

Alt-Az Telescope Initiative

Active Secondary Project Update

Alex Thompson, Jeff Jarema, and Bruce Holenstein

Conference on Meter-Class Astronomy

January 20-22, 2012

Waimea, Hawaii

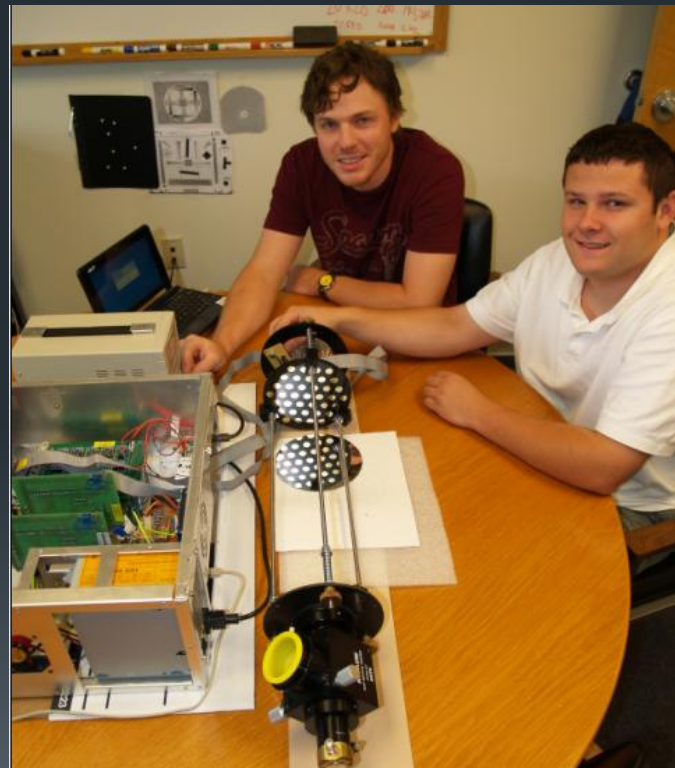
Active Secondary Mirrors

2

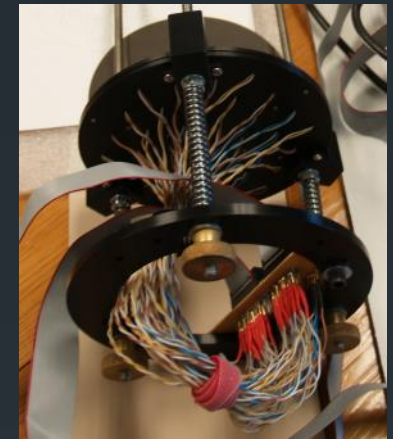
- *Active secondary project at Gravic*
- 40-channel controller
- 37-actuator piezo bimorph mirror



- Unblocked deflection of ± 35 microns over 120VAC
- About 0.2microns/Volt
- 10-g swing $\pm 150V$



Garth Boyer (L) and Jeff Jarema

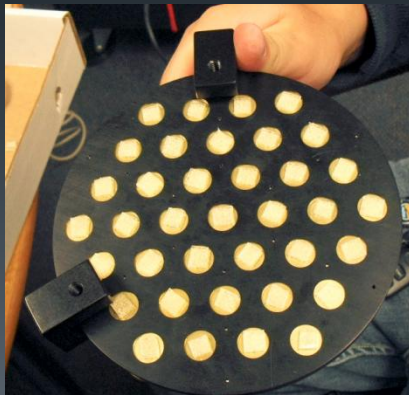


- 37-actuator design ready for final assembly

Active Secondary Mirrors

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- *Status as of January 2012*
 - *Controller is done*
 - *Mirror is complete*
 - *Software is in prototype stage*
- [Movie \(demo\)](#)



