Overview of Space Governance and Norms of Behavior

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Space Sustainability Challenges

• Lots more stuff happening in space
  • Growing number & diversity of space actors (governments and commercial companies)
  • Growing number & diversity of space activities
• Negative externalities could have widespread impacts for everyone
• Very few hard “rules” about what is and isn’t allowed

How can we ensure space is usable for future generations and uses??
Growing number of countries in space

Source: Science and Technology Policy Institute (2015)
Emergence of large constellations

<table>
<thead>
<tr>
<th>Constellation</th>
<th>Total Sats</th>
<th>Altitude (km)</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starlink G1</td>
<td>4,408</td>
<td>550 – 560</td>
<td>US</td>
</tr>
<tr>
<td>OneWeb</td>
<td>6,372</td>
<td>1,200</td>
<td>UK</td>
</tr>
<tr>
<td>Starlink G2</td>
<td>30,000</td>
<td>340 – 614</td>
<td>US</td>
</tr>
<tr>
<td>Kuiper</td>
<td>7,774</td>
<td>590 – 650</td>
<td>US</td>
</tr>
<tr>
<td>GW</td>
<td>12,992</td>
<td>590 - 1145</td>
<td>China</td>
</tr>
<tr>
<td>Cinnamon</td>
<td>327,320</td>
<td>550 – 630</td>
<td>Rwanda</td>
</tr>
<tr>
<td>LightSpeed</td>
<td>1,969</td>
<td>1,015 – 1,325</td>
<td>Canada</td>
</tr>
</tbody>
</table>

Source: Jonathan McDowell (2021)
Source: ESA (2022)
Adding to already congested domain

Source: SpaceX FCC Filing
Expanding into cislunar space and beyond

Projected Exploration Missions (2020-2030)

- **International Space Station**: 152 Crew and cargo missions to LEO
- **Chinese Space Station**: 95 Missions to the Moon
- **Missions to Mars**: 7

**As of August 31, 2020**

Source: BryceTech
Space governance today

• 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
United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS)

- Main international body on space, source of the five major international space treaties
- 100+ State members, plus 40+ observers
- Current issues
  - Orbital Debris
  - Long-term sustainability of space activities
  - “Dark and Quiet Skies” (light pollution from large constellations)
  - Space Traffic Management
  - Space resources
  - Use of space for sustainable development on Earth
UN LTS Guidelines

• In 2010, the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) established the Working Group on the Long-Term Sustainability (LTS) of Outer Space Activities
  • The Working Group was tasked with producing a set of voluntary, non-binding guidelines for all space actors to help ensure the long-term sustainable use of outer space
• In June 2019, the COPUOS plenary officially adopted these 21 guidelines, and agreed to create a working group under the agenda item of “The Long-term Sustainability of Outer Space Activities” of the Scientific and Technical Subcommittee
• 92 Member States agreed on these guidelines
• Full text available in UN document A/AC.105/2018/CRP.20. The four major sections:
  • Policy and regulatory
  • Safety of space operations
  • Cooperation and capacity-building
  • Scientific and technical R&D
National-level governance

• Under Article VI of the Outer Space Treaty, each country bears international responsibility for their national space activities and is required to provide “authorization and continuing supervision,” including of the private sector

• Typically results in requirement to get a license from the govt
  • US: FCC (spectrum), NOAA (remote sensing), FAA (launch/reentry)

• Current discussions on “space traffic management”
  • Who has oversight of new/emerging commercial space activities and what does that regime look like?
  • What does “continuing supervision” mean?
The rise of “industry best practices”

- Space Safety Coalition
- Satellite Industry Association’s “Principles of Space Safety for the Commercial Satellite Industry”
- Consortium for Execution of Rendezvous and Servicing Operations (CONFERS)
- Aerospace Space Safety Compendium

- Space Data Association
- Paris Peace Forum’s Net Zero for Space
- eSpace Space Sustainability Rating
Big takeaways

• Governance is polycentric in nature (multiple centers of semiautonomous decision-making with overlapping authorities)
• Top-level principles but not a lot of agreement on interpretation or implementation
• Policymakers do not have a deep understanding of the underlying technologies
• Most of the existing system is predicated on human-in-the-loop operations and slow-moving bureaucratic processes
Thank you!

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