

International Civil Space Situational Awareness

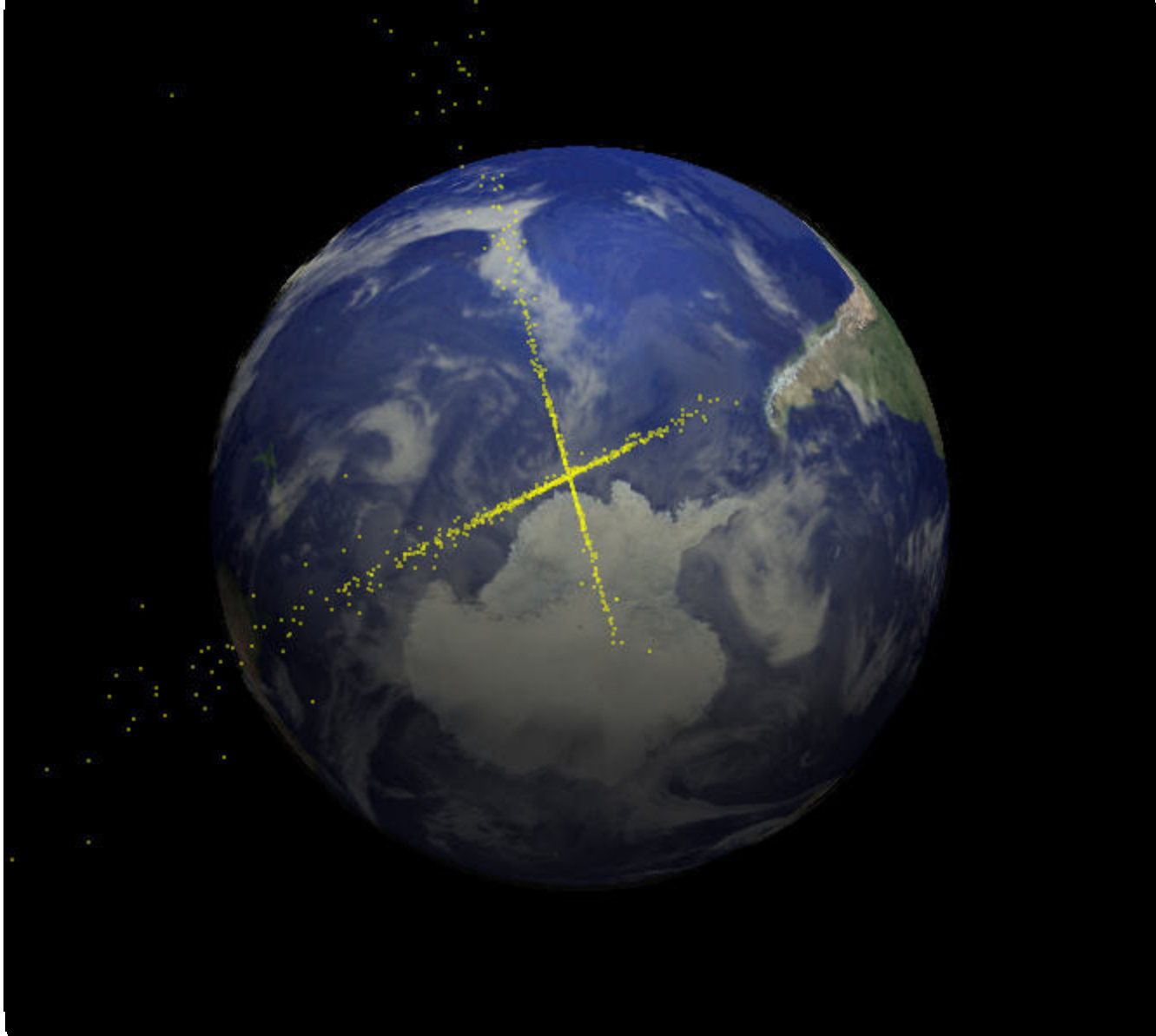
Brian Weeden
Secure World Foundation

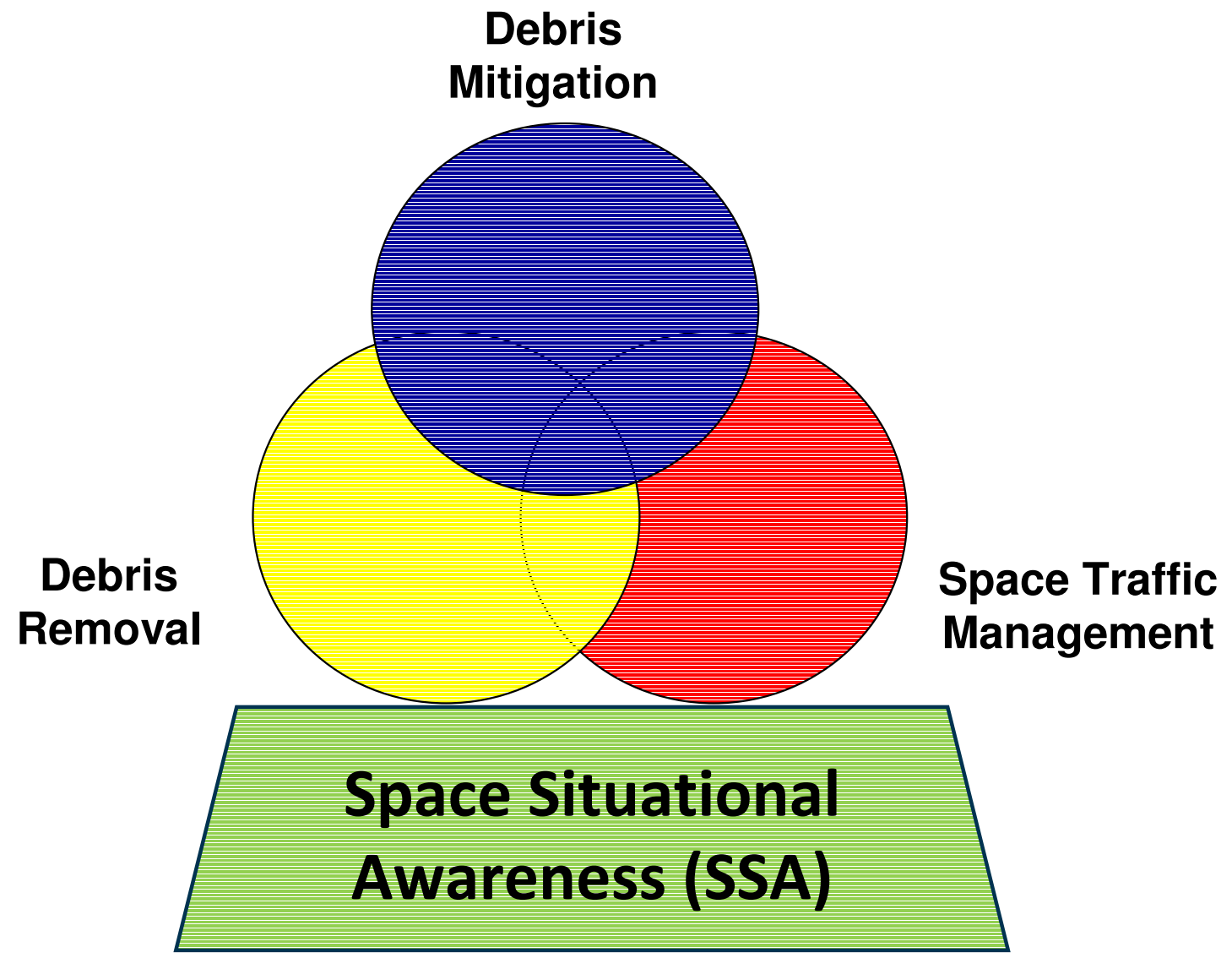
**Secure World is dedicated to
...developing and promoting ideas and
actions necessary for achieving the
secure, sustainable and peaceful use
of outer space.**



Collision of Iridium 33 and Cosmos 2251

Promoting Cooperative Solutions for Space Security





- All actors in space have a responsibility to operate in a safe and secure manner
- Certain actions in space can have severe long term consequences
- The actions of one or two actors in space can potentially affect all actors
- Most actors in space have the resources to provide indigenous SSA capabilities
- States that do have resources to provide SSA are often limited by national security and military restrictions from sharing it

- To provide **all** space actors access to the tools needed for safe and sustainable activity in Earth orbit
 - Sensor Data
 - Orbits and locations of objects
 - Solar activity
 - Atmospheric density
 - Analytical capacity
 - Conjunction Assessment (predicted close approach between two objects)
 - Collision Avoidance (maneuvering to mitigate high risk conjunctions)
 - Space weather predictions
 - Anomaly resolution

- Civil SSA is interested in the following:
 - Location of an object in Earth orbit
 - Point of contact for that object
 - Space Weather
- Military SSA is interested in these additional data points:
 - What the function of an object is
 - What the intention of an object is
 - Capabilities and limitations of an object

- SSA requires a geographically distributed network for sensors to track satellites
- Building a geographically distributed network is expensive
- Owner-operator positional data is a critical supplement to third-party sensing

Many States working together can provide sensor coverage over the entire Earth for little cost to each

- Each participant in the system chooses which data they provide
- All participants have access to all the shared data
- Each participant is able to use the data in their own analysis
