

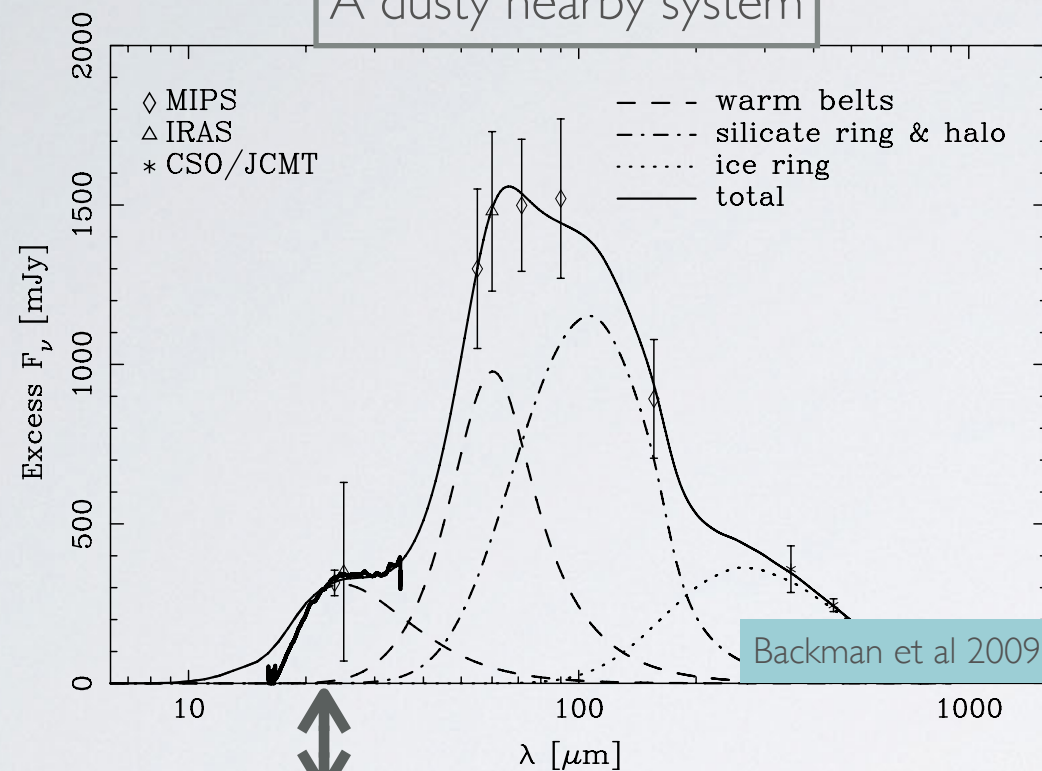
# Imaging the $\epsilon$ -Eridani system in visible light from a sounding rocket

Ewan Douglas

Boston University, Department of Astronomy

## Science

A dusty nearby system



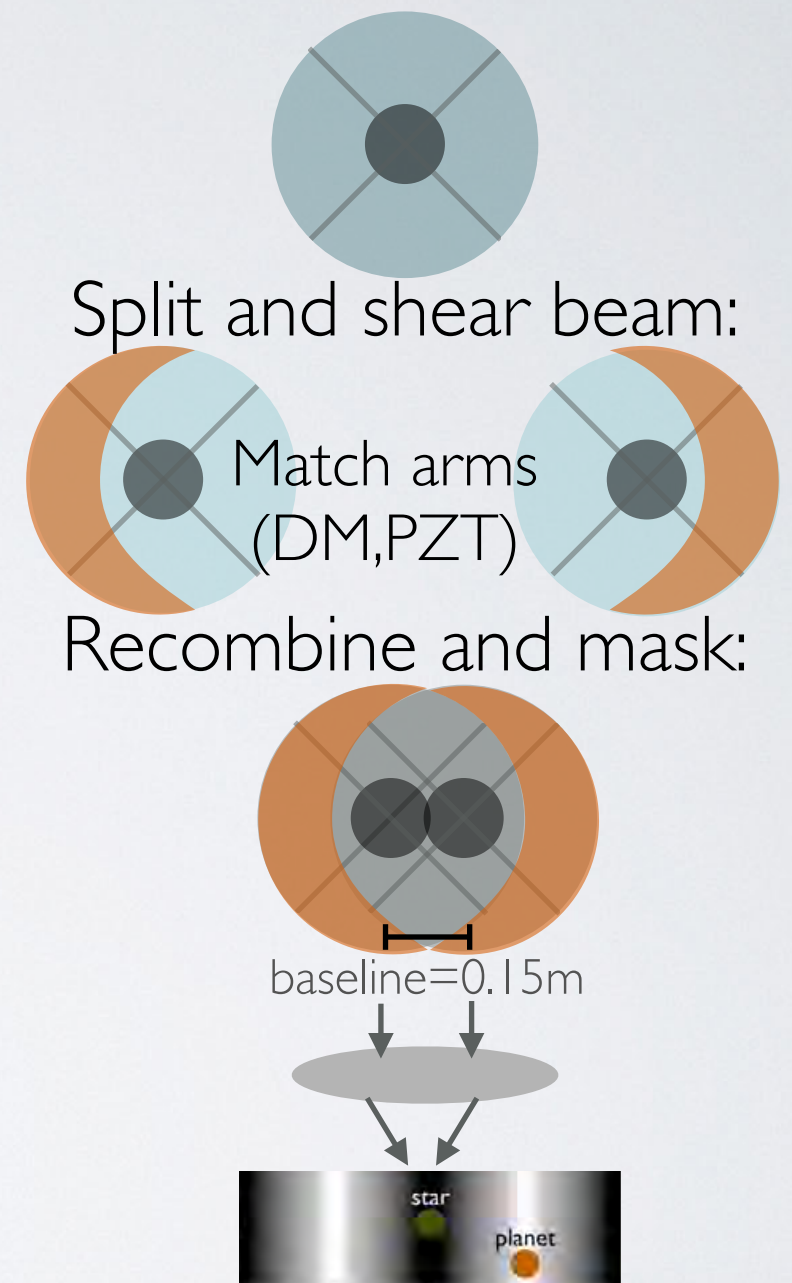
IR excess implies a warm belt at 3AU ( $1''$ )

