

SJAA EPHEMERIS

Two Days on the Moon

Craig D. Wandke

[Editor's Note: Craig, an accomplished lunar and Apollo enthusiast, will present a talk at the January general meeting of the SJAA.]

The beauty of the monuments and the wonder of all of the usual visitor sites in Washington D.C. thrilled and inspired me, but could not compare to the two days I spent at the National Air and Space Museum, the Library of Congress, and the National Space and Science Data Center in Greenbelt, Maryland.

I spent a day at the Space Museum thrilling to all the principal machines of the early space age — the Apollo 11 command module, as well as its Friendship 7 and Gemini 4 cousins, which stood silently on nearby pedestals. Particularly impressive was an actual Lunar Module, its gangly presence still as inspiring to me as it was on that day in 1969 when I looked at the moon through a muggy Honduran sky as a Peace Corps volunteer, with Neil's familiar words crackling over my little short wave radio. As I stood next to the Lunar Module, in the presence of a machine whose counterpart voyaged onto this new world over thirty years ago, my mind returned to those wonderful years of lunar exploration and the beginnings of my love affair with the moon.

Looking towards the ceiling above the Lunar Module, I marveled at Lunar Orbiter, Surveyor, and Ranger, each a daring precursor to Neil's first step. I smiled to think that the following day I would be visiting the NSSDC, hopefully to study and touch lunar images taken with these instruments.

During my earlier visit to Arlington National Cemetery, I inquired about the location of Pete Conrad's grave, and went out and paid my respects to the

gap-toothed, laughing Apollo 12 astronaut who was so kind to sign my moon globe and share a couple of minutes of levity with me during his visit to a Monterey art gallery in 1993.

Prior to leaving Monterey, I had written to Dr. David Williams, Principal Scientist at the Solar System Science Group at NSSDC, who very graciously told me to call him at Goddard upon my arrival and he would meet with me. When I told David that I specifically wanted to see Lunar Orbiter photographs, as well as Apollo images of the moon taken from the Service Module while in orbit, he took me over to another building to meet with Robert Tice, Manager of Goddard's Photo Archive. Bob led me into an adjacent and rather cluttered room with equipment, mailing tubes, canisters, and files from floor to ceiling. One enormous filing cabinet was labeled with Lunar Orbiter images. I could feel my heart pounding in my chest as I took out my laptop, into which I had scanned 772 key images of the moon from my personal collection and books at UCSC. Thanks to the miracle of the modern laptop, I was able to have these with me for reference as I examined Goddard's collection! Bob gave me a brief orientation to the contents of the room: "... Orbiter stuff is over here in these drawers ... Apollo stuff over there in those round canisters ... let me know if you need anything!" He returned to his tiny office, and suddenly I was all alone with tens of thousands of pristine moon images! Since I had a fairly clear

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SJAA Activities Calendar

Jim Van Nuland

December 2000

- 1** Hogue Park star party. Sunset 4:50 p.m., 32% moon sets 9:56 p.m.
- 9** General Meeting. Christmas party.
- 15** Hogue Park star party. Sunset 4:52 p.m., 71% moon rise 10:02 p.m.
- 16** Fremont Peak star party. Sunset 4:51 p.m., 60% moon rise 11:09 p.m. Moon rises early, but since astronomical dark begins at 6:24 pm, there are nearly 5 hours of darkness.

January 2001

- 5** Astronomy Class I
- 5** Hogue Park star party Sunset 5:05 p.m., 82% moon sets 3:50 a.m.
- 13** General Meeting: Craig Wandke on the Apollo Mission
- 19** Hogue Park star party: Sunset 5:19 p.m., 16% moon rises 4:17 a.m.
- 20** Fremont Peak star party: Sunset 5:19 p.m., 10% moon rises 5:09 a.m.
- 27** Coe and Peak star party: Sunset 5:26 p.m., 11% moon sets 8:30 p.m..

Speakers:

Feb. 1 — Kevin Zahnly, topic to be announced. More speakers needed.

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Two Days on the Moon

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idea of what I wanted, it was not difficult for me to go to the specific drawers and retrieve the images. I stuck my trusty Hallwag moon map on the wall with some tape, to consult as reference in case, in my excitement, I forgot the location of Mare Crisium or Sinus Iridum! For the next several hours I looked at images and consulted my laptop, noting image numbers and details for possible subsequent ordering.

At one point I leaned back on one of the file cabinets and just smiled all to myself ... hey! ... Here I was in a room surrounded by, to borrow a phrase from Egyptologist Howard Carter, "... wonderful things, wonderful things!" The orbiter images were huge transparencies (two by two feet) that I lovingly took out of big envelopes and examined with detail, cross-referencing pertinent images to my own collection. I was originally a bit disappointed that I would not be able to see actual paper positives for purchase right there, but the NSSDC's collection is available on a made-to-order basis. In the end, it was probably better for me, as I might have later regretted the expense incurred had I been able to write a check or surrender my credit card number!

