

A Sounding rocket experiment to image an extrasolar planet around Epsilon Eridani

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Don't get excited because, there have been **Many, Many** firsts



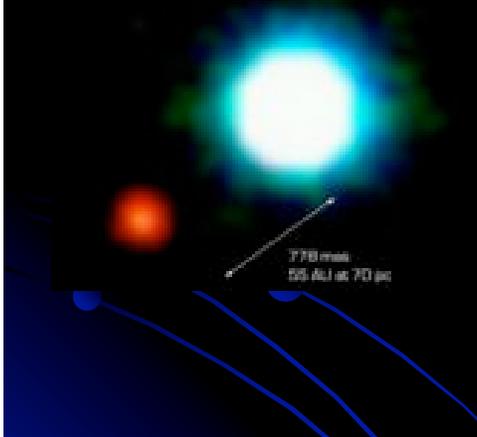
Pushing the Limit: Possible First Photo of Extrasolar Planet

By Robert Roy Britt

Senior Science Writer

posted: 07:00 am ET

10 May 2004



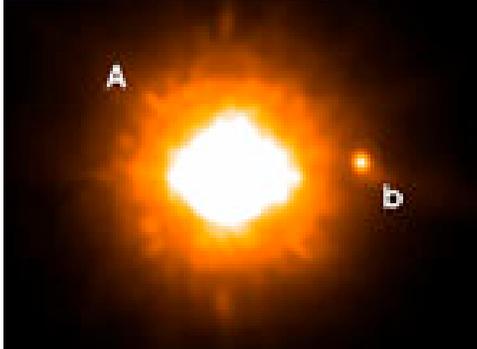
Likely First Photo of Planet Beyond the Solar System

