The Foundational Role of Space Situational Awareness (SSA)

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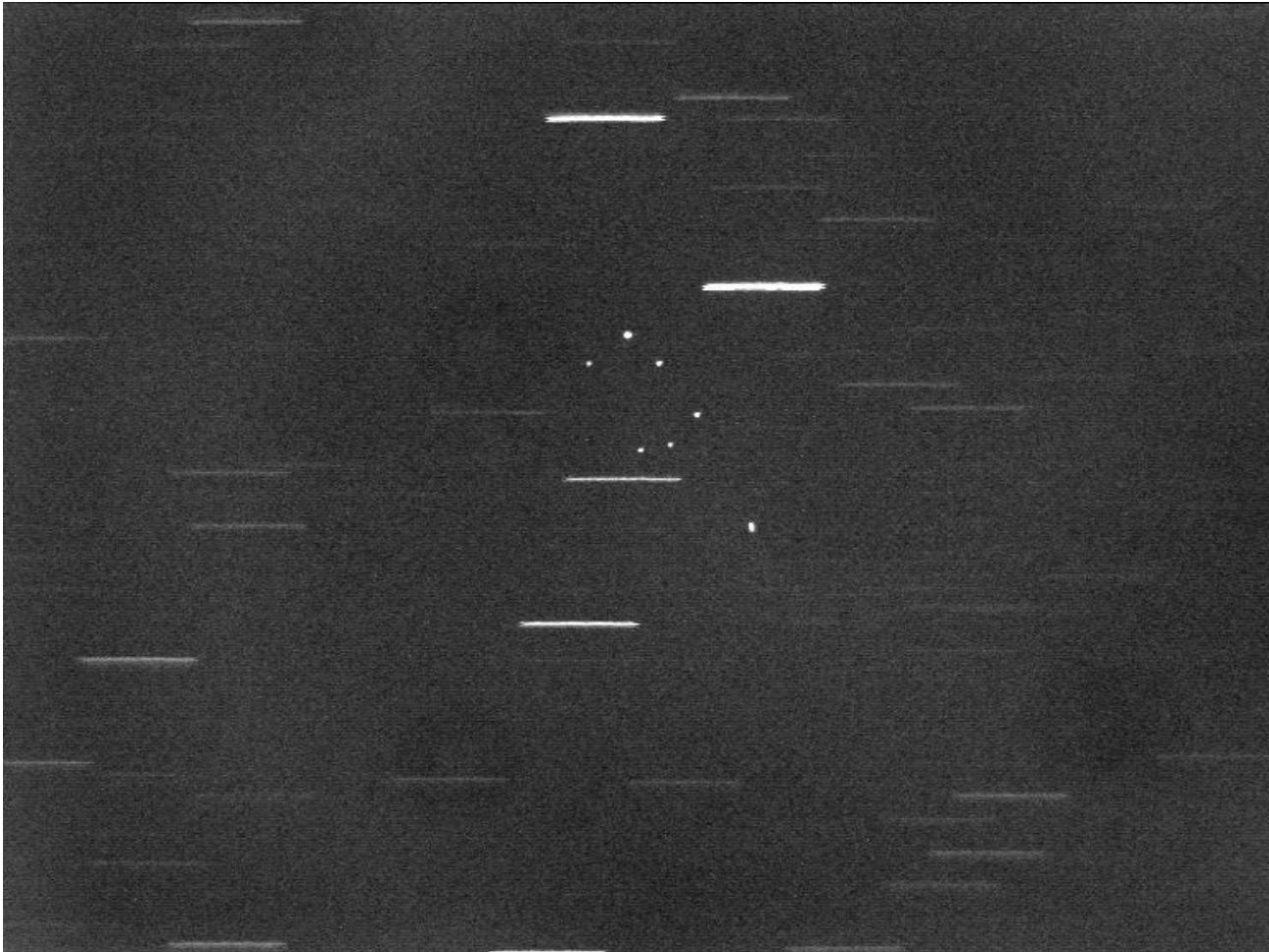*Promoting Cooperative Solutions for Space Sustainability*

Knowing all there is to know about objects in space

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Promoting Cooperative Solutions for Space Sustainability

Fusing data on the space environment, human activities in space, and their interrelationships to create actionable information

- Metric Data (Catalog)
  - Locations of objects in space and the ability to predict where objects were in the past and will be in the future
- Space Weather
  - Measurement, warning, and forecasting of the effects of Solar activity on objects in orbit
- Object Status
  - Health, telemetry, planned maneuvers (usually provided by owner/operator)
- Intelligence
  - Information about objects in orbit (images, signals, capabilities, behavior) collected on objects in orbit

