NGST

Next Generation Space Telescope

TOWN HALL MEETING

AMERICAN ASTRONOMICAL SOCIETY

Austin, Texas

January 5, 1999

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Can NGST be Built for the Cost?

This question has to be answered on three levels:

Technical - **Advanced Technologies**
Cost - **Innovative Approaches**
Sociological - **Programmatic Discipline**

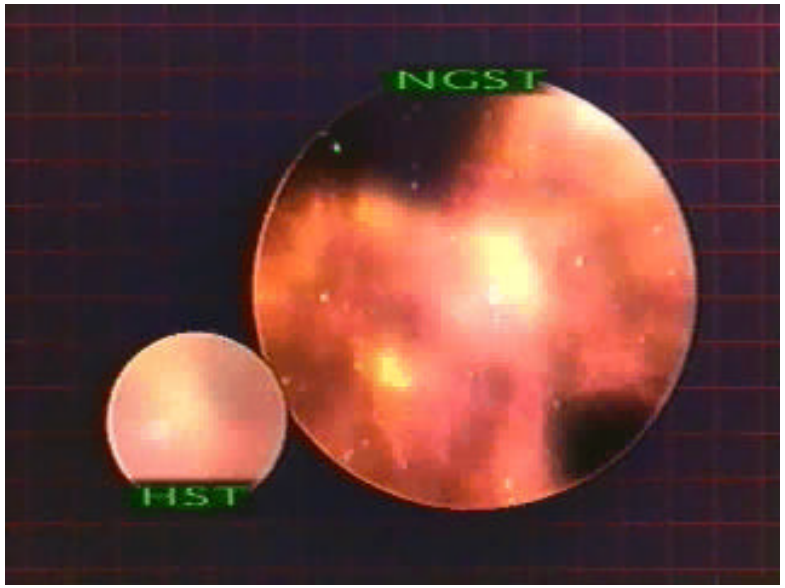
NGST Challenge Relative to HST

- **10x Collecting Area**
- **5x Lower Mass**
- **5x Lower Life Cycle Cost**
- **10yr Development Timeline**

Costs of recent space science missions incorporating the above have been dramatically declining

What does NGST have going for it?

- ***>40% technology investment ratio helps with Life Cycle Cost challenge***
- ***Early effective International partnering improves our NGST/HST cost-to-launch comparison ratio from 30% to 40%***
- ***Recent NASA track record of 4% underruns on major flight programs indicates strict NASA policy to force projects to meet their commitments (77% overrun before Dan Goldin)***



Cost Strategy

- **Early Emphasis on the Design Reference Mission (DRM) and End-To-End Integrated Systems Modeling**
  - *Rapid in-depth cost-performance trades*
  - *Early hardware prototyping*
- **Optimize observatory system based on capped Life Cycle Cost (LCC) and evaluate performance margins yearly against LCC**
- **International partnerships enable the project to recover cost, reduce risk, and strengthen program**
  - *ESA and CSA to contribute $200M (US) and $50M (US), respectively*
- **Partnering with the DoD at the unclassified level for mirror component technology provides NGST a 3:1 cost leverage**
- **Technology investments focused on requirements and traceable to flight designs**

