

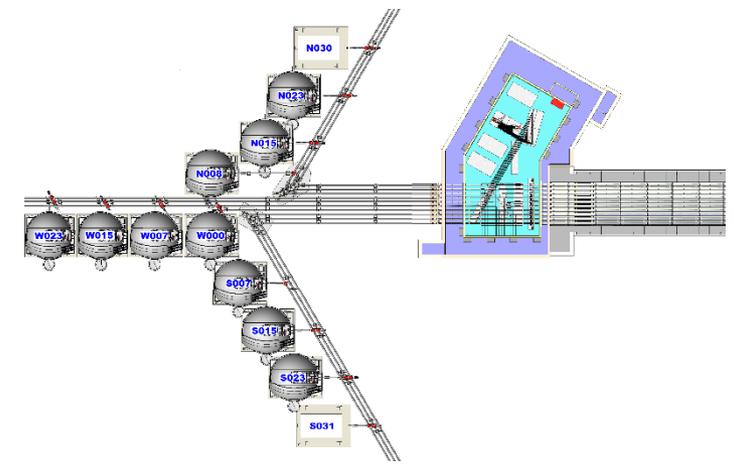


# Magdalena Ridge Observatory Interferometer

## New Mexico Tech



Artist impression of the completed MRO Array  
Image of the array: Andres Olivares. Aerial photograph: Tyson Eakman

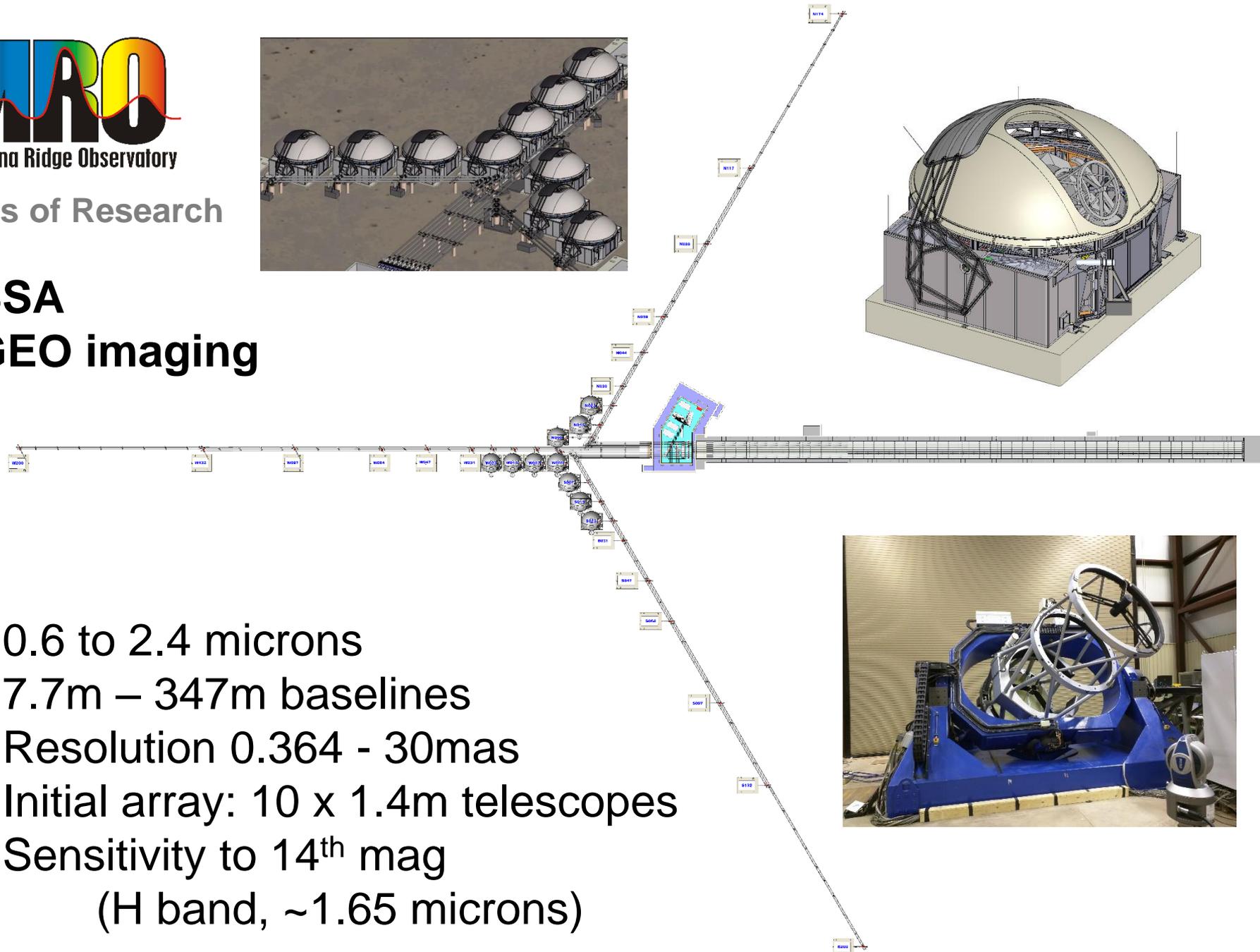
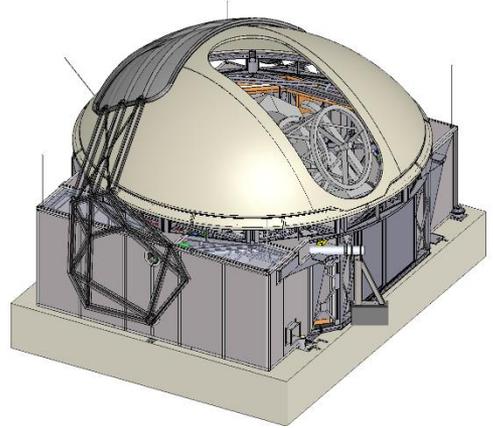


