Meeting the Challenge of New Actors in Space

Brian Weeden
Technical Advisor
Secure World Foundation

Who We Are

- Secure World Foundation ***is an endowed, private operating foundation*** that promotes cooperative solutions for space sustainability

- **Our vision:** the secure, sustainable and peaceful use of outer space that contributes to global stability on Earth

- **Our mission**: SWF works with governments, industry, international organizations and civil society to develop and promote ideas and actions for international collaboration that achieve the secure, sustainable, and peaceful uses of outer space for the socioeconomic and environmental benefits to Earth

Key focus areas

- **Space Sustainability:** mitigating environmental and human-generated threats to the long-term sustainability of space activities
- **Human and Environmental Security:** enhancing the use of space for socioeconomic benefits and security on Earth through improved governance and cooperation
- **Space Law and Policy:** supporting the development of national and international laws and policies to enhance the long-term sustainable use of space for benefits on Earth
- **Strategic Stability and Outer Space:** reducing the risk of accidents or misperceptions in space that could spark or escalate tensions

What's In Space Now

Satellite Quick Facts *(includes launches through 8/31/15)*			
Total number of operating satellites: 1,305			
United States: 549	Russia: 131	China: 142	Other: 483
LEO: 696	MEO: 87	Elliptical: 41	GEO: 481
Total number of U.S. satellites: 549			
Civil: 21	Commercial: 250	Government: 126	Military: 152

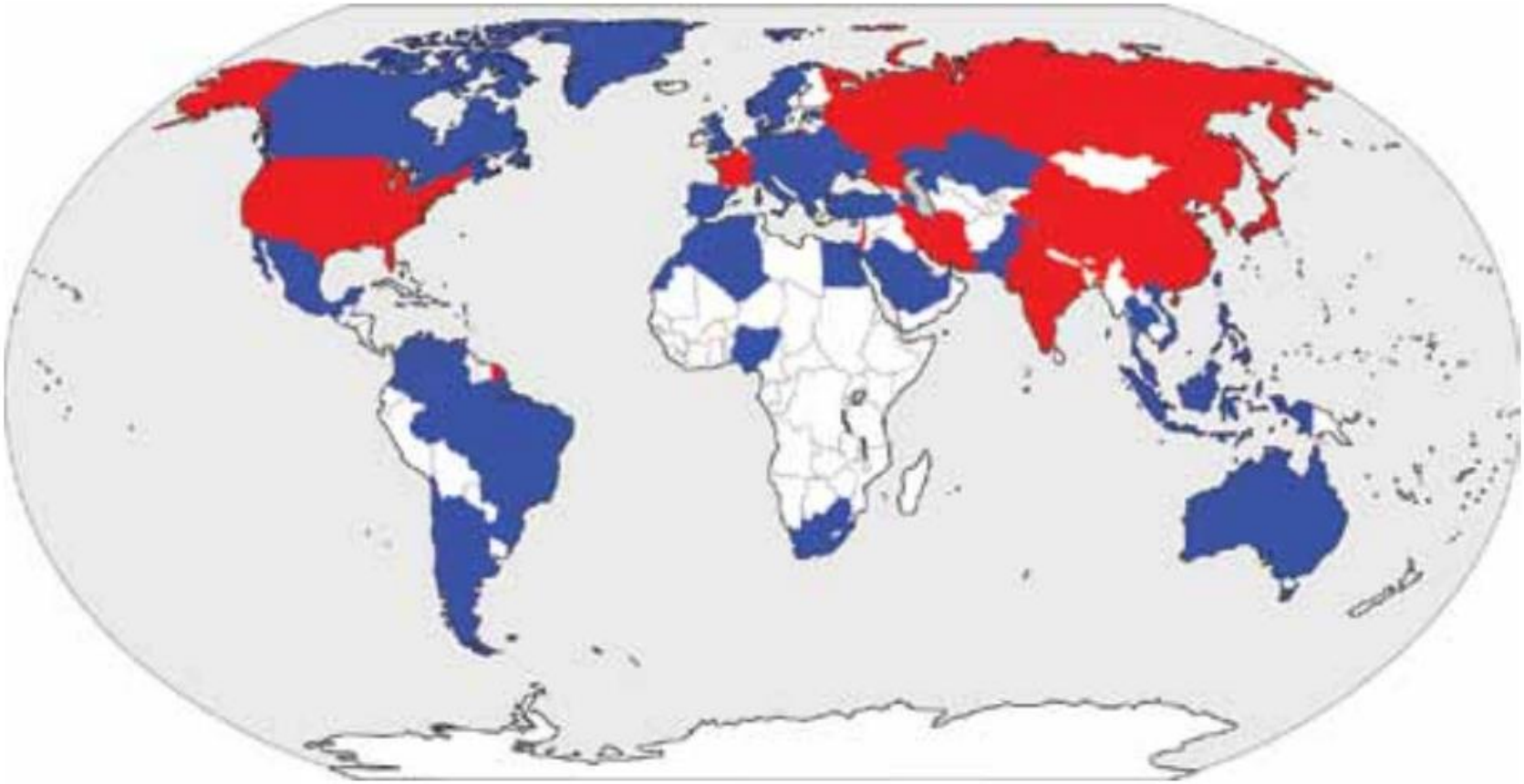
http://www.ucsusa.org/nuclear-weapons/space-weapons/satellite-database.html

