



News from I'oligam Du'ag (Kitt Peak)

NSF's NOIRLab



Issue #1

In this issue

- *Fire Story* 2
- *Time Capsule* 4
- *Kitt Peak at the Rodeo* 5
- *A Story About a Picture* 6
- *Science at NOIRLab* 7
- *Featured Art* 7
- *BaoBan The Ambassador* 8

Editor-in-Chief

Jacelle Ramon-Sauberan:
jacelle.ramon-sauberan@noirlab.edu

Editors

Sarah Logsdon
Katy Garmany

Production

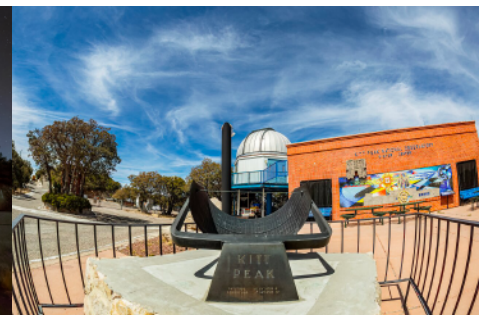
Communications, Education &
Engagement

Welcome

S-ke:g Tas Wusij! Welcome to the first Kitt Peak National Observatory Newsletter for the Tohono O'odham Nation. We want to share exciting news from Kitt Peak National Observatory and keep you up to date with outreach events and educational opportunities.

In September 2023, Kitt Peak National Observatory reopened and has since begun offering tours. All tours and programs except for the overnight program are FREE to Tohono O'odham Nation tribal members.

To schedule a tour please visit: <https://kpno.noirlab.edu/plan-your-visit/> or you can contact Jacelle Ramon-Sauberan who is the Tohono O'odham Nation Education Development Liaison. Jacelle joined NOIRLab-Kitt Peak National Observatory full-time in December 2023 and comes from the San Xavier District.



Fire Story

It has been nearly two years since the Contreras fire swept across our landscape, threatening communities both on I'oligam Du'ag and on the desert floor surrounding it. Looking at the mountain now, it is not so easy to recall how it looked that fateful week, ringed by fire and obscured by smoke.

It took the combined hard work of many individuals and organizations to get the observatory operational again: TOUA, TON Emergency Services, ADOT, and our neighbors all played key roles in our recovery, and for that we are forever grateful. Full recovery at the observatory has taken this long; we recently kicked off the final recovery project, restoration of the picnic area, and our nighttime staff can finally move back into the dorms that were damaged and had to be repaired.

The landscape itself has shown remarkable resiliency, with ground cover re-establishing itself almost immediately, causing us all to pause and appreciate the wisdom of nature. Our beautiful desert/mountain flora and fauna are an inspiration to us humans, and it is appropriate that we feel a certain amount of awe.

Today we are so happy to be welcoming people back to Kitt Peak and to be sharing our work. We would still like to set out in detail for everyone our experience of the fire, written earlier in the post-fire recovery period.

In June 2022 the Contreras Fire, which impacted communities and lands around the Baboquivari and Quinlan Mountains, also threatened Kitt Peak and the telescopes that are located near the summit. Thanks to the efforts