- Van Romero, PI
- Ifan Payne, Director
- Chris Haniff, System Architect
- David Buscher, System Architect
- Michelle Creech-Eakman, Project Scientist
- Fernando Santoro, Project Engineer
- Robert Ligon Instrument Scientist
- Andres Olivares, Lead Opto-Mechanical
- Allen Farris, Lead Software



## Areas of Research

- **SSA**
- **GEO imaging**



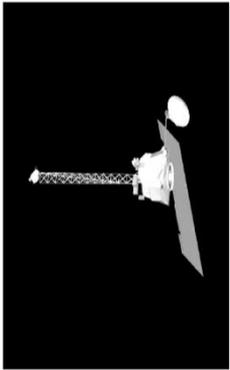
- 0.6 to 2.4 microns
- 7.7m – 347m baselines
- Resolution 0.364 - 30mas
- Initial array: 10 x 1.4m telescopes
- Sensitivity to 14<sup>th</sup> mag  
(H band, ~1.65 microns)



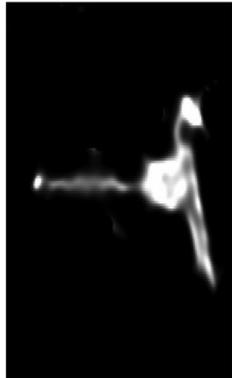


## Unique Qualifications

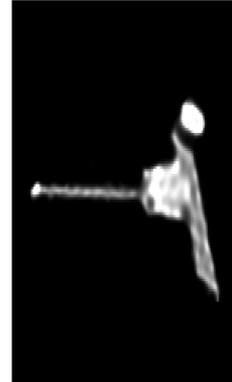
- ✓ Make measurements necessary to fully resolve those images to 12.5 nanoradian angular resolution and with image interpretability equivalent to Space Object Rating Scale (SORS) Level 6 or better
- ✓ Develop image reconstruction techniques that afford timely image development – at a minimum, all data collected on a given evening should be converted to final imagery before the next evening's data collection
- ✓ Data collection for a single GEO object must be completed in less than one hour
- ✓ Brightness detection thresholds must be consistent with GEO objects at baselines consistent with 12.5 nanoradian resolution and may vary depending on the Proposers' approach.



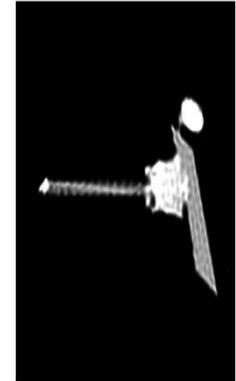
“Truth”



7 telescopes



10 telescopes



19 telescopes

**Can image details of  
60.75 – 135cm**

**Can image details of  
45 – 90cm**

**Can image details of  
27.5 – 45cm**

Data collection: less  
than 60 minutes

Data collection:  
about 120 minutes

Data processing & recovery: 1 – 4 hours



What We Seek

## JOIN US!

- Speed up the development to proof of concept (sensitivity, resolution, observation efficiency, data collection, image reconstruction)
- Use MROI as a test bed for your ideas and innovation (adaptive optics, throughput, fiber relay & delay, cfrp mounts, small mirrors, fringe tracking, detectors... etc.)



• Giant Magellan Telescope (GMT) > \$1 billion



• Thirty Meter Telescope (TMT) > \$1.2 billion



• European Extremely Large Telescope (E-ELT) > \$1.4 billion

**MROI is 10% - 15% of the cost for the same or better resolution**

MROI will have 100 to 200 times the resolution of the Hubble Telescope at 2% of the cost





## Contact Information

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