The Fremont Peak Observer

— Bringing Astronomy to the Public —

Vol. 43, No. 2

Summer 2026

2026 Program Dates

Saturday Evening Programs (lecture start)

March	14, 21 (8 PM)	July	4, 11, 18
April	11, 18, 25	August	8, 15
May	9, 16, 23 (8:30 PM)	September	5, 19 (8 PM)
June	13, 20	October	3, 10, 17

Solar Programs (2-5pm)

March	21	July	18
April	18	August	15
May	16	September	5
June	20	October	3

Board Meetings (Zoom, 1pm)

January	10	July	11
February	14	August	8
March	14	September	(12)
April	11	October	10
May	9	November	14
June	13	December	No Meeting

40th Anniv. Annual Meeting & SBQ

September 12

Please check our web Schedule and status for updates before heading up.

President's Message

Pat Donnelly

This time of the year (May/June), there are two (2) interesting events relative to the astronomy of the Earth – Summer Solstice and Earth's aphelion passage.

The first is the Summer Solstice. The Summer Solstice is the time when the Earth's north pole is tilted the maximum angle towards the Sun. The Summer Solstice occurs on June 21 this year at 01:24 AM for northern California. Note that this event is a time and not a day. Although the solstice occurs at exactly the same time for people living in Hawaii, it actually occurs on a different day! At the time of the solstice the Sun has its most northerly declination on the celestial sphere, and Summer begins in the northern hemisphere.

The other event is the Earth reaching the aphelion point in its orbit. The Aphelion point on the Earth's orbit occurs when the Earth is farthest from the Sun. This year the Earth will reach its aphelion point on July 6 at 10:30 AM for northern California. At this time, the Earth is approximately 94,503,000 miles from the Sun. It is ironic that our summer in California occurs when the Earth is farthest from the Sun. However, our summer climate is more affected by the

tilt of the Earth's axis and the fact that the northern hemisphere spends eight (8) more days in the summer season than the southern hemisphere does.

On June 16 there will be a very fine configuration of several planets and the Moon. On this day Mercury, Venus, Jupiter, and the Moon will form a tight bunch in western sky after sunset. Venus will be the highest in the sky along with Jupiter a few degrees below Venus. The two (2) day old Moon and Mercury will be a bit lower than Jupiter. The Sun will set at 8:27 PM, and all of these objects will be visible until about 10:00 PM. To get a good view one will need to go somewhere with a low western horizon. As I write these words, the open area on the road to the observatory approximately two (2) miles before the entrance to Fremont Peak State Park would be an excellent location. As a possible added attraction, the middle June is the postulated time, when T Coronae Borealis is expected to outburst from mag +10.4 to approximately +2.0 for about a week. One might just possibly be able to witness the outburst at the same time. Let's hope for clear skies.

As I write this, the observatory has all but recovered from the December 2025 storm. The siding has been replaced and reinforced. We are also in the process of upgrading the roof/building restraining system with new stronger turnbuckles and a reinforcement of the anchors. The new turnbuckle system will also have a new design to minimize the possibility of installing the turnbuckles incorrectly. I want to thank Rob Hawley for all his hard work in the design of the new system and Eric's help installing it.

The observatory has two (2) new additions to help with providing better public programs. The first addition is a research grade weather station installed on the southwest corner of the observatory. This weather station provides real time temperature, humidity, and wind speed data. There is a link on the FPOA website on the home page to access the current meteorological conditions at the observatory. If one couples this data along with the view from the CalFire cameras and the GOES satellite view, one can get a relatively complete picture of the weather at the observatory. The weather station is also connected to the "Weather Underground" system to access additional information. The other feature is the installation of pi-finders on the Challenger Telescope and the "Big Orange" telescope to help the telescope operators find objects quickly and accurately. Recently, the pi-finder on the Challenger telescope helped find M57 (Ring Nebula) and M5 (globular cluster) in less than a minute. I want to thank Rob Hawley for all his work to bring these improvements to reality this year.

In closing, remember that our 40th anniversary Star-B-Que is on September 12. See you at the peak. *Pat*

Fog settles in south of the observatory, blown in by winds from the Salinas Valley, over the ridge, and up from Reeves Ranch

New PiFinders Find Faster

Installation and setup of PiFinders installed on Challenger and Big Orange (16”) was a success. Thanks to Rob, for all the work he put into the project and the very secure Challenger enclosure.

We’re growing more fluent with the devices on our Alt-Az and Equatorial mounts. It takes some patience waiting on plate solves to settle, but we’re rewarded with faster finds, less public waiting, and a greater number of Challenger objects to show per program.

