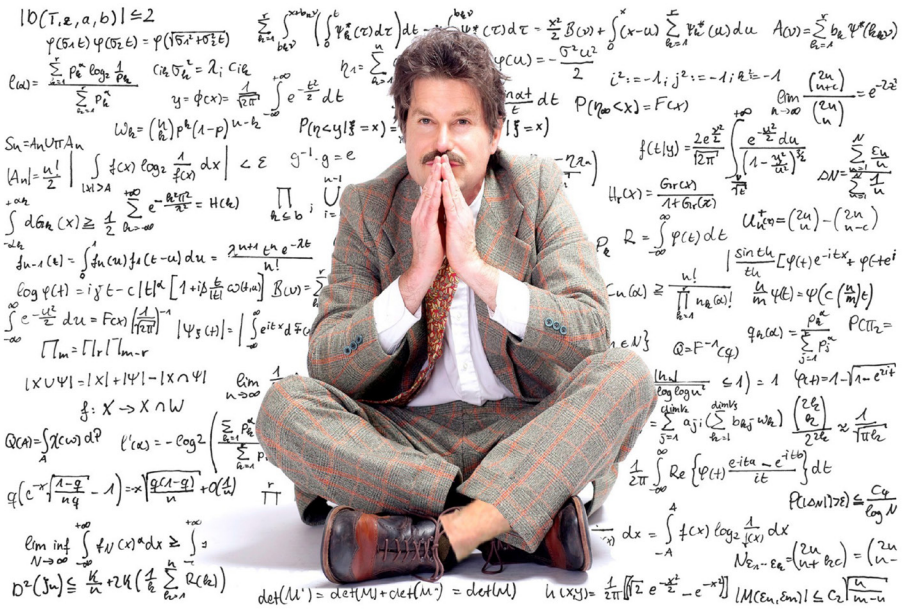
EINSTEIN!

Celebrating 100 years of General Relativity

Written, Researched, and Performed by Jack Fry
Directed by Tom Blomquist



Lick Observatory

September 9,10, and 11, 2022. All show times 7pm

Presented by

UNIVERSITY OF CALIFORNIA OBSERVATORIES

Tonight's Performance

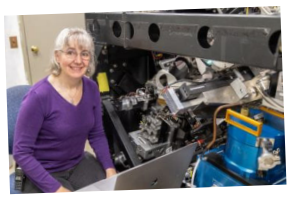
6:00 pm **Doors Open**

7:00 pm **Einstein! Great Refractor Dome**
Running time is between 80-85 minutes with no intermission.

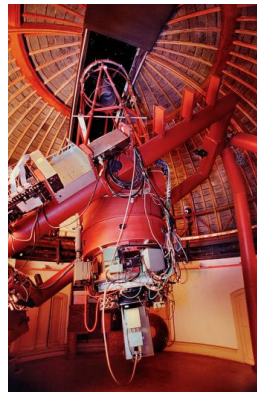
8:30 pm **Q & A, Great Refractor Dome**

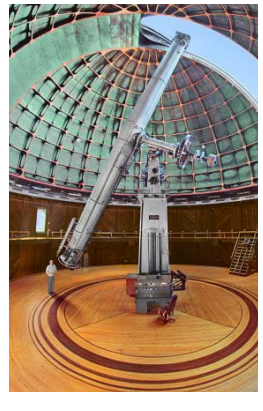
One of these experts on Lick Observatory and its history will assist with the Q&A after the play.

Anthony Misch ~ Solar Eclipse Expedition Expert
Tony Misch directs the Lick Observatory Historical Collections Project, which he founded in 2008 to protect, catalogue, organize, and present the remarkable collection of scientific objects, manuscripts, and photographic plates stored at the observatory. In the last several years, he has curated a number of exhibitions of Lick Observatory artifacts at venues around the state. Mr. Misch holds a BFA from University of Washington and MFA in painting from Otis Art Institute of Los Angeles County. His ambitions as an artist ran aground in the slopes of Mount Wilson Observatory in 1982, where he took a 6-month's job that accidentally became a 25-year career. In 1987 he left Mt. Wilson to join the staff of Lick Observatory as a resident support astronomer on Mt. Hamilton, retiring in 2007.



