NGST Programmatic Update

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11.30.01

NGST Cryogenic Infrared Observatory at a Glance

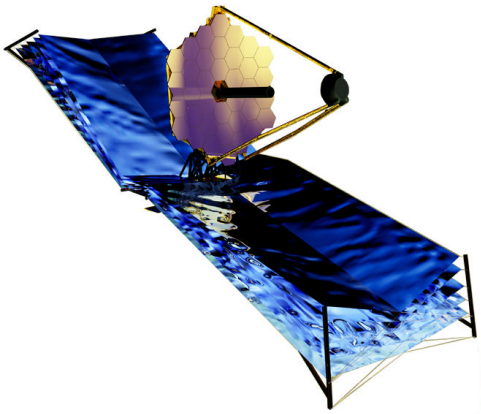
6-7 meter diameter deployable primary mirror

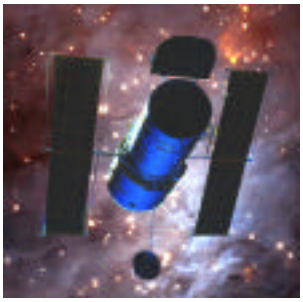
0.6-10+ µm wavelength range - near infrared optimized

5 year mission life (10 year goal)

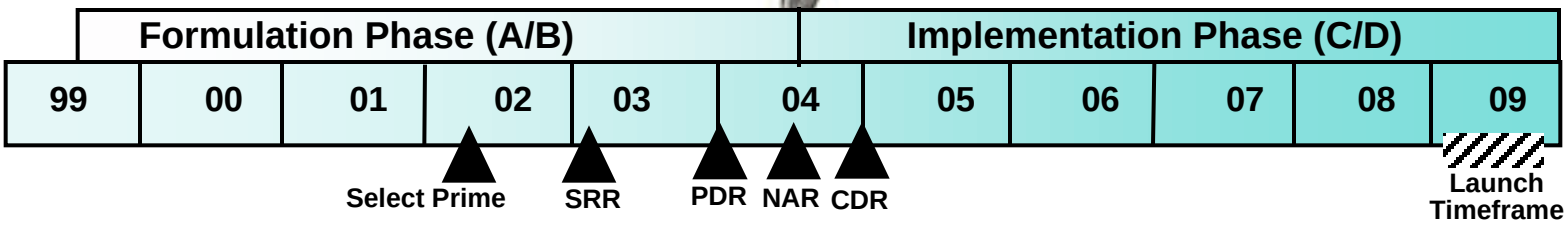
Passively cooled to <50K

L2 orbit





- Logical successor to HS
- Key part of the Origins Program – technological as well as scientifically



Project Manager's Assessment (1 of 3)

Studies

Competitive Pre-Phase A (18 months) and Phase A (18 months) studi
have resulted in:

- 2 viable architectures
- Reference (yardstick) design concept
- $50 M in matching industry funds
- Prototypes of all enabling and enhancing technologies
- Complete Level I, II requirements documents
- Operations concept
- Detailed, independently validated cost estimates for the prime contract

Project Manager's Assessment (2 of 3)

Pre-Program Product Improvements (enabling technologies)

