



SOLAR SYSTEM STEREOSCOPY WITH HUBBLE AND JAMES WEBB SPACE TELESCOPES



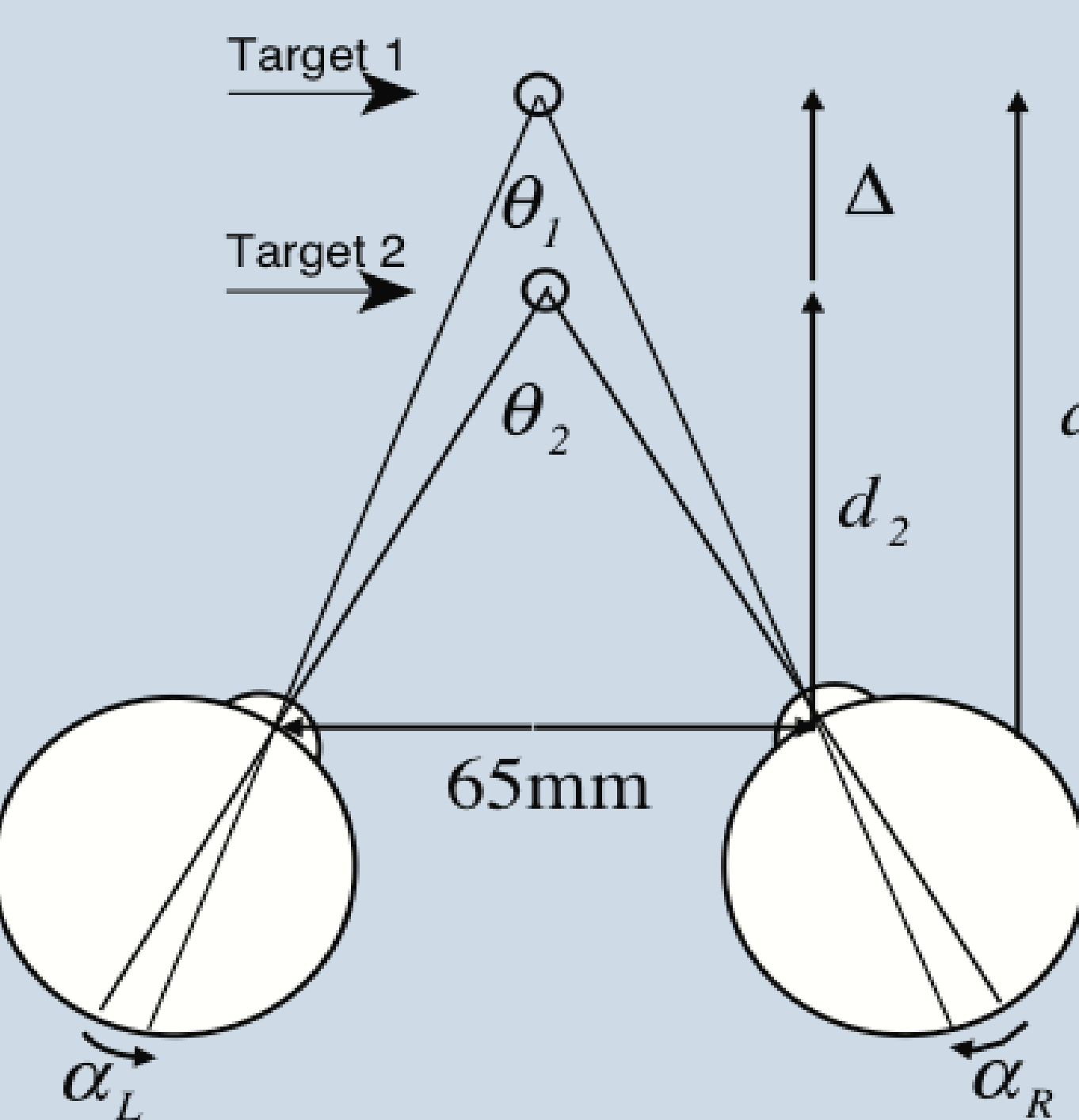
STScI | SPACE TELESCOPE SCIENCE INSTITUTE