After three hours of pouring over Lunar Orbiter images, I became aware of my growling stomach, so I went rushed down the hall and bolted down a sandwich and drink from a machine and quickly returned to my duties.

I asked Bob to let me see the Apollo film canisters, and he took out a huge roll of 5" x 5" film that was labeled boldly, "Apollo 15, NASA-MSC, Frames 001-679, Part 1 of 5, August 1971: HEAD" As he hefted the roll onto a viewing table with two rollers on either end, I could hardly contain my excitement. Memories of meeting Apollo 15's Jim Irwin in San Diego in 1972 and Al Worden at Moffet Field in 1994 rushed through my mind as Bob made final adjustments on the viewing table and I leaned over excitedly, turning the right handle as the images traveled over the

fluorescent lights in front of me. Huge and crystal-clear, they took my breath away with the purity of their presence, and, in my excitement, I had to be careful to accurately note the full number of each image I would consider ordering, since a mistake in one digit would mean the wrong image.

Most impressive were the sequential shots, covering hundreds of images, made during trans-lunar injection and lunar approach, each image taken from outside the service module, showing a moon that grew progressively larger in each subsequent frame. (How could anybody doubt we ever went to the moon!) The images of the Hadley region where Apollo 15 eventually landed were spectacular and breath-taking in their

"Display first 10,000 items?" [Y/N]:"

clarity, tonality, depth, and detail. Mesmerized by seeing so many photographs of my favorite and most mystical area of the moon, I painfully realized I had a limited time with each roll, and I still had two more full missions, of perhaps five rolls each, to examine.

At the end of the day, Bob began to get ready to go home, and I was careful not to impose on his time any longer. With my head swimming with the wonder of the day, I headed out of the building and back onto the Metro for my return trip to the city.

I stopped by the Library of Congress and procured a Photo-ID Reading Card (anyone can get one with proper ID!), which allowed me into the Main Reading Room and Science Building. I was literally speechless at the grandeur and the glory of the atmosphere of learning and academia that surrounded me, from the leather, brass, marble, and mahogany everywhere, to the hushed staff who moved about with a palpable sense of restraint and dignity, under the huge, gilded cupola that towered over us.

I sat down at one of the computer terminals and entered "SEARCH FOR:

Moon" and was greeted with "Display first 10,000 items? Y/N" YES! YES! YES! And the second 10,000, too! I found two intriguing books on Lunar Orbiters I and II which appeared to be internal McDonnell-Douglas reports, so I asked the librarian to bring those to me ... just to say I had researched the moon in the Library of Congress! The books turned out to contain a lot of technical specifications on Lunar Orbiter with few images, but it was fun going through the process of retrieving them.

As the 9:30 p.m. closing time approached, I went out the side door of the library and into the balmy night air; the white dome of the Capitol gleamed surreal in the distance, but I was present neither in time nor space, for my mind was still in that cramped room back at Goddard, or floating outside of the service module over the lunar Apennines so long ago, retrieving those precious canisters.



Author Wyn Wachhorst spoke at the October general meeting on his book The Dream of Spaceflight.

Won't You Lend Me a Telescope?

[Editor's Note: In November we asked if any club members who had spent time with one of the club loaner telescopes had a story to tell about their experience. Here are two stories from the SJAA loaner program. Do you have a story about your time with a particular telescope? Send it on to the Ephemeris! Email to: ephemeris@sjaa.net]

Using the H-Alpha Solar Scope Loaner

Steven Nelson

One of the enticements for joining the SJAA is the extensive loaner scope program. I had helped set up and run a loaner program at a club, so I know the work Mike Koop does to organize is often "behind the scenes." It is much appreciated!

I had used solar H-Alpha (Hydrogen Balmer-Alpha spectral line) systems before and was eager to test out the equipment. The system I was familiar with (at Foothill College) has an electric (line power) heater control of the "fine tuning" of the wavelength. These systems have *extremely precise* wavelength settings! The task of the special solar filter is to isolate less than 1 Angstrom of wavelength out of the sun's image. At a wavelength of 6356.5 Angstroms that 1 A will get you the emission line light of hot hydrogen gas blasting off the sun. These are the famous "solar prominences."

