Space Development Policy

Space Policy Development

Brent Sherwood

Space Domain Lead

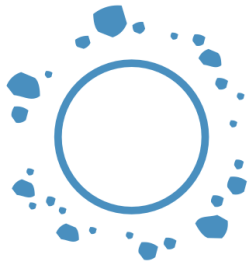
American Institute of Aeronautics and Astronautics

World Space Forum 2023, Vienna

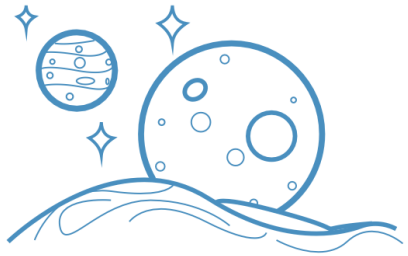
Space in the UN Summit / Pact of the Future

- More than 40% of the UN SDG targets leverage space observational data

Space Traffic Coordination



Space Debris



Space Resource Exploration

Conflict Prevention

- Harness benefits from rapid growth of space activity while mitigating risks
  - Frameworks for space sustainability
  - Prevention of an arms race in space
  - Inclusive governance approaches
  - Strengthened UN system collaboration

Change Indicators

- *Increasing* number of objects launched to orbit
- *Increasing* participation of the private sector
- *Increasing* commitments of public and private actors to return to deep space and enable long-term human interplanetary presence

*Our Common Agenda, Policy Brief 7, "*For All Humanity: the Future of Outer Space Governance", United Nations, May 2023

American Institute of Aeronautics and Astronautics

- World's largest professional technical society devoted to flight
  - 1963 merger of rocketry (from 1930) and aeronautics (from 1932) predecessors
  - From 91 countries, 95 corporate members and ~30,000 individual members
  - 7 regions, 57 sections, 71 technical committees, 21 integration/outreach committees
- Three strategic domains: Aeronautics, R&D, Space
- Space Domain priority areas
  - Space Traffic Management/Coordination — Space Traffic Coordination Task Force
  - Space Exploration
  - Competitive and Burgeoning Space Economy
  - Space Sustainability
  - Outpacing the Space Threat

  (Space Exploration, Competitive and Burgeoning Space Economy, Space Sustainability, Outpacing the Space Threat) — Cislunar Ecosystem Task Force

Examples of AIAA Technical Guidance

Best Practices guidelines

- “Satellite Orbital Safety Best Practices” white paper (Sep 2022)

