

HANDBOOK FOR



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WHAT IS THE HANDBOOK FOR NEW ACTORS IN SPACE?

As space participation broadens:

Societal Benefits Increase

- Increased innovation
- Growth in applications and services
- Lowering of costs

Challenges are Exacerbated

- Frequency interference
- Orbital debris
- On-orbit crowding
- Regulatory efficiency

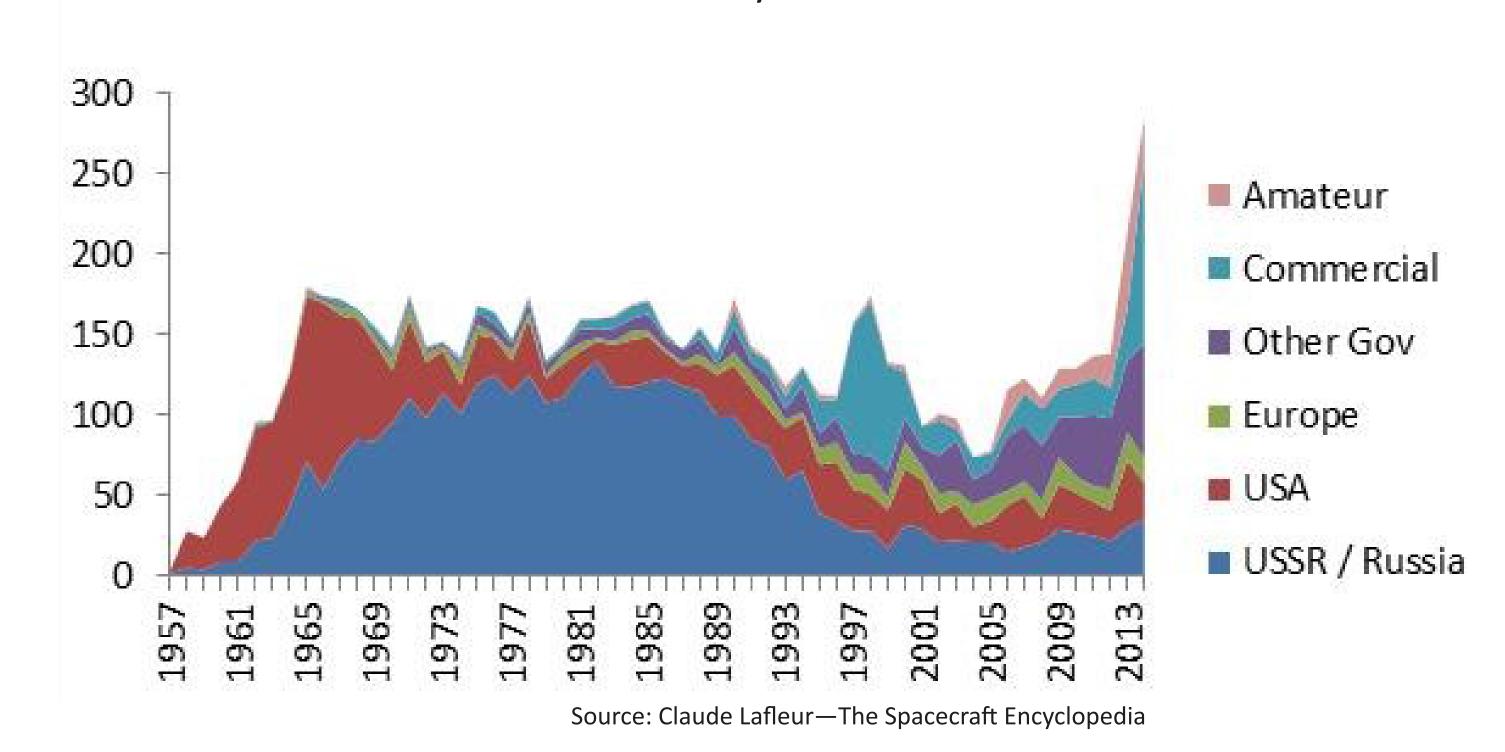
In order to help maximize benefits and reduce challenges the Handbook offers:

- An overview of fundamental principles, norms, and best practices for safe and responsible operations in space
- Provision of only useful information, and concrete facts rather than prescriptive or aspirational views
- Linked information across business, legal, policy and technical domains
- Concrete examples of how existing actors have approached issues

The goal of the Handbook is to assist new actors in space to continue to derive the many benefits space activities have to offer for the foreseeable future.