The SJAA filter controls the wavelength with manual tuning. A knob slightly tilts part of the precision optics. When I started observing, I found this much nicer to use than the electric system. I could "tune" the filter across the wavelengths while watching in the eyepiece. This allows very quick selection of the view you want. Once you are on the sun's image, there is not much temperature drift. Besides prominences (or detail surrounding sunspots) this system is good for sunspots. Just tune "off-line" and you get much more contrast for picking out small sunspots. This is because off-line you are looking at the "continuum" or temperature related part of the sun's light. Sunspots are much cooler in temperature, so you get less of this "continuum light" from sunspots than from the surroundings.

The equipment worked fine for solar surface work. The many elements in the optical train (red prefilter, doublet objective, internal tele-extender) tend to scatter light a little for prominences. Still easy to see brighter ones. The battery drive system is a bit primitive and tended to slip before I spent some time adjusting it. As you may have seen in an earlier Ephemeris — this system is very portable and I took it up to our Yosemite Park public program. The drive worked fine there.

One trouble in the teaching of concepts can occur with a solar scope: "It looks like fire." The H-Alpha line is extremely red light. A glob of hydrogen

*A glob of hydrogen plasma
blasting out of the sun looks
a lot like a lick of flame.*

plasma blasting out of the sun looks a lot like a lick of flame. "I saw the fire burning on the sun" is a very natural response to seeing a prominence. I always try to precede a novice's view with a short review of their own experience with "emission lines" — yellow and blueish street lights and "neon" lights. The energy in these different colored lamps comes out as different colors, depending on the gas. Low-pressure sodium (yellow), mercury (blueish white), and neon (red) all glow when we put them in bulbs and add energy. The hydrogen on the sun glows brightly in red light when energy blasts it off the surface!

I don't even try to explain about the view directly on the "surface" around sunspots and filaments! Absorption lines, continuum bound-free emission

from plasmas, thermal line-broadening, Dopler shifts, etc., really only have a place at the college physics level. Keep it simple (boiling and magnet line patterns)!

Starting with Ole Number 31.

Jamie Dillon

This started on a December night in 1998, when my boy Liam and I went on up the Peak with binocs and tripod. Figured we'd likely run into some stargazers, having noticed that there's a community of people who gather at such places. It was socked in drippy fog. First we ambled over to the observatory and met up with Robert Hoyle, who showed Liam, then 7, the sights. He said, "You guys haven't heard yet of TAC?"

By chance, just a bit later while we were sitting in the car in the main lot eating our supper, two cars came down in the fog from the SW lot, with Mark Wagner and Marsha Robinson. So we got some encouragement and a TAC address. A half hour down the line, other lights went by in the then dense fog, which later turned out to be Jay Freeman.

Signing onto the TAC list, within a day or so I got an e-mail from a certain Jim Van Nuland, who told me to join SJAA and get a loaner scope. Within two weeks, I'd gotten hold of Mark Taylor and Mike Koop and picked up an 8" f/8 dob. We dubbed it Oscar.

By 11 January we'd gone to our first star party, the one in fact where Marsha finished her first Messier survey. Looked at M31, M34, the Double Cluster and M42, as well as Saturn thru Oscar. Spent a solid hour trying to find M37, finally packed the effort in and mooched views thru Rashad al-Mansour's and Mark Taylor's scopes. Oscar has good clear optics but had a diagonal on the finder which I learned to cordially loathe.

Within a month we were propelled and bought our own scope from Lumicon, an 11" f/4.5 Celestron dob to be named Felix.

A Christmas Eclipse

Akkana Peck

The biggest news in the December shallow sky is the solar eclipse on Christmas morning. Beginning at 7:33 a.m. and lasting until 9:13 a.m., the eclipse will only obscure 18.5% of the solar disk at the maximum eclipse time of 8:21, with the sun only 9 degrees above the horizon. Residents of eastern North America (or anyone taking the excuse to visit them for the holidays) will see a much more pronounced eclipse, up to 55.9% in New York and 61.4% in Montreal.

This eclipse isn't total (or even annular) from anywhere on earth, so the sun won't be significantly less bright than it usually is, nor any less dangerous to the eye: a safe solar filter will be required to observe it directly. You can get extensive information about solar filters from ALPO Solar Coordinator Jeff Medkeff's Solar Observing FAQ, linked off my shallowsky.com web site.

Projection (pointing the eyepiece end of the telescope at a piece of paper or a white wall) can also work fine, especially if you want to take the opportunity to show the eclipse to family or neighbors (since many people can look at a projected image at once). Use a cheap eyepiece for this, and the smallest telescope you have (or an aperture mask): there's always the chance that the intense heat can damage an eyepiece, and this is particularly true with modern, multi-element eyepiece designs. And be sure to cover your finder and keep kids (and adults) away from the "business end" of the telescope whenever it is pointed at the sun.

Projection via the pinhole technique also works: any small opening will act like a "pinhole camera," projecting a tiny image of the eclipsed sun onto whatever is beyond it. Try lacing your fingers together and observing the shadow, with tiny eclipses at each of the bright spots.

