



# ***Space Situational Awareness (SSA)***

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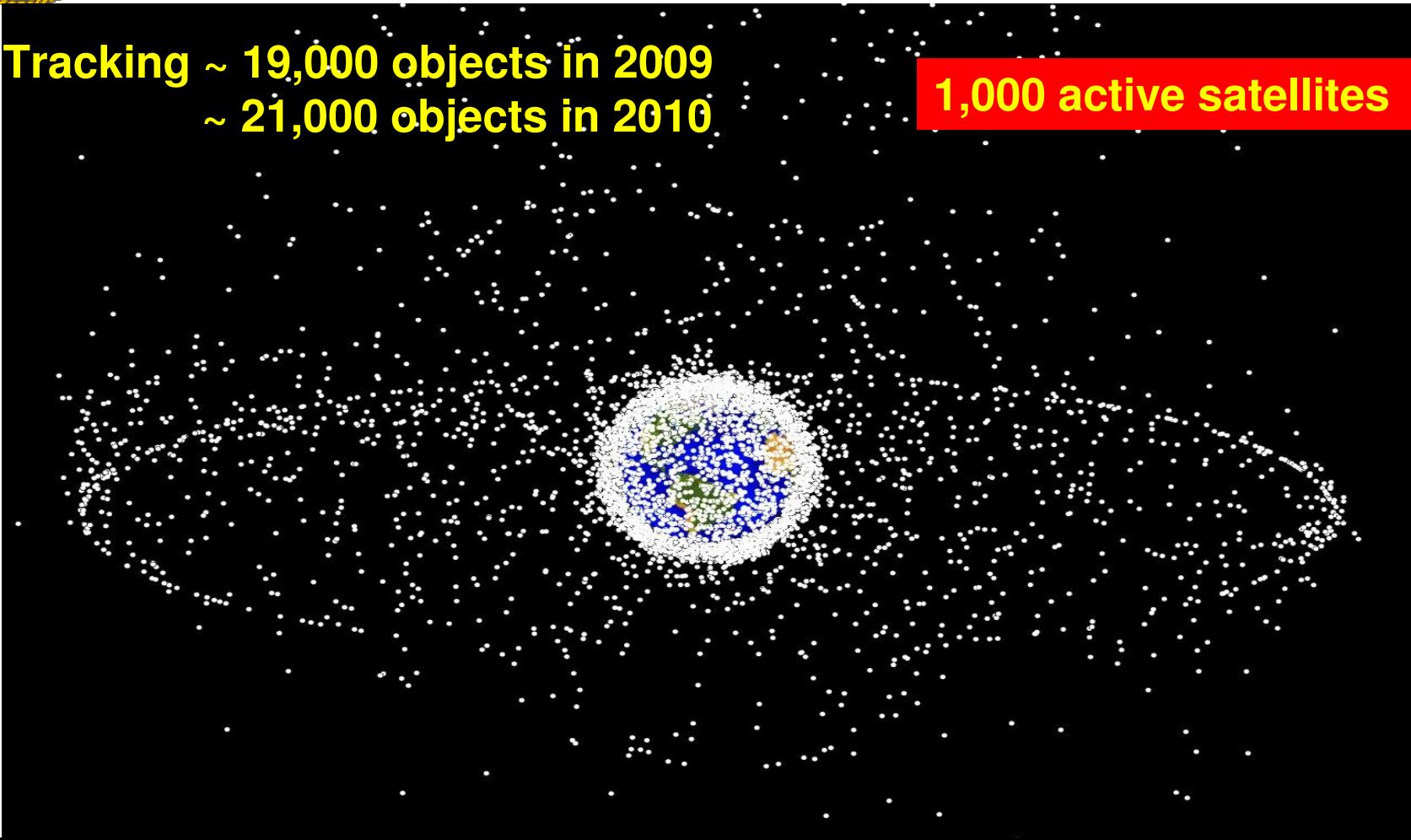




# *A Global Focus*

Tracking ~ 19,000 objects in 2009  
~ 21,000 objects in 2010

1,000 active satellites



Evolution from few, military only assets to many, multi-agency, civil assets

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# Current Space Surveillance Network



- Tracking Radar
- Detection Radar
- Imaging Radar
- Optical Telescope
- Network Command and Control

70 launches worldwide from June 2009 – June 2010  
100+ satellites placed in orbit