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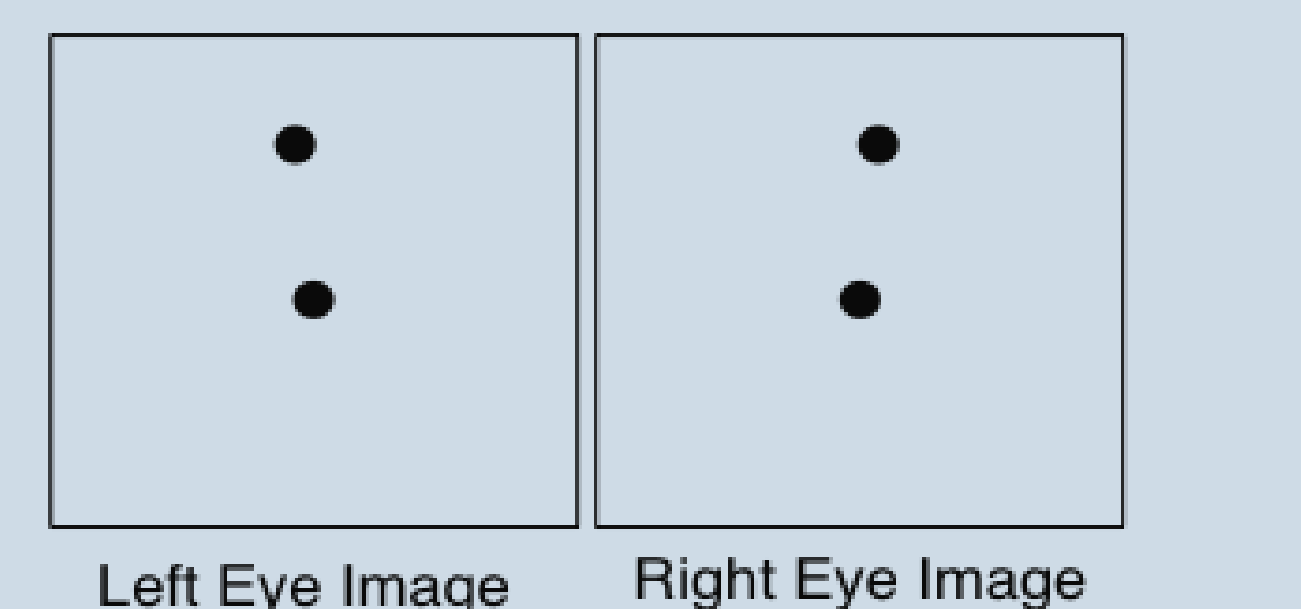