Solar activity is still very high, so there's a good chance of a nice sun-

spot display during the eclipse.

What to do for the rest of December while you're waiting for the eclipse to happen? Why, look at Jupiter and Saturn, of course! The planets are both high in the sky now, just past opposition and perfectly placed for observing, making a lovely pattern with the star clusters of Taurus. Last month, we talked about Jupiter's belt structure, features such as the GRS (great red spot) and the SEB (south equatorial band) that surrounds it. If you haven't looked closely at the giant planet, try looking at the color of the red spot — quite noticeable now compared to its

Try lacing your fingers together and observing the shadow, with tiny eclipses at each of the bright spots.

pale appearance over the last several years — and the split in the SEB preceding and following the GRS. And, of course, the ballet of Jupiter's four Galilean moons, and the transits of the moons and their shadows over their parent planet, is always wonderful to watch. Don't be fooled by all the "extra moons" Jupiter seems to have picked up this year as it passes through the bright local star cluster the Hyades. In fact, this is a wonderful opportunity to observe how different the Galilean moons look from stars, distinguished by their tiny disks (which look steadier, especially in unsteady seeing, than the point-source appearance of stars) and their off-white color.

Saturn is lovely as always, with the rings tilted well up, showing us the best view we're likely to get for many years of their structure. The big gap between the outer A ring and the inner B ring is called the Cassini division, and should be visible in any telescope on all but the worst nights. The faint, translucent C ring (also called the

"Crepe Ring", inside the B ring, is harder to see, but should be visible on most nights. Sometimes, the B ring appears to shade from brightest at the Cassini division to dimmer at the inside where the C ring begins. On extremely steady nights, with good optics, you may be able to see more details in the B ring, such as spokes (radial darkenings, most visible at the "ansae", the points where the rings are farthest from the planet from our point of view) or other bands of light or dark, seen by spacecraft but only by a few earth-bound observers. In the A ring, look for a darkening near the outer edge. The narrow gap popularly known as the Encke gap will probably not be visible — in fact, Encke didn't see it, either. Instead, what he saw was a gradual darkening, informally known among Saturn observers as the "Encke Minimum"; the actual Encke gap is a very thin line, very difficult to spot under most circumstances. I have more information on the gaps in Saturn's A ring, and links to other pages discussing the history of their observation, at shallowsky.com.

Venus rides high in the sky at sunset, outshining even Jupiter at magnitude -4.2, and remaining in the sky by nearly four hours after sunset. Its phase, viewed through a telescope, is waning gibbous, but its apparent size grows from 16.3" at the start of the month to 20.5" by month's end.

Sharing Capricornus with Venus are distant Uranus and Neptune, with Uranus less than two degrees away from Venus. This month is the last good chance to observe them this winter before they dip into twilight and reappear in the morning sky. The same constellation also holds the brightest asteroid 4 Vesta, the same brightness as Neptune at 8th magnitude.

Pluto and Mercury are lost in the Sun's glare all month.

How To Look At The Moon

Dave North

December is a good time to give a quick overview of How To View The Moon. Why?

Some of you will have just acquired new toys and be curious how best to use them. Others will be kept nearer to home by the weather, where dark skies are hard to find.

But best of all, December is when the tide turns and Moon Season starts up — the half of the year when the Moon is best viewed in the evening.

It doesn't hurt that the sun sets earlier, so there's more dark time ... but the real point is the Moon will be higher in the sky between now and June (basically) with the high point late in the cycle now (near full) and moving toward first quarter around March or April.

New telescopes, especially those with good optics, can cut their teeth very nicely on the Moon.

Sure, Jupiter and Saturn are up there (and you absolutely should spend time with them), but there just isn't an object as "telescope friendly" as the moon.

It has hard edges on the shadows of mountains and craters, and this creates practically the maximum contrast aside from a star against a black background.

Contrast is a good thing, especially to scopes with central obstructions (such as Newtonians and catadioptrics: SCTs, Maks, etc). The secondary mirror cuts contrast a hair, and having strong contrast in the image itself is a real plus.

More detail can be seen on the moon than any other celestial object, save perhaps the Sun with some very expensive equipment. For most of us, that means the Moon is the obvious starting point.

First, the issue of filters: you don't need any.

No doubt you'll try a low-power view at first, and that might prove to be pretty bright. But in the long run, you'll find the high-power views are most satisfying, and they cut some of the glare.

Then, you start working the terminator (the zone of high shadows where the "lit" side of the moon meets the "dark" side). Here the reflected light is not very bright at all, and you'll find it reasonably comfortable in just about any scope (I run my 12.5-inch wide open like this regularly, and have used the 30-inch at Fremont Peak full bore ... for those who have doubts about this, I just got my eyes tested last week and my doctor says they are still exceptionally sharp. So don't sweat it).