### Mission Stats:

0.5m telescope  
 $\sim 230$  sec. observing time  
 $\sim 240$  km apogee



## A Visible Nulling Coronagraph



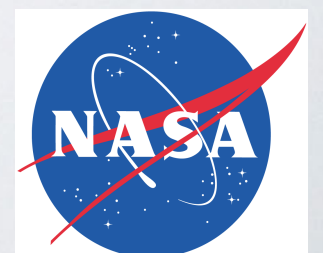
## PICTURE Team:

### 1st flight:

- JPL
- MIT
- Boston University

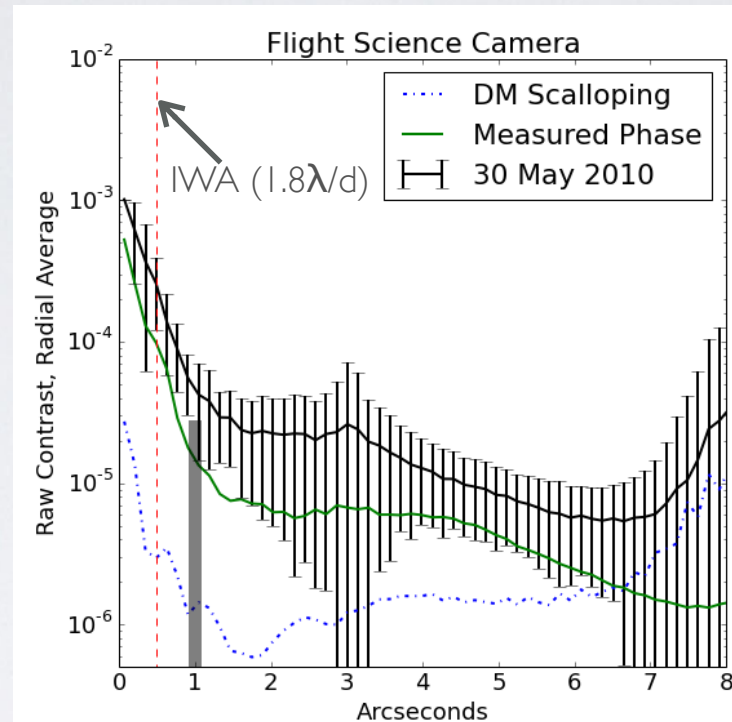
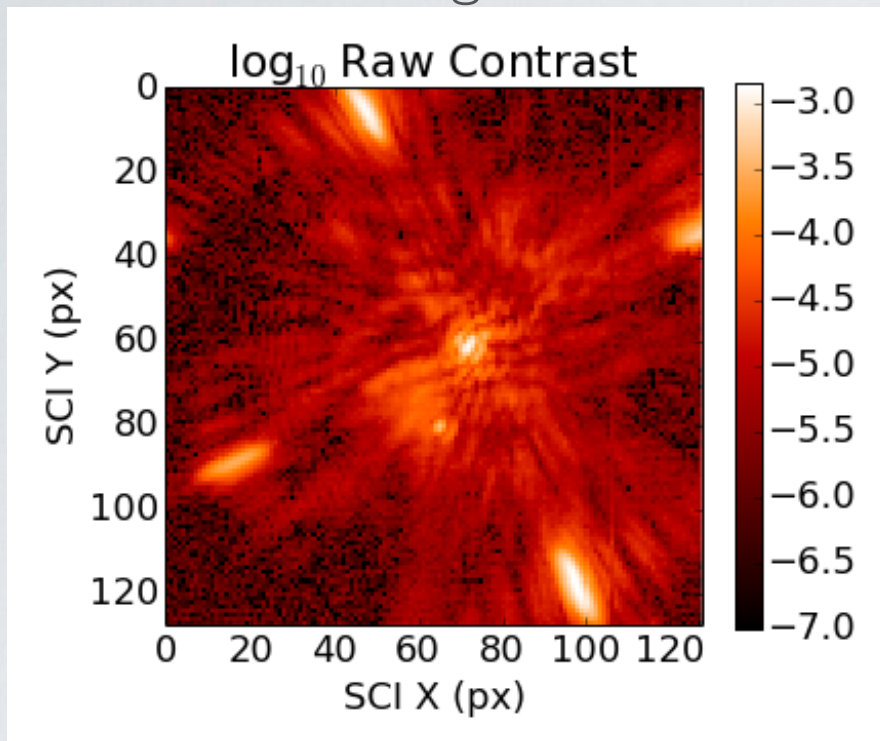
### Reflight:

- UMass Lowell
- Northrop Grumman/AOA Xinetics

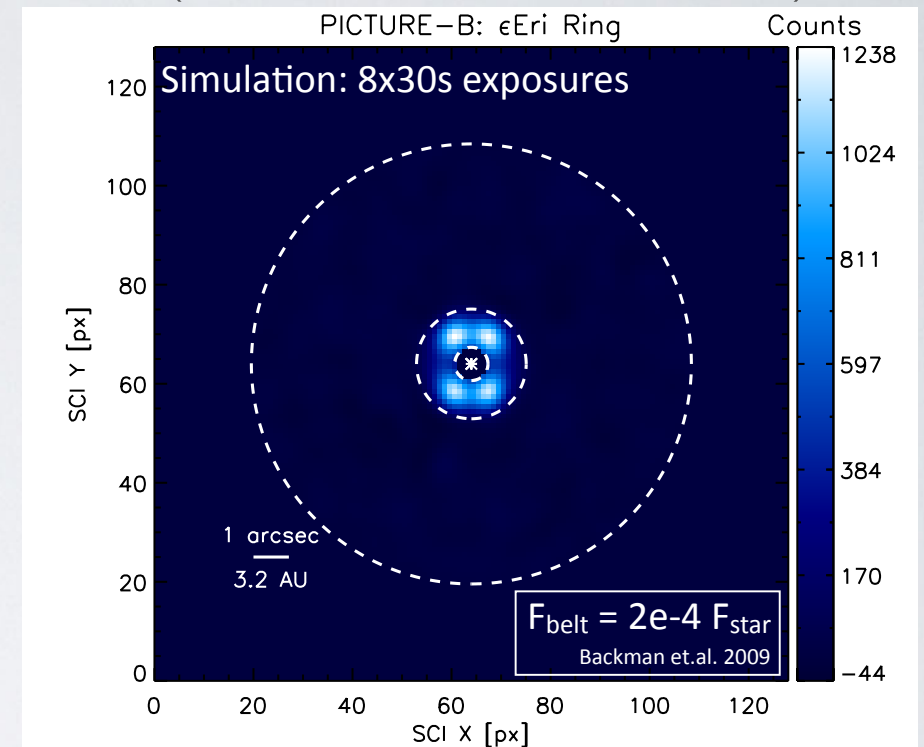


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Raw flight instrument contrast, measured in air



Simulated Observation  
(Calibration PSF subtracted)



Central Star Null Depth:  $\sim 1/700$   
 @ Science angle ( $1''$ )  $< 10^{-4}$   
 Effective Bandwidth (600-750nm):  $> 10\%$

Background and References:  
[umlcar.uml.edu/pictureb.html](http://umlcar.uml.edu/pictureb.html), [blogs.bu.edu/douglass/](http://blogs.bu.edu/douglass/)

Backman, D. et al. (2009), Epsilon Eridani's Planetary Debris Disk: Structure and Dynamics Based on Spitzer and Caltech Submillimeter Observatory Observations, *ApJ*, 690(2), 1522–1538

Mendillo, C. B., et al., (2012) Flight demonstration of a milliarcsecond pointing system for direct exoplanet imaging, *Appl. Opt.*, 51(29), 7069–7079,

Mendillo, C. B. et al. (2012), PICTURE: a sounding rocket experiment for direct imaging of an extrasolar planetary environment, in *Proc. SPIE*, vol. 8442.

Rao, S. R. et al. (2008), Path length control in a nulling coronagraph with a MEMS deformable mirror and a calibration interferometer, *Proc. SPIE*, 68880B–68880B,