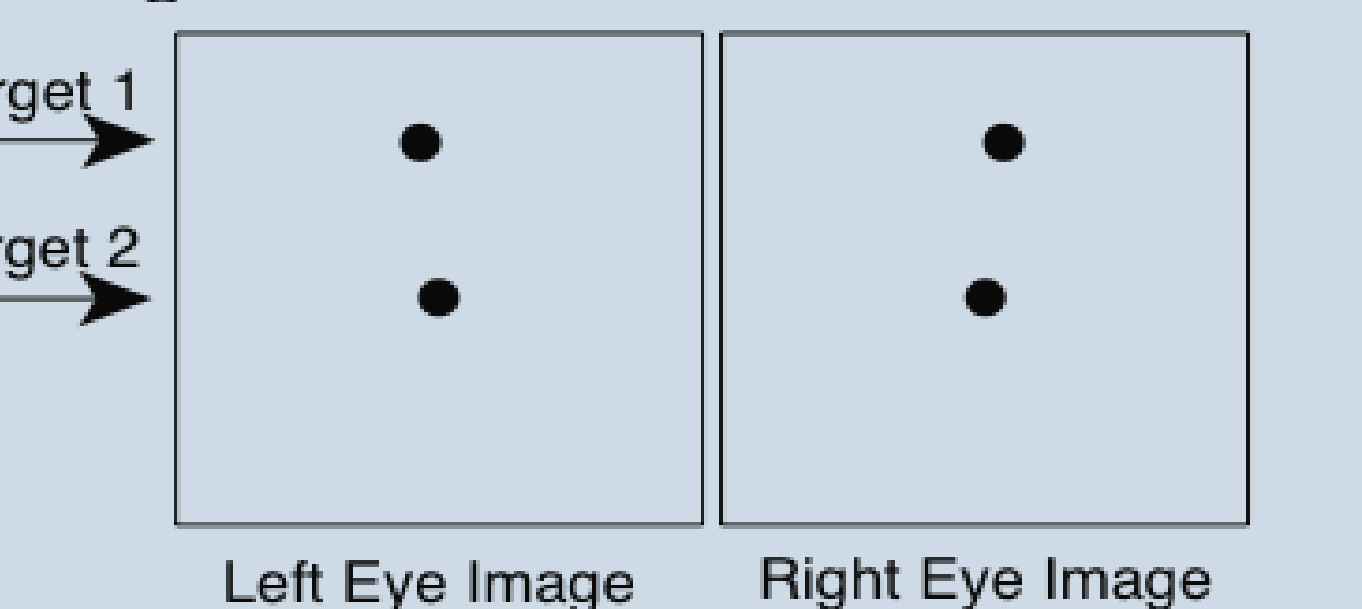
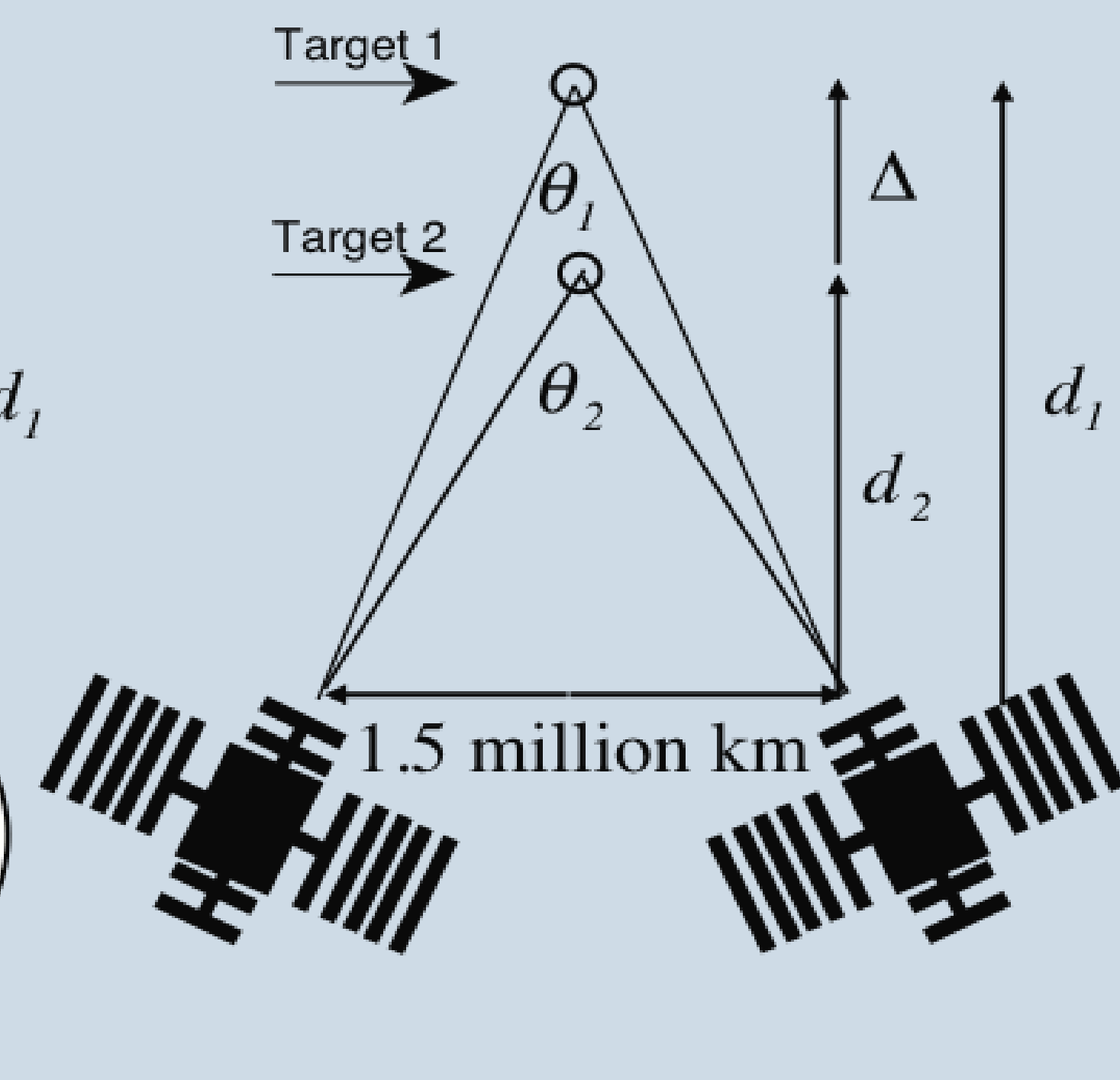
*at this meeting (Contact: meinke@stsci.edu)

