

# **Constellation X Alignment Using the Centroid Detector Assembly (CDA)**

Presented at the  
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May 1, 2002  
Paul Glenn

# Centroiding approach

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- The centroiding approach scans a pencil beam around the telescope aperture
- Slope errors in the transmitted beam are mapped to determine focus errors and aberrations
- Sensitivity of the order of 0.01 arc-second is possible using visible light
- Sensitivity is much better than with a classical wavefront test

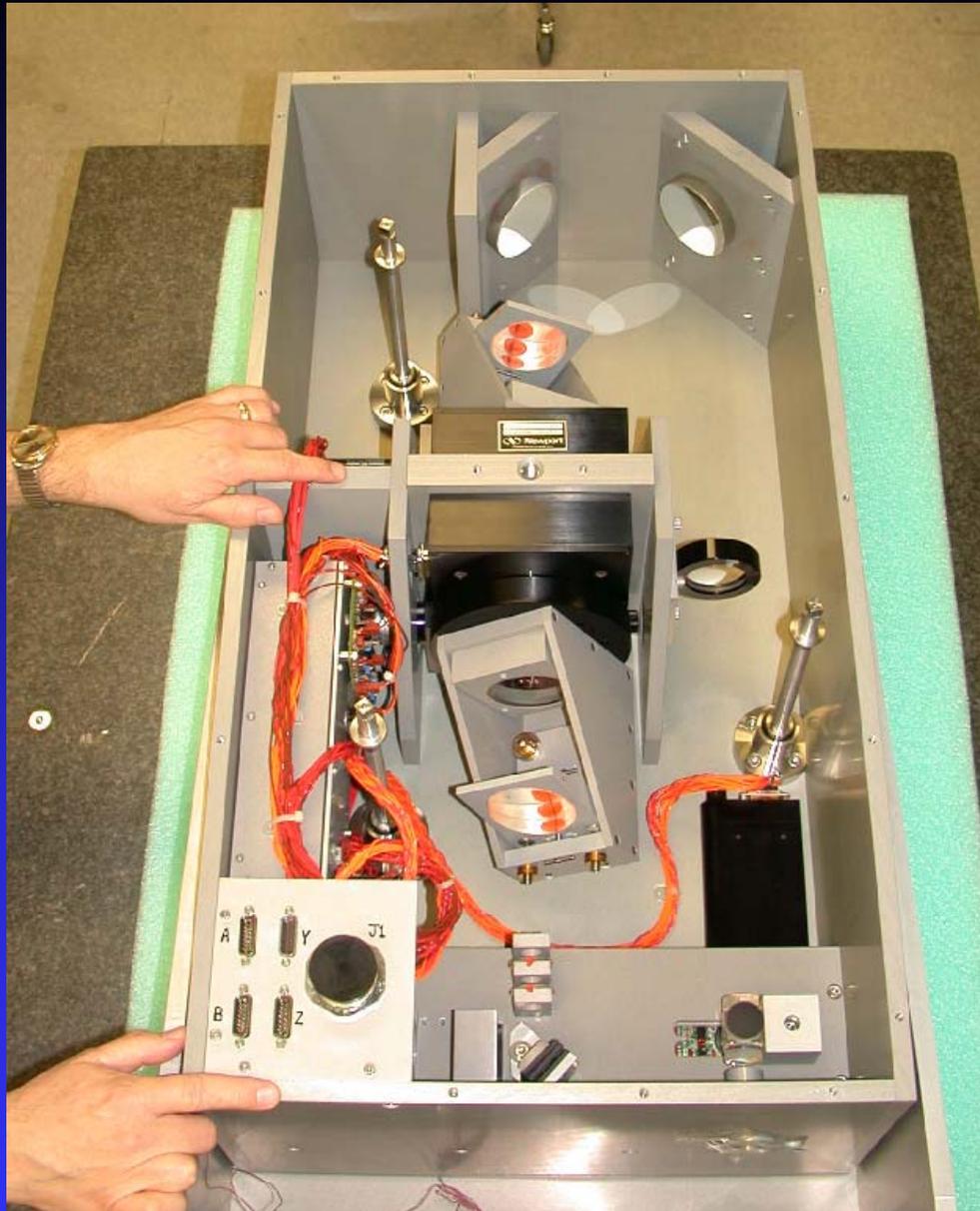
# Centroiding approach

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- The centroiding approach has been used for (among others)
  - ◆ HEAO-B
  - ◆ TMA (Chandra's technology demonstrator) via the "TMA instrument"
  - ◆ Chandra via the "CDA"

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# Inside View of the CDA



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# CDA errors for Con-X

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- A preliminary CDA error budget has been prepared for Constellation X, considering
  - ◆ Measured CDA performance for Chandra
  - ◆ Nominal scalings from Chandra to Constellation-X
  - ◆ Second generation electronics
- Resulting contributions to RMS image diameter:
  - ◆ Parabola: 0.02 arc-second
  - ◆ Hyperbola: 0.03 arc-second

# CDA Status

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- The CDA and its electronics are being refurbished and upgraded
- Basic layouts have been performed for using the CDA to align the Constellation-X engineering units, and long lead items are being procured
- We will soon be ready to use the CDA to help assemble and align the Constellation-X engineering units