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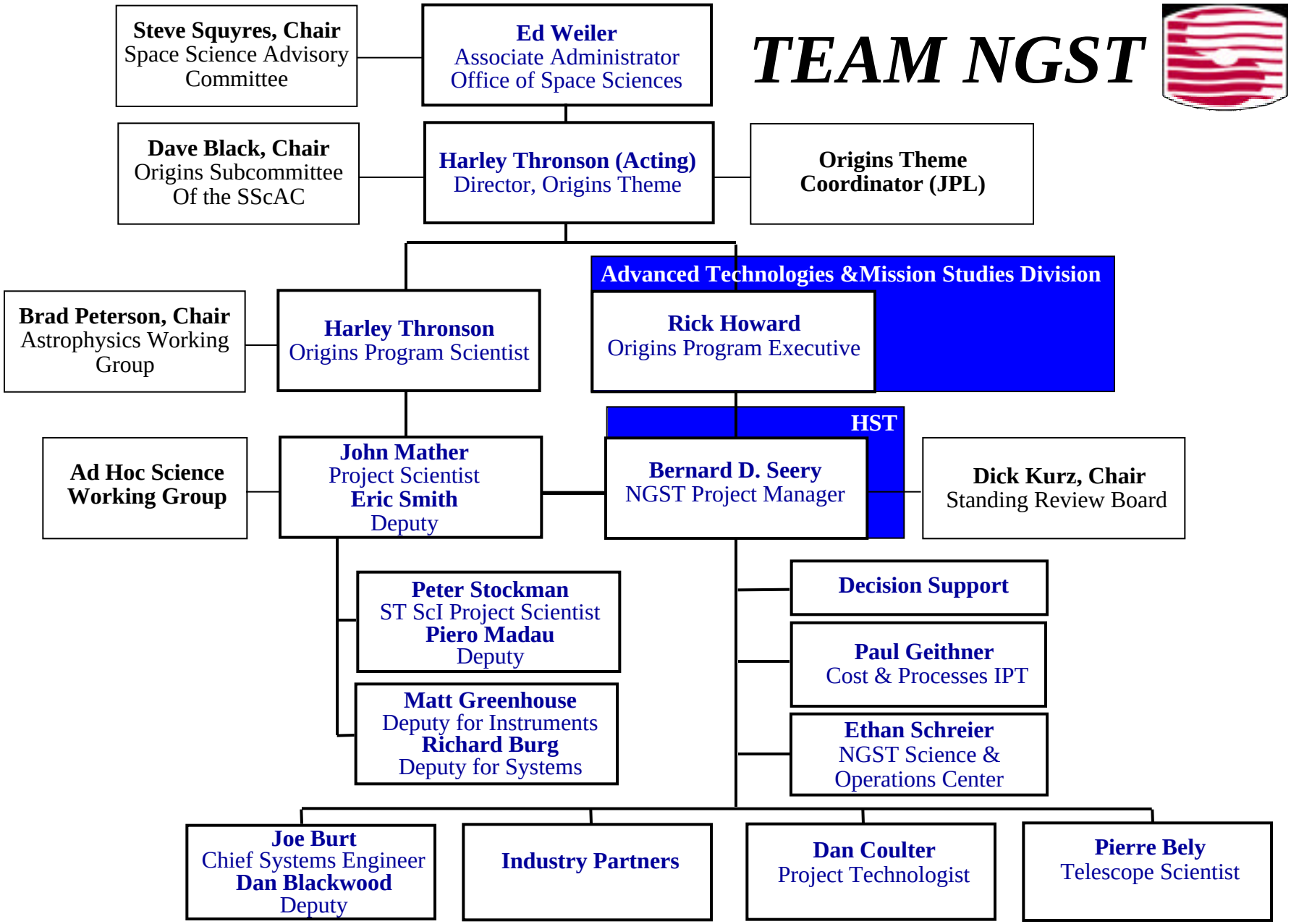
TEAM NGST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NGST Science & Operations Center
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Industry Partners
Dan Coulter
Project Technologist
Pierre Bely
Telescope Scientist

NGST Partners

GSFC+

- NGST Science Oversight
- Systems Lead
- International Coordination
- ISIM Space Frame

NASA HQs

- Origins Program Oversight
- Resources
- AO Releases

ST ScI

- Ground System
- Mission Operations
- Science Operations
- Science Community and Education Outreach