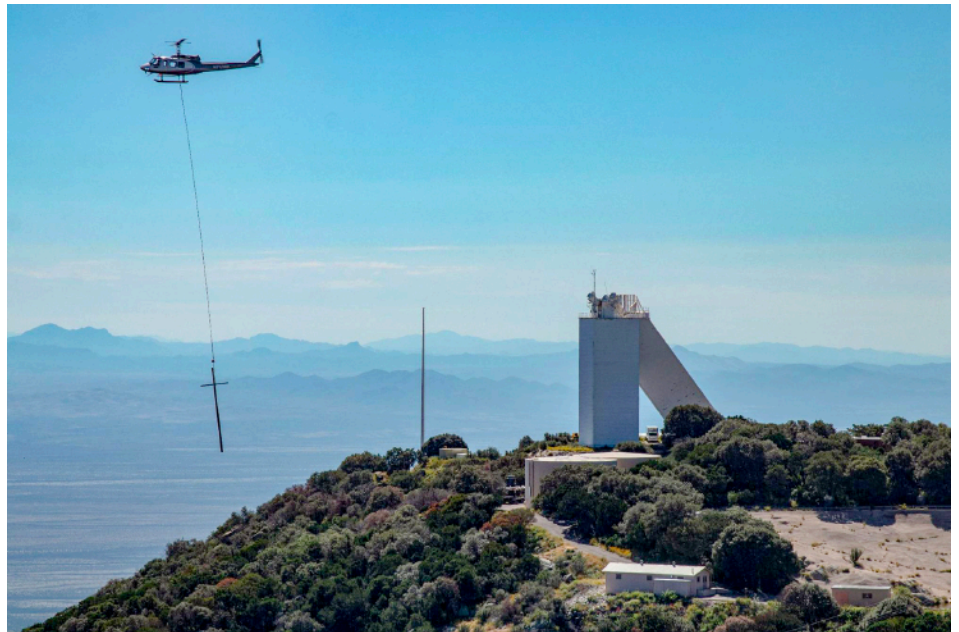


of firefighters from the Eastern Area Type 2 Incident Management Team and the Southeast Arizona Type 3 Incident Management Team, no telescopes or scientific facilities were lost. However, other structures did suffer damage, with two dormitories and two utility buildings destroyed and domes, bedrooms and offices covered in ash and smoke.

More critically, most of the observatory's infrastructure was impacted and we returned to a mountain with no potable water, no bathrooms, no electricity, no internet and no radio communications. Additionally, the road to the summit, Arizona State Road 386, suffered significant damage with guard rails destroyed along the last three miles up to the summit, more than 50 culverts filled with sediment and debris, and unstable rocks and dirt threatening mud- and rock-slides. This damage resulted in access to the observatory being significantly restricted by the Arizona Department of Transportation (ADOT) until September 2023, so that they could make necessary repairs.

Before staff could return to the site, independent contractors evaluated the electrical and structural integrity of the summit. Tohono O'odham and Bureau of Indian Affairs (BIA) officials worked with a special Forest Service emergency response team (BAER) to assess and protect natural and cultural resources from further harm. Once the site was deemed safe, Kitt Peak staff members returned to begin the difficult recovery process.

After weeks of cleaning, checking sensitive equipment and telescope mirrors, and rolling out temporary solutions for electricity and Internet we were excited to restart limited science operations in early September 2022, even welcoming a few overnight astronomers.



We worked with the Tohono O’odham Utility Authority (TOUA) to restore line power to the summit. This was an awesome undertaking by TOUA. Many of the power poles were inaccessible by vehicle, so teams crossed difficult terrain on foot and manually dug deep holes for the new poles. In October 2022, 18 new poles were delivered via helicopter and set in place across the mountain by TOUA staff, and then power lines were installed and energized. In December 2022, damaged poles near and on the southwest ridge were laboriously replaced and line power was returned to telescopes in that area.

As noted above, the Observatory road was closed to the public until September 2023, with daily ADOT crews on site removing thick mud and rocks from both winter and monsoon-season mudslides, repairing failing road surfaces, and restoring and improving guard rails.

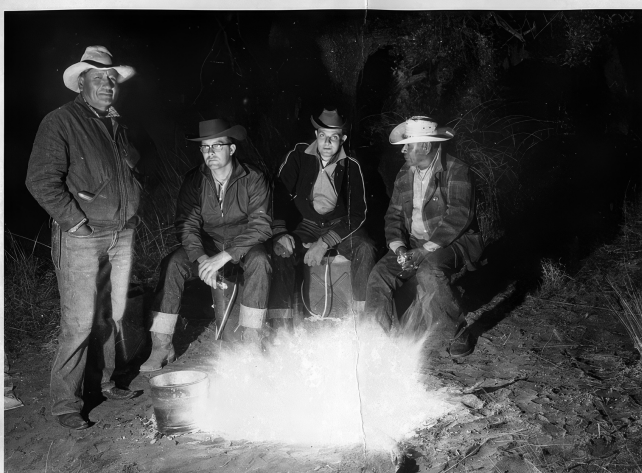
We are so happy that the telescopes on the summit have returned to exploring our vast and beautiful Universe and that we are able to share our explorations with the public!



