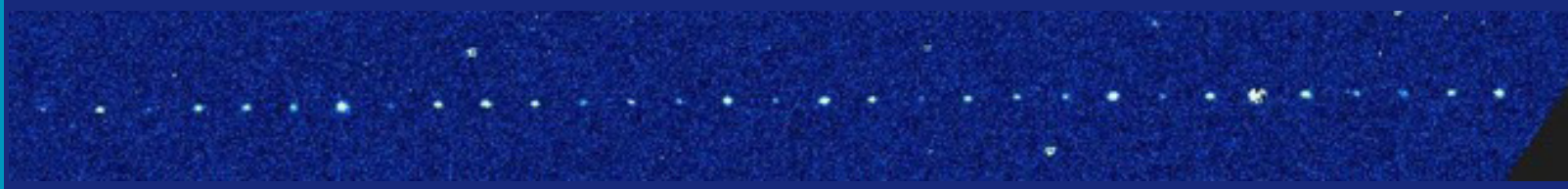


On January 27th, 2023, 31 x 1.2-second exposures of Near-Earth Asteroid 2023 BU were captured using the 4.3-meter Lowell Discovery Telescope. During the observation, the asteroid exhibited rapid brightness variation as it moved across the sky, and the data indicated complex rotation states.

THE LOWELL OBSERVER

Issue 129 | 2023 no. 2

The Colors of Asteroids

By Hannah Zigo, Former Research Assistant

There are about 30,500+ known Near-Earth Asteroids (NEAs), with this number continuing to grow each day. Approximately 97% of these NEAs are smaller than one kilometer. To provide some context, their dimensions span from the magnitude of the Golden Gate Bridge, which measures around one kilometer, down to the length of a baseball bat, which is about one meter in size. However, there's extremely limited information for these sub-kilometer (sub-km) NEAs. The smaller the objects are, the harder it is to measure their properties, even if there are more of them. One of my goals is to help build the current understanding of the sub-km NEA population by deriving some of their physical properties.

As a member of the Mission Accessible Near-earth Object Survey (MANOS), my motivation is to constrain the physical characteristics of sub-km NEAs that are close enough to be considered "mission accessible"- which is when a spacecraft requires a low amount of fuel (sometimes less fuel than getting to the Moon) to reach them, and they make close approaches to Earth so that they're

CONTINUED ON PAGE 11

IN THIS ISSUE

Communicating Science Under Arctic Skies

By Dr. Michael West, Astronomer

When I was in high school, I read a book that changed my life.

It was astronomer Carl Sagan's marvelous collection of essays, The Cosmic Connection. Sagan's poetic prose and insights into the universe's workings sparked a curiosity I'd never felt before.

I went on to get a Ph.D. in astronomy and have been a professional astronomer and educator for nearly four decades. I'm proof that science communicators can change lives.

CONTINUED ON PAGE 11

EXECUTIVE DIRECTOR'S UPDATE

By Dr. Jeff Hall

The Lowell Observatory Advisory Board meets twice a year, in June and in January. At the June meeting a few months ago, there was plenty to discuss. Work is proceeding rapidly on the Astronomy Discovery Center, as you can see in the picture below, and we are getting into the details of the programming and logistics of running the new facility. With the building expected to be weather-tight by this fall, we should not see further significant schedule slips if we have more mountains of snow this winter, and we are looking on track to open by next fall.

At the same meeting, Dr. Christoph Keller and Dr. Kyler Kuehn presented an overview of the new vision for science and technology at Lowell for the next 15-20 years. The science and technical staff have developed a wide-ranging set of projects encompassing expansion of staff, a new generation of instrumentation for the LDT and other telescopes, and necessary physical infrastructure.

This science and technical vision is "the next big thing." As we have wrapped the capital campaign for the ADC and are now working to establish an endowment for it, we are also beginning to lay the groundwork for the sci-tech campaign of the next decade.