Elinor Gates ~ Staff Astronomer & Public Programs Producer
Dr. Elinor Gates is a staff astronomer and visitor services supervisor at Lick Observatory. Her primary research interest is high tech instrumentation, specializing in laser guide star adaptive optics and near infrared camera instrumentation. Her scientific research focuses on studying active galaxies and quasars, but she has also participated in studying the atmospheres of Neptune and Uranus, as well as Supernova followup studies. She did her undergraduate work at Mount Holyoke College, majoring in Mathematics and Astrophysics. She received her Ph.D. in Physics/Astronomy from the University of New Mexico. Before coming to Lick Observatory in 1998, she had worked at the National Radio Astronomy Observatory, Smithsonian Astrophysical Observatory/International Astronomical Union Minor Planet Center, and the Air Force Phillips Laboratory.





Images © Laurie Hatch

9:00 pm **Telescope Viewings ~ the Great Refractor** pictured left **and Nickel Dome** pictured right.

11:00 pm **Doors Close**

Author's note ~ Albert Einstein has over 100 quotes about the importance of imagination. His thought experiments were a testimony to this creative power. In that vein, we humbly solicit your own imagination tonight. SEE the different characters portrayed as they weave an incredible, but true story of how he solved the relativity puzzle despite dramas coming at him in every direction. This story was unknown until 2007. ~ **Jack Fry**

The play takes place in and out of time in Albert Einstein's study.

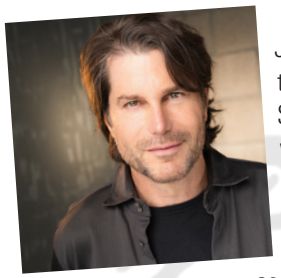
Assistant Director/Vocal Coach	Peggy O'Neal
Physicist Advisor	Ron Mallet
Voice of Mileva	Alexandra Kovacs
Graphics	Walker Schupp & Anthony Denha
Stage Manager/Tech Director	John Toom

"This show is a guarantee."~ **Jewish Journal**

"Funny, touching, intimate… Fry's portrait captures the iconic mathematician as you might not have imagined him before... a triumph."
~ **Huffington Post**

"Science history can merge with entertainment, and this is how you do it."
~ **VueWeekly, Edmonton**

Jack Fry- (Playwright/Einstein)



Jack Fry is a multi award winning solo artist and a fully credentialed teacher in LAUSD. EINSTEIN! had a recent Sold Out Run at the Sierra Madre Playhouse in April. Also, Jack Fry's performance was selected as A Best Performance from the New York, New Jersey, Delaware and Philadelphia stages by DC Metro Theater Arts in Washington, DC. It also garnered a Sold Out Run/HIGHEST GROSSING SHOW at the STEM Festival in NYC, and selected as Top 10 Shows to See in the NY Fringe Festival. EINSTEIN! was also chosen as an Encore Winner and Pick of the Fringe in Hollywood Fringe Festival. His first solo show was the critically acclaimed and international hit They Call Me Mister Fry – an autobiographical play about his first year teaching 5th grade in South Los Angeles with over 350 performances including a Command Performance for the Department of Education in Washington, DC., and numerous festival honors. A few of Jack's film credits include The Salmon Run, The Story Lady, and Enemies Within. His television work includes the comedy series pilot Whoa! as well as acting, puppetry, and voice work for over 30 "edutainment" films for children on the Nickelodeon Channel.

Tom Blomquist- Director

Tom Blomquist is an award-winning writer, producer, and director. His television credits include such popular titles as Farscape, Quantum Leap, Catherine Marshall's Christy, Nightmare On Elm Street: Freddy's Nightmares, Swamp Thing, The A-Team, Walker Texas Ranger, and Hunter, as well as the classic late-night talk show Tomorrow with Tom Snyder. Last year a comedy pilot that Tom directed, Whoa!, starring Academy
Award Nominee Linda Blair, Emmy Winner Leslie Jordan, and featuring Jack Fry – won top honors at the Independent Film Quarterly festival in Hollywood and the Los Angeles Sunset Film Festival. Tom is also tenured professor of film and television production at California State University, Long Beach and coauthor of the textbook Eye of the Storm: Directing Process for Film, Television & New Media (Kendall Hunt Publishers, 2013).