Last program, May 23rd, Rick and Eric successfully performed the alignment procedure by centering the telescope on Vega and then guiding the alignment cursor close to the star on the PiFinder display until it snapped onto the target.

Alignment done, we followed the guide [+/- (N/S) in Dec, +/- (E/W) in Ra] to find Pat’s challenge object M5 in about 1 minute.

Our new training video for use of the PiFinders on Challenger and Big Orange is now available on our website at https://fpoa.net/pi-finder.html.

Eric

New Weather Station

Several years ago, FPOA noticed that the “astronomy” weather forecasts for the peak were rarely accurate. The peak is a small land area, and weather models average predictions over a large square of land at a lower elevation. To compensate, we used the models’ vertical profiles (soundings) to predict weather changes with altitude, but it wasn’t sufficient. In spring and summer, the peak relies on a temperature inversion in the profile, which can be missing or its height incorrect. A few hundred feet can make a significant difference.

Getting accurate predictions is challenging due to potential model inaccuracies and small changes in observatory conditions that may indicate a higher or lower prediction than the

nominal 860 m.
New weather station installed on west arbor, weather station console above Mac Mini

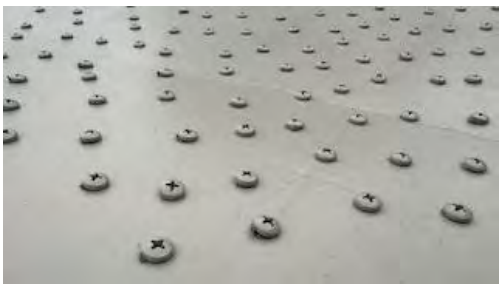
To improve accuracy, I need to know the actual observatory conditions. If the pressure deviates from the typical 860 m = 910 hPa mapping, I must adjust the prediction. Comparing the current dewpoint, temperature, and wind to the model provides confidence or skepticism. It also corrects for local conditions not included in the model.
To address this, I approached the board to install a weather system accessible before reaching the hill. Consumer-grade stations wouldn't survive the severe weather at the peak, so we chose a research-grade station that could withstand 200 mph winds.

The station also helps us when we are running a program. Clouds often move over the observatory and retreat, causing our old sensors to become useless. The station will accurately track humidity changes due to its fans circulating air over the sensors. While cloud cover is usually fatal, this year, it showed that extremely dry air cleared the clouds, which could have allowed us to reopen.

The station's values are available to the public through the Davis summary or Weather Underground. If you'd like to know how I make model corrections, please contact me.

Rob

Siding Screws



Following our salvage and reinstall of siding blown off the building this winter, and anticipating a rough El Niño event coming up this Fall, the board encouraged Eric to further secure the siding.

The new metal siding secures to the building with metal clips and small galvanized nails which the contractor installed per manufacturer spec. But that spec was created for our average residential home built in Windfree, Mildstate. On top of our ridge, where winds blow across at least 100mph on occasion, screws hold the siding more securely. At this late date in the year, with the time and help available, it's not practical to remove all the siding and reinstall before Fall, so a retrofit was approved.

The board decided to install screws with sealing washers through the existing metal shingles and Eric designed the install. Color coordinated stainless wood screws with sealing washers are installed up under the drip lines on the embossed shingle gaps, and along the bottom rows to secure the starting strips and prevent peeling from starting.

Eric

New Roof Attachment

For 20 years I have been complaining about the laughably weak way we protect the Challenger. While the roof has not come off again in the last 30 years, we are also not certain how close we may have come. As a part of this work, we discovered that at least one of the bolts that hold the current brackets in place was bent.

During Christmas of 2025 the Peak endured a storm that was as strong as we have seen since the infamous 90's storm where the Challenger blocked the roof and saved itself. The Christmas storm blew off one of the covers from the south shutter, but it also blew one of the park buildings apart and blew the siding off the west side of our building.

We have done a number of tasks this spring to protect the siding, but now it was time to protect the core element of our program - the Challenger