When I came to Lowell in 1992, we had about 45 employees and an operating budget about one sixth of what it is now. We've come a long way, and I look forward to seeing where the next big thing takes us in the future! •

TRUSTEE'S UPDATE

By W. Lowell Putnam

John Donne once wrote that "No man is an island." It is also true that no organization stands by itself. We succeed by doing more with others. In this issue you will see how many ways in which Lowell staff are involved in the various communities of which we are a part. It is great to support other organizations and, in turn, be supported by them.

We are also celebrating Dr. Joe Llama's tenure at Lowell. Also in this issue you will, unfortunately, read of the passing of Dr. Ted Bowell, who did such great work at Lowell in asteroids and was a vibrant member of our community. We also mourn the passing of Dr. William Tifft and thank him and his family for their gift which will continue research in extragalactic research.

All this plus lots of news about research, the archives and the ADC construction shows there is lots going on at the observatory. We continue to grow and do great work thanks to all who make up the community in which we live. •

The Astronomy Discovery Center Takes Shape

By Dave Sawyer, Technical Project Manager

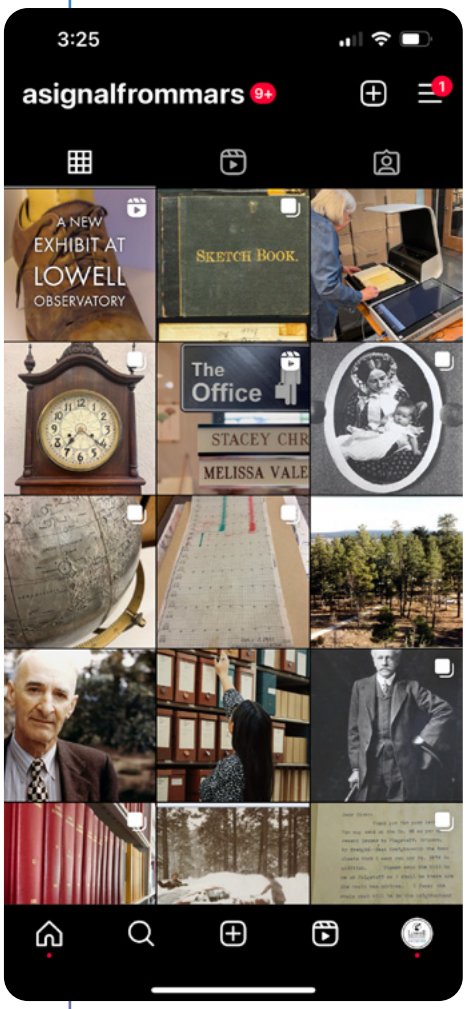
ADC building in late July 2023 as viewed from the future parking lot.

Great spring weather and a delayed monsoon have allowed excellent progress to be made on the ADC construction. The structural construction is nearly complete and the building has taken form. Attention has now turned to getting the facility dried-in (roofing is underway), connecting utility services, and completing the rooftop amenities (Dark Sky Planetarium and Skylight Terrace). In addition, crews continue to build interior walls, and install mechanical, electrical, plumbing and fire safety systems. Along with the brisk construction activity, the ADC project management team has been busy issuing many contracts needed for "fitting-out" the facility after construction is complete, beginning as soon as April 2024. These contracts include things like the theater LED screens and seating, exhibits and interpretation, building-wide audio/visual and IT systems, food service equipment, and retail merchandising fixtures. Contracts are also underway to produce engaging shows to be featured in the Universe Theater upon opening.

The Archives and Social Media

By Melissa Valenzuela, Former Archives Assistant

Social media has evolved over the last decade from cat videos and poking your friends on Facebook to a useful tool that institutions—like archives—are using to stay engaged with their audiences. Here in our archives, we're using Instagram, Twitter, and TikTok to highlight projects, including new exhibits, and items from our collections with the hopes of broadening our reach.