ASTRA cluster tracked by South African hobbyist
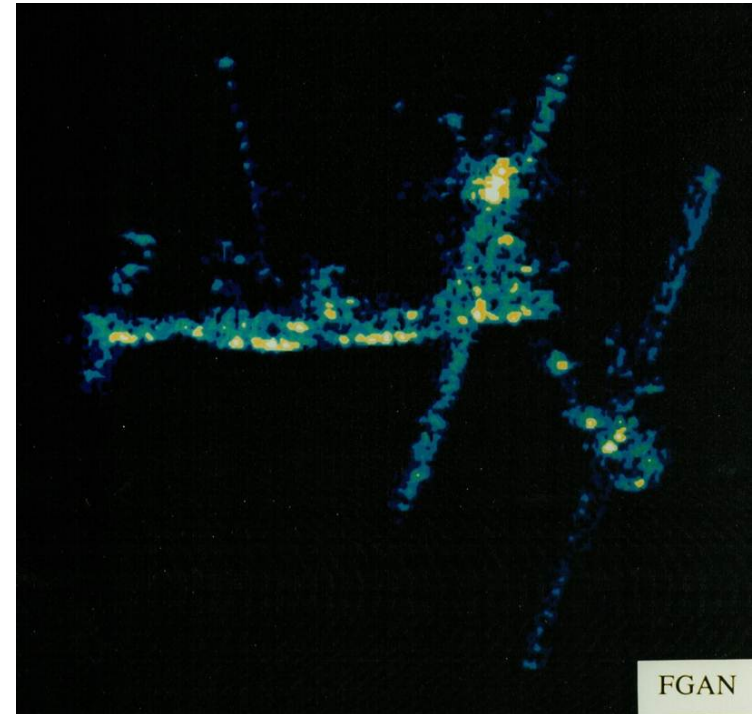
ISS and Discovery (STS-133)
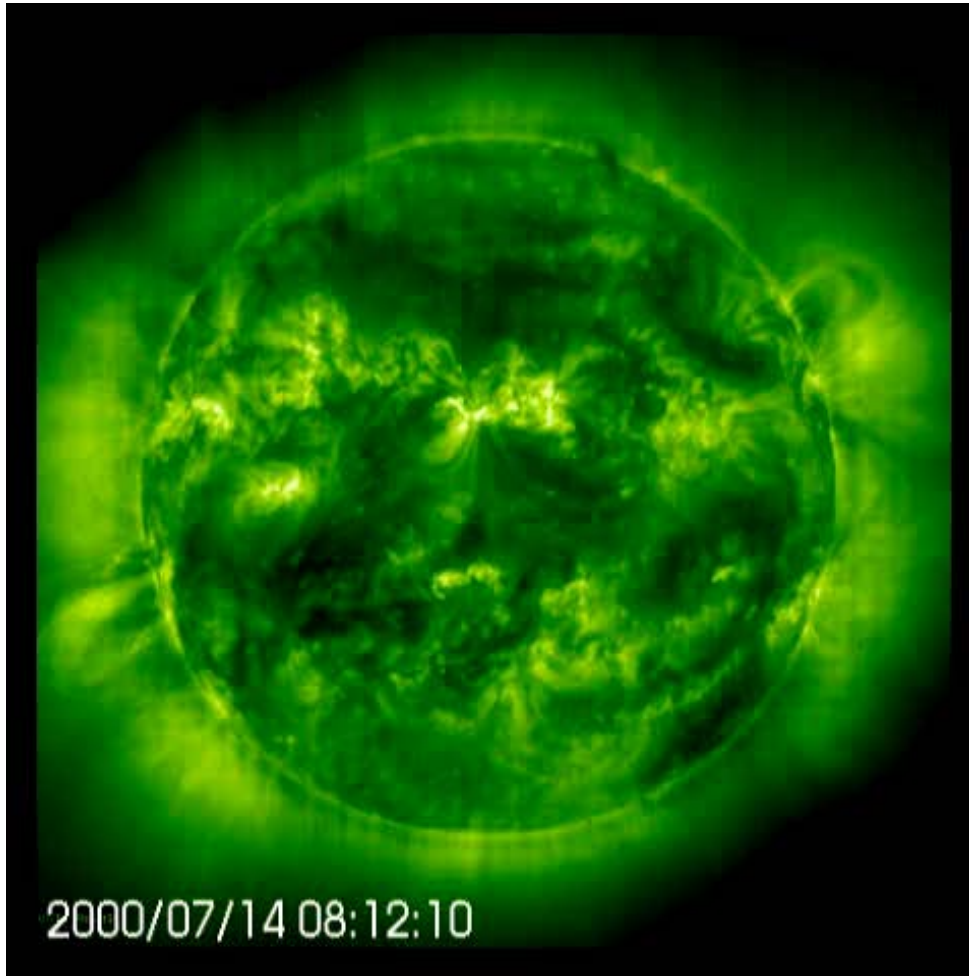February 28th 2011 17:58UT

Acquisition and processing:
Thierry Legault

Tracking system design and making:
Emmanuel Rietsch

ISS imaged by French hobbyist

FGAN

MIR imaged by German
FGAN radar

2000/07/14 08:12:10

Imagery of Coronal Mass Ejection and Particle Storm taken by NASA's SOHO satellite

- Predicting and preventing collisions on orbit

- Space traffic management

- Diagnosing spacecraft failures and malfunctions

- Calculating the risk to spacecraft due to environmental threats

- Detecting launches of new space objects

- Predicting atmospheric re-entry of space objects

- Monitoring behavior of spacecraft

- Detecting threats and attacks on spacecraft

- It is impossible for a single entity to achieve "good" SSA by themselves

- Fundamentally, SSA requires data sharing and cooperation between different actors
  - Networks of telescopes and radars distributed around the globe to track debris
  - Satellite owner/operators with telemetry, health, and planned maneuvers

- Multiple independent sources of SSA data are good
  - Greater accuracy and redundancy
  - Independent monitoring and validation

Thank you.
Questions?

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