Peggy O'Neal- Assistant Director/Vocal Coach

Peggy O'Neal is a voice actor whose credits include hundreds of episodes of network television shows like Bones and Friday Night Lights; hundreds of episodes of anime series including Digimon and Ghost in the Shell, and hit video games like Saint's Row and Supreme Commander. She is a certified Fitzmaurice Voicework® teacher, an adjunct professor at Moorpark College, and has taught Directing at Loyola Marymount University. Recent directing credits include Tell Me My Secrets and It's Complicated at the Actor's Workout Studio in North Hollywood.

Lick Observatory's 36-inch Great Refractor - Mt. Hamilton California August 21, 2022 . This extended single-frame exposure with the open dome in motion, reveals an intimate 180 degree interior view punctuated by the 36" Great Lick Refractor. The image is the spectacular work of Laurie Hatch with much help from our telecope operators Rick Baldridge, Patrick Maloney and Keith Wandry. © Laurie Hatch.

Lick Observatory was founded by a bequest from James Lick, real-estate entrepreneur and one of California's wealthiest citizens. Lick's bequest of $700,000 is the single largest philanthropic gift in the history of science, equivalent to $1.2 billion in today's dollars. The site on Mount Hamilton was deeded to the University of California by an act of Congress in 1876. Lick Observatory began operations in 1888 as part of the University of California.

Lick Observatory has a long history of innovation. It was the first permanent mountaintop observatory in the world and the site of some of the world's largest telescopes for 85 years. The first `laser ranging of the moon was done at Lick and it was among the first users of digital detectors in astronomy. Ultra-high-precision radial-velocity measurement for hunting extra-solar planets was pioneered at Lick, as was the development and use of laser adaptive optics, a technique for creating much sharper telescopic images, now in use at observatories worldwide.

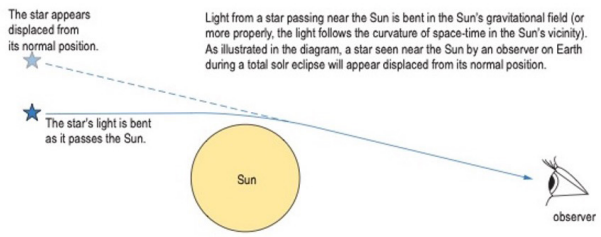
In addition to cutting-edge research, Lick telescopes are used for technology development, training of students, and public outreach and education. Active areas of research include stellar chemistry, extra-solar planets, super-novae, and active galactic nuclei.

About the Telescopes you will see tonight

Lick Observatory's 36-inch Great Refractor saw "first light" in 1888. At the time, it was the largest refracting telescope in the world. It is an enduring memorial to James Lick's philanthropy and is literally his tombstone: Lick is interred at the base of the telescope. The Nickel 40-inch Reflector, named for philanthropist Anna Nickel, was designed and built in the Lick Observatory Technical Facilities at UC Santa Cruz and completed in 1979. The 40" diameter mirror of this modern telescope makes it the third most powerful telescope on Mount Hamilton.

Lick Eclipse Expeditions

In a seminal 1911 paper, one of his early formulations of the General Theory of Relativity, Einstein demonstrated how his theory made predictions about the behavior of light in a gravitational field —that the normally straight path of a light ray traveling through empty space would be bent in the presence of a large mass. Einstein proposed a test that could prove or disprove this prediction —starlight passing near the Sun would be bent, thereby slightly shifting the star's apparent position as seen by an observer on Earth. Of course, stars are not normally visible near the Sun, their light being drowned out by the Sun's much greater brilliance. But there is an exception: during a total solar eclipse, when the Sun is briefly hidden behind the Moon, bright stars can be observed in its vicinity. The observation was a difficult one; Einstein's initial prediction for the maximum amount of shift in a star's apparent position was 0.83 seconds of arc—only about the size of a dime seen from 2.5 miles away!