Many museums and archives were hesitant to participate in the early days of social media out of fear that posting their works of art and artifacts openly would discourage the public from visiting in person. But as we, and so many other institutions, have come to find, social media is a great way to cultivate interest in the objects themselves and archival work as a whole—even the less glamorous parts of the job. Back in October when we posted a funny TikTok of me (who has severe arachnophobia) replacing the insect traps in the Putnam Collection Center, we found that the video gained a lot of positive attention and was a great device for talking about the importance of pest management. More recently, we have used TikTok to promote the opening of our latest exhibit about the Sykes brothers. We have also found creative ways to encourage our followers to interact with the history of Lowell Observatory through quizzes, polls, and weekly showcases of items in our collection. On Tuesdays, our followers can participate in trivia quizzes on our Instagram story that are all centered around people, places, and objects in Lowell Observatory's history, and on Fridays, they can tune in to learn more about that week's highlighted item from the vault. And while seeing these items digitally is compelling, nothing beats engaging with them in person. Thus, getting your followers excited about your collections will further motivate them to visit your space and check out these items for themselves.

Accessibility is a key pillar of archival work, and social media makes it easier than ever to make our collections available to the public. Our Friday Files segment has become a meaningful place to give visitors insight into the types of materials that we collect and talk about items from our collection that the public does not regularly engage with. In a similar vein, we participate in the monthly Archives Hashtag Party hosted by the United States National Archives on Twitter, which allows us to share items from our collections within a certain theme and connect with other archives across the country. By being active on social media platforms, we hope to demystify archival work and connect with the public in a more personal and engaging way. Follow us on Instagram, Twitter, and TikTok @ASignalFromMars. •

Dr. Lisa Prato Elected as AAS Trustee

In February, Dr. Lisa Prato was elected to the American Astronomical Society (AAS) Board of Trustees. The management, direction, and control of the affairs and the property of the AAS is the responsibility of the Board, which is the governing body of the Society. Prato has taken on a position of Trustee at Large; for the past four years she has been the Chair of the AAS Publications Committee, responsible for oversight of the Society's five peer-reviewed professional journals.

Lessons In Astronomy

What strikes me is the way they speak, the astronomers,
their sequential, dependent facts
of the universe and how they clutch each dot of once
each newly spun miracle in order

to fathom the ongoing locomoting of the neon
starfield and drong of planets. How extreme
the membranes of time. How in the midst
they can be in the unseeable: what surrounds and what

peels away. In the awkward kitchen above
the research rooms in this observatory, I am
crisping toast with a slice
of swiss when one scientist enters for a mug

and, making talk of nothingness
as the coffee drips predictably down,
he tells me of years in the study of cannibalized
galaxies, the data near impossible

to find through a lens, with the gnawing
atmosphere and wobble and whatever else is parceled out
in the entirety of worldbuilding a borderless
place. As he explains, I rethink the long

outer dark. The grandiose length
of time that is the universe, I see it softer now and
as a series of mercies and uncoiled lights.
There is more to stable about existing:

distance in trillions and billions,
and hydrogen, nitrogen. I try to carry the big things.
To take them with me
toward the thirst of living. Look, it is already night.

- Lauren Camp

Poet Lauren Camp contributed this poem. Lauren is the author of six books, most recently *An Eye in Each Square* (River River Books, 2023). Her honors include a Dorset Prize and finalist citations for the Arab American Book Award and Adrienne Rich Award for Poetry. She is the New Mexico Poet Laureate and was Astronomer in Residence at Grand Canyon National Park in 2022. She spent two weeks as Poet in Residence for Lowell Observatory this spring, and took every opportunity to learn from the telescopes, the educators, and the scientists on Mars Hill. She currently serves as Poet Laureate of New Mexico.

laurencamp.com

GRAND CANYON RESIDENCY

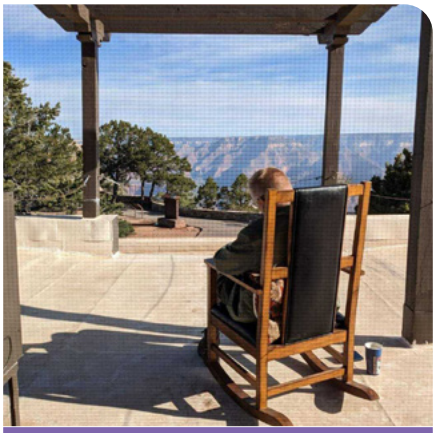
By Kevin Schindler, Historian and PIO

In May I had the honor of serving as Grand Canyon National Park Astronomer in Residence. This residency program is one of the many outstanding efforts sponsored by Grand Canyon Conservancy to preserve and celebrate the Grand Canyon. It brings in artists, poets, historians (in my case), research scientists, and others with some sort of connection to astronomy, with a goal of building public awareness of the night skies, astronomy, and the various disciplines related to natural darkness.