By Robert Roy Britt

Senior Science Writer

posted: 10 September 2004

08:50 am ET



EXCLUSIVE: First Confirmed Picture of a Planet Beyond the Solar System

By Robert Roy Britt

Senior Science Writer

posted: 01 April 2005

09:04 am ET

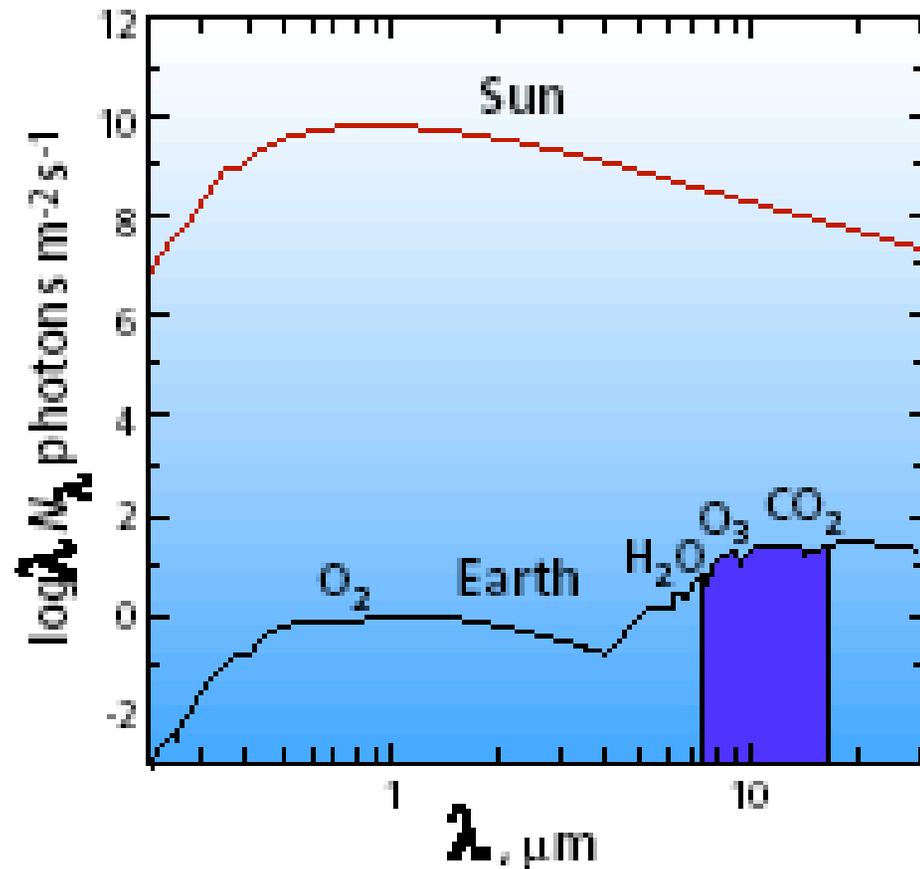
All from space.com

All by the same author

The Team

- **Boston University**
 - John Atkinson
 - **Thomas Bifano**
 - **Supriya Chakrabarti**
 - **Timothy Cook**
 - Paul Jung
 - Brian Hicks
 - Chris Mendillo
- **JPL**
 - **Michael Shao**
 - **B. Martin Levin**
 - **J. Kent Wallace**
 - Shanti Rao
- **MIT/Draper**
 - **Benjamin Lane**
- **Boston Micro Machines**
 - **Paul Bierden**
- **NASA WFF**
 - Ted Gass
 - John Gsell
 - Valerie Gsell
 - Andrew Mandigo
- **GSFC**
 - Douglas Rabin
 - Joseph Davila
 - David Content
- **Northrup Grumman**
 - Rocco Samuele

The Challenge

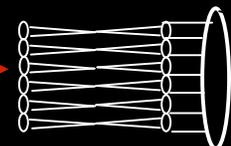
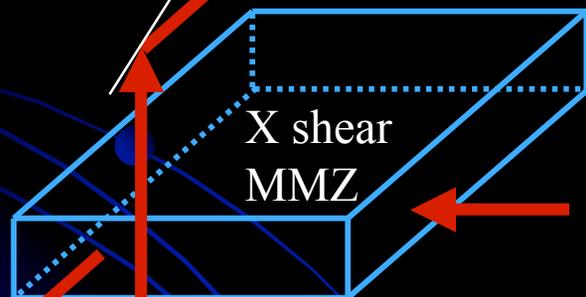


The full-up plan for TPF-C

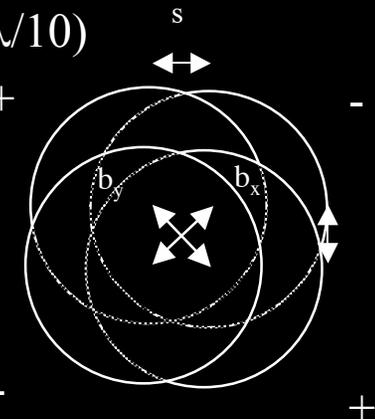
Beam with
X and Y shear,
 θ^4 null output

Lenslet and fiber-
optic array spatial
filter

Image plane
(real image)
 $\sim(64 \times 64)$



Diffraction limited
imaging system ($\lambda/10$)