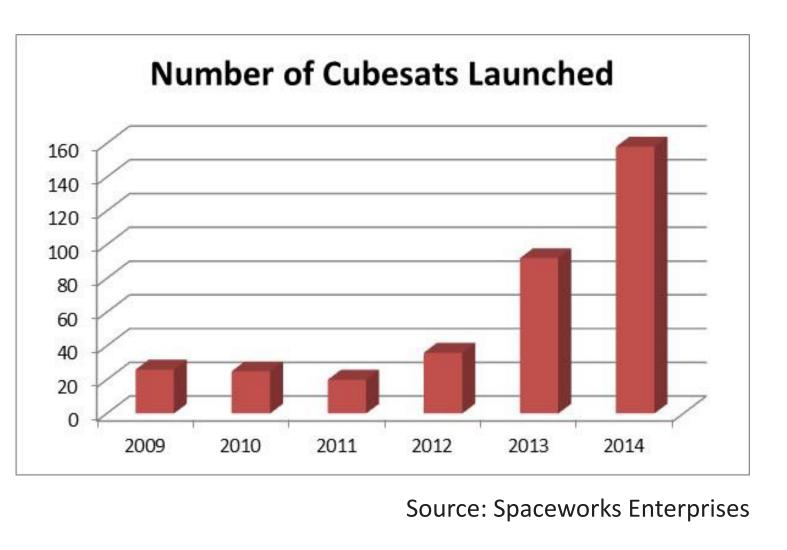
SPACE REGIME IS UNDERGOING MASSIVE CHANGE

Number of Satellites Launched Annually 1957-2014

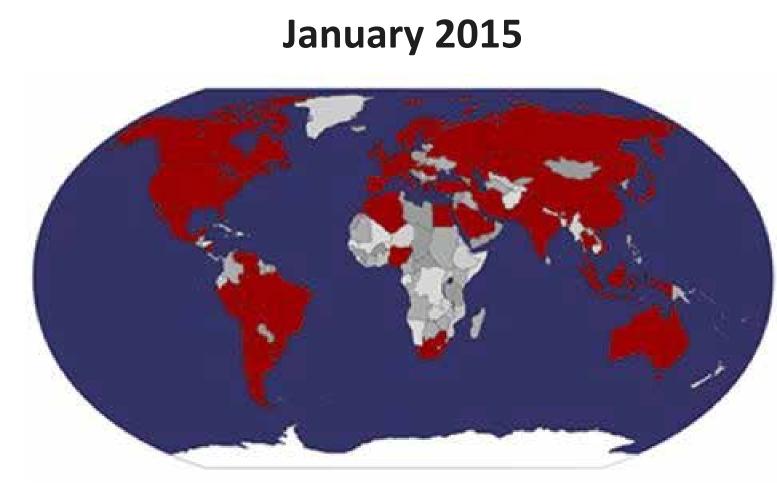


Diversification of actors and democratization of space community

States Operating Satellites as of



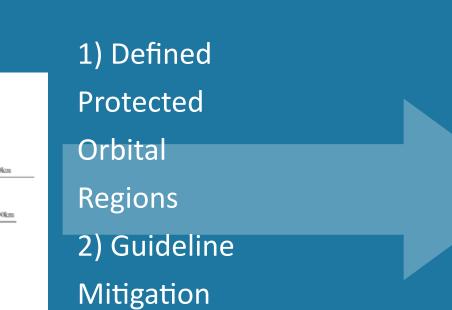
Dramatic increase in launches driven in part by emergence of smallsat-based business models



More than 70 States, commercial companies, and international organizations currently operate over1,200 satellites in Earth orbit

Example: Debris Mitigation Guidelines, Regulations, & Practices

Consensus-Built Guidelines Established



Practices

United Nations

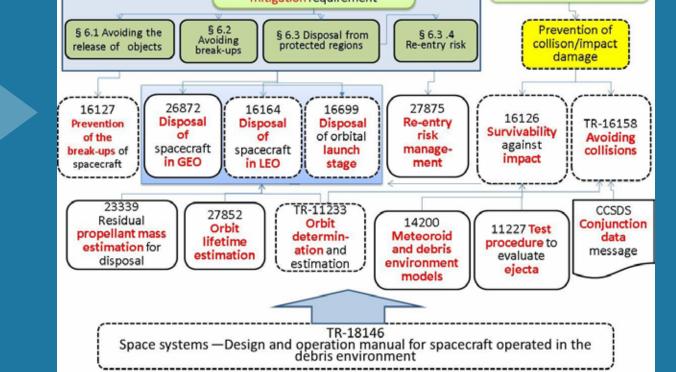
Endorsed Through the

Standards and National Polices ISO NASA Elements adopted into ISO Standard 24113

mplemented at varying levels in national and agency licensing, regulatory, and contracting policies.