The residency involves giving public presentations and developing and/or implementing a project related to the Grand Canyon and its wonderfully dark skies. During my month at the Canyon, gave 30 presentations, for groups ranging from two to 200 people, and made outstanding headway in my project of rephotographing sites along the South Kaibab and Bright Angel trails where Apollo astronauts trained in the 1960s.

Kevin Schindler talks about the Moon to students at Grand Canyon Elementary School.

One can't help but be inspired by living at the edge of the Canyon for a month, where the connection between the rocks below and the skies above is striking. In both cases, we are looking back in time. The constellation Coma Berenices, for instance, features a barred spiral galaxy that is about 270 million light years away. This means that the light emanating from it that we see today began traveling to us at about the time that the uppermost and youngest layers of the Grand Canyon, the Kaibab Limestone, were formed.



Kevin Schindler writes with a view of the Grand Canyon.

The rocks and skies also share a dichotomy of sorts. On one hand, there's stability and uniformity: the apparent constancy of rocks laid down, layer by layer, over time, is like that of the Sun rising every day. On the other hand, if you look closely, you see signs of chaos and treachery. The Canyon's Vishnu Basement Rocks were formed under punishing conditions of intense pressure, evidenced by rocks whose layers and bands are contorted and twisted, and the Sun is powered by the staggering forces of thermonuclear fusion.

Visiting the Grand Canyon is inspirational but living there is life altering and allows a most unique perspective of the Universe. •

Digital Cards Available

Lowell Observatory is stepping into the digital era with digital membership cards and guest passes. We have partnered with Cuseum to make this convenient change. This eco-friendly option streamlines the member experience and gives you easy access to your membership benefits. It's all in your pocket now! Members who prefer physical cards and passes can still request them by emailing membership@lowell.edu or calling the dedicated membership team at 928.255.5059.

Dr. Ted Bowell

Just as this newsletter was about to go to press, we learned of the passing of Dr. Ted Bowell on August 21. An eminent astronomer who specialized in the study of asteroids, Ted led the long-running Lowell Observatory Near-Earth-Object Search (LONEOS). Ted was a beloved member of the Lowell Observatory family and worked here from 1973 until his retirement in 2011. We will miss Ted's kindness, good cheer, and expertise of fine wines. Stay tuned for a full story about Ted in a future issue of *The Lowell Observer*.

Dr. Joe Llama Granted Tenure

By Dr. Christoph Keller, Director of Science

On January 25, 2023, Dr. Joe Llama was granted tenure with a corresponding promotion from Assistant Astronomer to Astronomer. Tenure at Lowell Observatory means that the observatory intends to continue the employment indefinitely provided that the performance continues to be satisfactory, and the institution does not encounter a financial emergency. The tenure committee, consisting of all tenured scientists at Lowell Observatory, and six external reviewers, were unanimous in their assessment of Joe as a great staff member with a broad range of abilities, from theory to observations and instrumentation. Joe has a significant number of papers and grants to his name, is a highly appreciated mentor to students and contributes in many other ways to the observatory. His excellent standing in the community is exemplified by the many job applicants that want to work with him. Congratulations, Joe!