What kind of scope? Any kind! That's one of the great things about the Moon. From smallest to largest, you'll get something worthwhile (though seeing can be an issue if you're packing an 18-inch or so — you might want to consider an off-axis mask for "nervous nights."

Anything smaller, just point and shoot.

I find the useful magnification range runs between 125x to 400x fairly often, with the most typical views between 180x and 225x due to seeing pains. If your eyepieces work that range adequately, you're okay for now.

This being winter, consider eyepieces with fairly significant eye relief. I find the moisture from my eye tends to fog up eye lenses when I get too close to them — this is not much of a problem in summer.

Books? There aren't any "ideal" maps, and I find most of them frustrating due to the reference numbers or other weird labeling systems.

In the long run, Antonin Rukl's *Atlas of The Moon* (under whatever publishing rubric you find it) is the best overall. And for more general finding, a Moon Globe is an unbeatable aid.

But any rough chart will work at first — when I started "mooning," I hated all the maps so much that I traced one out and labeled it myself. With your computer, you can probably make this project a little simpler if you decide to duplicate my effort.

If you do, publish!

I think it's best to start by memo-

rizing a few major features, particularly Mare Crisium, Mare Nectaris, Mare Imbrium, Clavius, Tycho, Ptolemaeus, and Mare Humorum.

I know you'll find Mare Tranquillitatis — who could resist?

If you have just these landmarks down, you'll be able to navigate to less familiar places ... so let that be your first project, after the obvious one:

Just looking.

If you are a new telescope owner, and don't know what they can do yet, there are at least four experiences that will be completely unforgettable:

Your first view of the Moon (unbelievable detail), your first view of Saturn (is that real?) your first view of Jupiter (you can see the bands and moons?!) and M42 (what, deep sky? Yup).

And of course, there will be more. But don't forget your first best friend ... the Moon.

School Star Parties

Jim Van Nuland

Ever wonder if it's worth the time and travel to bring a scope to a school? Here's a note from the teacher at last night's school:

"I owe you my heartfelt thanks. I continue to be amazed, year after year, that busy people with so much expertise would be willing to volunteer a whole evening to help complete strangers. I have heard nothing but praises from girls and their parents, and it seems like the event was a complete success. I think it sparked an interest in and love for astronomy in many girls (and parents), and also helped cement some concepts and facts that I have been trying to reinforce in my class. I know that I always come away feeling like I learned a lot. I enjoyed meeting with you and the other astronomers, and was really impressed with the equipment."

2001 — Meteoric Calendar

Jane Houston Jones

Thirty days hath September; all the rest I don't remember. But you'll be able to remember the meteor shower dates with this handy dandy meteor guide. You can all now plan your vacations.

January

January 4 - Quadrantids, active Jan 1-5. ZHR 120. These meteors are medium speed and bright, with some persistent trains. Moon Phase: 10 day old waxing moon

February

Weak showers with lowest sporadic rates of the year. Keep your eyes open for fireball-class sporadics, though.

March

Virginids, active with several peaks from early March to early

April. This shower tracks through Libra, Virgo and Libra. Slow, bright and low summarizes this shower.

April

April 21 - Lyrids, active Apr 16 - 25. ZHR up to 90, but generally 20. Swift, sometimes spectacularly bright, and many leave persistent trains. Moon Phase: 28 day waning moon (new moon).

May

April 15 - July 15 - like the Virginids which this near-ecliptic shower follows, Sagittarids are spread out over a wide area. The ill-known radiants are active at various times in Scorpius, Ophiuchus and Sagittarius. Low rates are expected.

May 5 - Eta Aquarids, active Apr 19 - May 28. ZHR 60. One of two showers associated with Comet Halley, last at perihelion in 1986. Swift, bright and many leave persistent trains. Moon Phase: 13 day old waxing moon

June

June 27 - Bootids, active Jun 26 - Jul 2. ZHR variable up to 100. Moon phase: 8 day waxing moon.

July

July 9 - Pegasids Active Jul 7-13.

ZHR 4. Swift, faint Pegasids are unmistakable. Moon Phase: 19 day waning moon.

July 27 - Delta Aquarids South, active Jul 12 - Aug 19. ZHR 20. Medium speed and faint, but bright ones do happen! Moon Phase: 8 day old waxing moon.

July 29 - alpha Capricornids, active Jul 3 - Aug 15. ZHR 4. Long trails and low elevation make this shower a photographers dream. Moon Phase: 10 day waxing moon.

