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2002 Symposium

Transforming Fantasy

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Transforming Fantasy

Space Situation Awareness:
A Solution to “Lost in Space”

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Space Situation Awareness

- Where is it? – Position, Track
- What is it? – Satellite vs. Debris
- What is it doing? – Status, Health Monitoring

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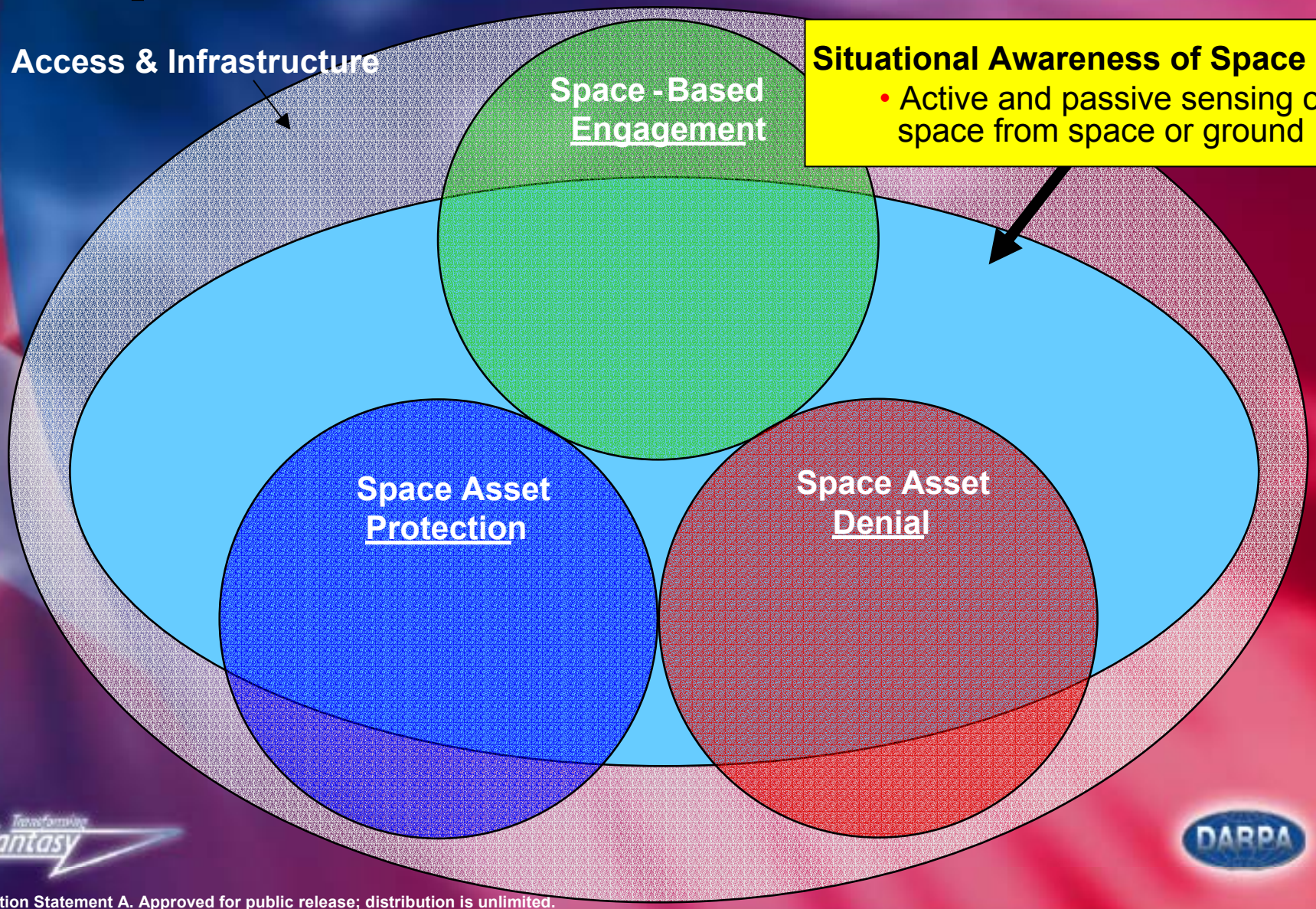
Space Situational Awareness



Situational Awareness of Space

- Active and passive sensing of space from space or ground

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SSA Approach

- Current system: Catalog-centric
  - System overload and timelines
  - Small objects
  - Unknowns
- Approach:
  - New sensors
  - System focus
  - Automated control