What is stereoscopic 3D imagery?

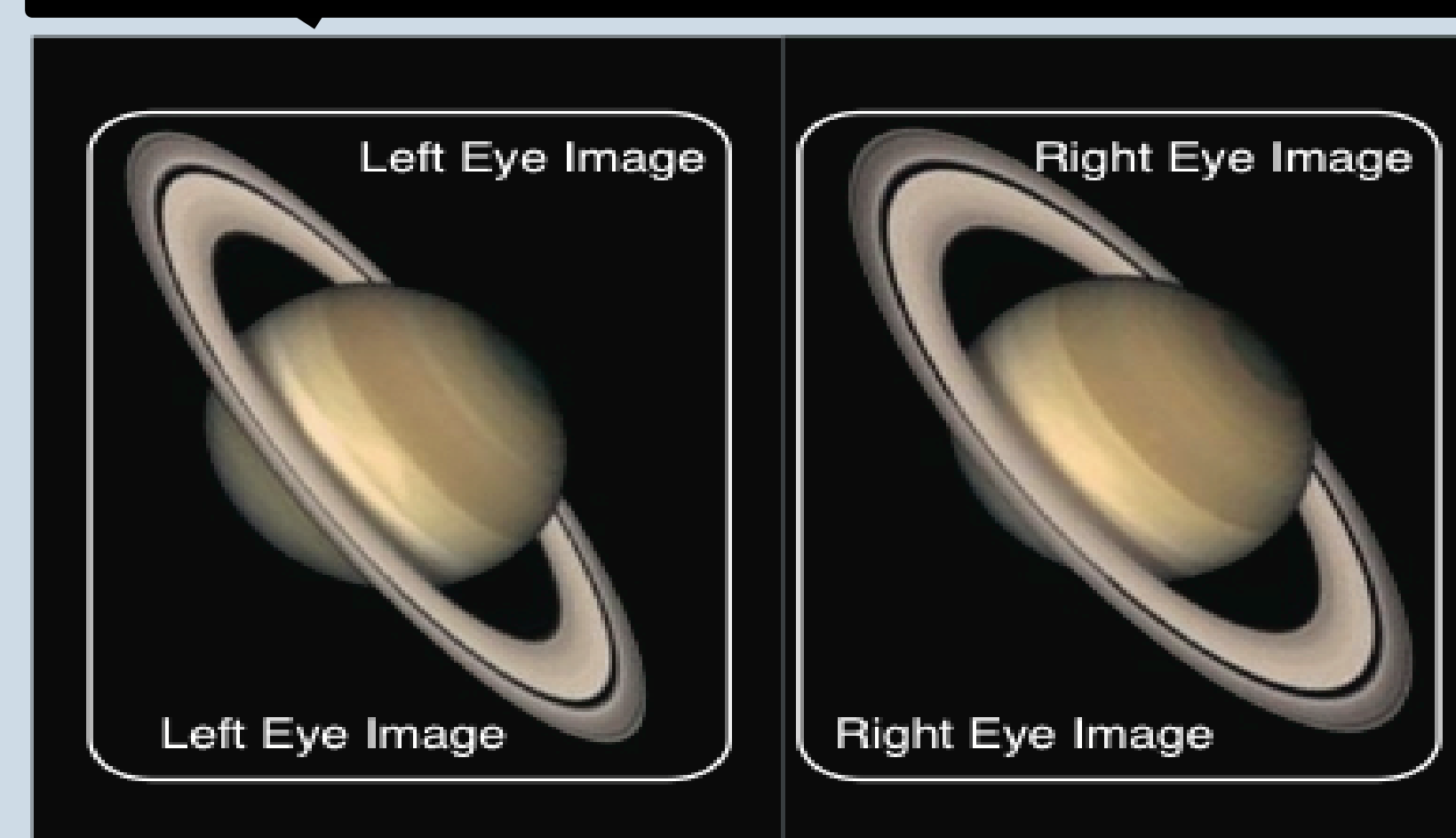
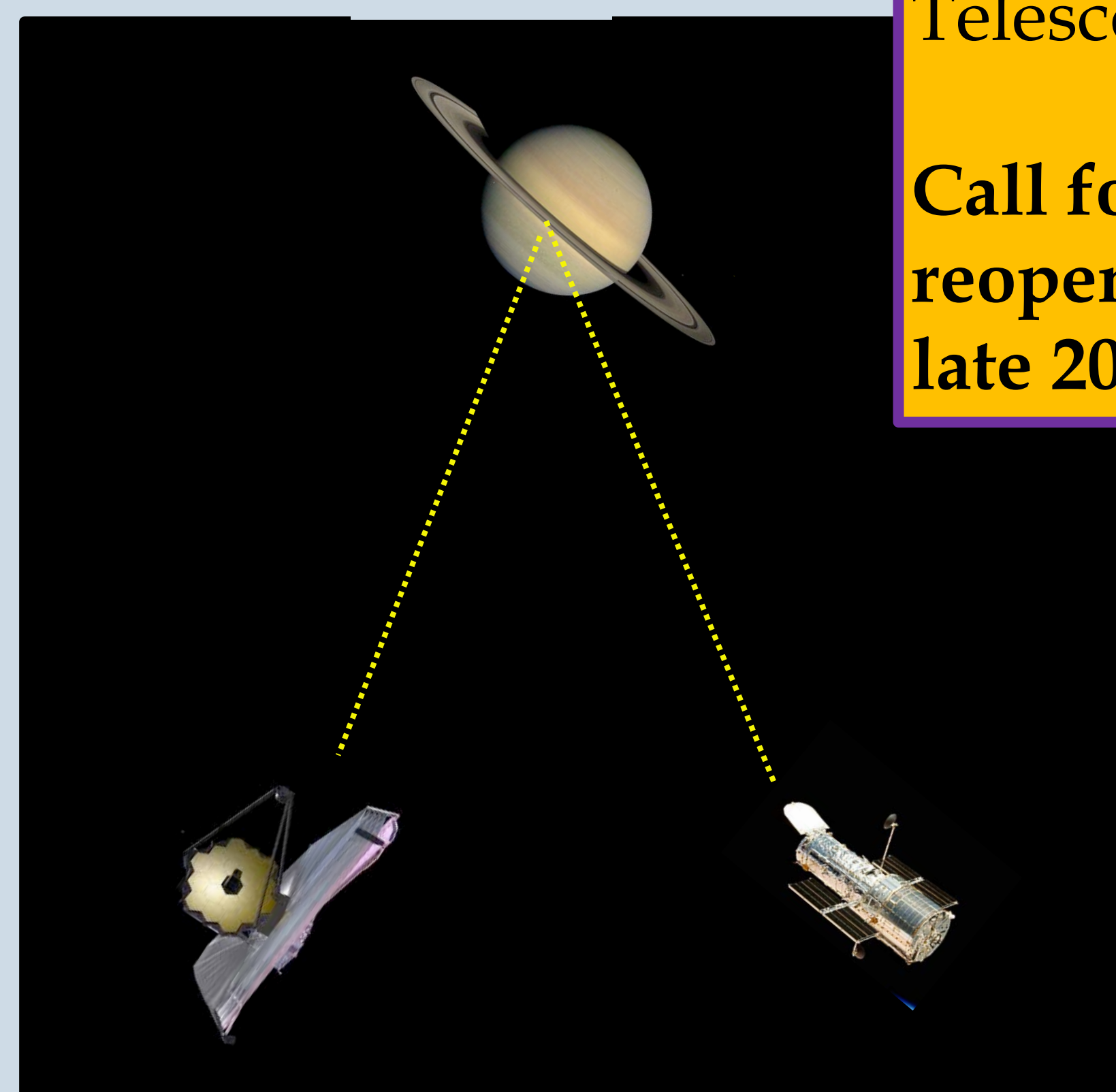
Human Stereo Geometry