August

August 12 - Perseids, active Jul 17 - Aug 24. ZHR 120-160. The big daddy of showers! These are fast and bright meteors and often leave persistent trains. Moon

Phase: 23 day old waning moon. Lawn chairs at attention. Now observe!

September

Best for sporadics and mysterious minor showers.

October

October 8 - Draconids, active October 6 - 10. ZHR from 0 to storm! Showers occur when the parent comet, 21P Giacobini-Zinner reaches perihelion. That happened in 1998. Moon Phase: 21 day old waning moon.

October 21 - Orionids, active Oct 2 - Nov 7. ZHR 20

November

November 12 - Taurids, active Oct 1 - Nov 25. ZHR 5. Low, slow, bright and yellow. Good offset to Leonids.

November 17 - Leonids, active Nov 14 - 21. ZHR variable 10-storm. Swift and bright with 50 to 70% leaving persistent trains.

December

December 13 - Geminids, active December 7 - 17. ZHR 120. One of the best showers, with bright medium speed meteors. It is associated with an Apollo asteroid, Phaethon, so the particles are asteroid dust not comet dust.

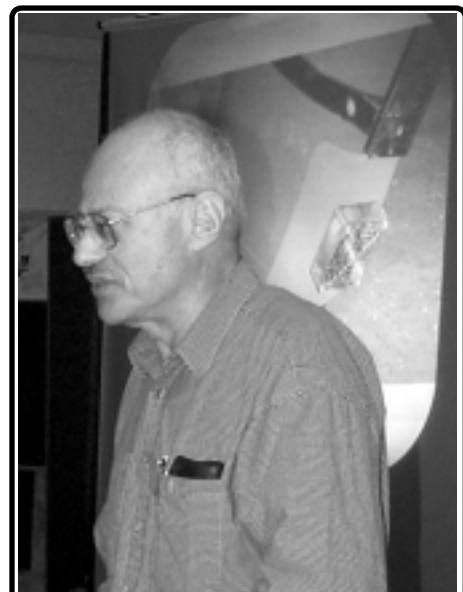
The Celestial Tourist Speaks

Observing in the October, 2000, New Moon Jay Reynolds Freeman

Despite spells of wet or windy weather, the new Moon of late October, 2000, was a banner period for observing. In five good nights and half a dozen of lesser quality, I logged over 800 observations.

The period started inauspiciously, with an evening at the Montebello Open Space Area on Tuesday, October 17, in which high broken cloud seemed too dense to warrant setting up Harvey, my Celestron 14. Eager to observe, I dug out a 10x50 binocular and chased Messier objects and other easy stuff through sucker holes, just for fun. Weather improved during the next few days, however, and on Wednesday and Thursday I set up Harvey at Montebello with good results. I made substantial inroads on my present main program of observing faint galaxies plotted on

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Alan Adler spoke at the November general meeting about his experiments in newtonian mirror design and thermal control. Behind him is a photo of his experimental telescope which features a fan mounted on the tube just above the mirror to homogenize the air in the tube and bring it to a consistent temperature. Photo by Morris Jones.

The Celestial Tourist

Continued from previous page

Millennium Star Atlas, working mostly the area from zero through four hours right ascension. Montebello is a surprisingly good deep-sky site when the transparency above is good, and when the objects do not have extremely low surface brightnesses. Galaxies are just fine.

Friday was cloudy, but on Saturday the 21st I went to Henry Coe State Park, only to find conditions so windy that most Dobsons were in danger of blowing over. I set up Harvey in the lee of my minivan. Fortunately, most of the objects I wanted to observe were only part way up the sky, downwind. I could observe them at low magnification — 98x — without much difficulty. Many people forget that wind often imposes serious limitations on telescope operation. (Most of them remember it when their telescope blows over.) The combination of C-14 and Losmandy G-11 is very capable in such conditions.

On Sunday, I was at Fremont Peak, and the wind had died. I had another good night with Harvey, though I quit at about midnight, because of work the next day. I drove home by way of Santa Cruz, and stopped at an all-night restaurant there with an astronomical theme for a snack. The restaurant is the Saturn Cafe, on Pacific a few blocks seaward of the heart of the mall, and it is not so much the astronomical Saturn as the psychedelic one — the decor is 1960s and 1970s nostalgia, perhaps as seen via designer drugs of the twenty-first century. The food, however, is very good — I particularly appreciated that there was more than one vegetarian item on the menu. Don't miss the chocolate tofu pie — it's very Santa Cruz.

