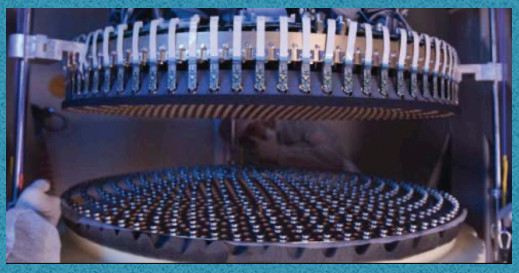
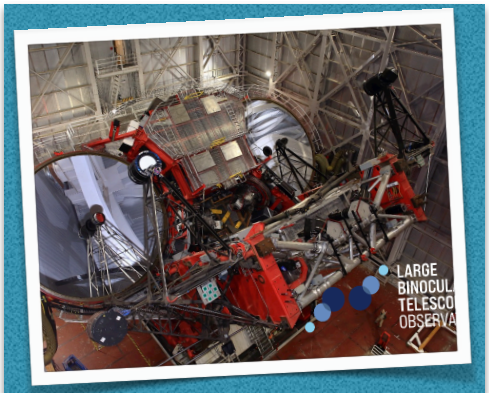
LARGE BINOCULAR TELESCOPE OBSERVATORY





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Welcome to the LBT Observatory!

We thank you for your interest in our facility and hope you will continue to follow our progress in technology and science.

- The LBT has two primary mirrors that are 8.4m in diameter mounted on a common altitude-azimuth mounting for a combined collecting area of a single 11.8m telescope.
- The primary mirrors, made of borosilicate with a lightweight honeycomb structure and fast f/1.1 focal ratio, are the largest monolithic telescope mirrors in operation.
- When the light from the two mirrors is combined coherently, the LBT has the resolving power of a telescope with aperture equal to the edge-to-edge baseline of 22.8m.
- The LBT was the first telescope to use adaptive secondary mirrors on a routine basis for correction of atmospheric distortion.
- Through its novel design utilizing multiple mirrors and advanced adaptive optics, the LBT is the first of the emerging generation of Extremely Large Telescopes (ELTs).
- The scientific interests of the LBTO partnership span the full range of modern astrophysics, from exo-planets to the high redshift universe.
- The LBT is located in southeastern Arizona on Mt Graham, which at 3200m is one of the highest research observatory sites in the continental U.S.
- The LBT's high altitude location is particularly valuable for mid-infrared observations that benefit from reduced water vapor opacity.
- The LBT is an international collaboration of the University of Arizona, Italy (INAF), and The Ohio State University, representing also the University of Minnesota, the University of Virginia, and the University of Notre Dame.
- Opportunities exist for additional institutions to purchase nights or join the LBT consortium.

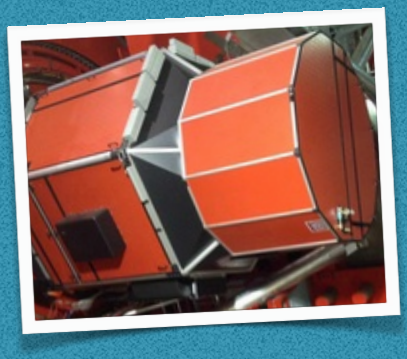
LBTO Instrumentation Suite

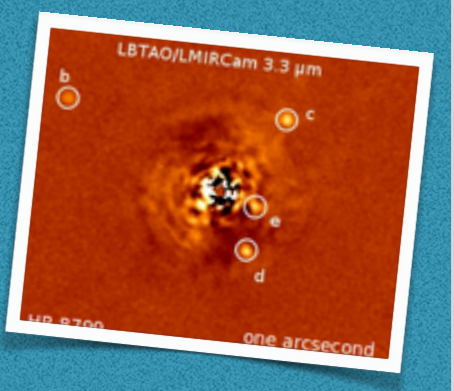
The **Large Binocular Cameras (LBCs)** are two wide-field cameras mounted at the prime focus of LBT. LBC Blue is blue-optimized for observations from 0.35-0.65μm, and LBC Red is red-optimized for observations from 0.55-1μm. The LBC focal plane consists of four EEV24-90 CCDs (2048 x 4608 pixels with 0.23"/pixel) that provide a field of view of 24' x 25'.

LUCI1 and **LUCI2** are a pair of cryogenically cooled near-IR instruments capable of imaging and spectroscopy (long-slit and user-created multi-object masks). The LUCIs can operate at ~0.9-2.4μm in three modes: seeing limited (SL), enhanced seeing mode (ESM), or diffraction-limited adaptive optics (AO). The instruments provide an imaging field of view of up to 4' and spectroscopic resolutions of ~2000 for H+K to 6500-8500 in single band z, j, H, K in the basic modes.

MODS1 and **MODS2** (Multi-Object Double Spectrographs) are a pair of matched low to medium resolution spectrographs/imagers. Each MODS offers high throughput over 0.32-1.05μm for both imaging and spectroscopy over a 6' x 6' FOV.

Gratings provide a spectral resolution of R~2000 and double-pass prisms provide a low-resolution (R=500-1500) faint-object mode. Each MODS has a dichroic, allowing for simultaneous 0.32-1.05μm coverage. MODS can use single long slits (0.3-2.4" wide x 300" long) or user-designed multi-object spectroscopy masks.





SHARK-VIS is a new visible-band (400-900nm) high-contrast and coronagraphic instrument mounted on the right side of the LBT and fed by the SOUL adaptive optics system. It delivers quasi diffraction-limited images with angular resolution of ~20 milliarcseconds.

SHARK-NIR is an extreme-AO equipped system with imaging and spectroscopic capabilities covering 0.96-1.7μm, mounted on the left side of the LBT. The field of view is 18" x 18" with a pixel scale of 14.5 mas/pixel. Observing modes include classical imaging without coronagraphic mode, dual-band imaging, and long slit coronagraphic spectroscopy.

PEPSI is a high-resolution spectrograph fed by a fiber pair (target + sky) from each primary mirror. The four fibers transmit to a single bench-mounted spectrograph with maximum resolution of R~250,000 and wavelength coverage spanning 383-907nm. A separate polarimetry mode is available.

LMIRCam operates with the LBT Interferometer (**LBTI**) at 3-5μm. The instrument can be used in several imaging modes, including nulling and Fizeau imaging and interferometry, and has an integral field spectrograph with 50 x 50 spaxels and a spectral resolution of R~100. The field of view is 11" x 11". **NOMIC** is also fed by LBTI, providing imaging capability at 8-13μm. The instrument has a field of view of ~9" x 9" and a spatial resolution at 10μm of 0.27" for a single 8.4m LBT aperture, and 0.1" for Fizeau interferometry with the dual apertures.

Coming this year - **iLocater**! A near-infrared extreme precision radial velocity spectrograph for discovering and characterizing exoplanets.