Astro Stereo Geometry



Green et al. 2016, arxiv 1610.07483



Seasonal differences; orientation Courtesy: HST/2004

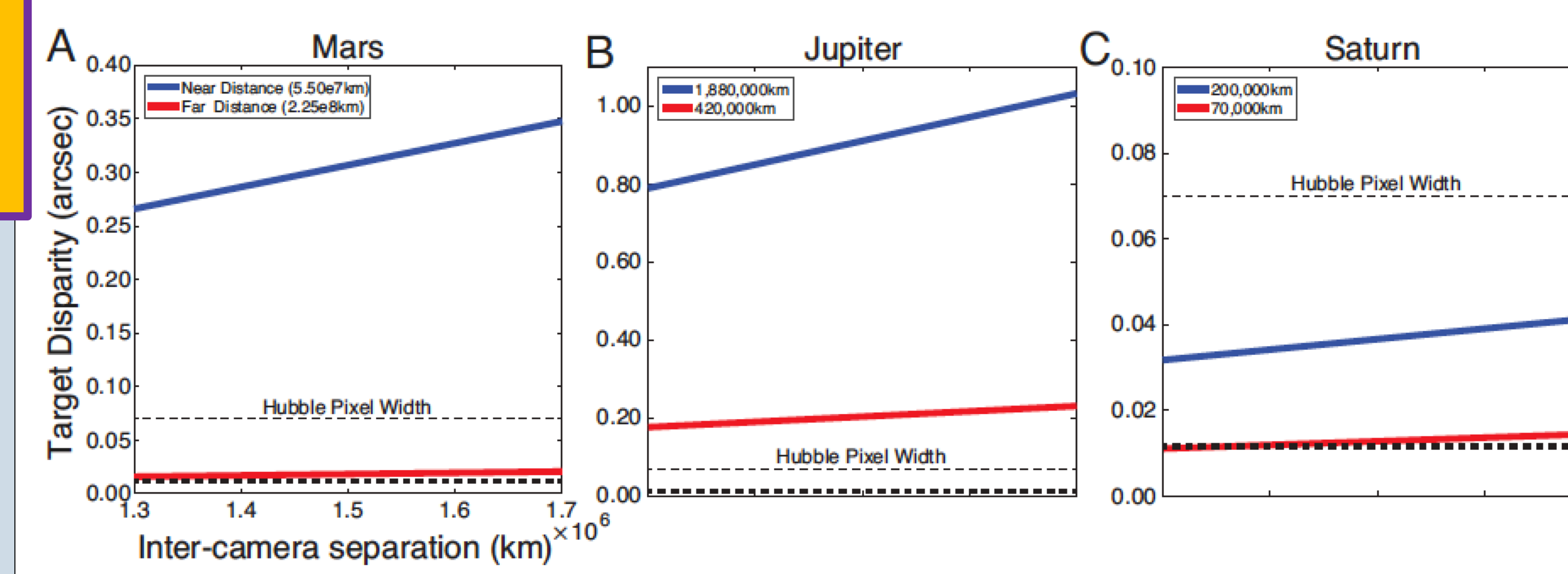
Ideas?

