

# Astro 25 Spr. 22 – Carrizo Plain National Monument



# Thursday 4/14 Pre-Trip Meeting On Campus

- **Checklist:**
- 1. Get liability waivers signed and returned
- 2. Collect \$10 each for camp meals. I will buy all your food (except lunch and snacks) on our drive down
- 3. Distribute map packet
- 4. Arrange car pooling. Make list of who and when planning to arrive.
- 5. Get cell phone numbers on a common sheet which we can dup and give out to people who need them. I'll give you mine
- 6. Continue with this Presentation
- 7. Planets Presentation is online
- 8. Planetarium

# Some Important Points

- **The last gas station is at Paso Robles. STOP and GAS UP at Paso Robles whether you need to or not!** It's 218 miles to the campsite, and another 30 or 40 driving around the park perhaps on Saturday and Sunday. Then more to get back to gas. **Repeat: TOP UP your gas tank in Paso Robles! If you forget, you'll have to drive to Taft out in the Central Valley and that's not that close either, and far out of our way. You'll miss the Sunday drive along the San Andreas along Bitterwater Rd.**
- **There's no water in the Monument.** Bring any water you'll need for personal use for the weekend. I'll bring water for cooking and cleanup.
- The last 7 miles are along (good quality) dirt roads. However, in rain, the road up to our campsite can be slick with some muddy spots.
- There's a port-a-potty at the visitors center which we'll stop at on Saturday morning, and there's also more at the Selby campground a couple of miles from our campsite. Otherwise, there's plenty of bushes. Bring a small shovel and TP! Bury it! Our camp spot is on a broad ridge.

# To Bring

- WARM clothes!!
- Personal camping gear (tent, sleeping bag etc)
- Personal water
- Red headlamp (EverReady at Outdoor World works great, \$20 or so)
- Binoculars if you have them.
- 3-ring binder notebook for notes, maps
- TP, towel
- Camp chair for around the fire, some firewood?

# Our Special Astronomical Events...

- Friday night, the occultation of a 12<sup>th</sup> magnitude star by the asteroid Suevia, crossing right over our campsite!
- Friday and Saturday night: the Lyrid Meteor Shower after 11pm. Will it be a rare strong year? Or more typical and weaker? We'll find out....

# **A Unique Study Location**

- It is the last and largest of the tracts of land preserving the native California Plains, such as once, 200 years ago, used to be the Central Valley.**
- It is also the best site in North America to see and study tectonic faults, such as we are finding now on not just Earth, but also Mercury and Jupiter's moon Europa, and which are critical to the carbon cycle creating a long term stable climate for planets**