Telescope
Pupil

θ^4 Null in
Pupil Overlap
Area

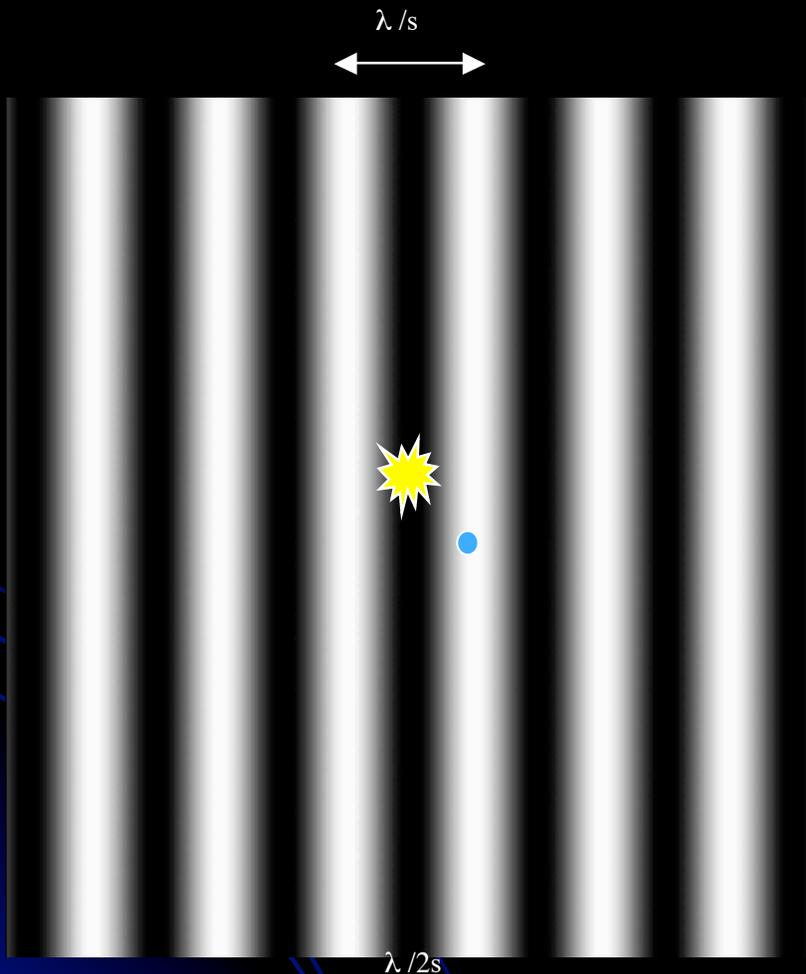
Baseline is $\sqrt{2}$ x shear

Single Mode Fiber array enables:

10^{-9} suppression achieved with 10^{-7} nuller and 100 lenslets

10^{-10} suppression achieved with 10^{-7} nuller and 1000 lenslets

So, what you want to do is:



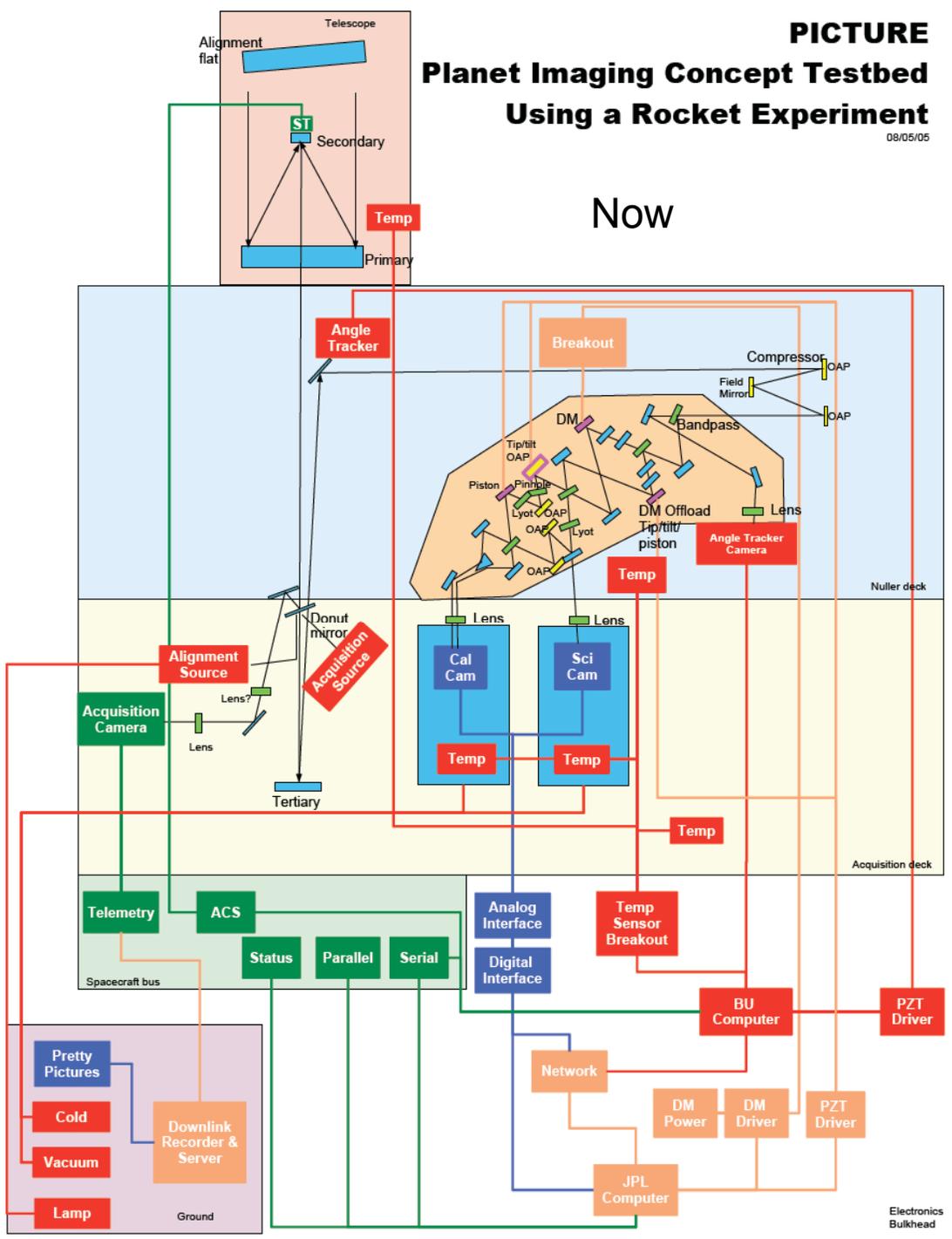
Hide the star behind bars

PICTURE
Planet Imaging Concept Testbed
 Using a Rocket Experiment

08/05/05

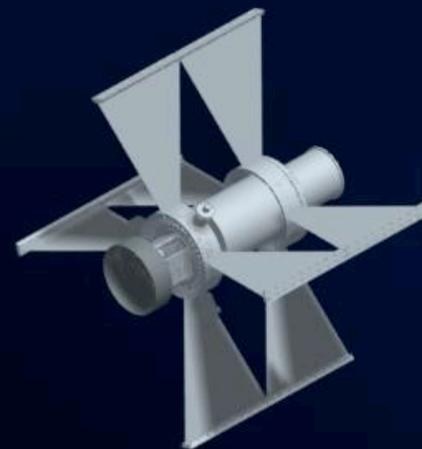
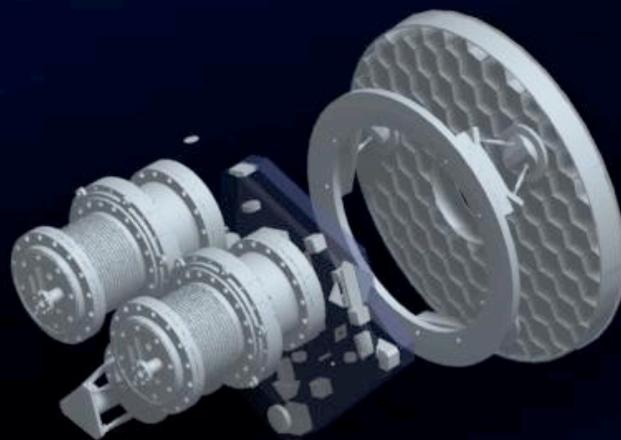
Now