NGST Project-Led Joint System Engineering Board

Prime Contractor

- Spacecraft
- Telescope
- Sunshade
- I&T
- Systems Modeling & Testbed

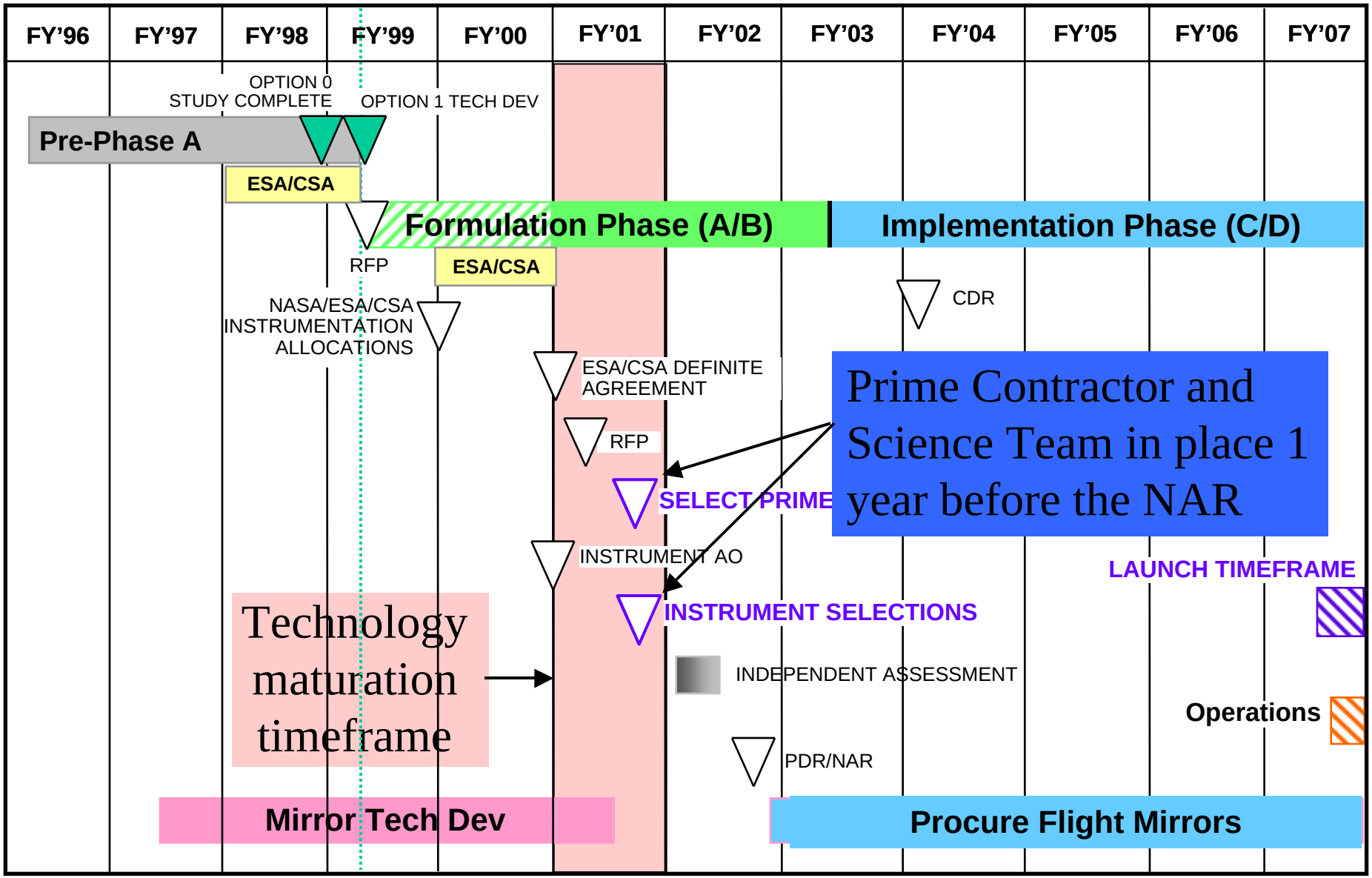
Internationals