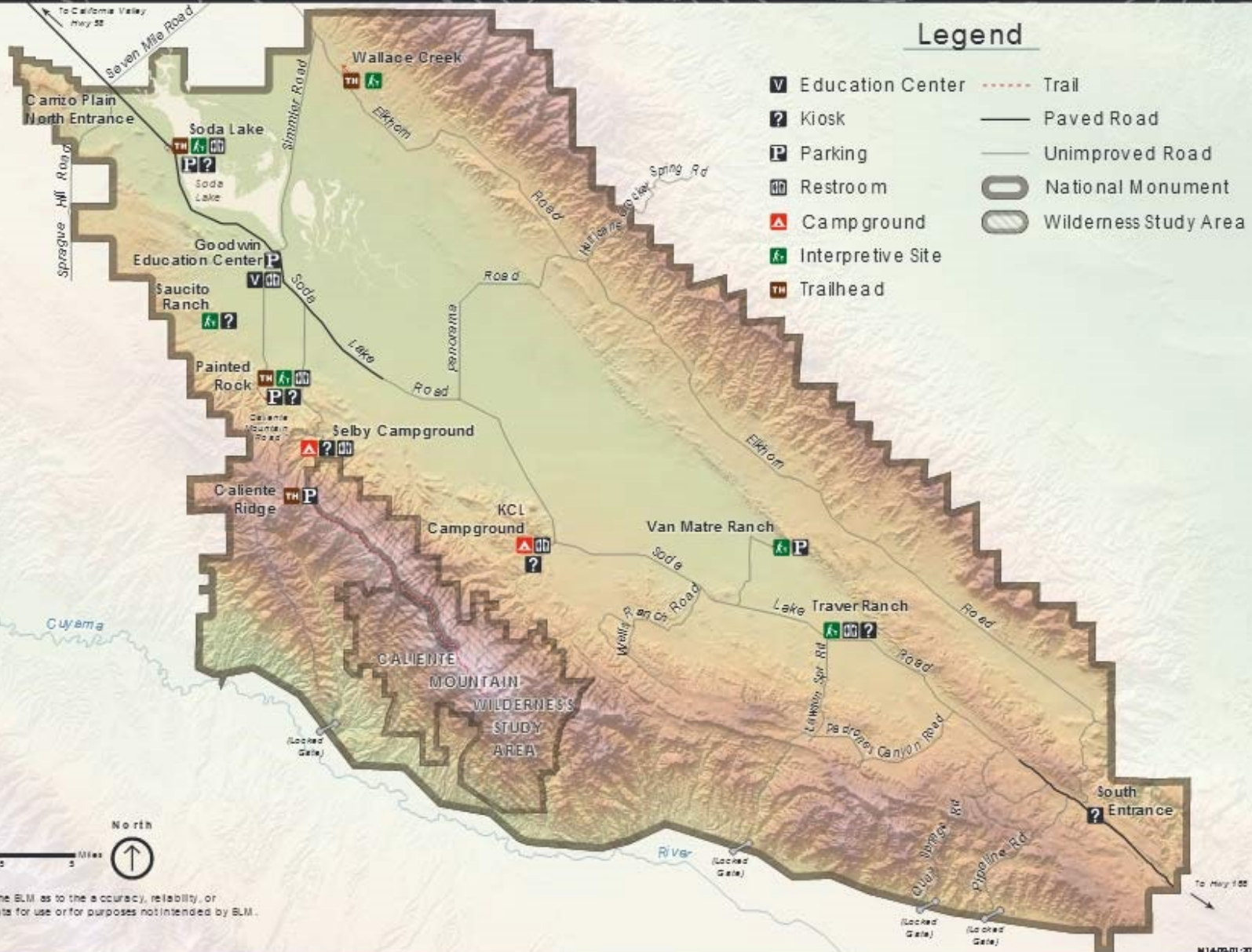
# The San Andreas Fault Makes a very obvious scar down the length of Carrizo Plain



- *“This remote monument, traversed by the **San Andreas Fault** which has carved valleys, created and moved mountains, and yet up close, is seen in subtle alignment of ridges, ravines and normally dry ponds. Prominent features on the monument include the white alkali flats of Soda Lake, Painted Rock, vast open grasslands, and a broad plain rimmed by mountains. When conditions are right, numerous wildflowers can carpet the valley floor; although short lived it can be breathtaking.*
- ***Soda Lake**, normally a dry lake bed, is one of the dominant geographic features of the Carrizo Plain. It is the largest remaining natural alkali wetland in southern California and the only closed basin within the coastal mountains. As its name suggests, Soda Lake concentrates salts as water evaporates, leaving white deposits of sulfates and carbonates that look like baking soda.”*



# Carrizo Plain National Monument



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Our campsite from the knoll above it



