Discovery Channel Telescope
Fact Sheet

About Discovery Channel Telescope: The Discovery Channel Telescope (DCT) – being built for Lowell Observatory in Flagstaff, Arizona – will be among the most technically sophisticated ground-based telescopes of its size. The telescope, expected to be the fifth largest telescope in the continental United States, is under construction at a dark sky site on the Coconino National Forest approximately 45 miles SSE of Flagstaff. The project is being undertaken in partnership with Discovery Communications, LLC. In its initial implementation, the telescope and associated infrastructure will cost approximately $42 million. The telescope will significantly augment Lowell Observatory's observational capability and enable pioneering studies in a number of important research areas.

Technical Capabilities: The telescope is designed to ultimately accommodate four different optical configurations: Ritchey-Chrétien (RC), prime focus, Nasmyth, and bent Cassegrain. First to be implemented will be the RC configuration in which starlight reflects off of primary and secondary mirrors and comes to a focus near the bottom of the telescope. Optical and infrared spectrographs and a high-resolution optical imager will be mounted at this position. Ultimately, the telescope is designed to be equipped with a very wide-field camera at prime focus near the top of the telescope, and with provision for very large stationary instruments or small special purpose instruments at the intermediate Nasmyth foci, or bent Cassegrain foci, respectively.

Research: The telescope will be applied to a wide and evolving range of research topics. Initially these will include a survey of the composition of Kuiper Belt objects orbiting the sun beyond Neptune, studies of brown dwarfs (faint objects which are neither true stars nor planets), investigations of planets orbiting other stars, plus studies of giant stars, binary stars, and dwarf galaxies, to name a few. When the prime focus camera is built, the telescope will also be able to perform powerful surveys of the as yet little explored distant Solar System and searches for numerous small asteroids whose orbits make them a potential threat for collision with Earth.

Timeline: Lowell Observatory and Discovery Communications formed a partnership to build the Discovery Channel Telescope in February 2003. A special use permit for construction and operation of the telescope at the Happy Jack site was received in November 2004 and improvement of an existing road to the site commenced immediately. The primary mirror blank was completed by Corning in late 2005. Construction of the telescope enclosure and an auxiliary support building began in mid-September 2005. Final figuring and polishing of the mirror, by the University of Arizona's College of Optical Sciences, will take about three years. The telescope is scheduled to be commissioned in 2010.

Project Leaders: Robert Millis, Director, Lowell Observatory; Byron Smith, Project Manager; Edward Dunham, Instrument Scientist

DCT Facts:

- 4.2-meter clear aperture, 100mm-thick actively supported meniscus ULE® primary mirror.
- Mirror weight – 6,700 lbs.
- Multiple optical configurations: Ritchey-Chrétien, Prime Focus, Nasmyth Focus, bent Cassegrain.
- 78-foot tall, 62-foot diameter metal telescope building.
- Located at 7,760-foot altitude on the edge of the Mogollon Rim at a site offering outstanding image quality and dark skies.

[revised January 2008]