- All participants have access to analytical support from data clearing house

Balance of data security and dissemination

- Provide the basic data necessary for all space actors to make educated, safe, and efficient decisions
- Increase the international awareness and understanding of space sustainability
- Increase cooperation and transparency between States on space activities
- Potential verification mechanism for “code of conduct” / “rules of the road”

- Organized panel session at 3rd International Association for the Advancement of Space Safety (IAASS) Conference
 - Focused on technical requirements and feasibility of international civil SSA
 - Involved technical experts from US, Europe, Russia, China
- Working with Center for Space Standards and Innovation (CSSI) on their SOCRATES-GEO project
 - Partnership between CSSI and several commercial GEO operators to pool data and provide analytical services
 - SWF helping to integrate additional SSA sensors and raise awareness of the issue with policymakers and space users

- Defunct INSAT-1B satellite was predicted to pass within 100 meters of ASTRA 1F on 4 February using publicly available data on INSAT-1B
- An international network of scientific telescopes was able to provide more accurate data to CSSI who confirmed a close approach within 3 kilometers but still with significant risk
- SES-ASTRA was able to use the data and analysis to perform a collision avoidance maneuver to increase miss distance to just over 14 kilometers

- Many satellites are operated in a vacuum of information about the objects around them and thus possible collisions
- Those States that have the information to prevent collisions do not have the immediate resources to screen all objects for possible collisions
- Many States, working together in a voluntary partnership with commercial partners, could provide the necessary data to all actors
- This information could not only mitigate future collisions but enhance cooperation, transparency and for future space governance issues

Thank you for your time.

Brian Weeden
bweeden@swfound.org