We're a few miles off the paved road, at 3,000 ft elevation

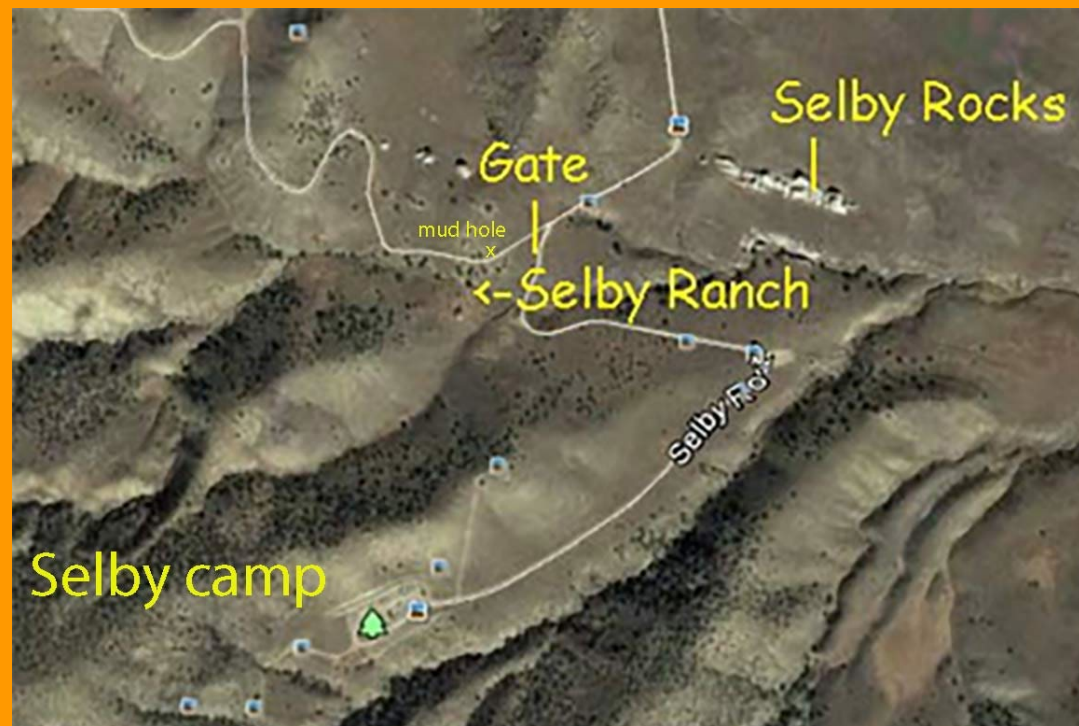


Our camp is 1.14 miles up from the gate at Selby Ranch

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**Rain Complications: Caliente Mtn road is all-weather from Soda Lake Rd to Selby Ranch. But recent rains can make for a mud hole (“x”) just past the gate. It could even be impassable. When you get to that spot, if at all suspicious, then check first our alternate camp spots to find us before trying to head up to our hoped for spot... Alternate campsites:**



1. The official “Selby Camp” at end of Selby Rd.
2. Below the bend in Selby Rd there’s a wide area with plenty of parking
3. Perhaps by Selby Rocks? Or behind Selby Ranch? Both of these might be touchy trouble with the Park people, though.

If somewhere else, we’ll place a sign at the Selby Ranch gate to direct you to find us. Look for: White Cabrillo vans or Kirk’s black Prius. I plan to get there Friday afternoon.

