

# Magdalena Ridge Observatory Interferometer

***M. J. Creech-Eakman (NMT)***

# Magdalena Ridge



- altitude 10,500 ft just outside Socorro, NM
- year-round access, infrastructure in place
- EIS fully approved
- money appropriated and funding in place
- ultimate instrument – 10 element, 1.4 m size alt-alt telescopes
- classical Y configuration, 34 pads
- 0.6 to 2.5 micron imaging and spectroscopy

artists's conception of array



NOAO-Building the System II

# Science with MROI

*To provide model independent, high-resolution imaging in a fraction of the time required by other interferometric arrays by utilizing a configuration fully optimized for imaging and the techniques of baseline and multiwavelength bootstrapping.*

- *3 key science areas:*

- **Active galactic nuclei:** resolved imaging of the nuclear dust component, the BLR, synchrotron jets and nuclear and extra-nuclear starbursts.
- **Stellar accretion and mass loss:** via winds, jets, outflows, and Roche-lobe overflow. Examples in single and binary systems.
- **Star and planet formation:** detection and characterization of protostellar disks. Accretion, disk-clearing, x-winds, fragmentation and duplicity.

# The MROI Design

## ♦ Sensitivity:

- 1.4m telescopes, high throughput (20%), state of the art detectors (< 1.5 electrons readnoise), 0.6—2.5 microns.
- $H_{\text{mag}} = 14 \Rightarrow$  full range of galactic and extragalactic astrophysics

## ♦ Angular resolution:

- Baselines from 6 – 400 m  $\Rightarrow$  25 – 0.3 mas resolution.
- Reconfigurable array for a broad range of science targets.

## ♦ Imaging:

- 10 elements
  - Baseline bootstrapping and snapshot UV coverage
  - Reconfigurable array (11 positions per arm)
- Model-independent and rapid imaging.

# Agressive Schedule

- Hiring for interferometer this year ~ 15 FTE
  - Lead opto-mechanical & control software engrs. hired
- Building construction expected to begin this year
  - Foundations for buildings and pads in next year
  - Prototype beam combining enclosure
- Telescope contracts to be let 4<sup>th</sup> quarter 2004
  - ROM quotes distributed late 2003 – 7 responses
- First light on first baseline pair late 2007
- First closure phase science in 2008

# Who is participating...

- **Main parties** – NMT and Cavendish Astrophysics Group – Cambridge
- **Other participants** – NMSU, LANL, UPR
- **NRL oversees project**
- **PI** – V. Romero (NMT)
- **P. Architects** – D. Buscher & C. Haniff (Cambridge - COAST)
- **P. Manager** – M. Sirota (NMT – formerly Keck)
- **P. Scientist** – M. Creech-Eakman (NMT – formerly JPL)

For more information:

<http://www.mro.nmt.edu>