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SSA Sensors

	Search	Identify / Characterize
LEO	RF	EO or RF
GEO	EO: SST	RF: Deep View On-orbit: Orbital Express

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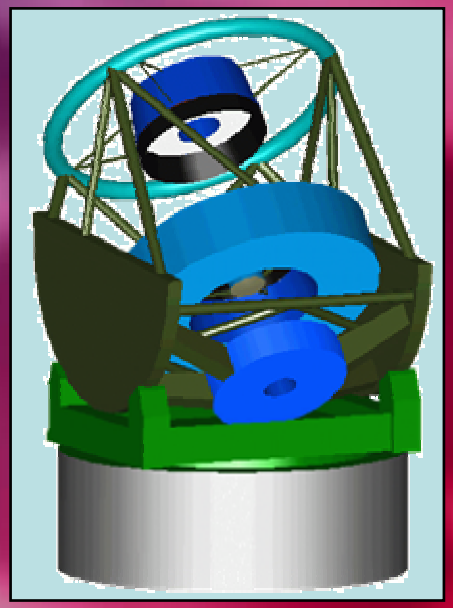
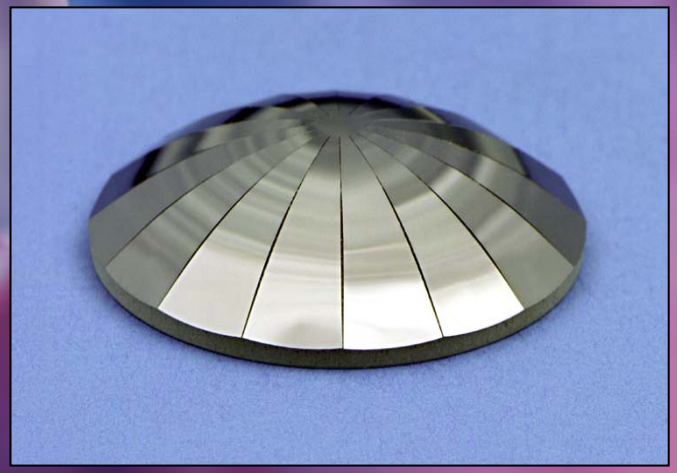
Space Surveillance Telescope

- Develop large aperture, wide-field-of-view telescope
  - Un-cued search
  - Microsats, debris, asteroids





- Technical Approach
  - Curved focal plane array
  - Next-generation optics

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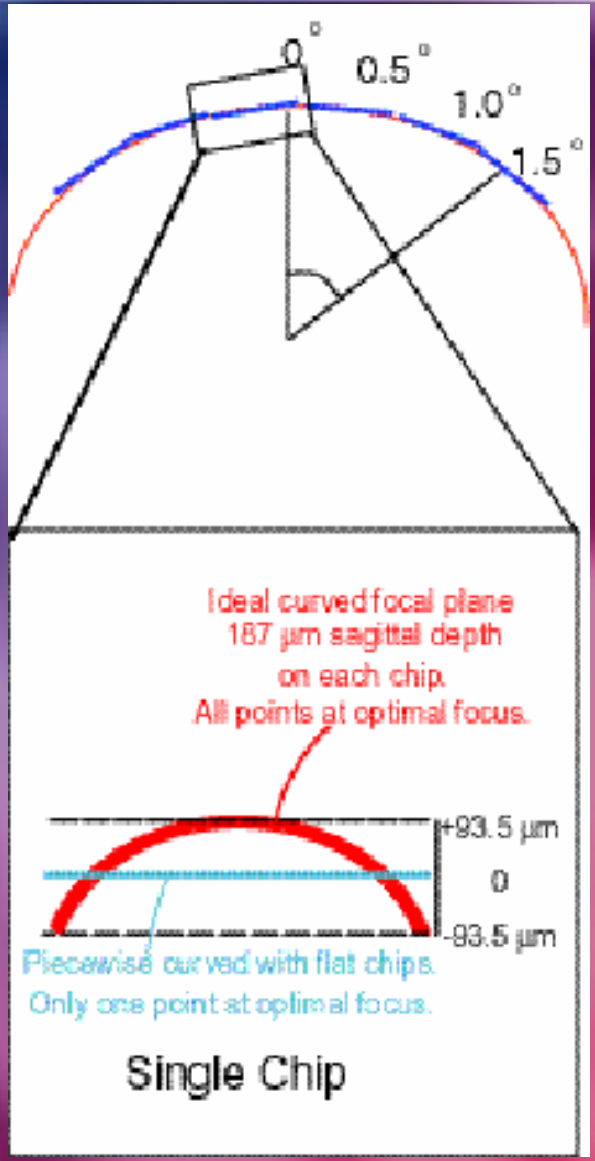
Why Curved Focal Planes?