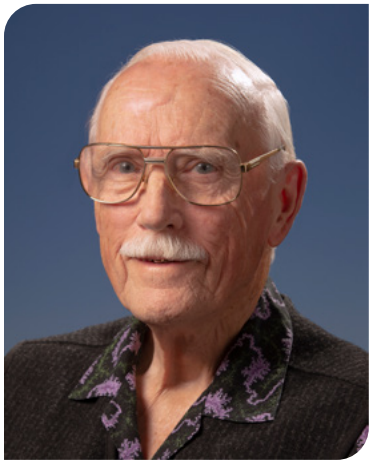
William Tifft Endowment

By Stephen Riggs and Bruce Kosaveach, Philanthropy Managers

In 2022, a long-time Lowell Observatory supporter and former Lowell Observatory astronomer, Dr. William Tifft, passed away. Tifft was a Professor of Astronomy at the University of Arizona whose work focused on cosmology. He received numerous prestigious awards during his career and his publications, though not without controversy, were voluminous. In his estate plans, he arranged for Lowell Observatory to receive a large portion of his works and papers. He also provided a generous bequest to the Lowell Observatory Foundation to establish the William G. Tifft Endowed Fund for Extragalactic and Cosmological Research. This fund will support research in the areas of galactic structure and formation, large-scale structure of the universe, and cosmology. The Fund will also preserve his works and materials and make them accessible to researchers.

Helping to facilitate the gift was his daughter Jennifer Tifft. As executor of her father's estate, she has been an indispensable help to Lowell regarding columbarium arrangements, the estate gift, and her father's extensive archival logs, plates and notes. Many of Tifft's archival materials will be preserved at the Putnam Collection Center. The observatory is in her debt for the meaningful and heartfelt assistance she has provided.

Tifft received a Bachelor of Arts in Astronomy from Harvard University in 1954 and completed his Ph.D. in Astronomy and Physics at the California Institute of Technology in 1959. He worked at Lowell from 1961-'64. He taught at the University of Arizona for 38 years and was awarded emeritus status upon retirement. He completed four years as a National Science Foundation (NSF) pre-doctoral fellow and received a two-year postdoctoral NSF fellowship at the Australian National University in Canberra, ACT, Australia. Tifft received several grants from NASA, the National Science Foundation, and the Office of Naval Research. His bequest will help further extragalactic and cosmological research at Lowell Observatory in perpetuity. •



Though Dr. William G. Tifft passed away in 2022, his contributions to astronomy will continue thanks to the endowment he funded at Lowell Observatory.

They Came. They Experienced Lowell. They Helped.

By Lisa Actor, Chief Philanthropy Officer

In January, when it became clear that pandemic-related construction-cost increases for the Astronomy Discovery Center (ADC) were beyond our ability to raise from private sources, State Representative David Cook offered to help. He entered a budget bill, then brought a group of Arizona legislators for a visit. They toured the ADC construction site, heard a talk by Dr. Teddy Kareta about the DART mission, and enjoyed GODO telescope viewing. Impressed by what they'd experienced, this group of Arizona House members came through. Thank you, State of Arizona! •

Participating in a tour of the ADC site are: David Noble, Amanda Bosh, Danielle Adams, Dave Sawyer, Jeff Hall, Samantha Gorney, Rep Justin Wilmeth, Rep Teresa Martinez, Rep David Cook, Rep Leezah Sun, Rep Patty Contreras, Lisa Actor, Hannah Rounds, Bruce Kosaveach.

Members-Only Facebook Page

By Emma Wood, Membership Assistant

The Lowell Observatory Member Community Facebook group is a space where members can meet and discuss topics of shared interest, as well as stay up to date on astronomical events. Every week members can expect to receive a Sky Report on the next week's astronomical events, courtesy of Stellar Vista Observatory. On top of that, members regularly share interesting articles, stories, beautiful pieces of astrophotography, astronomy memes, and more. Join now to become an engaged part of the Lowell Observatory Member Community!

facebook.com/groups/lowellobservatorymembers

Catie Blazek
HR Manager

By Madison Mooney, Content Marketing Specialist

STAFF PROFILE

Over the course of her 11-year tenure at Lowell Observatory, HR Manager Catie Blazek has seen a staggering amount of growth happen at Lowell. From the time she started as an educator in Lowell's Public Program department in 2012, she has watched the observatory's staff grow from 90 employees to more than 160.

As an educator, Catie led historic tours and operated telescopes on campus for about a year. Then, she moved into an administration role and became the Human Resources Assistant shortly thereafter. She continued to move up within the department from there, serving in various roles. In 2022, Catie was promoted to the HR Manager position.