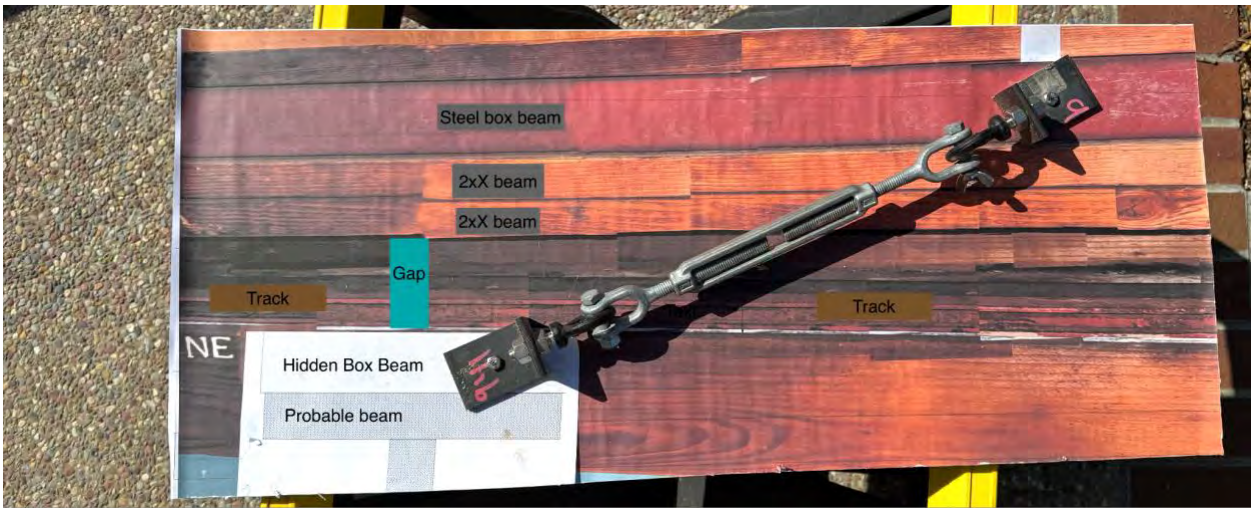
As I described to the board any new system to secure the roof had to meet a number of requirements

- Can be installed correctly in an obvious way
- Does not have a single point of failure
- Is mutually supporting so it would require the failure of multiple components before the roof moved
- It can be no more difficult to install during the operating season than the current installation
- Regardless of how a turnbuckle is installed, it cannot detach from its attachment. Consequently, it will contribute to safety, even if it is on the opposite side.

During the remainder of the winter and into spring we explored various options, but each failed one of these criteria. Some proposals were too difficult to install even though they were much stronger. Hooked turnbuckle installations failed because the turnbuckles opposite the direction of movement can actually fall off. Simply replacing the existing turnbuckles with stronger ones proved to fail the ease of installation criteria and relied on the same weak attachments.

It was time to rethink the entire system. What I proposed to the board in early May and was approved was a new concept that relied on a different type of turnbuckle, but also stressed greatly improved attachments. Here is a picture of the prototype. In this picture the elements labeled 2xX beam are at the bottom of the movable roof. Below these are a gap of about 4”. Below that is the top of the fixed building

Below is a picture of the prototype I built to demonstrate the design to the board (we have since learned that the building is constructed differently).



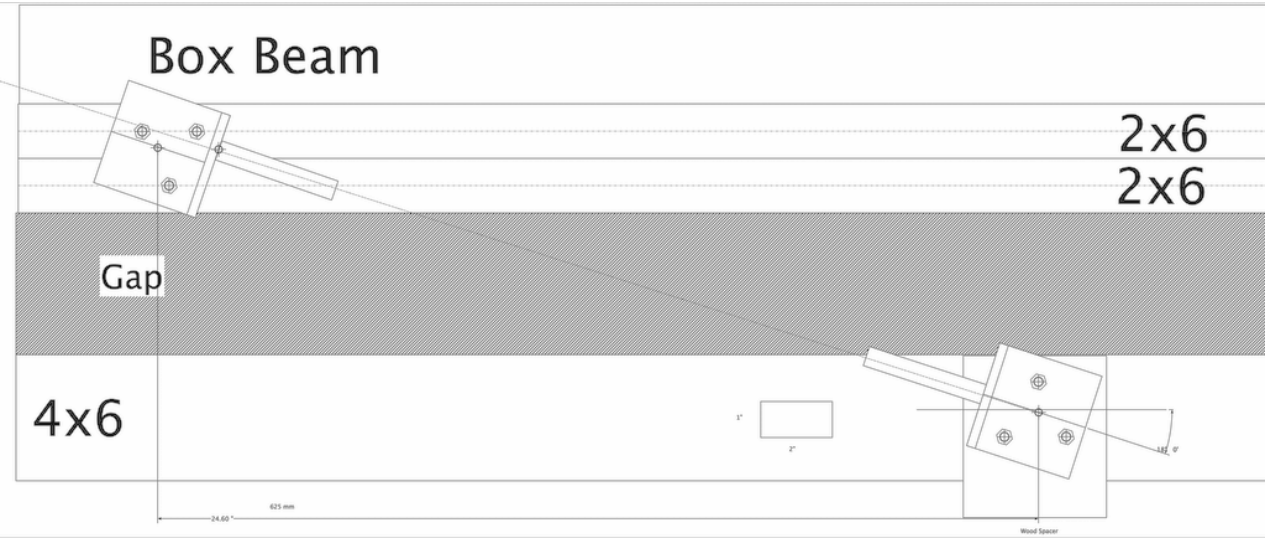
We have made some subtle changes to the design since this picture was taken, but it illustrates the point. We are converting to a "Jaw" turnbuckle.