The burgeoning commercial sector

- Massive explosion in active satellites
  - OneWeb: 648 smallsats (plus on-orbit spares) at 1200 km
  - Planet Labs: 105 3U cubesats at 475 km
  - Spire: 50+ cubesats at 600 km
  - SpaceX: 1,000 to 4,000 smallsats at 1100 km
  - Many, many more on the way

- Lots more opportunities to launch
  - 25+ smallsat-class launch vehicles currently proposed or under development

A much more international game



Key challenges

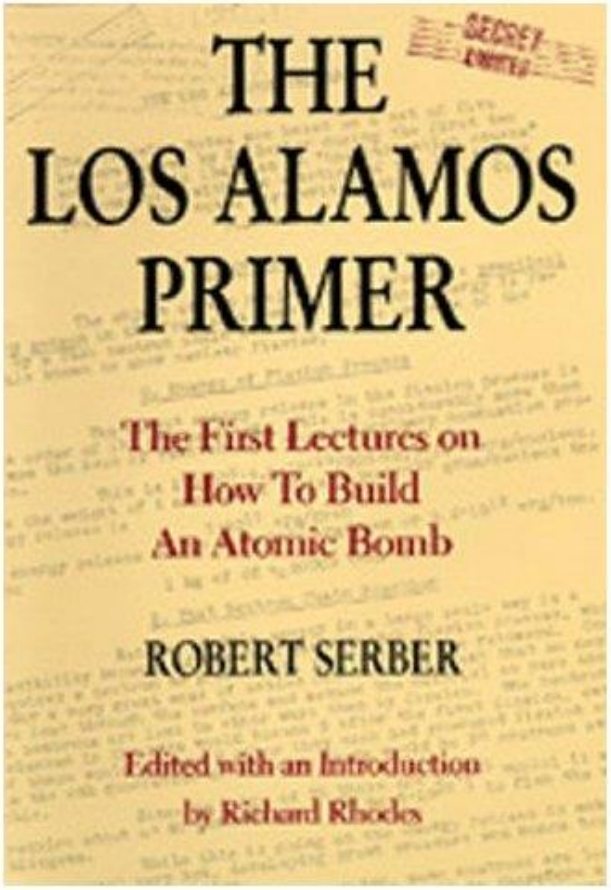
- Will all these new actors experience the same "learning curve" as the legacy actors?
  - Will they make the same mistakes, or just new ones?

- What sort of national policies and regulations should new spacefaring countries be adopting?

- How do we help maximize the benefits from new actors entering the space domain while minimizing potential sustainability challenges?

The Los Alamos Primer

- Collection of 5 essays given by Robert Seber in 1943
- Summed up the world's knowledge on nuclear fission
- Became entry level reading for all new scientists to the Manhattan Project



SWF Handbook for New Actors in Space

- **Proposal:** Create a publication that provides an overview fundamental principles, laws, norms, and best practices for safe, predictable, and responsible activities in space

- **Two specific audiences:**
  - Countries developing space programs and/or having to oversee and regulate their first satellites
  - Universities and start-up companies that are developing/operating satellites

Format

- Integrate legal, policy, and technical issues and perspectives
- Provide concrete examples, but not attempting to be exhaustive
- On emerging or contentious issues, attempt to present the main issues and viewpoints and refrain from advocacy on what should be done
- Goal is 100-130 pages in length, plan on a 5-year lifetime between revisions

Content (1)

- Chapter 1: International framework for space activities
  - Freedom of access, exploration, and use
  - State responsibility and liability
  - International cooperation
  - Remote sensing and radio broadcasting
  - Frequency coordination
  - International export control
  - International standards
  - Space debris mitigation and space traffic management

Content (2)

- Chapter 2: National policy, administrative, and regulatory frameworks
  - Space policy
    - Rationales
    - Objectives
    - Interagency coordination
  - Oversight and control of private sector activities
    - Licensing
    - Regulation
  - Export controls and technology transfer
  - Spaceports

Content (3)

- Chapter 3: Best Practices for Sustainable Space Operations
  - Pre-launch
    - Payload opportunities and launch aggregators
    - Launch Services Agreements
    - Frequency allocation and coordination
  - Launch
    - Range safety
    - Deployment
  - On-orbit
    - Sources of space situational awareness data
    - Conjunction assessment and collision avoidance
    - Radiofrequency interference mitigation
  - End-of-life
    - Post-mission disposal

Way Forward

- Working with the space community to develop the content for the Handbook
  - Input on topics to include, particularly best practices
  - What aspects of anomaly resolution and failures should we include?
- Plan to publish first printed edition of the Handbook in 2016
- Phase 2 will be developing an electronic complement to the printed version
  - More details and examples of the topics and issues in the Handbook

Thank You

bweeden@swfound.org