

Alt-Az Initiative

Update on the development of portable and affordable meter-class telescopes

Russ Genet and Bruce Holenstein

29th Annual Meeting of the International Occultation Timing Association

July 16-19, 2011 Rocklin, CA

Agenda

- Alt-Az Initiative Goals
- Activities (Since November, 2010)
- 1-Meter Slumped Meniscus Mirror Scope (Big Blue)
- 1.5-Meter Portable Scope Progress
- New Technologies

Alt-Az Initiative Goals

- Reduce cost per photon x10 to x100
 - 1-Meter portable scope for cost of C14
 - Work ~ 2.5 magnitudes fainter
 - Each magnitude fainter worked is about 300% more targets (2.5 mag. is ~30x more!)
- Banich Bylaw – 30 minute setup max.
- Somewhat purpose-built
 - Visual observers vs. science mission
- Light Bucket *and* High Quality Optics

Light Bucket Astronomy Conference

- Mirrors, Telescopes, Instruments, & Research Programs
 - December 31, 2010 – January 2, 2011 Canada France Hawaii Telescope Headquarters
 - Toured Gemini and IRTF
- About 35 talks and demonstrations
 - Mirror making
 - NIR, HTRA, other photometry
 - TNO and other occultations



Florida Fringe Festival

- February 25-27, 2011 Oak Hills, FL



RTMC Astronomy Expo

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- May 28/29, 2011, Big Bear, CA

Talk on 1.5 meter telescope design

Workshop meter-class telescopes

Big Blue won Merit Award



Nearly hurricane force winds
trashed RTMC but
Big Blue survived unscathed

Upcoming Events

- *Portland V*
 - *July 29-31, 2011 Seattle, WA*
- *Portable Meter-Class Astronomy Conference*
 - *January 18-20, 2012, Waimea, HI*



1-M Meniscus Mirror Telescope Prototype

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Weight under 400 lbs

Fits in back of Jeep Cherokee

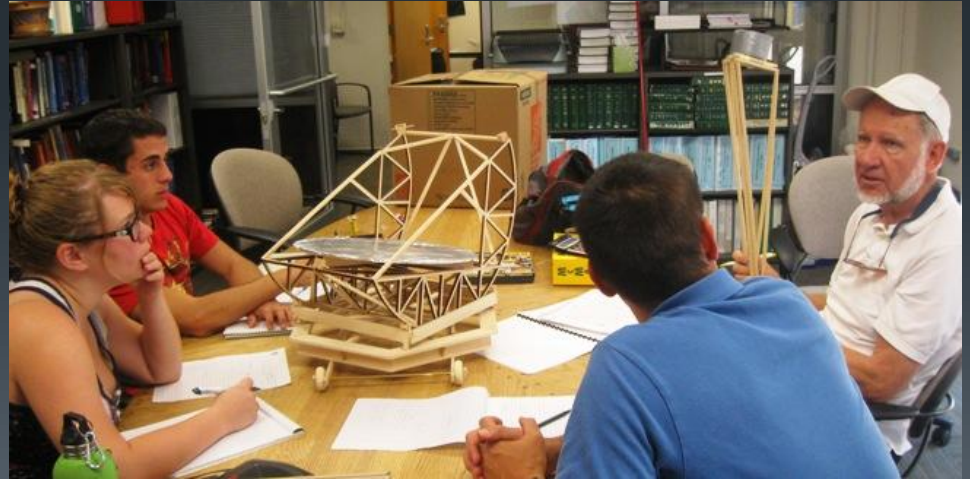
On-axis light bucket

Possible active optics



1.5-Meter Portable Scope Progress

- World's largest portable scope
- Two 1/8th and one 1/4th scale models
- Under 400 lbs
- Transport on any road with small trailer



New Technologies

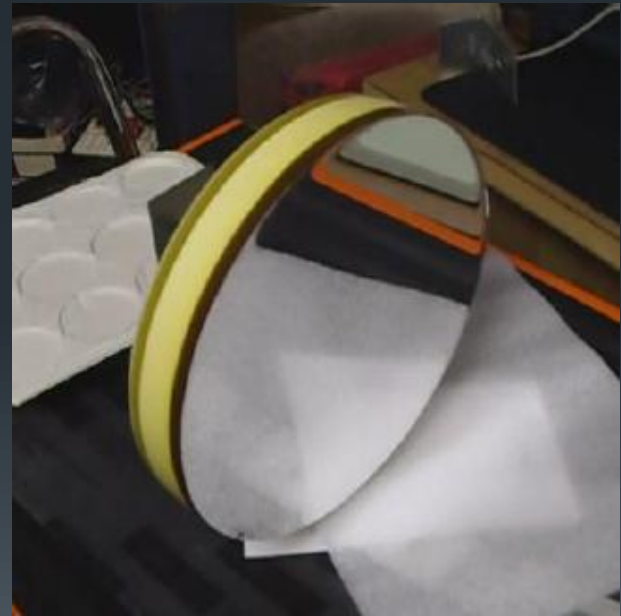
- Mirror fabrication progress
- Ultraportable scopes
- Fast cameras
- Non-Vacuum Coatings
- Active Mirrors

Mirror fabrication progress

- Foam glass
- Slumped meniscus mirrors
- Epoxy Spin-cast



25" OTF Designs Foam glass core



Lander 10" epoxy mirror

Ultraportable scopes

- Hubble UL20 mount – 50 lbs
- OTF Designs Foam glass mirror 13 lbs (18")
- 30" kit version of 1.5 meter



