NATIVE STAR STORIES NIGHT

Your stories. Your science. Your future.

WITH GENEROUS SUPPORT FROM...

University of California Observatories
Lick Observatory

Lick Observatory's education and public outreach (EPO) mission is to discover and share the mysteries of the universe from atop Mt. Hamilton. They strive to engage our local communities in learning about scientific practices, astronomical discoveries, and enabling technologies. They empower our community members to be scientifically literate, to explore careers in science, technology, engineering, and math (STEM), and to understand science as a human endeavor. Ultimately, they aim to improve the scientific advancement of students at all levels, of educators, and of the general public in our communities.

University of California Santa Cruz
American Indian Resource Center

The American Indian Resource Center (AIRC) works in collaboration with other resource centers, faculty, staff, students, and organizations such as the Student Alliance of North American Indians (SANAI), the University of California American Indian Counselors/Recruiters Association, the Amah Mutsun Tribal Band of California Indians, as well as the indigenous tribal community leaders of the region to develop co-curricular programming, cultural activities, and events that assist public understanding of native peoples. Invested in creating a campus climate that supports all students, the center provides leadership development, internship opportunities, mentoring, and personal and academic advising. The AIRC is located on the third floor of the Bay Tree Building in Quarry Plaza. For more information, call (831) 459-2881, email airc@ucsc.edu, or visit the AIRC website.

American Astronomical Society
National Osterbrock Leadership Program

Earning the PhD in Astronomy is a rare chance to develop resourcefulness, creativity, and critical thinking. The Osterbrock Leadership Program is founded on the conviction that the lifelong value of the PhD – to the recipient and to society – will be maximized if PhD candidates can master basic principles of leadership and management in addition to their regular research training. The Osterbrock Leadership Program provides unique training opportunities to the UCSC Astronomy graduate community through a variety of educational activities, mentorships with outstanding leaders, and leadership experiences conceived and executed by the students themselves.

AGENDA

5:00 pm **Arrival and Dinner**

5:40 pm **Private Tour of Lick Observatory**

7:00 pm **Sunset Ceremony**

7:15 pm **Indigenous Astronomy Activity**

Share stories, explore online tools/resources

8:00 pm **Western Astronomy Activities**

Look through telescopes

8:45 pm **Two-eyed Seeing: combining both perspectives**

9 pm **Wrap-up and swag bags**

LAND ACKNOWLEDGEMENT

The land on which the University of California, Santa Cruz sits is the unceded territory of the Awaswas-speaking Uypi Tribe. The Amah Mutsun Tribal Band, comprised of the descendants of indigenous people taken to missions Santa Cruz and San Juan Bautista during Spanish colonization of the Central Coast, is today working hard to restore traditional stewardship practices on these lands and heal from historical trauma.

UCO Lick Observatory and the land on which we gather is the unceded territory of the Ohlone (Costanoans), Tamyen and Muwekma Ohlone tribes.

Solidarity Actions

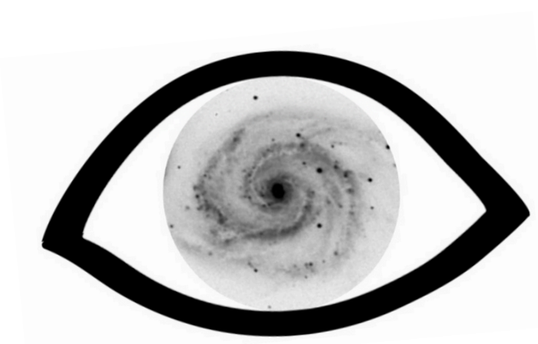
Engage with the Amah Mutsun Tribal Band and Land Trust by:

- Learning about current actions and campaigns that require community support
- Volunteering at Amah Mutsun garden spaces (regular monthly opportunities in two locations: Pie Ranch and San Juan Bautista State Historical Park)
- Connecting with the Amah Mutsun Relearning Program at the UCSC Arboretum
- Donating if you can (i.e. paying a land tax, if you're not Indigenous)

WHAT IS TWO-EYED SEEING?

"Etuaptmumk or Two-Eyed Seeing is learning to see from **one eye with the strengths of Indigenous knowledges and ways of knowing**, and from the **other eye with the strengths of Western knowledges and ways of knowing**, and **to use both these eyes for the benefit of all**."

- Albert Marshall, Mi'kmaq Elder
(Bartlett, Marshall and Marshall 2012, 336)



"These aren't just superstitions about the natural world. The ancients were deep thinkers. They looked at things and analyzed them and put them together in a logical, analytical fashion. It wasn't just random individual beliefs. If you see the three stars of Orion rising in a vertical line, what does that mean? It's knowledge, and [the ancestors] put it to practical use."

- Ojibwe elder and artist Carl Gawboy
Talking Sky: Ojibwe Constellations as a Reflection of Life on the Land

These are not practices of the distant past, because they are our stories and

we are still here today.

Indigenous Way of Knowing: Star Stories

What is your star story?

Guiding Questions

1. What is similar between stories? What is different?
2. What is something that stands out? Something that is silly, moving, memorable, surprising, etc.
3. Why are many of these stories missing today?
4. What is the value of these stories?
5. How do we recover these stories and practices? If we can't, how can we protect them going forward?

Western Way of Knowing: Telescopes

What I Saw:

Reflection Questions

In what ways were looking through telescopes and listening to the astronomers *similar* to indigenous star stories? In what ways were they *different*?

Two-eyed Seeing: Combining the Indigenous and Western Perspectives

Write, draw, talk, act, or even dance out **your own new star story** about something you saw through the telescopes tonight. You are welcome to chose whatever method you feel most comfortable with, including ones not listed above!