- Instrument Development
- Spacecraft/Telescope Contributions

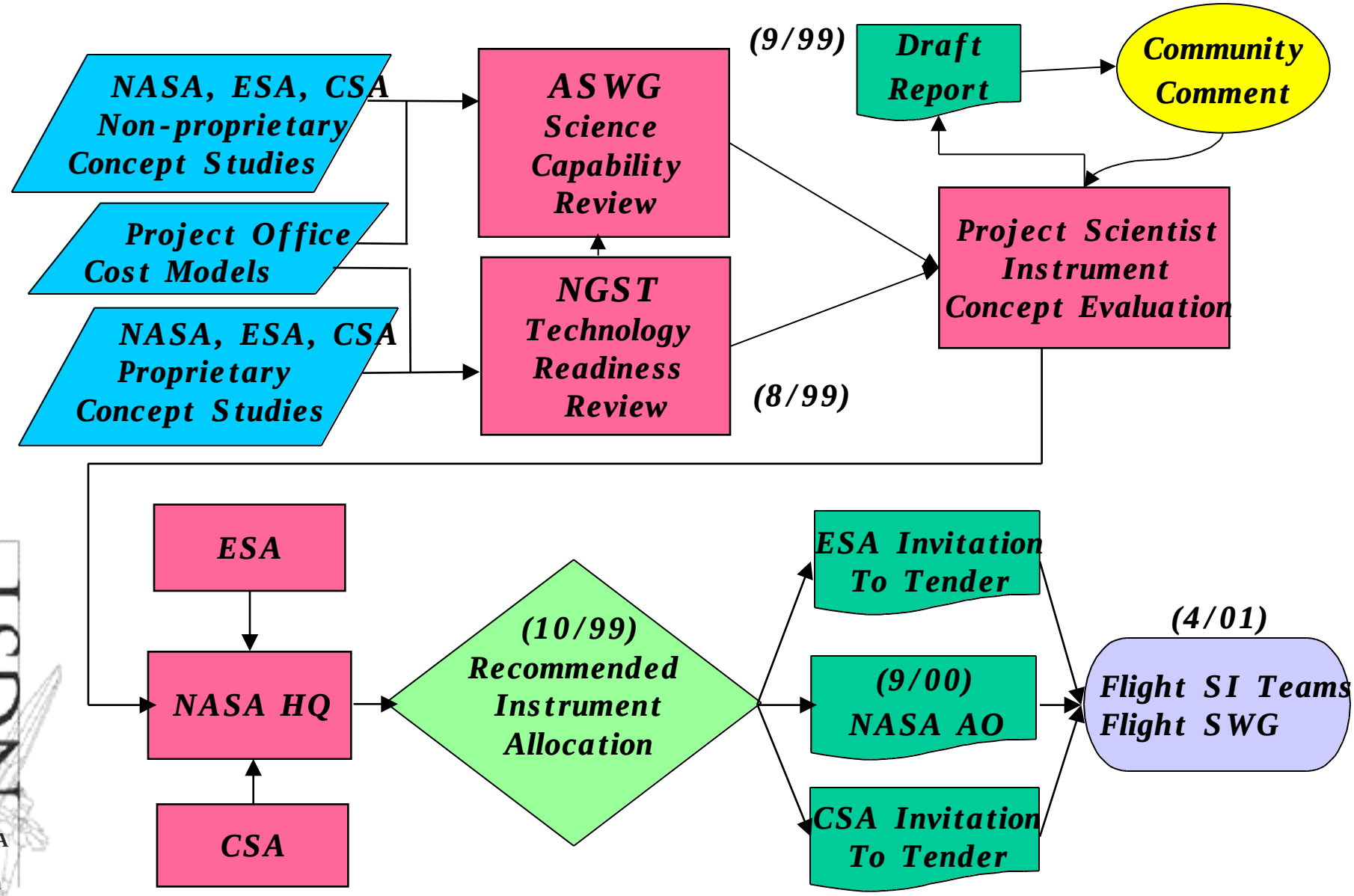
Science Community

- Instrument Development
- Science Advocacy
- Education & Public Outreach
- Data Analysis