For most of the next week, it rained. I did get to Fremont Peak on Friday the 27th, and found two other eager beaver astronomers there, chasing objects through sucker holes. I did not think it worth setting up the big telescope, so out came the 10x50 again. I was getting tired of Messier

review, so I opened a relatively new small sky atlas that I had been carrying for some time, Eric Karkoschka's *Observer's Sky Atlas* (Springer Verlag, 1999), and used some of its finder charts for binocular objects to find a variety of easy non-Messier deep-sky targets. Karkoschka's atlas is handy in size and well designed for field use; observers whose experience corresponds to mid Messier survey or perhaps a bit beyond will find it very useful, and so will more advanced

Eager to observe, I dug out a 10x50 binocular and chased Messier objects and other easy stuff through sucker holes, just for fun.

users on those evenings when they want bright objects for small equipment.

I thought that was about it for the new Moon period. I was wrong. I did a little front-yard astronomy with my 70 mm refractor on Monday, October 30, and then supported a tour at Lick Observatory on November 2. The tour group was part of an introductory planetary sciences class from U. C. Santa Cruz, and Jupiter and Saturn did not rise till quite late. Some of the students had to leave early — 8:00 classes and the like — and would not have gotten to see any planets if I had not set up the same 70 mm refractor outside, for a view of the two big gas giants not long after they cleared the



SJAA members Pete Zarubin, Chris Angelos, and Ming Li prepare photo equipment before the November general meeting to capture a possible Leonid meteor shower. Photo by Morris Jones

tree line. We did get to them with the 36-inch late in the evening, when they were far enough up for the big refractor to reach them, but so-so seeing made the views less wonderful than I have previously had with that telescope.

It was windy at Lick, too — staff astronomer and tour guide Ellie Gates rather hastily closed the dome of the 36-inch after we had all seen Jupiter, and the 3-meter reflector, whose dome has a much wider slit, had by that time long since shut down. My 70 mm refractor had been set up east of the main building, in its wind shadow, and did not have any trouble.

On Friday, 3 November, the Moon was almost at first quarter, and I was tired, so I almost didn't go observing. A double espresso at my favorite coffee house (Coffee Society, at The Oaks Shopping Center, in Cupertino) refreshed me, however, so I trundled down to Pacheco State Park. This site has little light pollution and wide horizons, but is often plagued by fog or wind, sometimes even both. When I arrived, the humidity was high, the air felt cold and clammy, and tendrils of visible moisture clung to the grass in several directions. At least it was dead calm, so there was no wind chill, so I set up Harvey, set the Kendrick anti-

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The Celestial Tourist Speaks

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dew system to "pasteurize" (a low position — the next two are "fricassee" and "engage Klingon grand fleet"), and started observing. To my delight, even though the relative humidity soared above 96 percent, the traces of fog dissipated, and lines of sight even a short distance above the horizon remained clear. What a shame only three observers were there! I had plenty of galaxies bright enough to view at 98x or occasionally 244x, even with the Moon up, and after it had set, I continued on to fainter and more demanding stuff.

Millennium shows globular clusters and other internal features of many large nearby galaxies, and the Fornax Dwarf Galaxy was on the area I was working that night. Conditions were good enough that it and its larger companion, the Sculptor Dwarf, were only difficult in the big SCT, and the Fornax system has five globular clusters which were on the chart. One of those is an NGC object — NGC 1049. I had seen it once or twice, long ago. It wasn't particularly difficult in the C-14, obviously non-stellar, though at the great distance involved there was no sign of its individual stars; it looked like an elliptical galaxy seen in round cross-section. The other globulars are Fornax 1, Fornax 2, Fornax 4, and Fornax 5. At 244x, they were each harder than NGC 1049, but much easier than the parent galaxy, which was not detectable at that magnification, though I had could see it at 98x. Fornax 2 was the most difficult of these non-Milky-Way globulars.

The night continued very clear and dark. I had an excellent view of the Horsehead Nebula, at 98x with no nebular filter, showing an unusually large amount of the emission nebula, IC 434, against which it is in silhouette.

I had brought a big binocular with me as well, the Orion 25x100 that I bought in June, 2000. After I had put Harvey to bed, I took it out and did some Messier work, and looked at a few other objects as well. This instrument is wonderful for wide-field deep-

sky views. I cannot hold it still enough unsupported for more than a few seconds' worth of wobbly view, but it works satisfactorily when braced on either the top of one of my car doors or on one rail of the roof rack. I had notably pretty views of the Rosette Nebula complex, the Christmas Tree cluster, NGC 1975-7-9, and most of the autumn and winter Messier objects.

Before leaving, I pulled out the 5x10 Zeiss "MiniQuick" binocular that I usually have with me, and logged a handful of Messier objects with it as well. I made 212 observations that night, which is nearly a record for me.

I did some more "yard work" in the moonlight on two evenings of the subsequent week, to wrap up a wonderful observing run. All autumn new Moons should be as good as this one was.