**Selby Rocks, you'll see as you drive in approaching Selby Ranch and the gated road up the mountain**



**Here's our planned campsite. The main open flat is reserved for group kitchen and scope stuff**



# Schedule on Friday

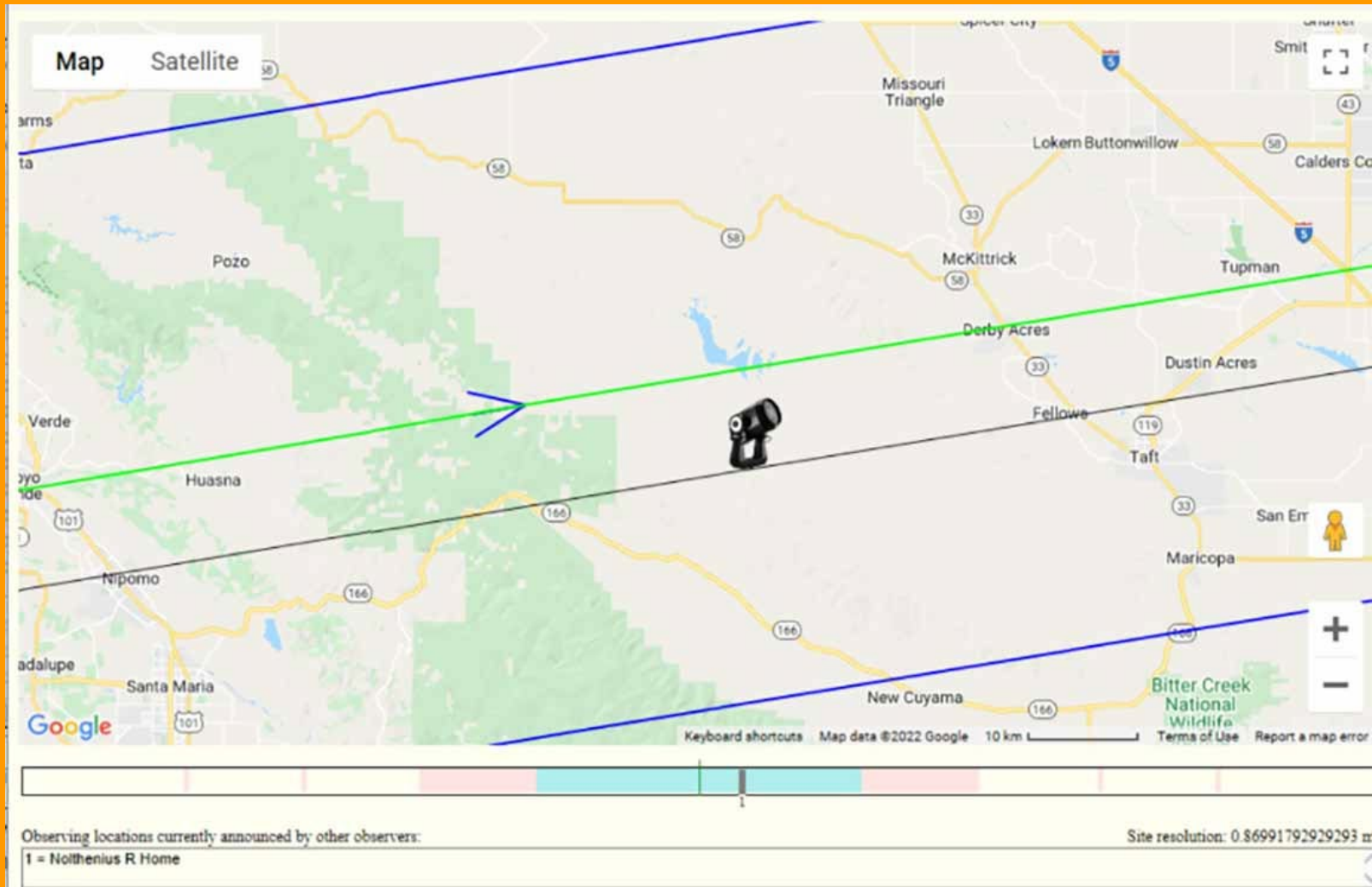
- Plan to arrive at camp hopefully before dark on Friday. I expect to get there in afternoon if all goes well. I know you may have work or class or may otherwise come in a bit later, but try to arrive before dark if you can.
- Park on the right side of the road, and allow room for cars to pass if you're on the side of the dirt road itself. Allow a space for the College Van closest to the camping area, in case you arrive before I do.
- My team will work on dinner as soon as sunset nears and we have set out our camping gear
- You're welcome to camp anywhere except on the obvious flat area right next to the cars, which will be devoted to the "kitchen", and telescopes and space for the campfire ring and campfire lectures.
- If you have some firewood at home, and kindling, bring some!

# Friday Night: The Big Sueva Occultation at 9:30pm

- We'll divide into two groups. One group will accompany me in the van as I drive back up to Soda Lake and set up telescope and video equipment and we attempt the Sueva occultation.
- The other team will remain at camp and help / observe Kirk's attempt to video record the event from there. We want two separate sites to get two separate chords across the asteroid to better constrain its shape and size!