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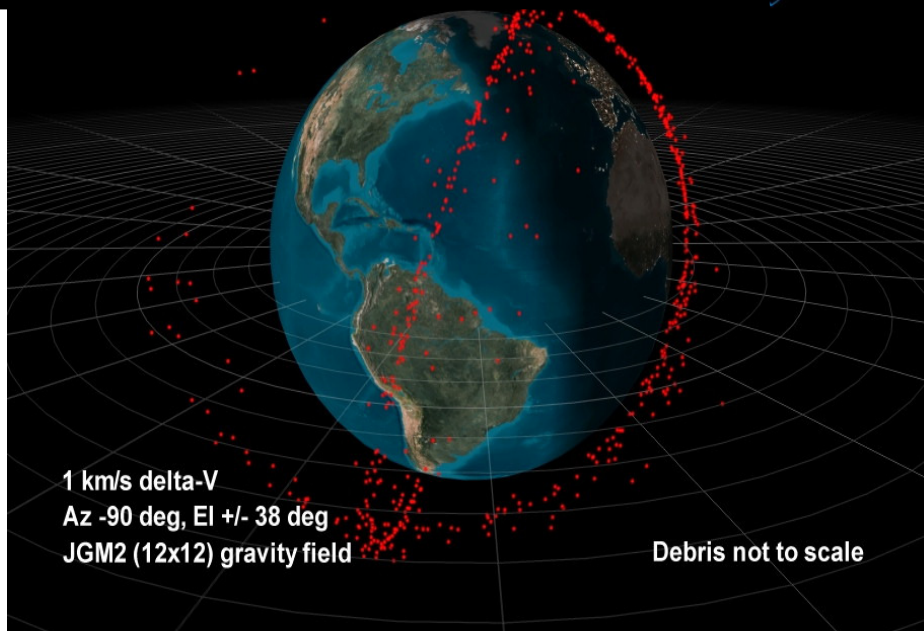


# Space Environment

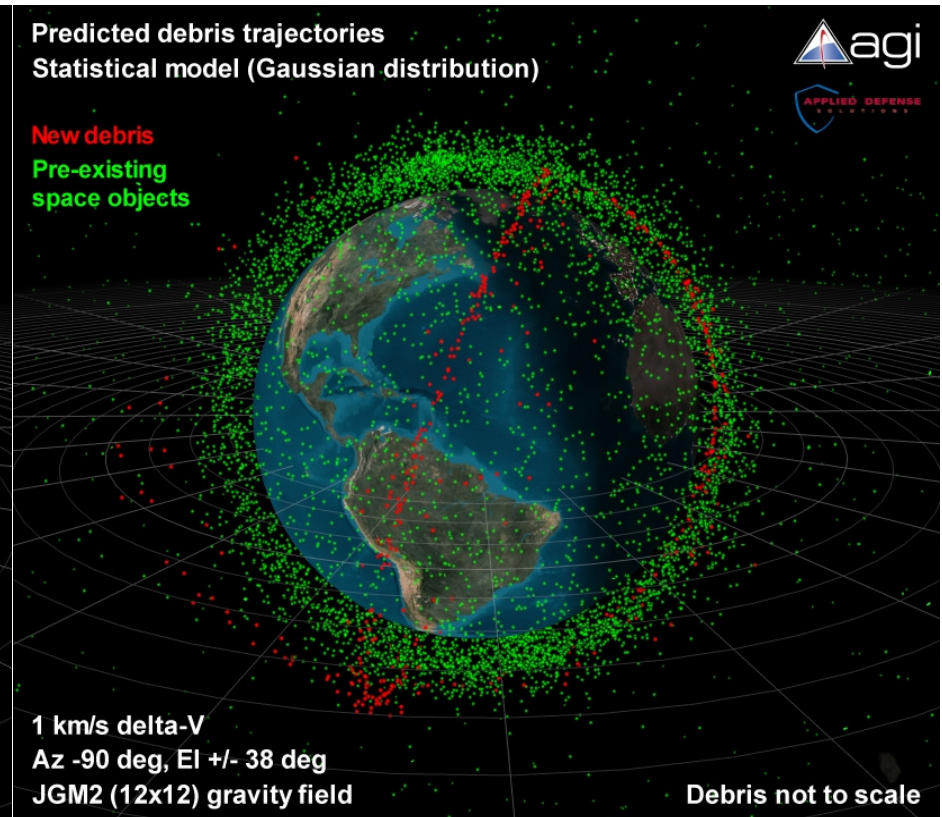
## Iridium-COSMOS Collision:

Debris cataloged: ~ 1700

Debris re-entered: 77



Representation of debris trajectories



Representation of debris trajectories

Collision debris + existing objects

New objects added to catalog since June 2009 = 1,529

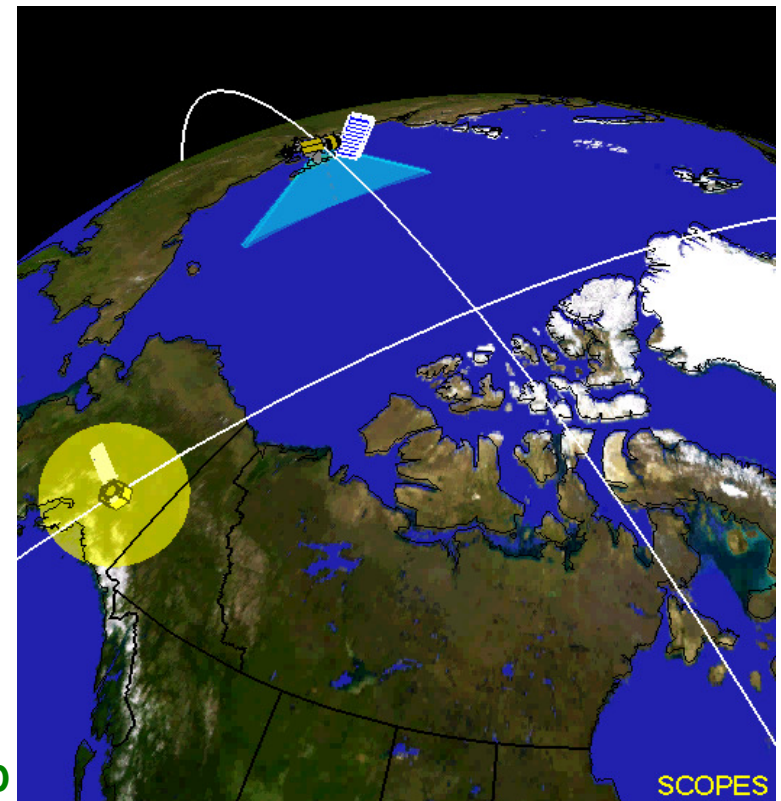
Images courtesy of Analytical Graphics, Inc. ([www.agi.com](http://www.agi.com))

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# SSA Sharing

- **Goals**
  - Create transparency of satellite information
  - Promote space flight cooperation and safety
  
- **SSA Services provides:**
  - Basic Services Website
  - Advanced Services
  - Emergency Notifications

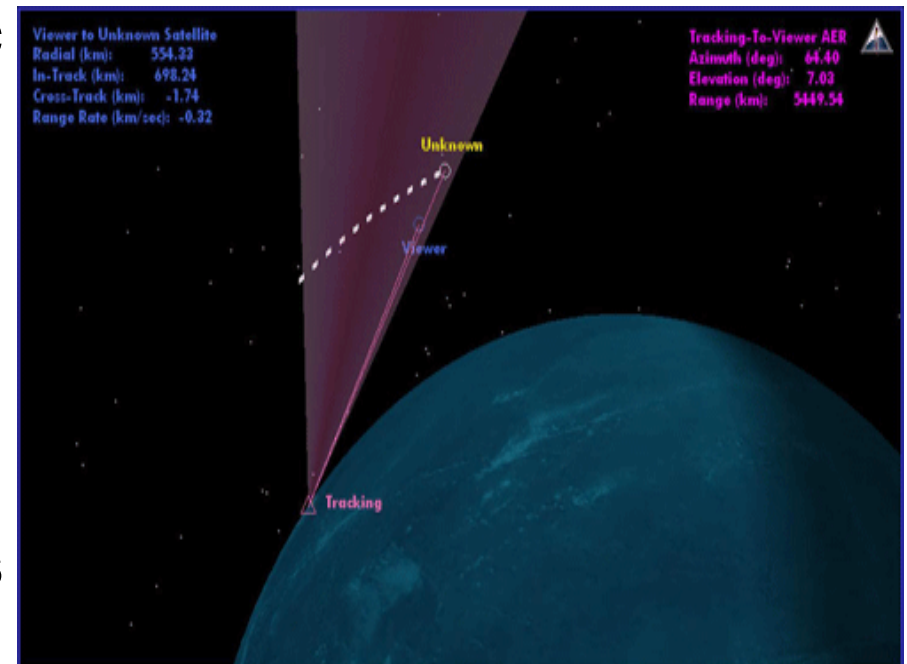


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## Basic Services - Website

- [www.space-track.org](http://www.space-track.org)
- Maintained by U.S. Strategic Command
- Historical and current satellite data
- Decay and re-entry data
- Support request procedures
- Free of charge



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## *Advanced Services*

- **U.S. law requires SSA agreement in place**
- **Two-way information exchange**
- **Mutual terminology, data formats, and units**
- **Mitigate collision risks**





# Emergency Notifications

- **Joint Space Operations Center analyzes catalog for close approaches**
- **20 – 30 close approach notifications per day**
- **E-mails direct to satellite operator**







## *Future Improvements*

- **Cooperative partnerships with other governments**
- **Sharing data with partners**
- **Sharing operator contact information**



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# Way Ahead

- **Best Practices**
  - Voluntary confidence-building mechanisms
  - Expand on debris mitigation
  - Widely-accepted practices
- **Engagements and Agreements**
  - Global effort



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# Questions



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