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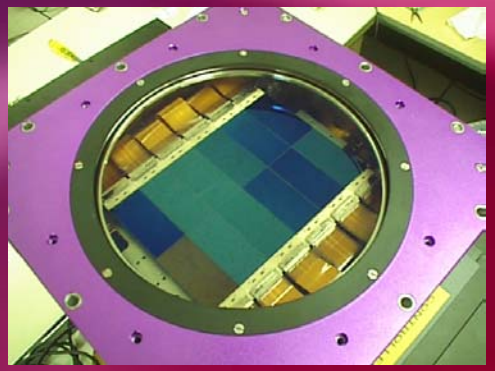
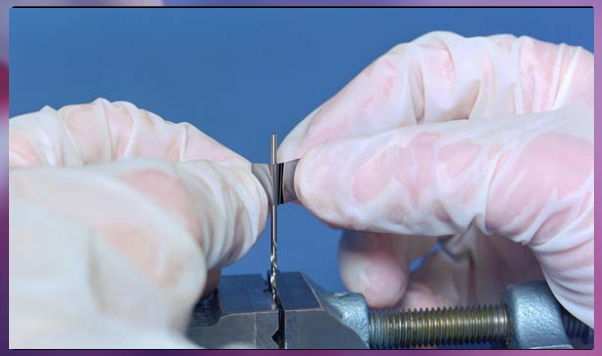
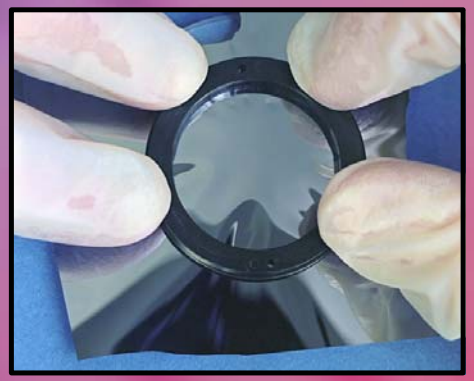
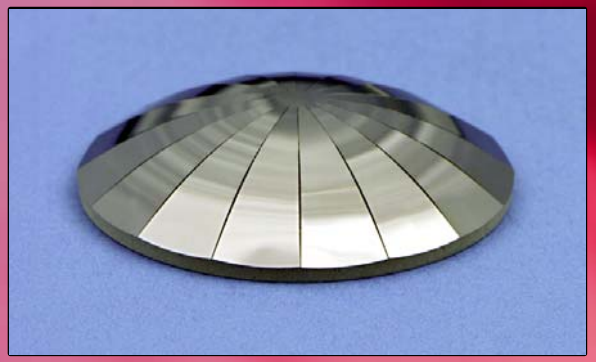
DARPA/MTO Curved FPA

- Demonstrated mechanical integrity
- Demonstrated electronic integrity









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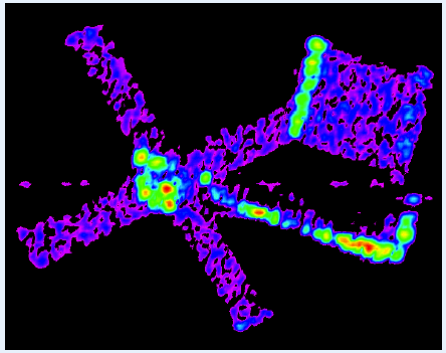
Deep View Objective

Develop a ground-based wide-band radar system for timely, high-resolution satellite imaging at GEO

New Sensors

Radar Images



New Signal Processing

Derived Information

Space Situational Awareness

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Transmitter Technology

- High Power
- High Bandwidth
- W-Band

Power Combining

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SSA Program Plan

- SST
  - System study
  - Large-area, light-weight optics study
  - Demonstration system by FY08
- Deep View
  - Transmitter tube technology study
  - Signal processing algorithms
  - Demonstration by FY08

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