NGST Top Level Baseline Schedule
Progressive Downselect



Instrument Acquisition Process



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A NASA Origins Mission

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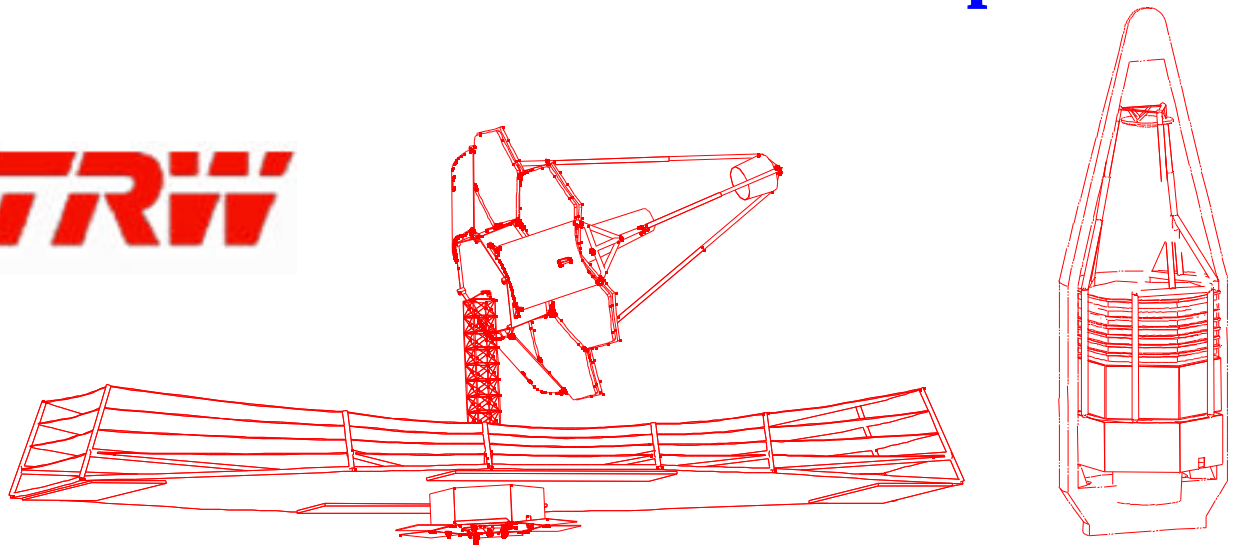
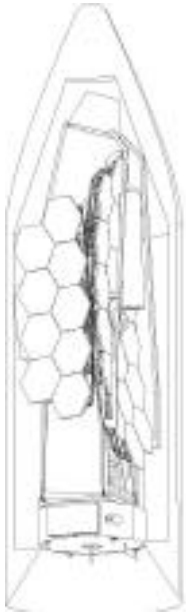
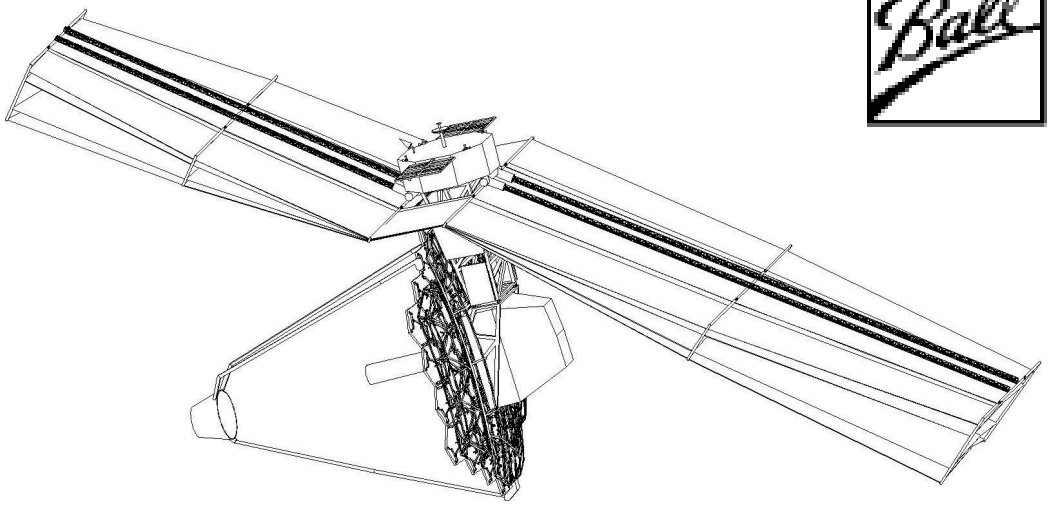
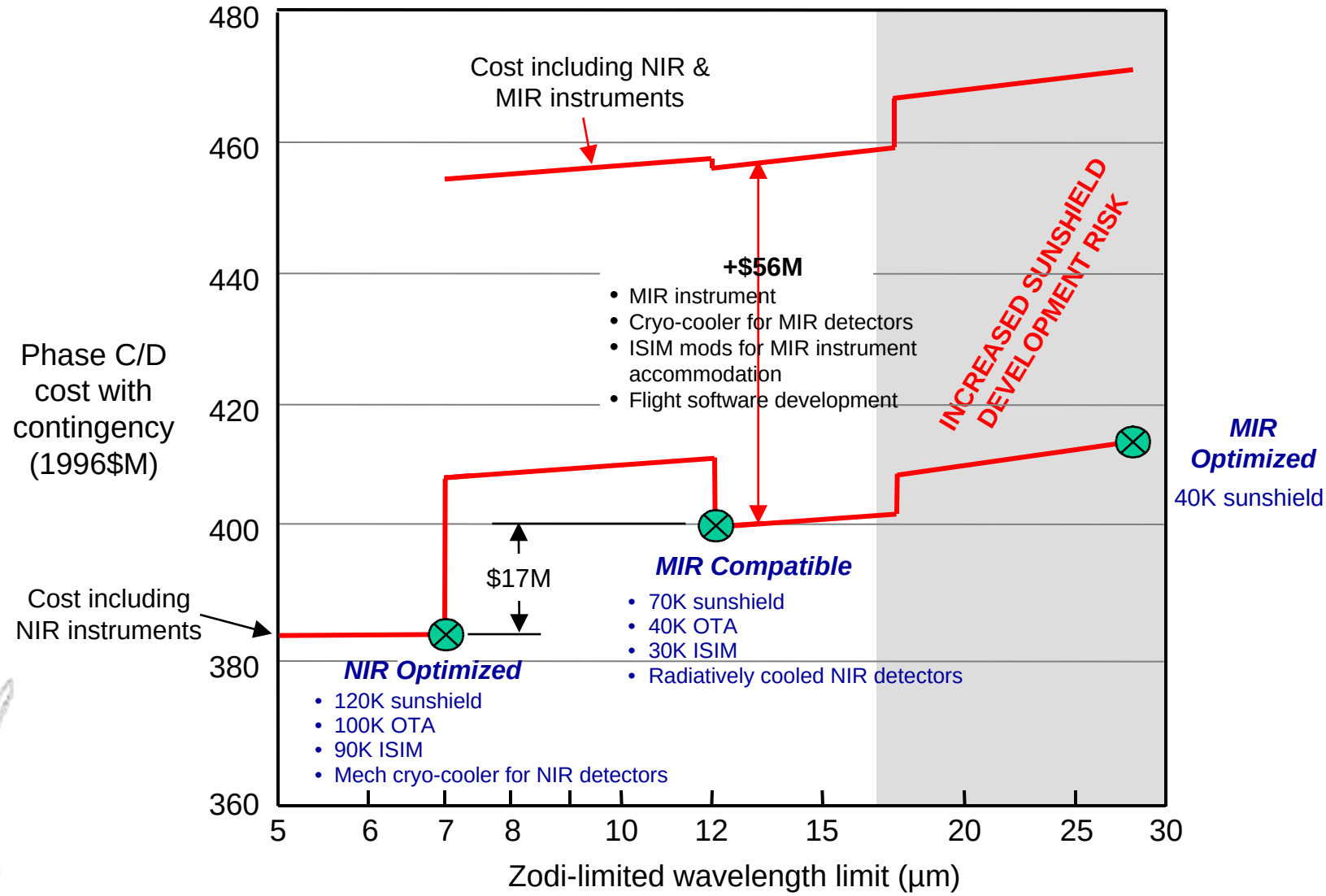
Latest Contractor Concepts