By the time Einstein proposed his scheme to test for the deflection of starlight, Lick Observatory was a world leader in eclipse observations.

The Lick party in front of the improvised Einstein Camera, Goldendale, Washington State, 1918.

Since 1889 Lick had been sending expeditions to observe total solar eclipses as far away as Chile, Japan, India, Sumatra, Egypt, and the South Pacific. With its long experience, photographic expertise, a suite of specially designed eclipse instruments, and a reliable benefactor to fund its expeditions, Lick was a natural candidate to conduct the Einstein observation.

One hundred years ago on September 21, 1922, an expedition from the Lick Observatory on Mount Hamilton, California, led by Lick director William Wallace Campbell, conclusively proved Einstein's general theory of relativity at a total eclipse of the sun in remote Wallal, Australia – confirming a new formulation of space, time, and gravitation that changed the course of science and ushered in our modern technological age.

Einstein! underscores the importance of Lick Observatory's role in verifying general relativity.

Learn More

lickobservatory.org/friends-of-lick-observatory

FRIENDS OF LICK OBSERVATORY

lickobservatory.org

Visit our website to find out more about the Lick Observatory Eclipse Expeditions, events and becoming a member of our friends group.

Become a Friend of Lick Observatory ~ Since its founding, Lick Observatory has enjoyed the goodwill of those who are inspired by the cosmos. Throughout its history, friends have been an indispensable part of the observatory's success, starting with James Lick and including early philanthropists, like those who funded the Lick eclipse expeditions that verified Einstein's theory of general relativity, and more recent donors like Google and individuals just like you!

A big thank you to the Friends of Lick Members Board ~ They sponsored the costs of the making of this special EINSTEIN! Program celebrating 100 years of General Relativity.

© Laurie Hatch: Jupiter Rising Star Trail Composite. Jupiter is at closest approach to Earth (385,473,504 miles from Mount Hamilton) and 100% illuminated by the sun (magnitude -2.9, 49.1" diameter). But the Great Refractor isn't watching — it's pointed at M92 with open slit visible to the camera and red observing lights glowing within.

Future Events

We host a range of events yearly at Lick ~ The Summer Series, Public and Private Tours, Weddings and Photography Nights.

Don't miss out on upcoming events ~
Send an email to social@ucolick.org to join our email list.

© Laurie Hatch: A group of visitors to Lick Observatory is being welcomed at the entrance to the Main Building.

To see the original photos, equipment and more about Lick Observatory's solar eclipse expeditions, check out "Einstein Was Right: Lick Observatory's Test of the General Theory of Relativity" San Francisco Exploratorium 09/23 to 11/27.

exploratorium.edu

This evening's event is presented by ~ University of California Observatories (UCO). We are a collaborative, multi-campus research unit serving the entire University of California system. Our mission includes promoting science literacy and providing UC Astronomers with continuing access to preeminent observing and instrumental facilities. We design and build cutting-edge scientific instruments for the telescopes we manage at **Lick, Keck**, and **TMT Observatories**. We unite and coordinate optical and infrared observational programs for research teams across the UC system and provide world-class facilities and research opportunities to advsance education at all our campuses.

As you will learn tonight, UCO has had a leading role in astronomical discovery for almost 150 years. In that tradition, our scientists—including multiple Nobel laureates—continue to advance our scientific capability to answer the greatest questions of our time: **Are we alone in the universe? How did we get here?** Our laboratories are producing the next generation of scientific instruments to increase our telescopes' capabilities.

Visit our website to find out more ucobservatories.org

No matter what you are most excited about—from the search for extraterrestrial life, the black hole at the center of own galaxy, gravity waves from neutron-star collisions, to the mysteries of dark matter and dark energy—UCO strives to be the top place in the world to understand the rest of the universe.