Formalized in International Industry

Practiced by Satellite Operators



Example: Conjunction Assessment and Collision Avoidance

JSpOC Conjunction Warnings

ASSET TDR POSITION (M): 2570098.594 2244663.456 6281494.300 ASSET TDR VELOCITY (M/S): 4418.768701 4833.542969 -3526.781960

INT. DES.: 1997-030E
ELLITE A
SPTED OB: <6 HOURS FROM MESSAGE CREATION TIME
O (DAYS): 7.88/ 5.50 RESIDUAL ACCPT: 97.8 % NUM OBS AVAIL/USED: 592/ 418

APOGEE (KM): 779 PERIGEE (KM): 765 INCLINATION (DEG): 86.4

RADAR CROSS SECTION (SCALED): LARGE (>1m sq) WEIGHTED RMS: 0.864

BALLISTIC COEFFICIENT (M2/KG): 0.045663

SOLAR RADIATION PRESSURE COEFFICIENT (M2/KG): 0.000000

ENERGY DISSIPATION RATE (W/KG): 4.54570E-05

GEOPOTENTIAL: EGM-96 362,36T DRAG: JACCHIA70DCA LUNAR/SOLAR: ON

SOLAR RAD PRESS: OFF SOLID EARTH TIDES: OFF IN-TRACK THRUST: OFF Satellite Operator Risk Assessment JSpOC Data Retrieval
Service / Space-Track.org

JSpOC Data Processing
Service

CDM Collision Prebability
Analysis Service Maneuver Optimization
Service

Maneuver Trade Space
Service

Avoidance Maneuver Planning

HOW CAN THE SMALLSAT COMMUNITY CONTRIBUTE?

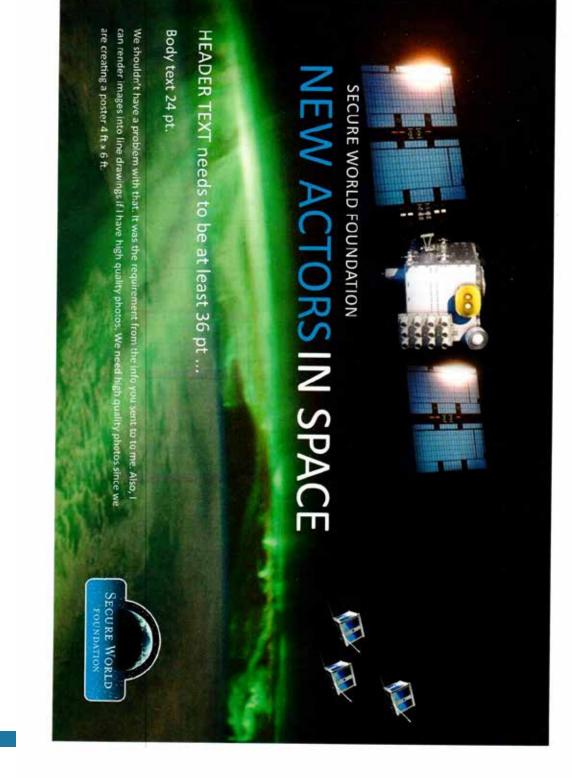
SWF is developing the Handbook in an interactive manner with the space community. By contributing your experiences you will help to ensure that all perspectives are represented.

Share Your Experience

- Best Practices
- Lessons Learned
- Issues and Resources Encountered

Provide Feedback

- Suggest overlooked content
- Identify areas of improvement

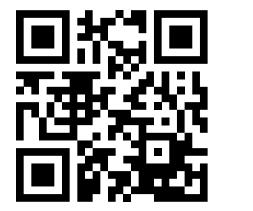


1. International Framework for Space Activities

2. National Policy, Legal and Administrative Frameworks

3. Best Practices for Responsible Space Operations

Find out more by visiting our website:



TOPICS COVERED BY THE HANDBOOK