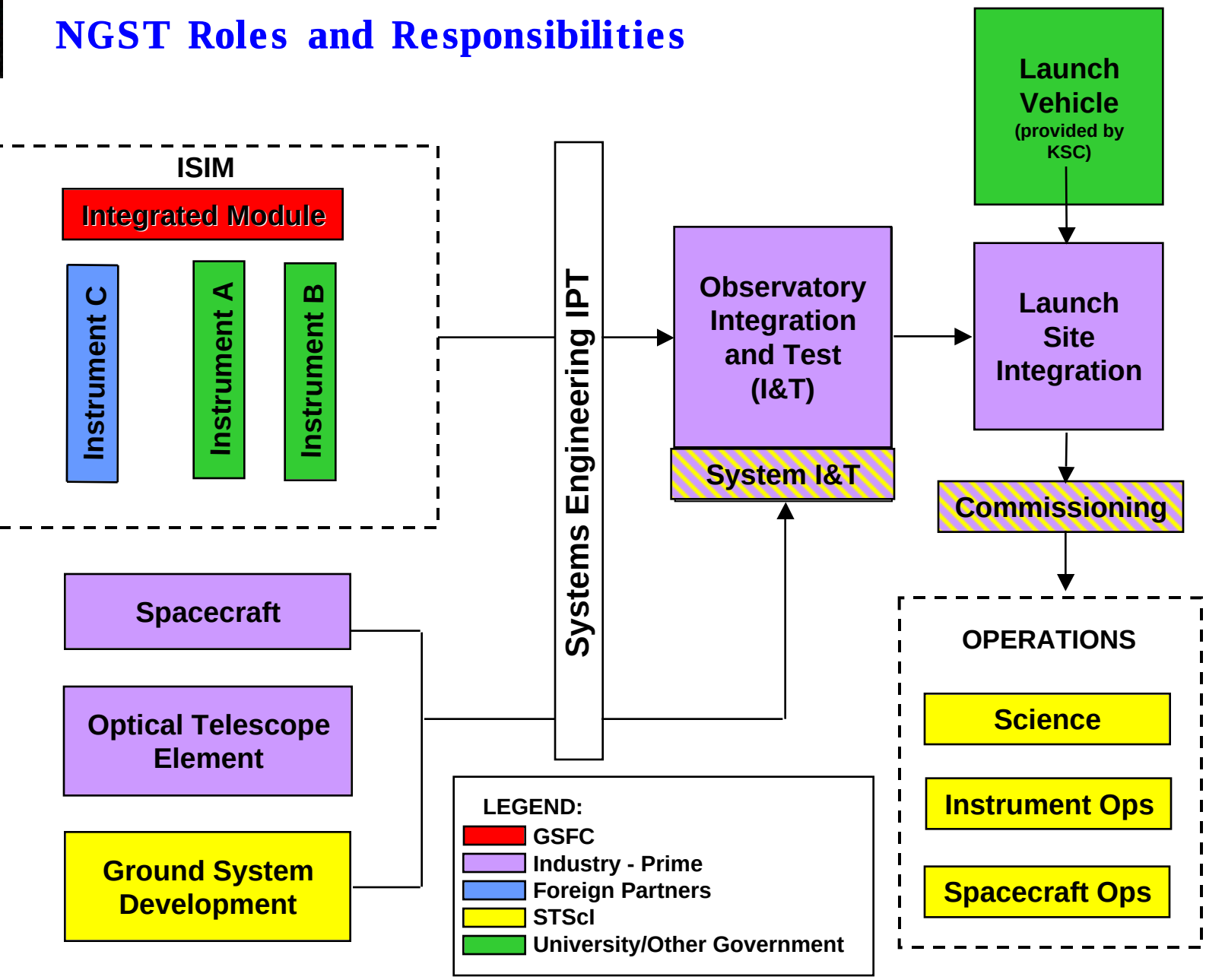
- **Active optics**
  - Cryogenic actuators with low hysteresis
  - Image-based wavefront sensing algorithms and techniques
  - Ultra-lightweight facesheets
- **Deployables**
  - Cryogenic hinges and latches
  - Cryo-material effects on populated reaction structures
  - Multi-layer sunshield
- **Focal Planes**
  - Low noise NIR and MIR detectors
  - Low noise electronics designs
  - Ultra-low background detector evaluation facilities

Project Manager's Assessment (3 of 3)

Pre-Program Product Improvements (enhancing technologies)

- **Micro-Electro-Mechanical Systems (MEMS) programmable aperture mask**
  - 3 concept devices tested at cryo
- **Scientist's Expert Assistant (SEA)**
  - Completed and successfully transitioned to HST/ACS for beta testing
- **Programmatic emphasis on early, rapid prototyping of hardware and software has greatly reduced the uncertainties in the respective cost estimates**

NGST Roles and Responsibilities



International Traffic In Arms Regulations (ITAR)

The development of NGST to include exports to the NASA International partners is controlled under the ITAR

NGST has staff on-board who are familiar with "taming the ITAR beast"; having worked with and still supporting other NASA programs involving extensive international collaboration

NGST Letters of Agreement are in place to handle current "formulation" activities

- Have been used as basis to support industry Technical Assistance Agreement development