For Catie, there's no such thing as an average day on the job. Each day is different, offering its own unique challenges and opportunities. Her responsibilities include leading and directing the routine functions of the Human Resources Department, including hiring and interviewing staff, administering pay, benefits, and leave, and enforcing company policies and practices. Catie's favorite part of her job is the fact that it's always changing, and that it allows her to help the observatory grow and succeed in its mission.

FUN WAYS TO SUPPORT THE ADC

By Sarah Dankof, Corporation and Foundation Philanthropy Manager

Have you ever dreamed of seeing your name written in the stars?

Well, at Lowell Observatory, we can't do that, but we do have a number of opportunities that are the next best thing. The Kemper and Ethel Marley Foundation Astronomy Discovery Center will be a gateway to the universe for hundreds of thousands of visitors, and you have the chance to put your name on part of that life-changing experience.

- Share your support for diversity in astronomy by sponsoring a plaque on the Diverse Universe Wall ($3,500): an exhibit that truly highlights how astronomy is for everyone.

- Quite literally support our visitors when you sponsor a Universe Theater Seat ($1,500)! The revolutionary Universe Theater will use talented presenters, compelling stories, and breathtaking visuals to bring guests on a journey through Lowell's past and present discoveries. And they'll do so in comfort, thanks to your gift.

- Show guests your love for the beauty of space by sponsoring a 4-foot x 4-foot cosmic image taken by Lowell Observatory astronomers and planetary scientists that will adorn public spaces with out-of-this-world high resolution detail and color ($3,500).

The Hanging Planets in the Orbits Curiosity Zone will be approximately to scale ranging from Jupiter at almost eight feet to tiny 2.5-inch Pluto. Donors will be recognized on a plaque in the exhibit hall.

- Instill wonder in the next generation of astronomers by sponsoring a planet in the Orbits Curiosity Zone ($5,000 - $20,000). The planets will hang dramatically from the ceiling of the gallery, providing an inspiring sight for space explorers big and small.

Your gift can be made up-front or delivered in installments. Contact sshaffer@lowell.edu to claim your piece of discovery today! •

Star Stuff, Season 2

Star Stuff: A Space Poddity is well into Season 2. Host Cody Half-Moon continues to explore the cosmos with new special guest stars, plus a few fan favorites. Start your interstellar journey on your favorite listening platform today. All Season 2 episodes are now recorded on video as well, so you can watch them on YouTube.

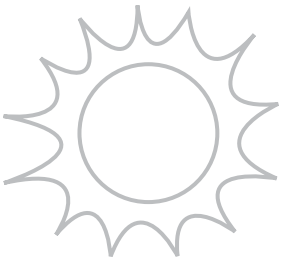
Tom Horne Visits Lowell

Arizona Superintendent of Public Education Tom Horne visited Lowell Observatory in June. He was particularly interested in seeing the Orbits Curiosity Camps in action. Jeff Hall, Hannah Rounds, Todd Gonzales, and Kelly Ferguson hosted Mr. Horne, his wife, and two members of his team. He spoke with kids attending the camps and then Jeff led a brief tour of the ADC site.

Learn Navajo

The Navajo language is a descriptive language. Several words in Navajo could correspond to one English word. The word "gym" could be translated as the shape or the color of building where people lift heavy iron or play basketball. When describing space or elements, some of the terms are sacred to the Navajo culture. Therefore, they are only taught during certain times of the year or during enclosed ceremonies.

To read the Navajo language, pay attention to the diacritical markings. Use slightly higher tones for hyphenated letters and lower tone for under markings. Use a small push of air from your throat, for the glottal stops. Below are words for all ages.



