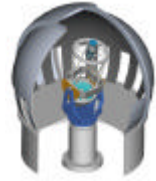


Lowell Observatory – Campaign piece

Next Generation Lowell Telescope - Impact on Science *Playing a Lead Role in Astronomical Discovery*



NGLT's state-of-the-art design will allow Lowell astronomers to address a broad range of scientific problems, giving the Observatory a commanding lead in the search for potentially-threatening asteroids, Kuiper Belt Objects and Extra-Solar planets.

EARTH-THREATENING ASTEROIDS

Identifying Cosmic Collisions

It is now commonly accepted that the extinction of the dinosaurs was caused by an asteroid colliding with the Earth. Such collisional processes continue to sculpt the planets, as witnessed in 1994 when Comet Shoemaker-Levy 9 collided into Jupiter. Had even one of the major fragments of the comet struck Earth instead, it would have been a catastrophe of Biblical proportions. The event spurred a congressional mandate in 1998 to identify (by 2008) all asteroids of 1 km diameter or larger – the size of Flagstaff's Mt. Humphrey - that could strike Earth. Lowell astronomers created the LONEOS program (Lowell Observatory Near Earth Object Search) in response to this mandate and currently discover 30 near-Earth asteroids per month. **With NGLT, the team's efforts will increase 25-fold, allowing them to discover 30 asteroids per hour and complete the survey in just three years.**

KUIPER BELT OBJECTS: *Propelling Science Into New Frontiers*

Lowell astronomers joined the exploration of the Kuiper Belt – the largely unexplored region of our solar system beyond Neptune - in late 1998 using Tucson's Kitt Peak National Observatory and Cerro Tololo InterAmerican Observatory in Chile. The project, *The Deep Ecliptic Survey*, is led by Lowell astronomer, Bob Millis, and searches for objects within the Kuiper Belt (KBOs) in an effort to better understand the distant members of our solar system. The Lowell team has discovered roughly one quarter of the total known KBOs today. **Expressly designed to unveil the secrets of the Kuiper Belt, NGLT will increase the number of KBOs identified per night by a factor of 10.**

EXTRA-SOLAR PLANETS: *Searching for Life Beyond Earth*

Astronomers have always imagined the possibility of life on other planets. But until recently, the technology to conduct such exploration was not available. Lowell astronomers are currently searching for planets in orbit around distant stars by detecting the miniscule dimming of the parent star caused by the passage of the planet across the face of the star. This occurrence briefly blocks some of the starlight from view and indicates the possible presence of a planet. With a robotic telescope and currently evolving software and observational techniques, Lowell astronomers hope to lead in this exploration. **NGLT's wide field of view and tremendous light grasp will make the discovery of Extra-Solar planets a routine occurrence.**

Continued Discoveries By Lowell Astronomers

How big is the Universe? What's it made of? Does life exist beyond our planet?

While a starry night will often conjure these fleeting questions - Lowell astronomers have dedicated their lives to pursuing the scientific answers. The NGLT telescope will undoubtedly shed light upon some of the most perplexing questions posed to the field of astronomy, and Lowell astronomers Ted Bowell, Marc Buie and Ted Dunham will be at the helm.

Ted Bowell, Ph.D., University of Paris, 1973

Identifying Earth-Bound Objects: Asteroids and Comets

In charge of one of the most productive Near-Earth Object surveys of all time - Lowell's LONEOS program - Ted Bowell is a cunning watchdog for planet Earth. Charged with the important task of identifying potentially-threatening objects headed for Earth, he and his team must continually monitor the sky. Once an object is located, they must calculate its orbit, determine its degree of threat and prove that it won't strike the Earth. With 552 numbered asteroids to his credit - plus a share in 946 numbered LONEOS discoveries and thousands of unnumbered asteroids - Bowell is ranked in the top 10 worldwide for his asteroid, comet and Near-Earth Object discoveries. During NGLT's initial years of operation, significant time will be dedicated to the LONEOS Near-Earth Object survey.

Marc Buie, Ph.D., University of Arizona, 1984

Designing the Right Tools: Kuiper Belt Objects & Pluto

While Marc Buie has spent more time than anyone else on the planet looking at Pluto - and completed the first map of the planet's surface - his astronomical interests are varied. A collaborator on the Deep Ecliptic Survey team, he is the inventor of software that uses color to detect motion - a key that has enabled Lowell astronomers to identify a greater number of Kuiper Belt Objects. He is also working with Boston University in the development of an infrared spectrograph, *Mimir*, for Lowell's 72-inch telescope. The instrument will gather data in support of a NASA mission to Pluto in 2006. Buie anticipates building an instrument like *Mimir* for use on NGLT after the telescope is built.

Ted Dunham, Ph.D., Cornell University, 1978

Answering an Age-Old Question: Extra-Solar and Beyond

Few would argue that the discovery of life on other planets is an exciting possibility. For Ted Dunham, it is just one of his current scientific missions. A participant in NASA's upcoming Kepler mission - a space-borne telescope designed to hunt for Earth-sized planets in our galaxy - Ted will provide input on the optics, detectors and electronics of the telescope. He is also building the main test instrument for NASA's revolutionary airborne observatory, the Stratospheric Observatory for Infrared Astronomy (SOFIA). The SOFIA telescope is attached to the top of a Boeing 747 that observes occultations - when one celestial body conceals or obscures another. In addition, Ted will assist in the building of NGLT's complex and unique camera system.