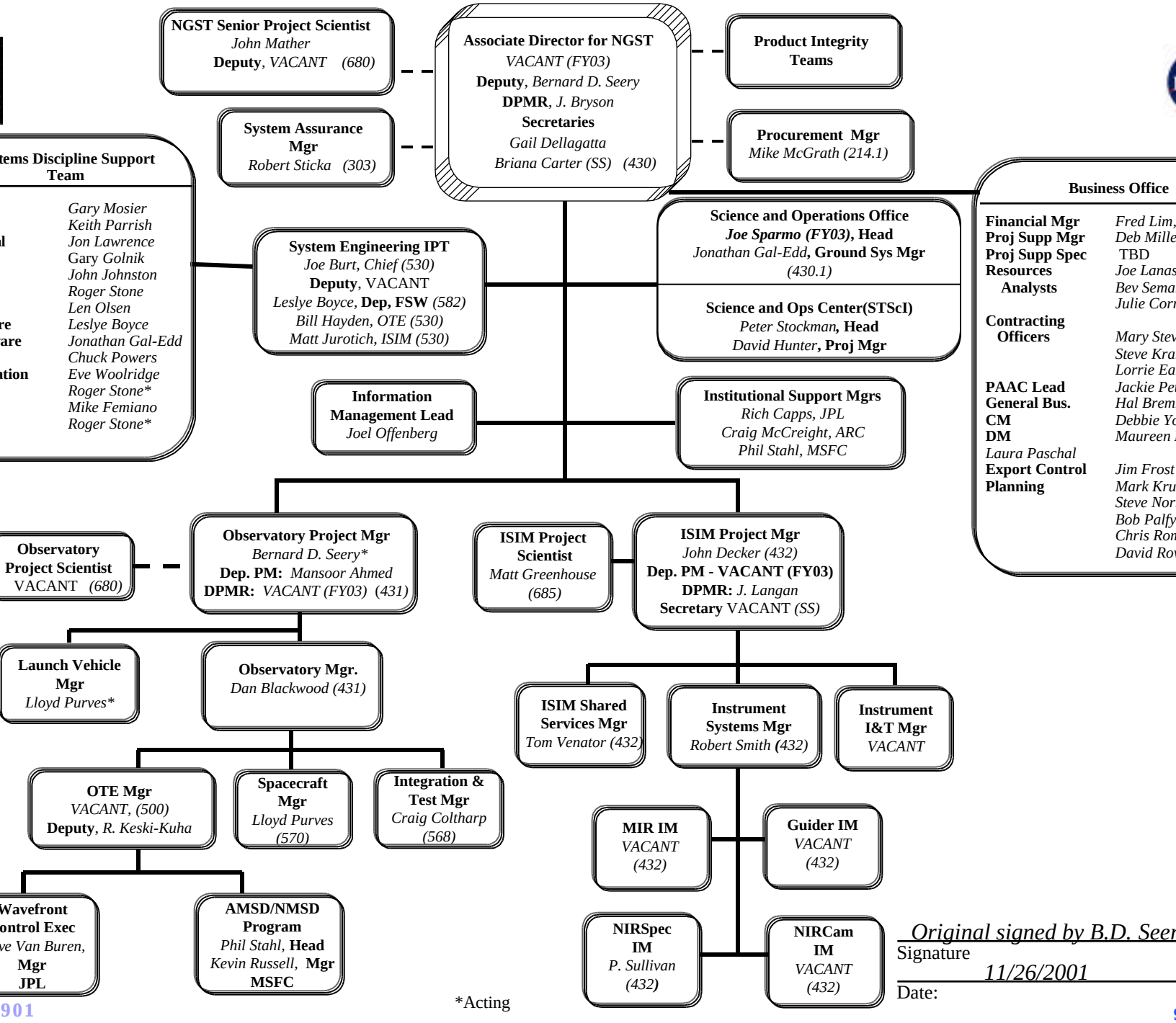
Working with Code IS NASA Office External Relations in developing deliverables and requirements

Developing NGST International Collaboration Annex (NICA) as annex NGST Project Plan