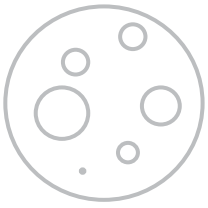
Sun - Jóhonaa'éí (Joh-ho-naa-ay)

[Translates to the Sun Bearer]

Other words that can be used to describe the Sun:

Yellow – **Łitso (thih-tsoh)**

Circle – **Názbąs (naas-baas)**



Moon – tł'éé'honaa'éí (glheh-hoh-na-ay)

[Translates to The One Carried At Night]

The Moon could be explained as:

bumpy – **Diwol (dee-wool)**

white – **łigai (thih-guy)**

grey – **łibáh (thih-bah)**

blue – **yágo dootł'izh (yaa-go doh-gliizh)**

Eclipse Over Texas: Live From Waco to Celebrate April 8, 2024 Total Solar Eclipse

By Kevin Schindler, Historian/PIO

On April 8, 2024, a total solar eclipse will be visible from a narrow path running from Mexico to Canada. Texas will be an ideal viewing spot, and Lowell Observatory is teaming with The City of Waco, Baylor University, and Warner Brothers Discovery on a public event, Eclipse Over Texas 2024: Live from Waco. This will include an onsite celebration at Baylor University's McLane Stadium in Waco, as well as virtual programming that people around the world may view.

Eclipse Over Texas 2024: Live from Waco will consist of a full day of presentations by astronomers and educators, interactive activities, and telescope viewing. Warner Brothers Discovery will broadcast the event on their linear and digital networks. All of this will center around the eclipse: the Sun will begin to be eclipsed at 12:20pm CDT. The Sun's surface will gradually be covered until totality sets in at 1:38pm CDT. This will last for four minutes and 11 seconds, at which point the Sun will begin its gradual move out of the Moon's shadow.

Waco sits in the middle of the path of totality. This, combined with typically excellent weather in April, as well as easy accessibility, makes Waco an ideal location for an eclipse event.

For information and to reserve your spot at this event, see **eclipseovertexas2024.com**.

Supporter Feedback

Compiled by Heather Craig, Marketing Operations Specialist

Fun for the whole family! Learn about planets, stars, and other space entities. We got to see the telescope that was used to discover Pluto and declare it as a planet. If you stay past dark, you can look through telescopes to see some of the nearby planets and stars!

Google Review

Yelp

Wonderful experience even during the day! Staff really engaged with visitors and made the science easier to understand. They helped me capture these pictures of the sun through the telescope!

Google Review

We love coming here & learning more each & every time while having a wonderful & fun time. Everyone should experience this!

Google Review

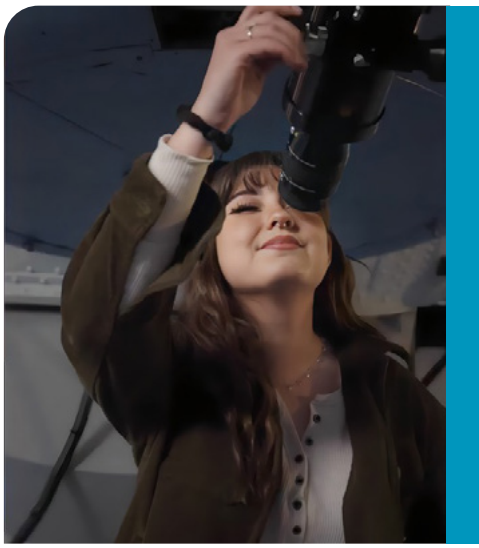
Had a great time with the family. A family membership ended up being a better value for us, so we will definitely be coming back again to use it. I highly recommend attending during different times of day to get the most out of your visit. If you park an electric vehicle, you must check in at the visitor center to get a key, but the charging is fast and free.

THE COLORS OF ASTEROIDS | CONTINUED FROM PAGE 1

easily accessible by spacecraft. One key characteristic I'm interested in is an asteroid's spectral taxonomic type – a proxy for what it's made of. Asteroids typically consist of (but are not limited to) rocks such as clays and silicates, metals like nickel and iron, and minerals such as olivine and pyroxene. Each of these reflects sunlight uniquely, and we can measure these differences to determine an asteroid's composition. However, this is complicated by several factors like an asteroid's motion across the sky, rotation, and intrinsic faintness.

Using the Lowell Discovery Telescope, the Nicholas U. Mayall Telescope, and the Southern Astrophysical Research Telescope, we gather data with VR (broad visual light), green (g), red (r), infrared (i), and near-infrared (z) filters. The VR data is processed to generate a rotational light curve of how an object's brightness changes over time. Additionally, we divide the reflected light from the asteroid in the g, r, i, and z filters to extract the photometric colors, which resembles a light curve but for specific wavelengths. The outcomes are then matched to an existing template of asteroid taxonomic types to obtain our resulting type.

