Mt. Lemmon SkyCenter Celebrates 10 Years of Wonder and Exploration

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From 1956 to 1969, three long-range, high-powered radar antennas atop Mount Lemmon scanned the skies for incoming Soviet Union bombers.

Today, telescopes located at the site have a variety of more peaceful purposes. Some still look for intruders, such as the instruments of the University of Arizona's Catalina Sky Survey, which searches for asteroids that may come close to Earth. Others point up to the night sky to bring the wonders of the universe closer to us earthlings.

This year marks the 10th anniversary of the UA's Mt. Lemmon SkyCenter [1], whose mission is to engage people of all ages with Southern Arizona's clear and dark night skies and the natural world of the region's unique "sky islands" – tall mountain ranges jutting up from the Sonoran Desert.

"When the SkyCenter was founded, the idea was to utilize the night sky as a resource," says SkyCenter Director **Alan Strauss**. "Now, as our programs have expanded, we really think of 'sky' broadly and consider our place on a sky island, where we focus on the world above by night, and the world around us during the daytime."

Bringing science to the people

The SkyCenter was established with the idea of connecting the public with some of the world-class science projects pursued by UA researchers. It is now part of an initiative by the UA College of Science [2] that seeks to integrate public outreach efforts across venues such as the SkyCenter and Biosphere 2 [3] to present innovative new learning experience.

Adam Block, a renowned astrophotographer who now works as operations specialist with Steward Observatory, developed the idea of a public astronomy outreach center while with the Department of Astronomy. In spring 2009, he delivered the first night sky program at the center.

"We want to dispel the notion that telescopes are just expensive toys for smart people to play with," says Strauss, himself an amateur astronomer. "People in Southern Arizona live in a place where the night sky is well-visible and understandable, and we want them to have access to the wonder and the science."

Thanks to generous donations, the SkyCenter boasts telescopes of a caliber not commonly associated with public university outreach programs: a 32-inch telescope provided by the Schulman Foundation, and a 24-inch telescope that was provided by **Ed Beshore**, a longtime member of the UA Lunar and Planetary Laboratory who retired from the UA in 2016. Beshore's donation was in honor of his wife, Amy Philipps.

"The UA is a leader in space systems science," says Strauss. "In addition to the astronomers and planetary scientists, we have biologists looking for life on distant planets, geologists and chemists studying the building materials of our solar system – to name just a few. Yet many people living in Tucson and the area don't know about these resources at the UA."

Accordingly, the programs offered at the SkyCenter have taken on a more interdisciplinary flavor and the staff has grown. Its 10 members include enthusiastic amateur astronomers as well as a number of UA employees who work with UA flagship projects and moonlight – some literally. Those projects include the Large Binocular Telescope Observatory [4]; the Large Synoptic Survey Telescope [5]; and the High Resolution Imaging Science Experiment, orHiRISE [6], a Mars imaging mission.

"Our staff represents the breadth of people and resources we have at the UA," Strauss says.

The SkyCenter's stargazing programs now see between 20 and 30 people a night, he added.

A chance to explore

This year, the SkyCenter will host between 3,500 and 4,000 members of the public for evening astronomy programs at the observatory. In addition, more than 1,200 schoolchildren from throughout Southern Arizona will attend immersive residential science programs at the SkyCenter through the UA SkySchool [7] program. While the nightly public observing program focuses on astronomical outreach, SkySchool provides place-based and inquiry-based science education programs to students in third through 12th grade. Programs focus on areas of UA expertise such as sky island ecology, geology and astronomy, and meet state science education standards. The program, which began in 2012 and served about 100 students from four schools, now works with around 30 schools annually.

SkySchool draws schoolchildren from around Arizona – the majority of whom have never been to the mountaintop – to explore, learn about science and the natural world, conduct experiments and interact with UA graduate student scientists. During these programs, the kids spend up to a week atop Mount Lemmon and design their own science projects,

facilitated by graduate students in not just the College of Science [2], but also the College of Agriculture and Life Sciences [8], the College of Medicine – Tucson [9] and the College of Education [10].

"For many, this is the first time they have stepped outside the city and into the wilderness, or seen the clear, star-filled sky high on the mountain away from city lights," Strauss says. "The message we want to get across is that science is not a big mystery, but something they can do. We want them to see themselves as future scientists. We also want them to see the UA not as a 'red-brick fortress' but a place that's accessible to them."

While the SkyCenter programs are available to all K-12 schools in Arizona, a special partnership with Tucson Unified School District allows TUSD students to take advantage of SkySchool programs at no charge.

The goal is to provide students with science exploratory opportunities that expand learning, according to Janna Acevedo, director of TUSD's magnet programs. Elementary, middle and high school students learn to engage in science inquiry and research while working directly with UA students. High school students are afforded the experiences to solve scientific inquires at the Mount Lemmon site.

"As a result, our students gain self-confidence while building skills such as collaboration, goal setting and fact-based understanding," Acevedo says. "Benefits also include exposing our students to the advantages of higher education and career opportunities available in the sciences."

Facilitated by 20 UA graduate students, the SkySchool directly connects K-12 education to some of the UA's top-rated programs, including ecology, geology, hydrology, genetics and neuroscience, the science teacher education program at the College of Education, and the School of Natural Resources and the Environment [11].

"When kids come up here with their schools, everything they do is inquiry-based," Strauss says. "We really try to teach the process of science and how to go about it, rather than the content. We let them make observations of the rocks, the climate and the trees around them, come up with a hypothesis, and then design experiments to test that."

Even classes whose students are too young to spend multiple days on the mountain can take advantage of the SkySchool, Strauss says.

"We do the same program in their schoolyards," he says. "But even there, it's all very hands-on and outdoors."

The SkyCenter operates under a permit from the U.S. Forest Service, and Strauss says the partnership is an important one because both share the vision of helping people understand how the world around them works, helping them become better stewards of the environment.

The next 10 years

Over the next decade, Strauss says he "would love to see the program continue to grow and to see some investment into the infrastructure at the site that would allow us to increase visitorship and expand its technological capabilities. In the near future, the SkyCenter is planning to open a small visitor center at North Bear Canyon and East Tanque Verde roads, just before East Catalina Highway turns off to wind its way up Mount Lemmon.

"For most people on Earth, the night skies are disappearing," Strauss says. "Some 80 percent of the population can no longer see the Milky Way. We are very lucky here in Arizona, and so we want to make that as accessible as possible."

The center also is expanding its programs to audiences worldwide, for example through online outreach. The center's livestream of the total lunar eclipse on Jan. 20 was viewed more than 18,000 times during that night.

"We would like our visitors to leave with the understanding that science is a rational way to understand the world around us, and there is a beauty in the science surrounding the big questions that we pursue here at the UA," Strauss says. "Big questions like, 'Where do we come from?' and 'Where do we go from here?'"

Visit the SkyCenter website [1] to learn more about its various educational activities, including a public evening observing program, summer Sky Island programs, workshops, camps, remote observing, and special educational events. For more information on the SkySchool, visit the SkySchool website [7].

Links
[1] https://skycenter.arizona.edu/ [2] http://cos.arizona.edu/ [3] http://biosphere2.org/ [4] http://www.lbto.org/ [5] https://www.lsst.org/ [6] https://www.uahirise.org/ [7] http://skyschool.arizona.edu/ [8] https://cals.arizona.edu/ [9] https://medicine.arizona.edu/ [10] https://www.coe.arizona.edu/ [11] https://snre.arizona.edu/