NGST Programmatic Decision Support Team

Science Working Group

Senior Project Scientist



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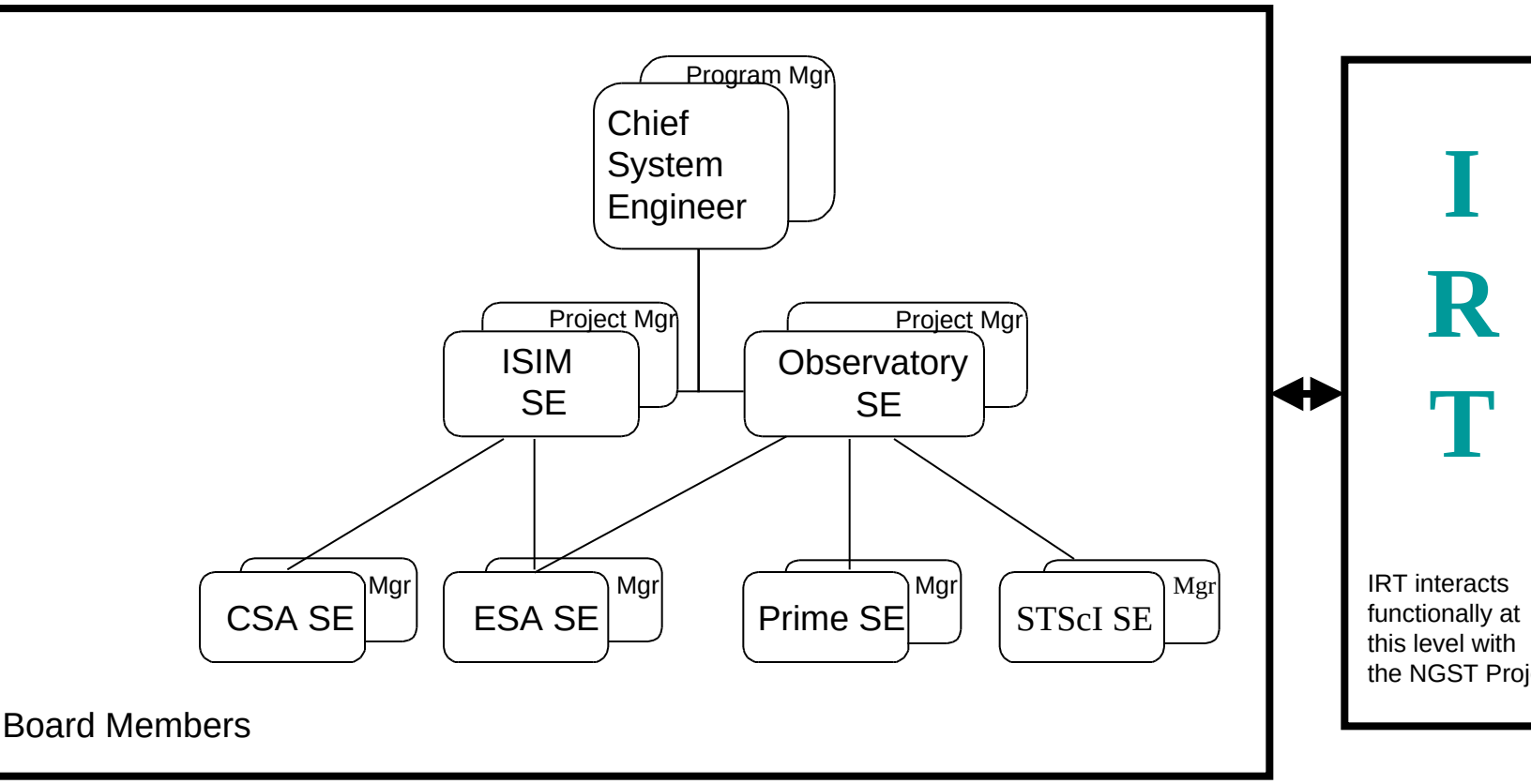
Joint System Engineering Board (JSEB)



International Collaboration

Motivation for Partnering

- Increased observatory scientific capability/productivity
- Increased project contingency

Resource Portfolio (FY96 US $) & Preliminary Contributions:

ESA	$200M	NIRSPEC instrument; 50% MIR instrument; spacecraft bus or avionics
CSA	$50M	Guider subsystem; NIRCAM instrument contribution