Cost versus Wavelength Coverage



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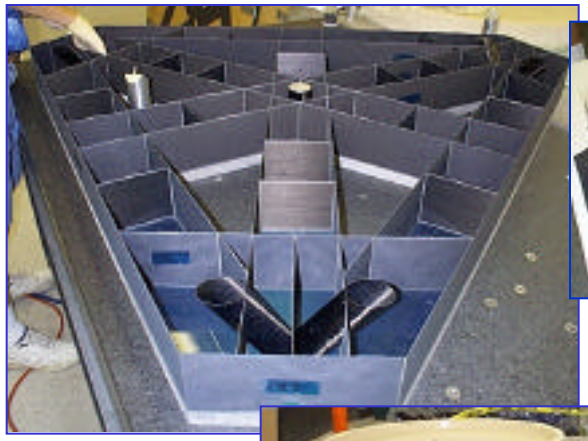
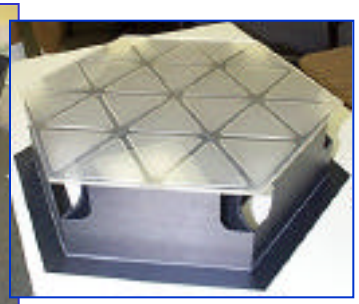
Phase A Requirements

Parameter	Requirement	Comments
Wavelength Range	0.6 to 10+ microns	zodi-limited to 10
Aperture Diameter	8 meters	maximum fill factor
Optical Performance	diffraction limited to 2 microns	goal of 1 micron diffraction limited
Orbit	L2	
Mission Lifetime	5 years	size consumables to 10 yrs
Instrument Complement	wide field camera/spectrometer	