Best Practices peer-reviewed, published, and used by NASA

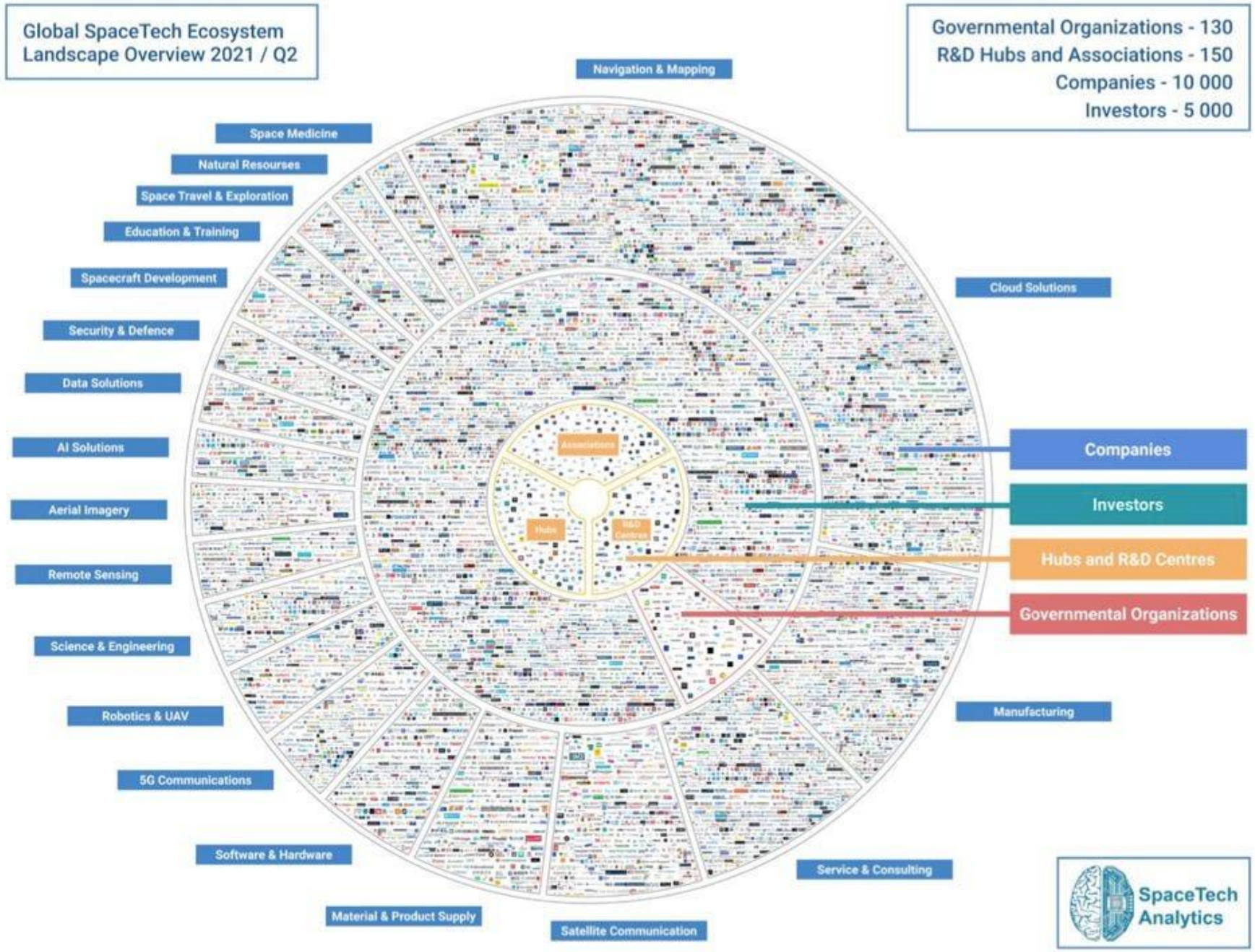
- Oh D, Goebel D, Hofer R, Snyder S. "Solar Electric Propulsion for Discovery Class Missions," *Journal of Spacecraft and Rockets* 51:5, 1822-1835. (AIAA, Dec 2014), doi: http://arc.aiaa.org/doi/abs/10.2514/1.A32889)

Formal standards

- Mass Properties Control for Space Systems (ANSI/AIAA S-120A-2015)

Space Policy Development in Global Context

- Simultaneous global sustainability challenges…
  - Energy
  - Clean water and air
  - Circular materials use
- …along with acceleration of technical innovations…
  - Networked Operations
  - Biomedical & Genetic
  - Nanotechnologies
  - Artificial Intelligence
- …cause us to reinvent how we think about and use space
  - Proliferation of capable actors
  - More private capital
  - Need for global interoperability
  - Reduction of the infinite



- 10,000 private space technology companies, more than half in the USA
- 5,000 large investors
- 150 R&D centers
- 130 state organizations
- 20 business sectors

Public-Private Partnerships at NASA

- Cargo services to/from the International Space Station
- Crew flights to/from the ISS
- Maturation of enabling technologies
- Commercial Lunar Payload Services
- Lunar Human Landing Systems
- Commercial Low Earth Orbit Destinations
- Space Suits
- Lunar Terrain Vehicle Services

Congest and Contest: Space is Not Infinite!

- EM spectrum
- Low Earth Orbits: debris, constellations, and Dark Sky
- Geosynchronous Longitudes
- Cislunar special places: EM L1, ±15˚ Lunar Exclusion Zone, Lunar Farside radio environment
- Lunar special places: Lunar Anthropocene, exosphere, polar sunlight, ice resources