missions to the moon, crewed and uncrewed
- United States, China, Russia, South Korea, Japan, Australia, Canada, India, Turkey, UAE, Saudi Arabia, Ukraine, United Kingdom all plan to go to moon
- States, some through corporate proxies, will compete for resources and prime locations on the moon, particularly at its south pole
- Artemis Accords provide template for dealing with such competition, but China and Russia reject its premise

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Conclusion: Astropolitik and Lunapolitik?

- Geopolitics, Astropolitics, and Lunapolitics all natural, even healthy, outlets for competition
- Failure in statecraft, however, can lead to unnatural and unhealthy Astropolitik and Lunapolitik conditions
- As cislunar and deep space activity becomes cheaper and achievable legitimate interests of all actors must be acknowledged, not ignored

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