From my sample, I have identified taxonomic types for 67 NEAs, which revealed challenges that restrict our understanding of sub-km NEAs. Rapid changes in the light curve relative to image exposure time make it difficult to distinguish color variations. Not only that, but NEAs often only make a couple of close approaches to Earth every few decades. Basically, there's a reason not a lot is known about these objects– they are hard to observe and derive reliable data from. Despite these challenges, the taxonomic distribution of my sample helped confirm previous MANOS results that show a higher abundance of "younger/newer" Q-types compared to the "older/weathered" S-types, which could provide insight into the general age and composition of the sub-km NEA population. •



In March 2022, Zigo was invited to be featured in a Lexus commercial campaign for the work she does at Lowell, shot at the 100-inch telescope located at Mount Wilson Observatory, California.

ARCTIC SKIES | CONTINUED FROM PAGE 1

Today, the need for scientists to be effective communicators has never been greater. Yet the sad truth is that most scientists receive little or no training in science communication. Consequently, many scientists are uncomfortable giving media interviews, or talk and write in ways that are difficult for non-scientists to understand.

Recently, I had an opportunity to share what I've learned as a science communicator with scientists and future scientists in Finland.

Thanks to an award from the U.S. Fulbright Program, I spent two months in the delightful Finnish city of Turku this year and last. There, I taught an eight-week course on Communicating Science with the Public at the University of Turku.

The course covered a wide range of topics, with an emphasis on sharing science with diverse audiences.

Participants included undergraduate and graduate students, as well as professors from fields such as astronomy, biology, chemistry, engineering, and mathematics. Most students were Finns, but there were also international students from countries such as Iran, Peru, Taiwan, and more.

I also visited science education and cultural centers throughout Finland to learn more about Finnish ways of communicating science and culture with the public. My travels brought me as far north as 70 degrees latitude.

One of the highlights was the Arktikum Science Centre. Located on the Arctic Circle, Arktikum weaves together the science of the Arctic with the culture of the indigenous Sámi people of the far north. It's a powerful illustration of how science, art, and culture all try to answer the same big questions of who we are, where we came from, and where we're going.

There's a saying in Finnish, oppia ikä kaikki, which means "we can always learn something new." I certainly learned a lot about science communication from my colleagues in Finland, and I hope that they learned something from me too. •

Front cover: Under the northern lights near the city of Rovaniemi on the Arctic Circle.

Left: Helsinki, Finland's capital city.

Recent Publications

Prato, L., Simon, M., 2023, RNAAS, 7, 150, Evolution of Circumstellar Disks around T Tauri Stars as a Function of Stellar Age

Richey-Yowell, T., Shkolnik, E., Schneider, A., Peacock, S., Huseby, L., Jackman, J., Barman, T., Osby, E., Meadows, V., 2023, ApJ, 951, 44, HAZMAT. IX. An Analysis of the UV and X-Ray Evolution of Low-mass Stars in the Era of Gaia

Tang, S., Stahl, A., **Prato, L.**, Schaefer, G., Johns-Krull, C., Skiff, B., Beichman, C., Uyama, T., 2023, ApJ, 950, 92, Star-crossed Lovers DI Tau A and B: Orbit Characterization and Physical Properties Determination

Kareta, T., Noonan, J., Harris, W., Springmann, A., 2023, PSJ, 4, 85, Ice, Ice, Maybe? Investigating 46P/Wirtanen's Inner Coma for Icy Grains

Dr. Stephen Levine has created a listing of research utilizing the 4.3-meter Lowell Discovery Telescope. It is based on the Astrophysics Data System (ADS) and is updated regularly: **www2.lowell.edu/users/tac/bio/dct_ref_pubs_etal.html**

Dr. Levine has also put together a list of work by Lowell Observatory staff: **www2.lowell.edu/users/tac/bio/Lowell_Annuals.html**

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