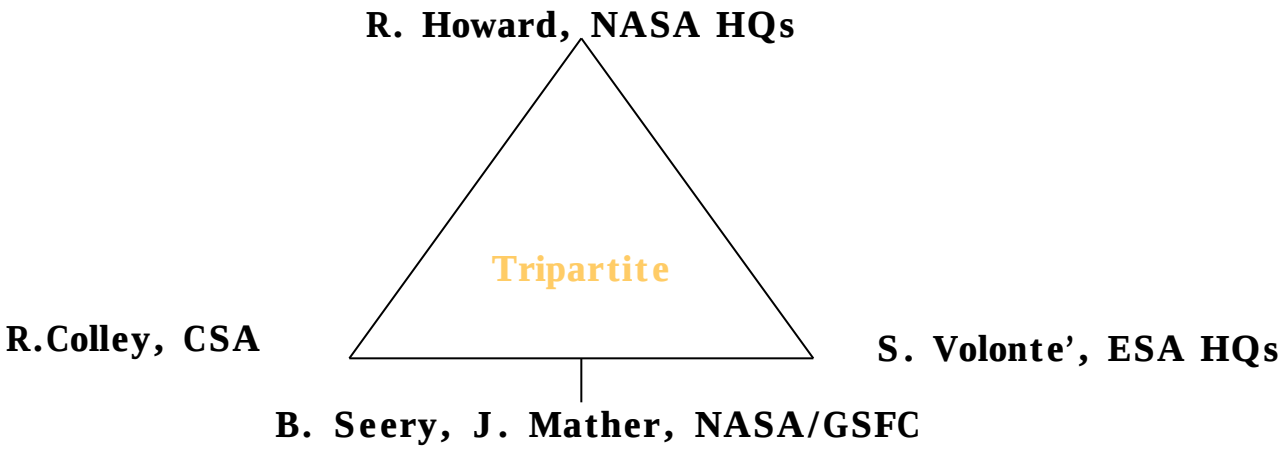
Plans

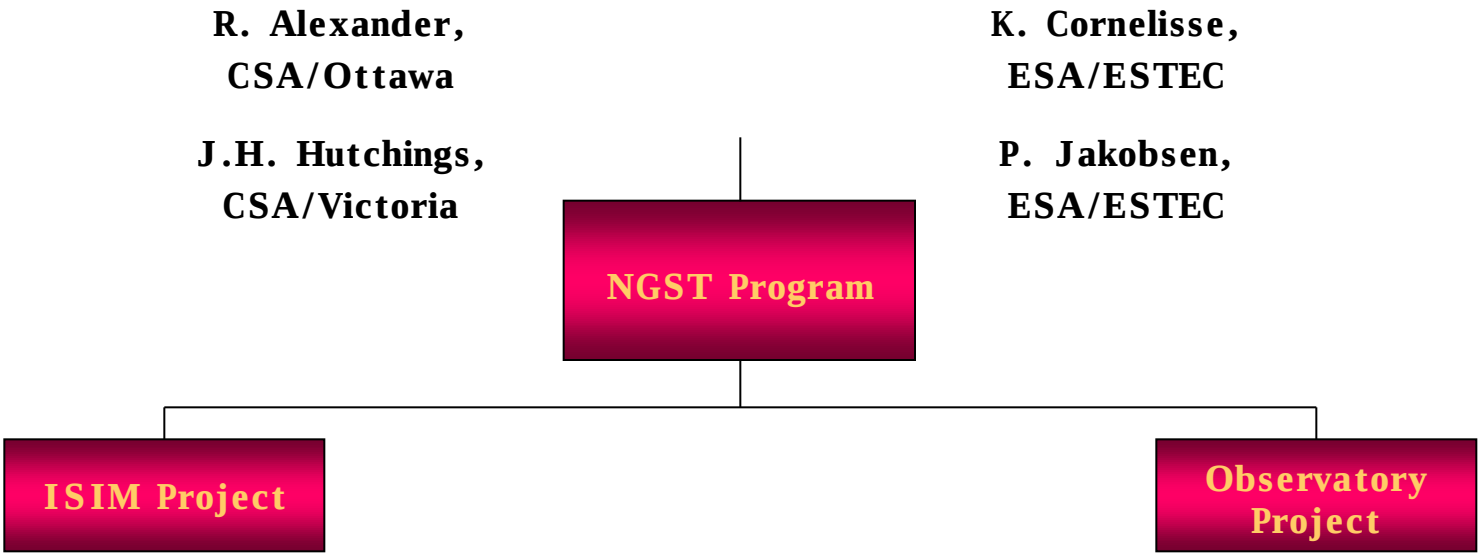
- Extend the NASA/ESA MOU for HST, while incorporating NGST, to maintai the 15% allotment of observing time for ESA astronomers
- Establish a similar partnering arrangement with CSA for a proportional amount (5%) of NGST observing time