Jeff Jarema (L) and Alex Thompson

Contact

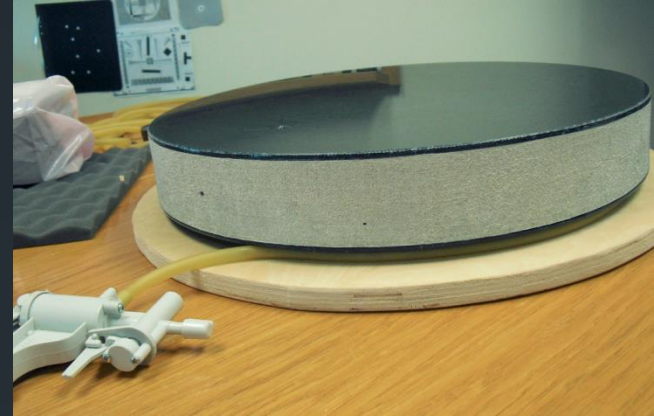
- Emails: bholenstein@gravic.com
- Gravic Website –
www.gravic.com/graviclabs/rd/astronomy/papers.html
- Initiative Website - www.AltAzInitiative.org
- Yahoo Discussion Group -
<http://groups.yahoo.com/group/AltAzInitiative>

Utility slides

- (Other projects)

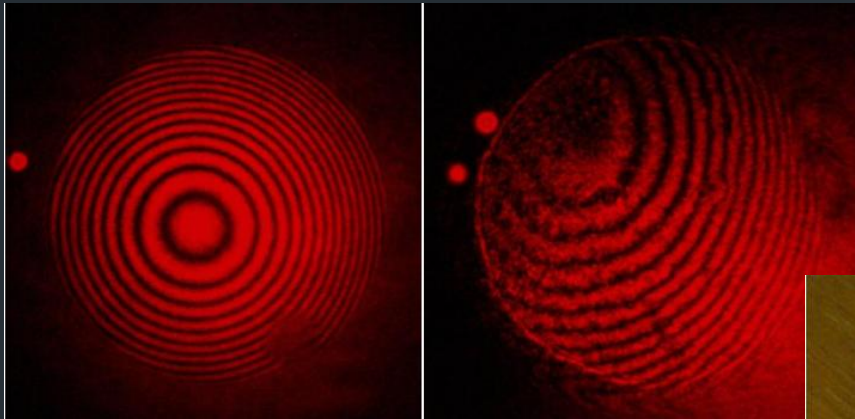
Active Primary Mirror

- Hubble UL20 mount – 50 lbs
- OTF Designs Foam glass mirror 13 lbs (18")
- Pneumatic actuators



Non-Vacuum Coating

- Evaluations are on-going at Gravic
- Still looking for a high-quality overcoat agents