Zade Arnold, Kitt Peak Senior Environmental Health and Safety Technician from Ali Chukson wrote:

“Wildfire has been something that Kitt Peak National Observatory had always anticipated and I can say with full confidence we made it through this event in great shape and with minimum structure loss to the site. It was an exciting experience to help the firecrews on the mountain and to provide my knowledge of our facilities, equipment, and resources. All I could think about most of the week was the value of the scientific equipment on the summit, the history of our mountaintop, and the livelihoods of my coworkers. Our main goal was to save the telescopes and structures at Kitt Peak.”

Thank-you to the Firefighters, the Tohono O’odham Utility Authority, and the Arizona Department of Transportation!



Time Capsule

Starting in 1955 a small team (mostly astronomers) were working to identify the best mountain in the southwest where the planned National Astronomical Observatory could be located. In March 1956 they arranged with the Schuk Toak District of what is now the Tohono O’odham Nation to have local ranchers familiar with Kitt Peak take them to the top of the mountain. Those ranchers were Al Martines and Raymond Lopez. Dr. Aden Meinel, Harold Thompson and journalist Cliff Abbott of the Tucson Citizen were taken by horse to inspect the summit.

Kitt Peak at the Rodeo



Kitt Peak was pleased to attend the 85th Annual Tohono O'odham Nation O'odham Wapkiyal Ha-tas Rodeo on Saturday 3 February 2024. We started the morning by participating in the Rodeo Parade. As part of the parade theme we had astronomy-related words in O'odham and English such as to:mog/ Milky Way. Kitt Peak took first place in the Business Category. Near the food vendors, we also had solar telescope viewing and a booth with educational materials, pictures, and even puzzles, which were a big hit with the kids. Many of our staff came out to meet rodeo attendees, answer questions about the observatory and discuss the latest happenings in the night sky. Thank you to everyone who stopped by and we hope to see you again at next year's rodeo.





A Story About a Picture

By Joan Najita

One of the most spectacular things in the night sky is the Milky Way, seen in this image arching above the Nicholas U. Mayall 4-meter Telescope at Kitt Peak and resembling a pale band of bright specks entangled with dark clouds and glowing red wisps that shimmer like fireworks. The Milky Way is known as to:mog in O’odham, and in one traditional Tohono O’odham story the Milky Way was created when Coyote, the trickster, was playing in the kitchen and looking for something to eat. Hearing someone coming, he grabbed a bag of flour and escaped

into the night sky in a great hurry. The bag tore open and flour spilled out, creating the Milky Way.

There’s an echo of that story in how astronomers understand the Milky Way, just with the light and dark reversed. Here, the bright white specks are not powdery flour but stars in our galaxy. And a different kind of powdery substance, interstellar dust, creates the dark clouds by scattering and absorbing the light from background stars. But this dust isn’t the same stuff we sweep up from under our beds. Instead, it’s a kind

of soot that forms in the atmospheres of some stars and is the material from which planets like Earth are made. It’s pretty valuable stuff — just like the flour that Coyote ran off with!

In this image we can also see other interesting features. The familiar constellation of Orion the Hunter is just above the [Nicholas U. Mayall 4-meter Telescope](#). And the glowing red fireworks spread across the sky are bright clouds of gas in the galaxy that are lit up by hot stars.

Science at NOIRLab: Stars Disappear Before Our Eyes

NOIRLab's Globe at Night educational program reveals how increasing light pollution is robbing us of the night sky.