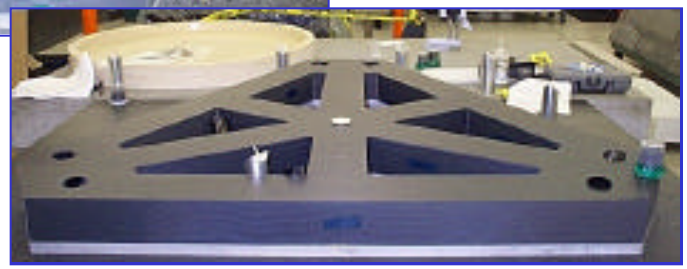
NGST Technology Portfolio in 1998

University of Arizona





Composite Optics



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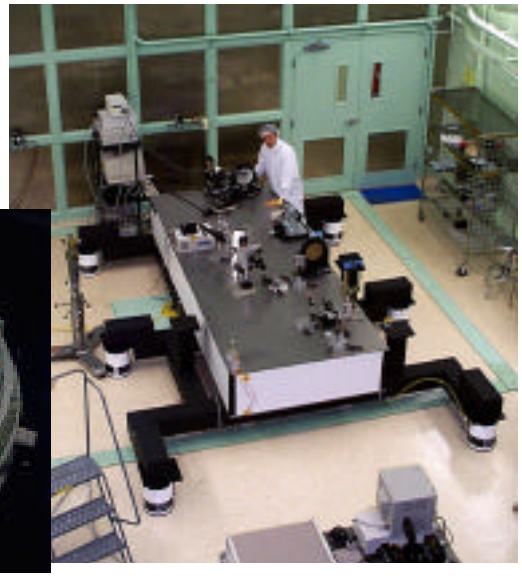
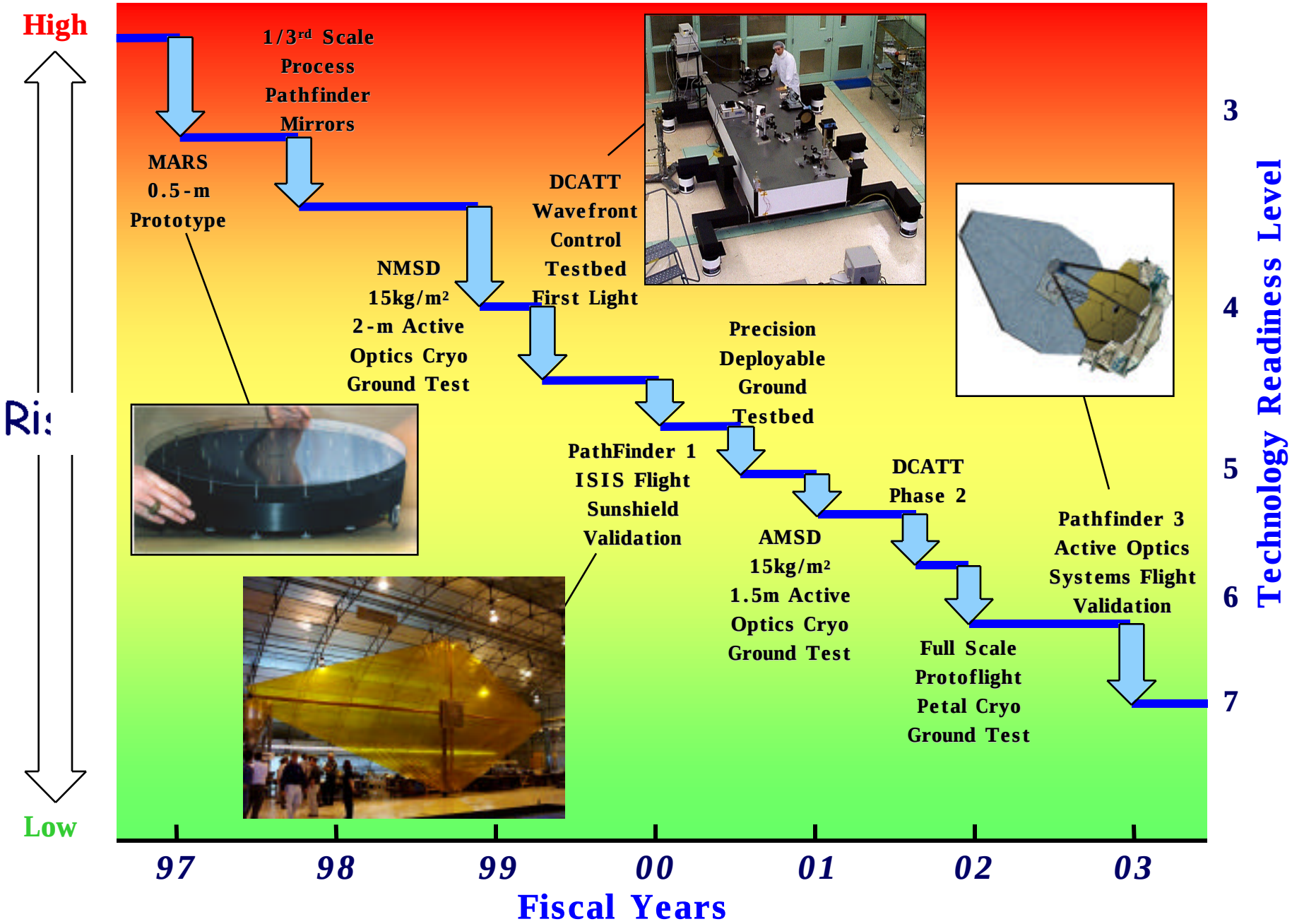


Telescope Technology Risk Mitigation Flow



Project Is Committed to Open Access by the Scientific Community

- **Listservs**
  - http://www.ngst.nasa.gov/News/lists

- **Comments to science teams**
  - http://www.ngst.nasa.gov/project/text/emailform.html

NGST Science & Technology Challenges

- **September 13-17, 1999 Woods Hole, MA**
- **<u>Purpose:</u> Bring scientific and technology communities together at one conference for focused discussions of NGST relevant challenges**