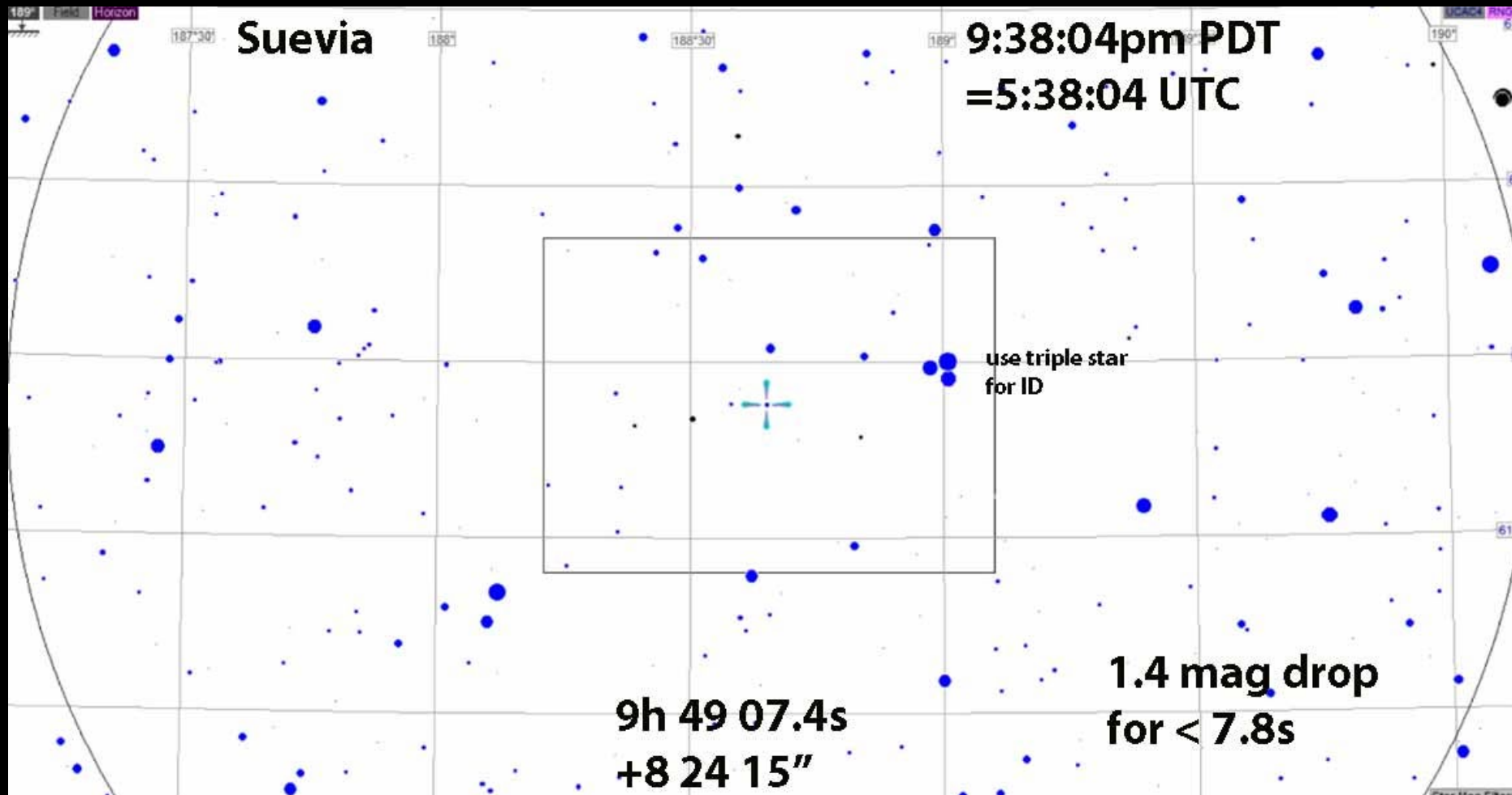
The nominal path shadow is between the blue lines, and our campsite is the telescope icon.



**Our 2<sup>nd</sup> site, mine, will be at a parking site close to the shore of Soda Lake. If you arrive after 8:45pm, look for me and stop here to participate in my station's activities**



**The entire event lasts only a few seconds! So we'll review our data quickly, pack up, and head back to join the campsite group to compare and discuss our results**





After we return to camp, let's plan to lay out our sleeping bags under the sky and do a 1 hour count of Lyrid Meteors. The radiant rises about 11pm in the north east, but Lyrids can be seen anywhere in the sky after that.

The Lyrid radiant point seen here in relation to Vega and Lyra. NASA Night Sky Network



We'll have a solar viewing and sunspots lecture on Saturday morning as we finish up breakfast.