A startling analysis from Globe at Night — a program run by NSF NOIRLab that invites members of the public to measure the brightness of the night sky from wherever they are — has concluded that stars are disappearing from human sight at an astonishing rate. The study found that, to human eyes, artificial lighting like lights from homes and street lamps has dulled the night sky more rapidly than indicated by satellite measurements. The study was published in the prestigious journal *Science* in 2023 and showcases the unique contributions that the public can make in essential fields of research.

From the glowing arc of the Milky Way to dozens of intricate constellations, the unaided human eye should be able to perceive several thousand stars on a clear, dark night. Unfortunately, growing light pollution has robbed about 30% of people around the globe and approximately 80% of people in the United States of the nightly view of their home galaxy. Can you see the Milky Way from your home?

To learn more about Globe at Night and to share sky brightness measurements from where you are, please visit: <https://globeatnight.org/about/>.

Featured Art



In 2021 NOIRLab commissioned Tohono O'odham artist Jeffrey Antone Sr, from the GuVo Community, to create a design for our Tohono O'odham Nation Engagement Program. His design has been put on buttons, magnets, stickers, and puzzles and has been displayed at engagement events.

Artist's Statement:

"This logo that I created represents the Traditions, the beauty, the artistic ability and the guidance of the Tohono O'odham people. All of these I just mentioned surround the Kitt Peak National Observatory that is located on the Tohono O'odham Nation. The observatory shows a lot of respect to its surroundings and to the people of the Nation. Each section of this logo shows a certain importance of the Nation, as you can see the friendship dance that can be seen in our ceremonies and in our artwork (baskets, pottery and paintings). We also see the guidance of our families who encourage their children to get a better education and with the help of the observatory some can be guided to search for the stars. This symbol also represents the four directions which is also very important in the O'odham culture."

BaoBan The Ambassador

Content modified from an original post by Samuel Brieden on the [DESI Blog](#)

BaoBan is the Dark Energy Spectroscopic Instrument's ambassador for Education and Public Outreach. The Dark Energy Spectroscopic Instrument, or DESI for short, is measuring the effect of dark energy on the expansion of the Universe. DESI is working on obtaining optical spectra for tens of millions of galaxies and quasars, as well as constructing a 3D map spanning the nearby Universe to 11 billion light-years. This study is being conducted on the Mayall 4-meter telescope at Kitt Peak National Observatory (KPNO).

BaoBan's name, which was selected by the Tohono O'odham Nation Youth Council, combines several ideas. "Bao" is reminiscent of the sound the coyote makes and is also the acronym for "baryon acoustic oscillations", a technique the DESI astronomers are using in their study.


"Ban" is the word for coyote in the Tohono O'odham language. "BaoBan" is also the short form of "Ba: 'o ñia g Ban" meaning "Where is coyote looking?", which symbolizes DESI's exploration of the wonders of the Universe.

"BaoBan symbolizes how the enormous scientific effort by ~70 member institutions with over 700 active collaboration members from all over the world is deeply connected with the TO, who share part of their homeland to discover the mysteries of our universe. BaoBan reminds us that the night sky is the same for everyone, independent of national or cultural identity. Furthermore, BaoBan reminds us to always respect our roots and our environment, and to never forget that the deeper our maps of the cosmos become, the deeper the relationships we will foster among different cultures and people," said Samuel Brieden.

BaoBan likes to wear tie-dye, has their own comic strips and made an appearance in the 85th Annual Tohono O'odham Nation Rodeo and Parade with KPNO.



Kitt Peak National Observatory is a Program of NSF's NOIRLab, the US national center for ground-based, nighttime optical astronomy.

 Kitt Peak National Observatory Tucson, AZ 85634, USA
31°57'36.288" N 111°35'53.411" W

 Visitor Center: +1 520 318 8726

 info@noirlab.edu

 <https://kpno.noirlab.edu/>

Kitt Peak National Observatory sits atop l'oligam Du'ag. Astronomers are honored to be permitted to conduct scientific research on l'oligam Du'ag (Manzanita Bush Mountain), in the homeland of the Tohono O'odham Nation. We honor their past, present, and future generations, who have lived here for time immemorial and will forever call this place home.