Propose for time with the James Webb Space Telescope!

Call for Proposals will reopen late 2019/early 2020

What are the capabilities of Hubble+Webb stereo 3D?

Potential Capabilities



Limiting Factors

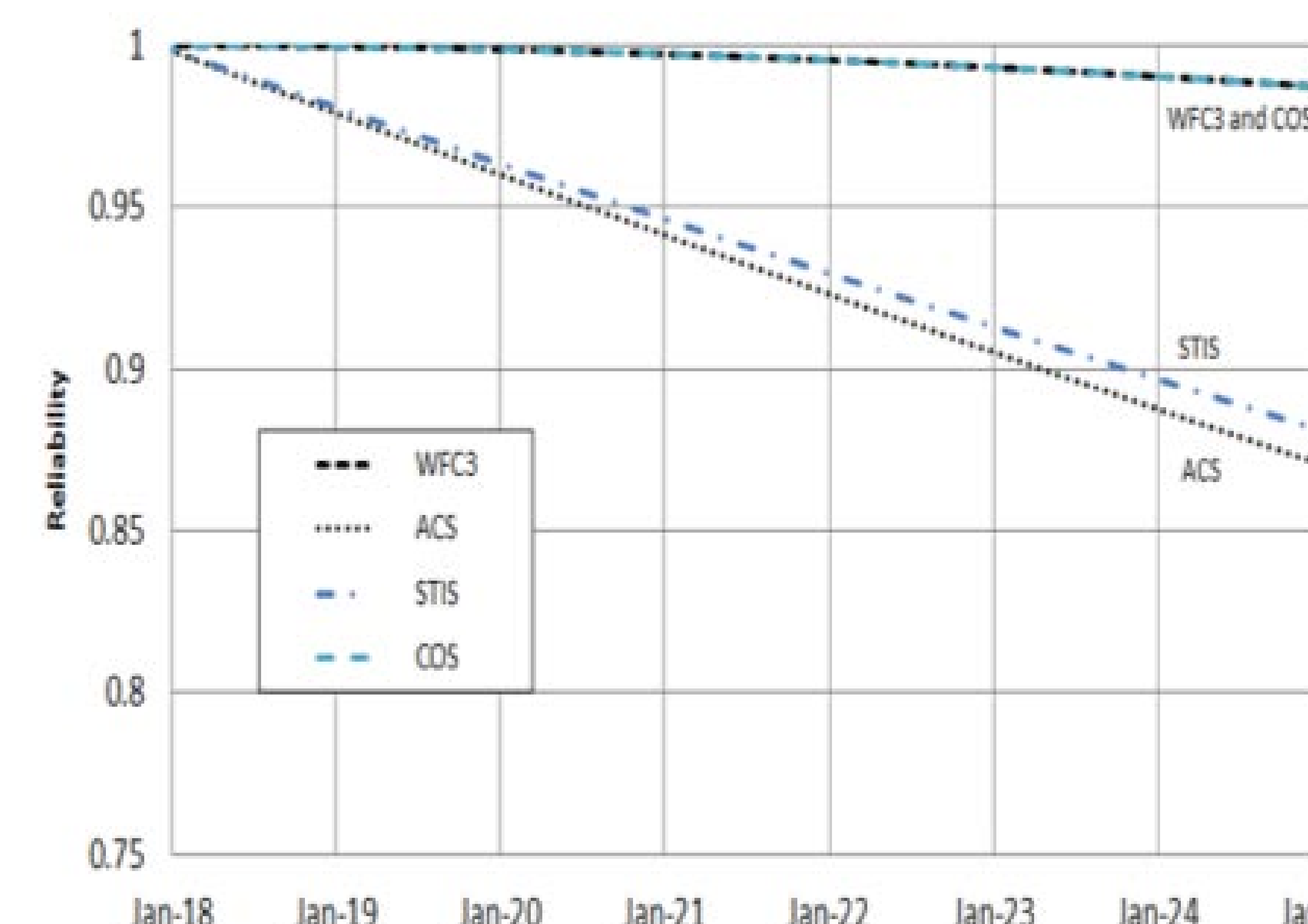
Limiting (optical) resolution: 0.07''
→ Limiting disparity: ~ 0.012''