# Saturday Night Telescope Adventures

- We'll use the 8" Meade LX200 and Kirk's 12" Dobsonian to explore the winter Milky Way, the star forming regions of Orion and Gemini, and the Galaxies of the Virgo and Leo region and exploded remnants of a supernova in Taurus, and all variety of stars, with micro-lectures along the way.
- Bring your WARM WARM clothes! Double socks, or down booties, multiple pants, gloves, wool caps... get the picture? We'll be under a big sky and radiating your energy to that night sky.





Orion and Canis  
Major setting  
over the west in  
Spring evenings,  
and our camp  
area lit by red  
headlamps



# San Andreas fault scarp in the distance





**Here's a view Saturday morning from our planned  
campsite, with Soda Lake in the distance. A  
panoramic view of the sky and surrounding plains**





Saturday  
Breakfast: My  
famous French  
Crepes batter,  
given an extra  
bit of attention  
for the photo by  
one of my Astro  
28K students

Focus! Concentration is required for good crepes!





**My former Lab  
assistant Becky  
enjoying her crepe,  
sweetened with  
lemon curd!**

After breakfast, we caravan vans down the ~7 miles to the Goodwin Visitor's Center. Might we get a tour of the Pictographs at Painted Rock?



**Astro students in the flowers by Soda Lake, our next lecture spot after Goodwin. This picture taken in April.**





# Saturday late morning micro-lectures in the wildflowers down on the Plain by Soda Lake



We'll have to get out and look close at the road along Soda Lake, it can be too sloppy and might require a detour to get to Wallace Creek



We'll explore Soda Lake, its origin and parallels with dry lake beds on Mars and Titan (but Soda Lake might not be so dry!)



**Tectonic movement creates offset and also “beheaded” streambeds along the San Andreas Fault. We’ll walk along those you see below, at Wallace Creek, via Elkhorn Road**



© 2016 Google

Google Earth

# My Astro 28K class standing on the San Andreas Fault trace near Wallace Creek



We may then drive south on Elkhorn Rd to search for evidence of a comet impact 13,000 yrs ago along erosion'd depositional spots





Measuring the depth of a possible dark Comet Impact layer.

(Alas, it was just some old roots. I've not found this layer yet)





**A beautiful gopher snake, pausing for its close up.**



**Saturday late afternoon, back at camp**



**We'll all carve together, come dinner time Saturday!**





We'll stoke up a  
campfire at sunset  
to eat dinner  
around, and listen  
to plans for  
Saturday nights  
observing events

# The Hyades Star Cluster





Occultations  
are valuable.  
Here, Alpha  
Tauri;  
Aldebaran  
about to be  
covered by  
the evening  
moon on a  
prior Carrizo  
Trip

That's me, getting the video gear going



# Happy students and the moon







This year we video record an asteroid occultation. Below we got an estimate of the diameter of Aldebaren with a little simple math