Documentation

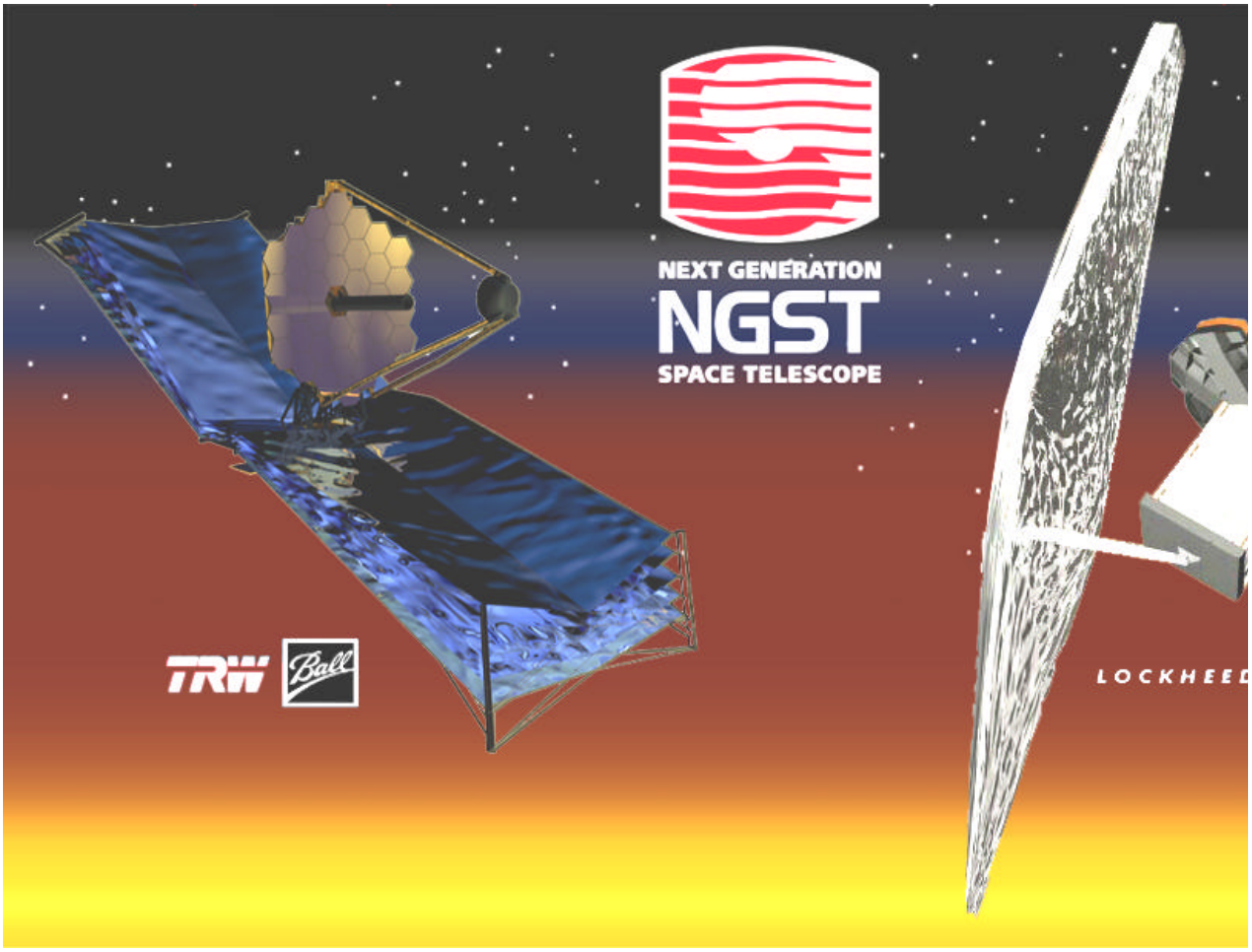
- Concept Agreement signed by Bonnet/Weiler in December 1998 and Wetter/Weiler in April 1999
- Letters of Agreement signed for CSA and ESA - Feb 2000
- Memorandum of Understanding (MOU) for ESA/CSA under construction

Tripartite Partnership Group





Comprehensive and Systematic Trade Studies Have Produced Two Viable Observatory Designs



Public Outreach

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