In this type of turnbuckle, the "clevis pin" (bolt) is the load bearing surface. The pin is secured by a wing nut. (above)

Instead of attaching to a hook, it is held by an eyebolt. With an eyebolt, the turnbuckle cannot escape. The eyebolt is secured to a steel angle which will be attached to 2x6's in the movable and a 4x6 in the fixed building.

To release the tensioner, loosen the turnbuckle a couple of turns, remove the wing nut and bolt freeing the turnbuckle, replace same, and then let the turnbuckle dangle. (prev. page, right)

Here is the engineering drawing for the SE and NW corners (see full size here),



There have been a few changes from the prototype. First, we now know what's underneath the sheetrock in the fixed part of the building which affected the bracket design. Second, I realized I needed to put a spacer under the brackets on the fixed building to lift the eyebolt away from the track, making it easier to use. In the southeast corner, we might need an additional spacer. Third, I had to modify the design of the top brackets so that the eyehook wouldn't hang below the wood, which prevents it from hitting the flashing on the north wall.

As of June 1, we have all the parts and the brackets have been machined. I anticipate the installation will happen sometime in June. I'll post a video to explain the new roof closure process.

Rob

West Stairway Lighting

The west stair lights had a few broken LED leads and were updated with a few more lights connected in parallel, LED holders, and fitted with a dimmer board for adjustment.

Eric

Support

Thanks to those who renewed. FPOA receives most of its income from our memberships. Most annual members are now Observers. We still need your support. Contributions cover publications, phone, insurance, rent, etc.

Please consider volunteering, it's great fun and a service to our community. Please see the back page for details.

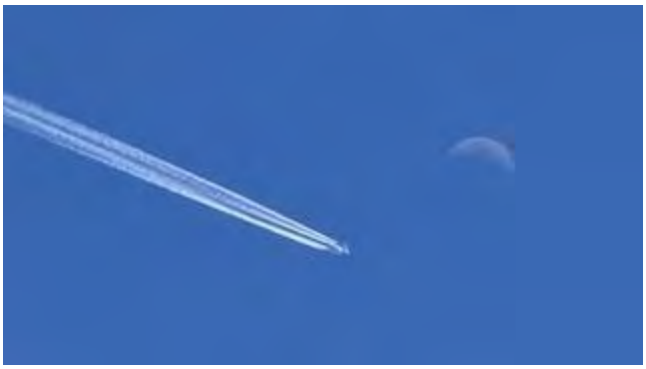
Membership Renewal

To join or renew, please select from the list of options on our Membership page and pay via PayPal or mail a check to:

FPOA Membership
c/o Rob Hawley
1233 Hillcrest Dr.
San Jose, CA 95120

Gallery

From top right CW (jump to next page): *Moon and Airbus A380 (Taipei to LA at 40,000 ft, 495 knots), Vandenburg rocket launch (down range rocket just above hillside), (p. 10) using the PiFinder to point the Challenger, inspecting the declination drag clamp (vertical threaded rod at left; little bolts attach to the brake pads), telescope setups (3), Steve's solar scope, California Ringlet butterfly on wild yarrow, (p. 9) Blue-eyed grass, California Yellow Pansy, Indian Paintbrush.*



Moonrise over the east Oak tree

Observing Reservations

Please send the following information ***48 hours in advance*** to:

schedule at fpoa.net

- Member name
- Reservation date
- Estimated arrival time
- Duration of stay
- Number in party
- Vehicle description and license plate
- Specific observing site request (pad)

Reminder – 48-hour notice for Observer Access is non-negotiable

Please, No 'last minute' requests

We lease access to the FPOA area from the State. Our agreements with the State require we give 48 hours' notice for all visitors. Observer members agree to the 48-hour notice per the liability contract.

Public Program Volunteers

- Complete the updated 2023 liability waiver and return to *membership at fpoa.net*.
- Also, please email name, vehicle, and the program date to *schedule at fpoa.net*.

Fremont Peak Observatory Association

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	Chris Angelos
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	Loren Dynneson

Dates and Delivery

Members, The Observer is now sent by email and posted on our website at FPOA Observer online
Please send email updates to *membership at fpoa.net.*

The *Fremont Peak Observer* publishes four times a year following Winter, Spring, Summer and Fall. We welcome articles and photos from our members. Please email those to *editor at fpoa.net* by Feb 25th, May 25th, August 25th, and November 25th.