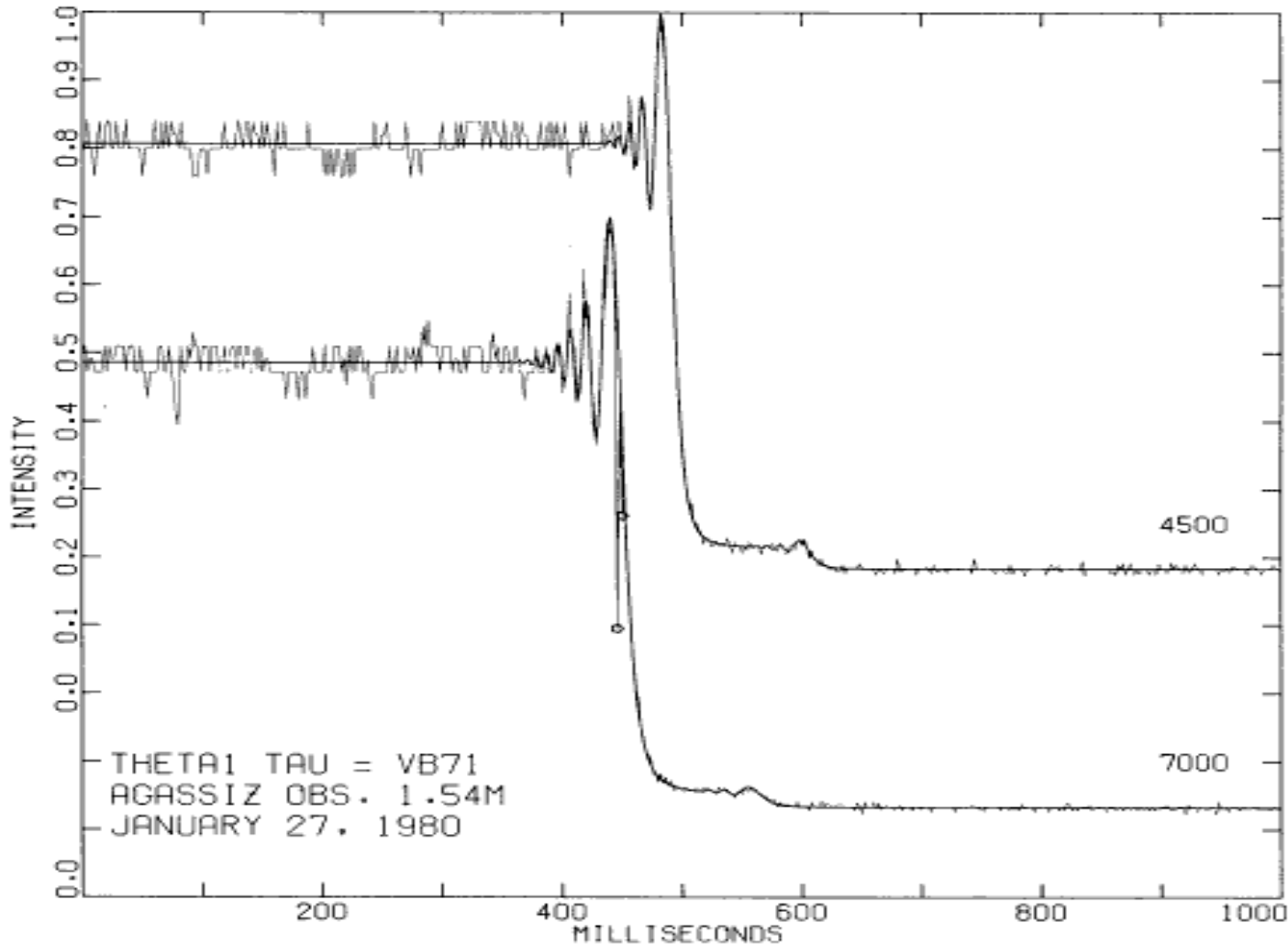


FIG. 2. The Agassiz observations of  $\theta^1$  Tau. Note the arbitrary shift in the timing zero points and the two bad data points in the red channel ( $\triangle$ ) that were excluded in the fitting process. In this plot the data are averaged over two-millisecond intervals.