Fast Cameras

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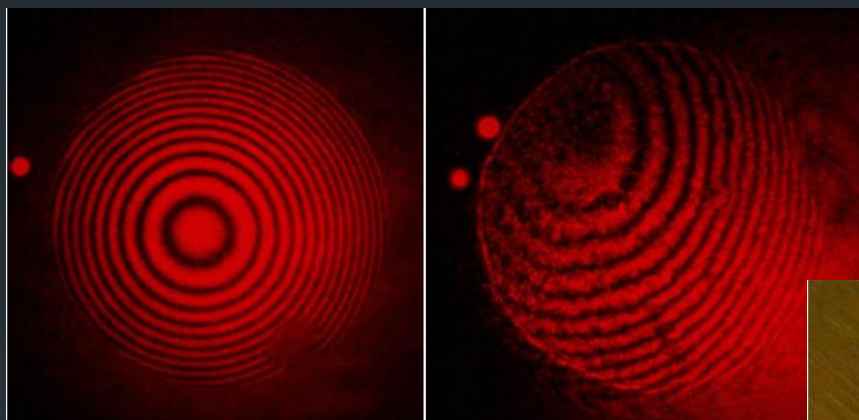


- Evaluations for suitability
 - Occultations, spectroscopy, astrometry, other uses
 - Four emCCDs (Bruce) – High speed and low read noise
 - One emCCD (Russ) —Portable



Non-Vacuum Coating

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



Uncoated

With Permalac

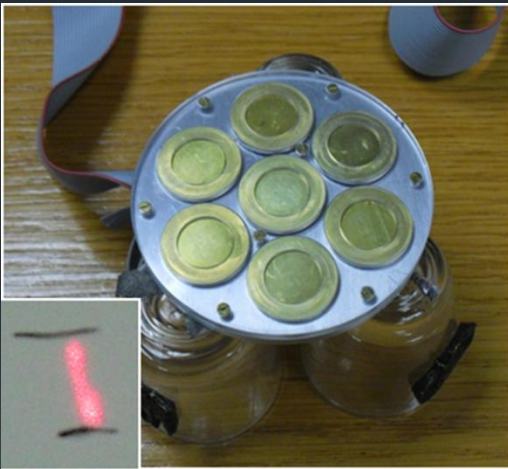
Cold silvered, optional
Permalac overcoat



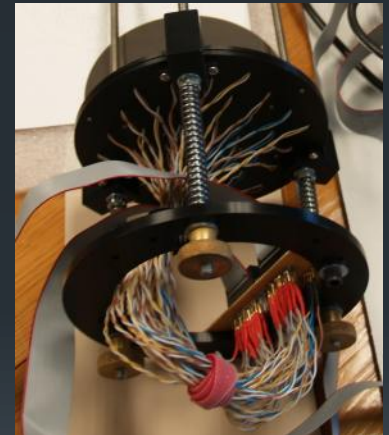
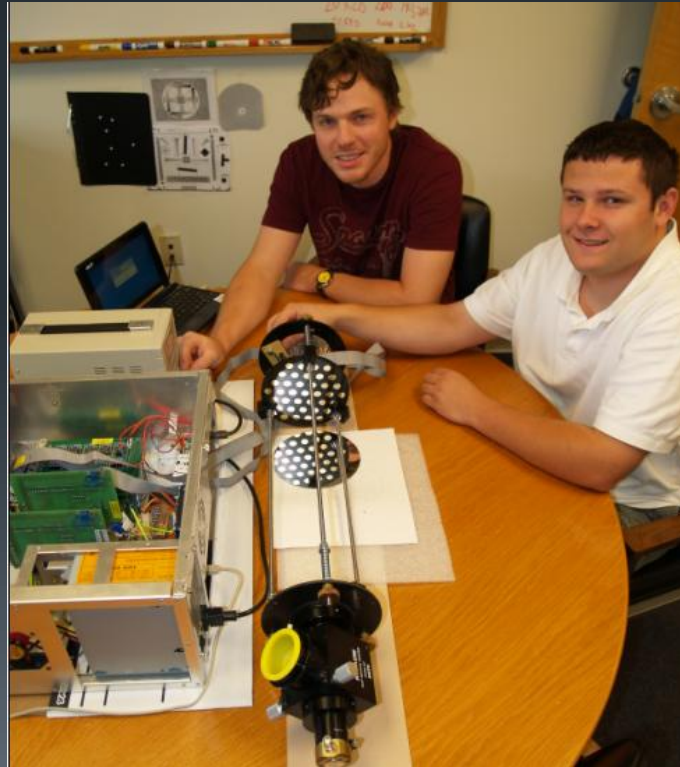
Active Mirrors

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- *Active primary mirrors*
 - July 29-31, 2011 Seattle, WA
- *Active secondary mirrors*
 - 37-actuator piezo (Bruce – pictures below)
 - Electrostatic (Umesh Korde and Brian Fehrman)



- Unblocked deflection of +/-35 microns over 120VAC
- About 0.2microns/Volt
- 10-g swing +/- 150V



- 37-actuator design ready for final assembly

Contact

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- Initiative Website - www.AltAzInitiative.org
- Yahoo Discussion Group - <http://groups.yahoo.com/group/AltAzInitiative>