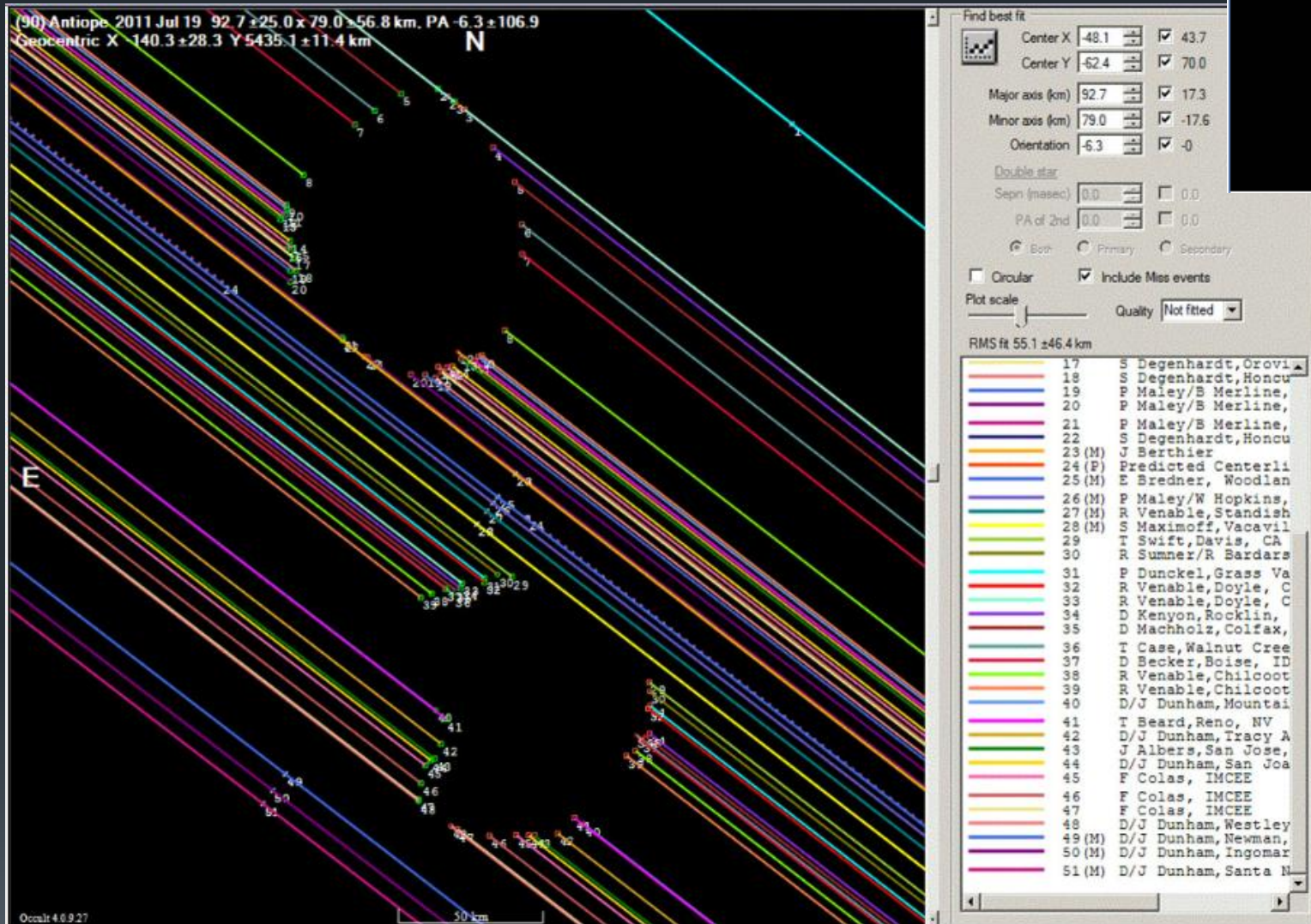
Uncoated

With Permalac

Cold silvered, optional
Permalac overcoat



Build on IOTA Successes



- Antiope success – July 19, 2011

“IOTA Nano?”

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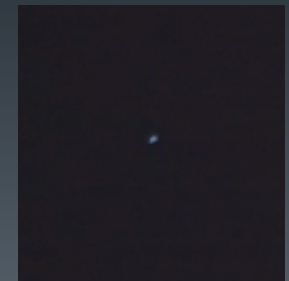
- Potential opportunity is to involve the masses
 - 1000's of chords for publicized events
 - Build interest in IOTA and occultation studies
- Will it work?
 - Some tests with a iPhone4 & inexpensive iPhone telephoto



15mm f/1.1 lens 6.5⁰ field on iPhone4



Moon



Vega

“IOTA Nano?”

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- iPhone4S camera
 - Back Illuminated
 - HAD technology
 - 5MP, 8MP (4s)
- 125M sold since 2007
- Functions
 - Compass
 - GPS
 - Gyros
 - Networking



“IOTA Nano” for the masses?

- Alerts via Occult Watcher
- Alarm & instructions
- Pre-pointing guide (theodolite)
 - Up/down/left/right, etc., camera used to avoid trees
- Automatic recording of event
 - Time, GPS location, 30fps HD video
- Automatic transmission of raw video
- Automatic reception of results
- Other:
 - Instant messages for coordination
 - 50mm Telephoto and adapters for 1.25” eyepieces

Telescope Automation



Automate and refurbish scope for high school
16" Klein Newtonian Cassegrain