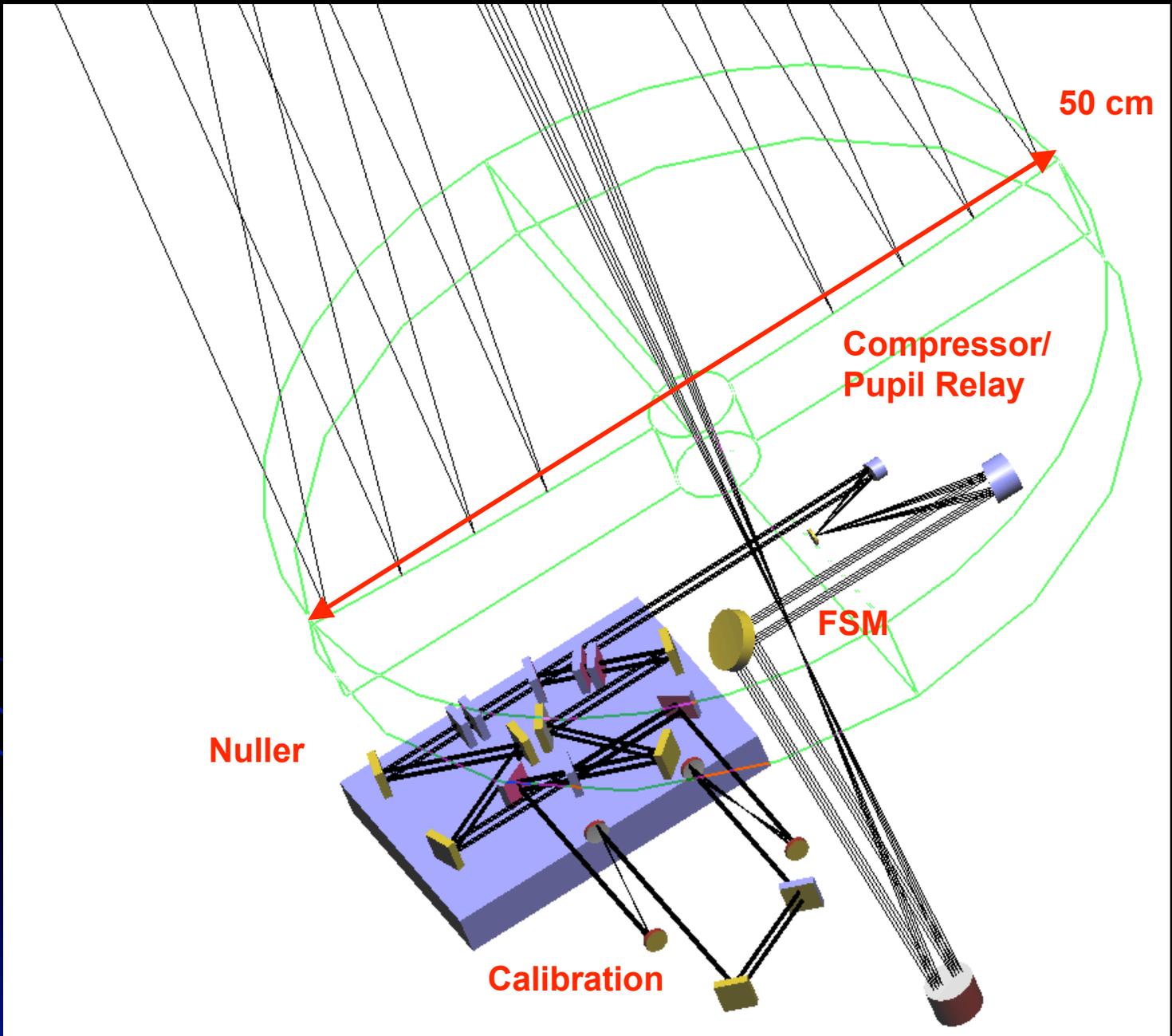
The System View



PICTURE:

Planet
Imaging
Concept
Testbed
Using a
Rocket
Experiment



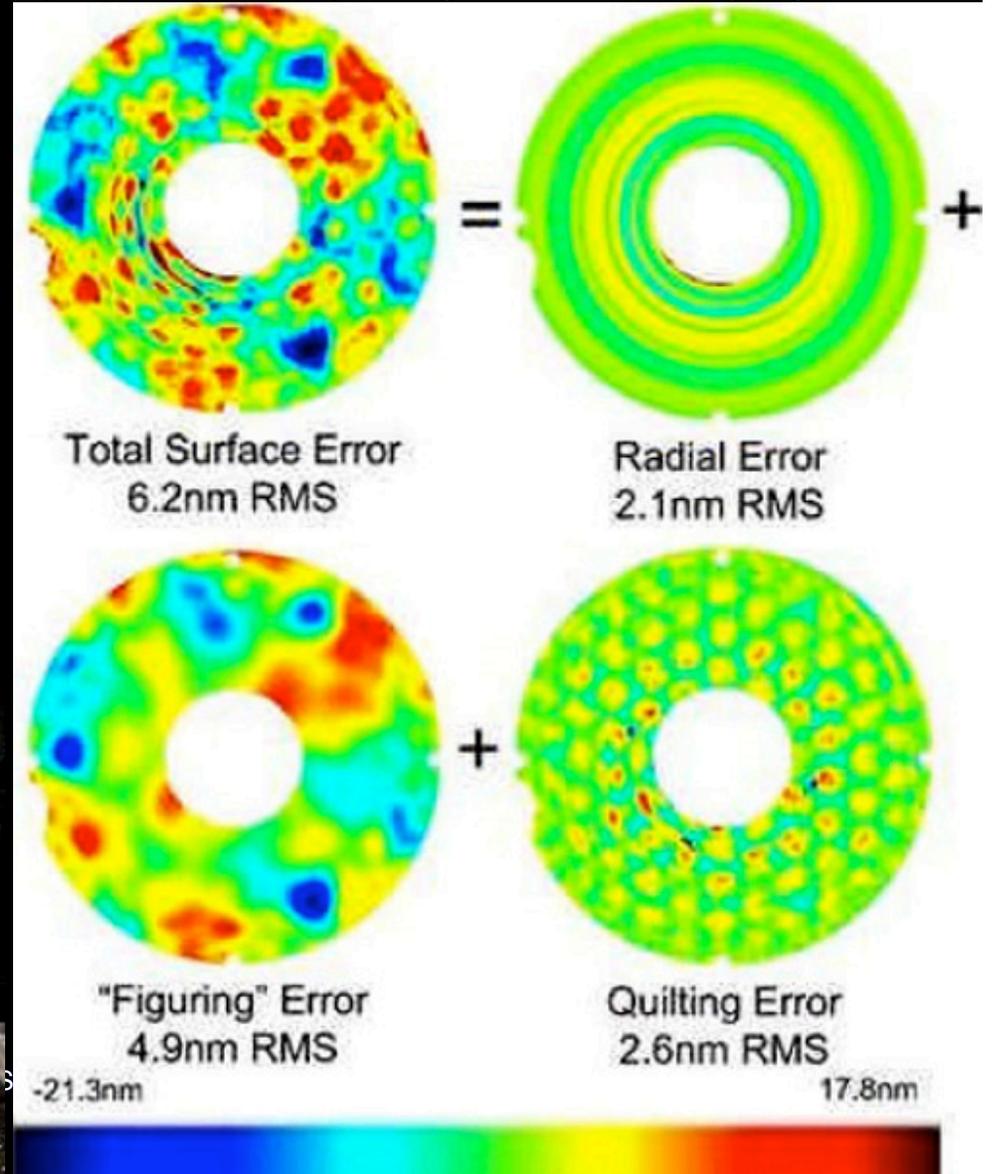
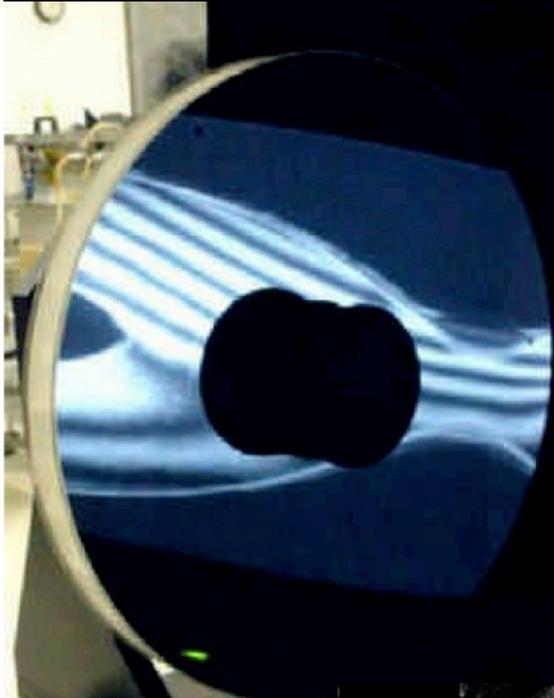