Limiting motion tracking: 0.030''

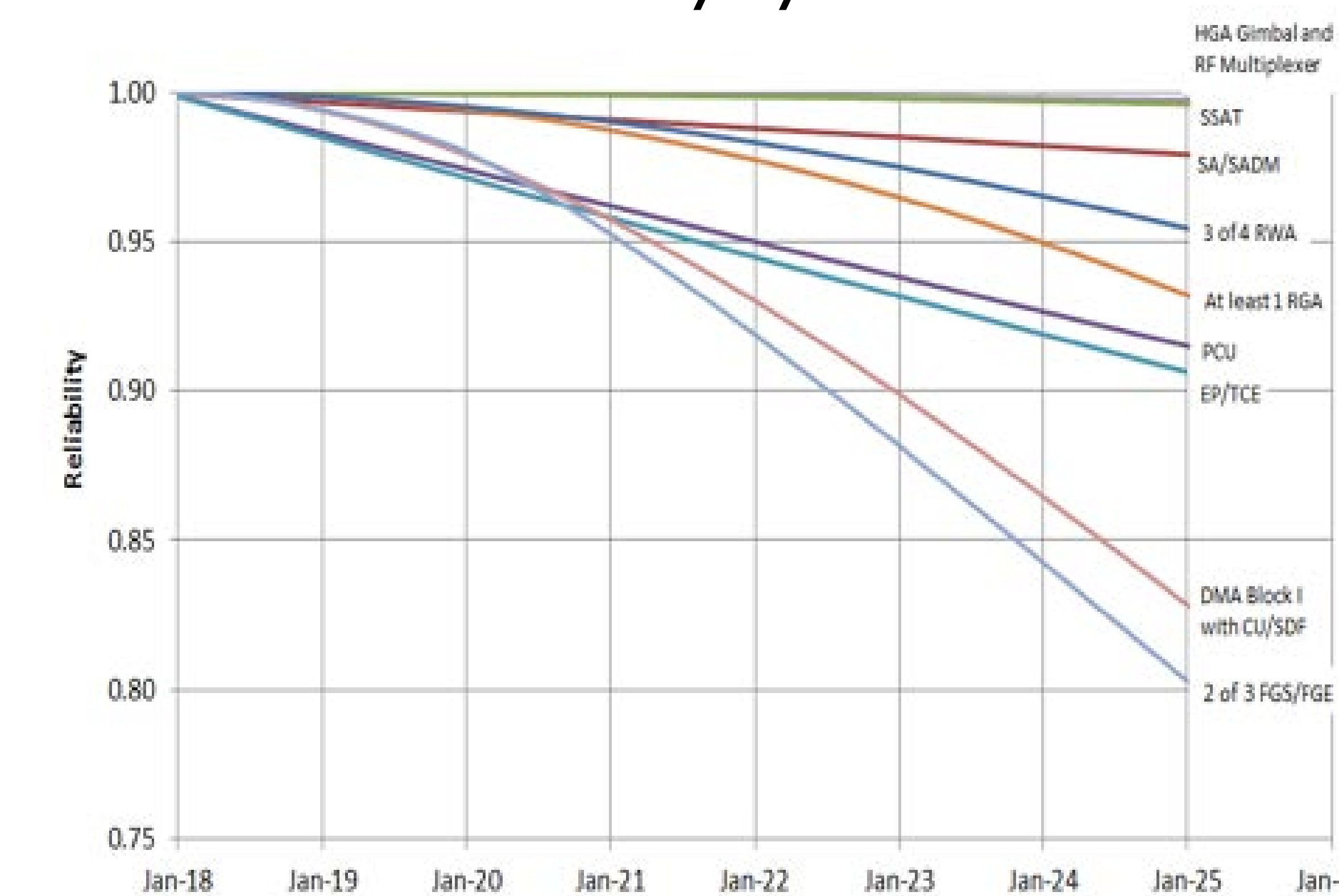
Webb cannot observe directly at opposition