How will you use storytelling in your daily life?

Things to ask about college:

- **Why did you decide to go?**
- **Where do I live on or off campus?**
- **How much does it cost?**
- **How do I get the money to pay for college?**
- **How much would I need to study?**
- **How long do students attend?**
- **What are the different types of degrees?**
- **Which classes do I take?**
- **How do I select a major?**
- **What kinds of jobs are are available after college?**
- **Where would I live after college?**
- **How much money would I make after college?**
- **What kind of student organizations or support systems exist for students of my background?**

We all have a right to Dark Skies

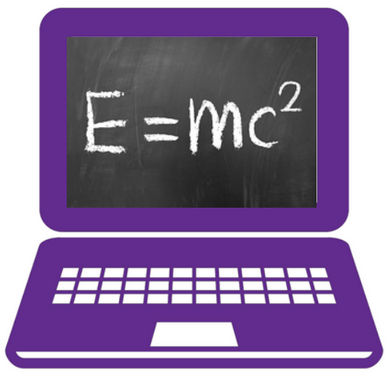
How many of you could see the stars from where you grew up? Our ancestors across the world had access to a very different sky. One unaltered by light pollution. Light pollution is yet another threat to traditional star science and ways of life.

Indigenous and Native American communities are among the most vocal advocates for dark skies. Read more about their leadership in advocating for the future of this precious resource:

- ***National Parks Are Embracing Indigenous Astronomy*** (https://www.outsideonline.com/adventure-travel/national-parks/national-parks-indigenous-stars/)
- **The world needs dark skies more than ever. Here's why. (**https://www.popsci.com/story/science/dark-sky-places/)
- ***'We come from the stars': How Indigenous peoples are taking back astronomy*** (https://www.cbc.ca/news/science/indigenous-astronomy-1.5077070)
- ***Light Pollution Threatens Millennia-old Indigenous Navigation Methods*** (https://www.discovermagazine.com/environment/light-pollution-threatens-millennia-old-indigenous-navigation-methods)
- ***Dark Skies Toolkit*** (https://www.usu.edu/gnar/tools/dark_sky_tools/dark_skies_and_culture)

How do you become an astronomer?

Take as much math and physics as your high school offers.
Consider taking computer science, too! Don't love math? That's okay, astronomy is a lot more than just math.



Go to college and earn a Bachelor's Degree in astronomy or physics
Or (less common) math, geosciences, space science, planetary science, engineering, or computer science. Going to a community college and transferring to a 4-year college for the last 2-3 years of college can be a great way to save money. Often, programs exist to support transfer students and first-generation college students. Do research!

Go to grad school and get a PhD (or get a job)
Because there is a lot to learn in astronomy, you usually need an advanced degree to get a job. A PhD is typically 5-6 years long and you are paid during that time. That's right, a PhD is free! After you are done, you will be Dr. [Insert your name here].

Or...choose your own adventure! There are many paths to becoming an astronomer

Work at...
A university
An observatory
A community college
A research institution
A planetarium
A school
A think tank
Science communication
Science policy and laws
A big, rich programming or data science company.

Astronomers are known for being very creative and good with numbers, so people want to hire you for these jobs **and more!**

Indigenous Astronomy Resources

Created by Professor of Astronomy Annette S. Lee in 2007, Native Skywatchers Combines art, science, and storytelling. There are outreach programs across the US for high schoolers, middle schoolers, and general audiences. Website includes resources for teachers. Native Skywatchers is a seminal leader in the field of recovering star stories across the world.
nativeskywatchers.com

The Myths, the Magic, and the Mysteries of the Universe

Run through the Lunar Planetary Institute in Huston, Sky Tellers invites young kids to explore the mysteries of our Universe through ten Native American myths and legends. Each narrative video is accompanied by the story that scientists tell today.
https://www.lpi.usra.edu/education/skytellers/

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SCIENCE FRIDAY

ARTICLE BEST OF 2019

Relearning The Star Stories Of Indigenous Peoples

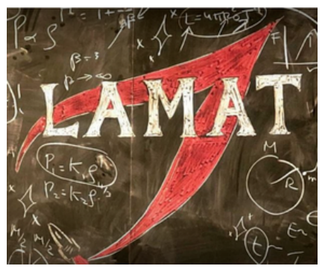
Local Astronomy Programs

Shadow the Scientists

Sit in on a real, uncurated observing experience. *https://crest.ucsc.edu/shadow-the-scientists/*

Pyar: Python and Research

PSeveral times a year, a 2-day virtual course is offered for students around the world to learn the Python programming language by working through a real astronomy research project which was originally conducted in 2015. Pyar is also the Hindi word for love. *https://pyar.ucsc.edu/*



Lamat Summer Research Program

Founded by UCSC Vera Rubin Presidential Chair for Diversity in Astronomy, Enrico Ramirez-Ruiz, the Lamat Program provides career support and gives 4-year and community college students a chance to conduct astronomy research at UCSC, a world class astronomy institution. Lamat means star in Mayan. *https://lamat.science.ucsc.edu/*

Local College Programs

Science Internship Program
(https://sip.ucsc.edu/)

Student Outreach and Recruitment
(https://www.sjsu.edu/soar/spartaneastsidepromise/)

Young Scholars Program
(https://www.scu.edu/ysp/)

Resources for Native/Indigenous Students

Advancing Chicanos/Hispanics & Native Americans in Science

ADVANCING INDIGENOUS PEOPLE IN STEM

INDIAN HEALTH CENTER OF SANTA CLARA VALLEY