**A cosmology lecture after the occultation excitement is over. Here, I'm trying to explain how BIG the universe is**



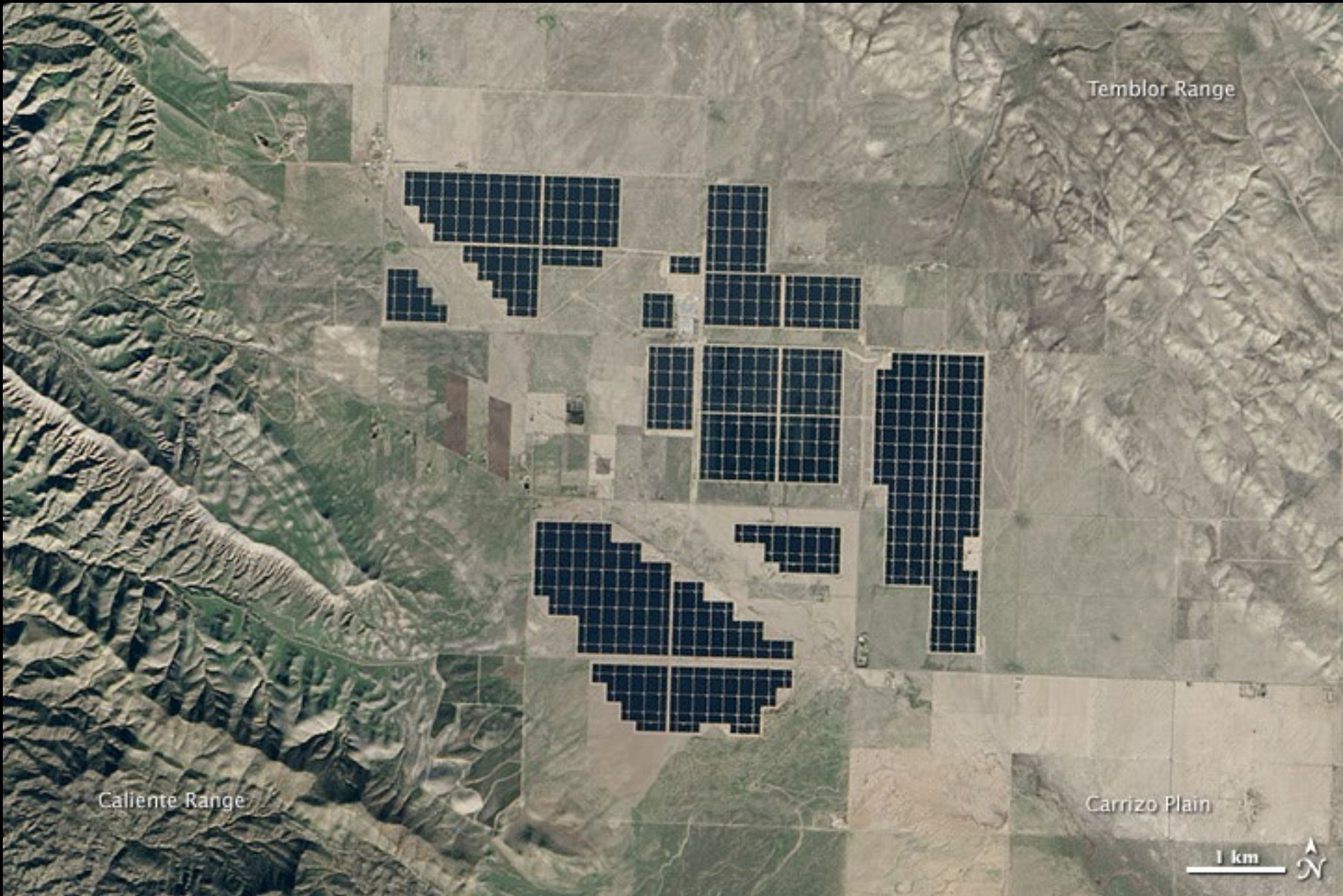
# Sunrise Sunday from camp, looking southeast



# Sunday Plan

- We'll prep breakfast; fried veges in olive oil and scrambled eggs with cowboy toast
- Then clean up and pack up camp
- Then head down into the plain, pausing at Soda Lake Overlook, where there's a nice view of the lake and also a bathroom.
- Then head to Topaz Solar Farm which borders Hwy 58 on our way out. It's one of the largest solar Photovoltaics installation in the world!

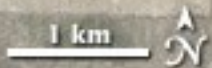
# Topaz Solar Powerplant



Temblor Range

Caliente Range

Carrizo Plain



# Sunday late morning continued.

- Then continue up Bitterwater Rd through the bizarre landscape along the San Andreas Fault, pausing for a micro lecture or two along the way.
- Stay alert to the possibility of washout's from our weather. If the road says "impassable" or "closed up ahead" at the south end of Bitterwater Rd, we'll not go up very far before turning back, most likely.
- We'll discuss whether to stop at James Dean Memorial Junction and Jack Ranch for lunch, or whether to just continue on Hwy 46 when we arrive and head back to Paso Robles and on home. Our last stop will need to distribute the final take-home exams.

# After We Return

- We won't have a post-trip meeting, although I hope to do a Zoom session you can join, to show you the results of our asteroid occultation and meteor counts.
- I'll have exam(s) on Canvas for you to complete
- Your grade will be based on the exams and on your participation on the trip, with most on the exams and your meteor observations if we get clear skies for that part of our adventure.
- You'll have plenty of time to complete the Canvas exams!