The Top Plate



The Primary Mirror

<http://newsroom.spie.org/x3847.xml?highlight=x521>



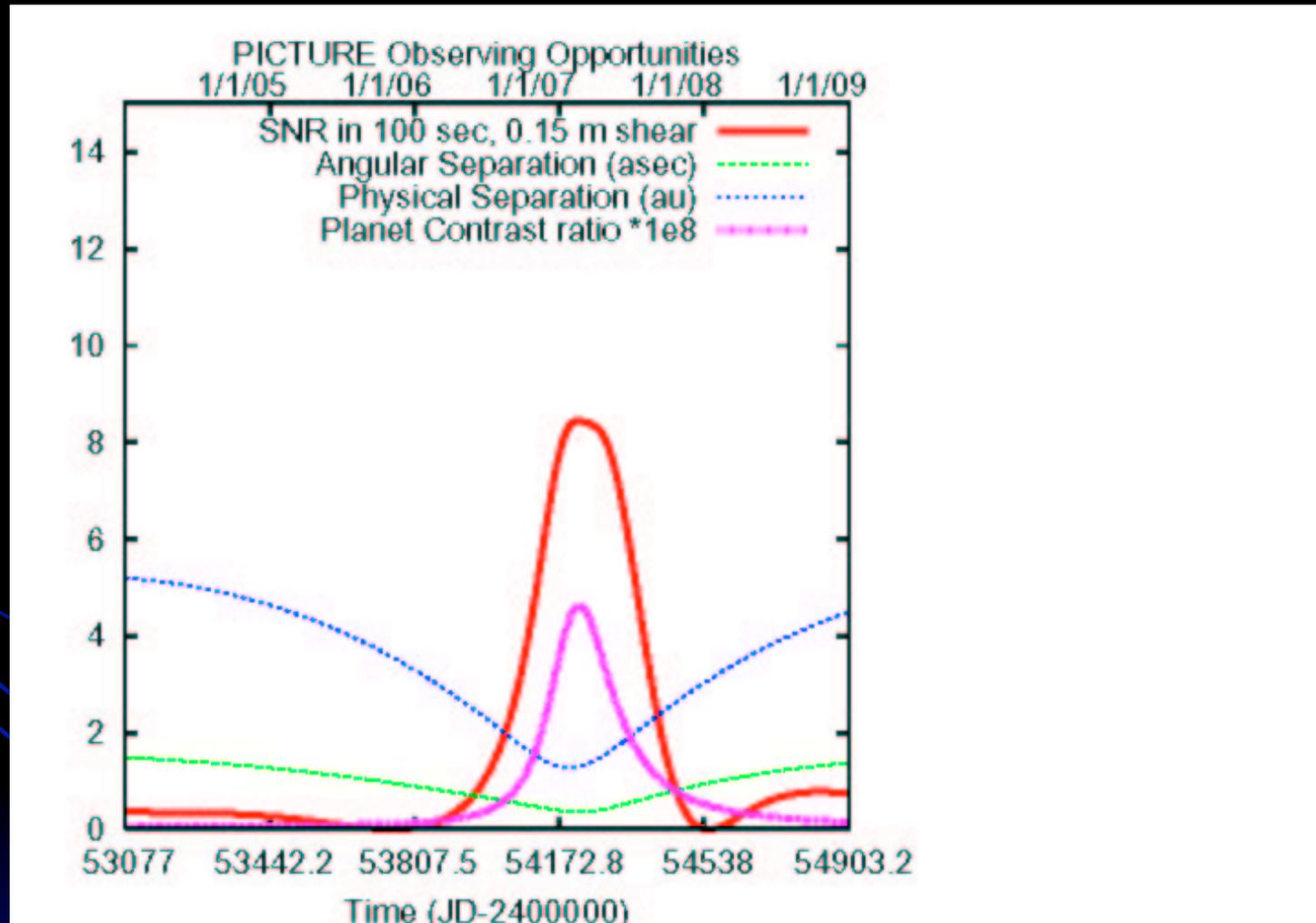
Feb 2, 2007

Telescope

- The Structure components have been built
- These are now at GSFC being used to assemble the telescope
- Primary mirror shake successful



The Options



Launch Window