We expect Hubble to be scientifically productive well into the 2020s

Science Instruments



Observatory Systems



Sample Imaging Cases: Solar System planets



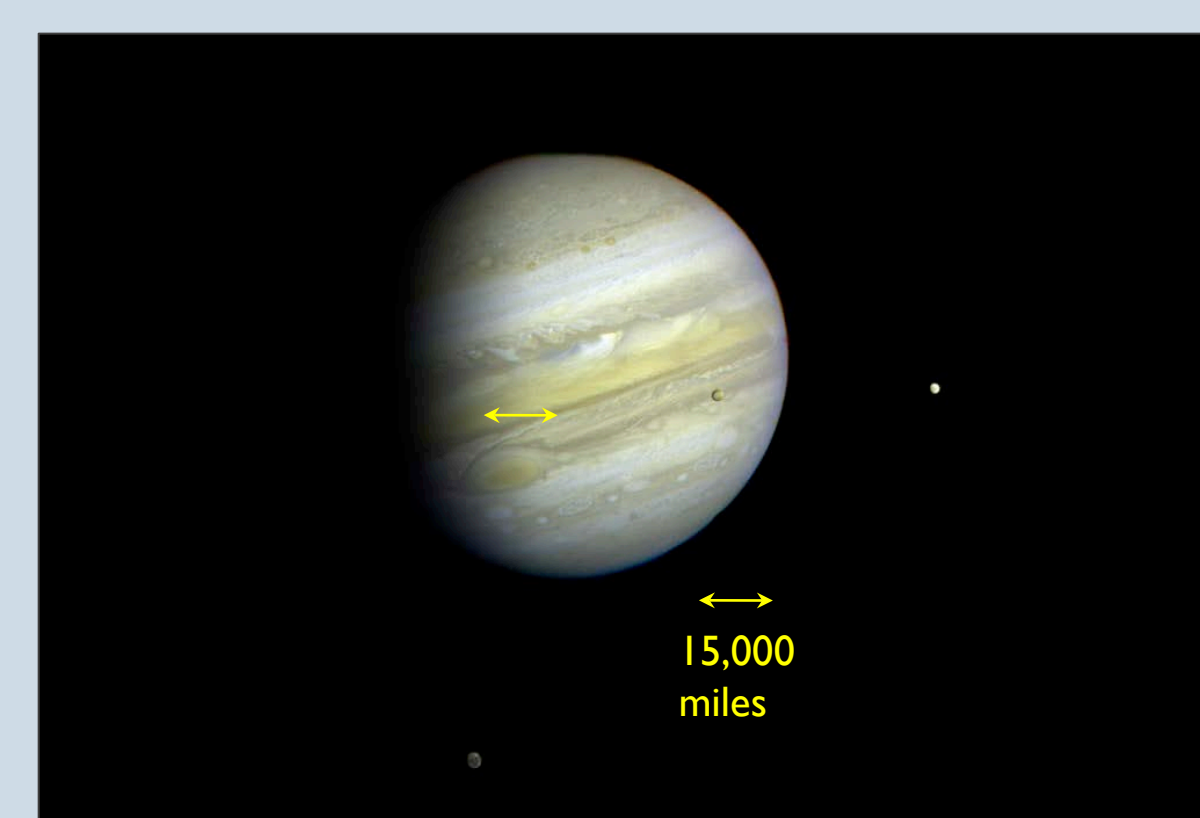
Near Earth Asteroid motion.

Although unresolved, the 3D effect can be seen in the asteroid's tumbling path.

Active comet/asteroid. Several comets have been observed by HST while on their closest approach; combining this track with JWST could produce an intriguing 3D sequence.

Great Red Spot or other cloud features. It may be possible to discern or monitor the changes in topography of cloud tops or other atmospheric features on Jupiter's surface, particularly at differing wavelengths.

Changes in Saturn's rings due to structural or disruptive events may produce wave effects (Esposito et al. 2008; Murray et al. 2014).



Resolving a 3D Great Red Spot on Jupiter.

Expanding Our Reach, Increasing Our Impact Using New 3D visualization Tools

- (1) Connect the science (and scientists) to the public through interactive experiences.
- (2) Emerging technologies will soon engage wide range of audiences in new and innovative ways.
- (3) Underserved and underrepresented audiences now have access to astronomical images.
- (4) Leverage partnerships in science communicators to present JWST content in innovative

More info about JWST:

jwst.stsci.edu

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