Loaner Notes

Mike Koop

Del Johnson has retrieved his telescope (#18, an 8" equatorial mounted Cave Astrola) after 6 years of service in the loaner program while Del was away in South Africa with the Peace Corps. Del is currently living near Big Bear Lake and will be attending RTMC regularly. The SJAA and the 11 people who borrowed the scope thank Del for his creative method of storing the scope while he was away.

December Holiday Party

Mark Taylor

The club's December general meeting will again be held as a holiday party and social occasion. Last year we had many tasty "potluck" contributions, interesting "show and tell" items, a fun-filled "white elephant" gift exchange, and lots of great conversation.

If you would like to participate in this year's "white elephant" gift drawing, please anonymously wrap (no name tag) an astronomical item of small value and/or large humor and bring it along. It can be a used item you no longer want, an inexpensive new item, and can be either useful or funny.

Celestial Calendar

December 2000

Richard Stanton

Lunar Phases:	Date	Rise	Trans	Set
FQ 20:55 PST	03	13:08	18:01	23:04
FM 02:03 PST	11	16:16	00:43	08:02
LQ 17:41 PST	17	23:42	05:39	12:29
NM 10:22 PST	25	08:05	12:00	15:52

Nearer Planets:	R. A.	Dec.
Mercury, 1.43 A.U., Mag. -1.3		
07 06:22 11:17 16:12	16:14.0	-20:58
17 07:01 11:44 16:28	17:20.3	-24:00
27 07:35 12:15 16:55	18:29.7	-24:59

Venus, 0.91 A.U., Mag. -4.9		
07 10:20 15:08 19:58	20:05.7	-22:42
17 10:17 15:17 20:18	20:53.8	-19:43
27 10:09 15:22 20:36	21:38.9	-15:56

Mars, 1.92 A.U., Mag. 1.0		
07 02:36 08:18 14:01	13:16.8	-06:43
17 02:26 08:01 13:37	13:39.3	-08:56
27 02:16 07:45 13:13	14:01.8	11:02

Jupiter, 4.11 A.U., Mag. 2.8		
07 16:00 23:10 06:25	04:12.5	+20:14
17 15:16 22:26 05:40	04:07.2	+20:02
27 14:33 21:42 04:55	04:02.8	+19:52

Saturn, 8.25 A.U., Mag. 0.5		
07 15:37 22:36 05:38	03:37.4	+17:04
17 14:55 21:53 04:56	03:34.5	+16:56
27 14:14 21:12 04:14	03:32.2	+16:49

SOL Star Type G2V	Intelligent Life in System ?
Hours of Darkness	
11:15 07 07:09 11:59 16:49 16:57.1	-22:39
11:19 17 07:17 12:04 16:51 17:41.2	-23:22
11:18 27 07:21 12:09 16:57 18:25.5	-23:19

Astronomical Twilight:

		Begin	End
JD 2,451,885	07	05:37	18:22
	895	05:43	18:25
	905	05:48	18:30

Sidereal Time:

Transit Right Ascension at Local Midnight

07	00:00 = 04:57
17	00:00 = 05:37
27	00:00 = 06:16

Darkest Saturday Night: 23 Dec 2000

Sunset	16:54
Twilight End	18:28
Moon Rise	05:25
Dawn Begin	05:47
Hours Dark	11:19

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SJAA Loaner Scope Status

All scopes are available to any SJAA member; contact Mike Koop by email (loaner@sjaa.net) or by phone at work (408) 473-6315 or home (408) 446-0310 (Leave Message).

Available Scopes

These are scopes that are available for immediate loan, stored at other SJAA members homes. If you are interested in borrowing one of these scopes, please contact Mike Koop for a scope pick up at any of the listed SJAA events.

# Scope	Description	Stored by
23	6" Newt/P Mount	Raghu Srinivasan
30	7" f/9 Newt/Pipe Mount	Mike Koop

Scope Loans

These are scopes that have been recently loaned out. If you are interested in borrowing one of these scopes, you will be placed on the waiting list until the scope becomes available after the due date.

# Scope	Description	Borrower	Due Date
3	4" Quantum S/C	Bob Havner	2/2/01
8	14" Dobson	Andrew Pierce	1/6/01
10	Star Spectroscope	Denny Woolaghan	11/13/00
11	Orion XT6 Dob	Peter Norvig	11/10/00
12	Orion XT8 Dob	Nick DeMonner	11/27/00
13	Orion XT6 Dob	Ilkka Kallio	11/29/00
15	8" Dobson	Daron Darr	10/20/00
16	Solar Scope	Gary Mitchell	11/20/00
19	6" Newt/P Mount	Li-Chung Ting	12/22/00
26	11" Dobson	David Cameron	12/8/00
27	13" Dobson	Bill Maney	1/22/01
28	13" Dobson	Dennis Hong	11/27/00
32	6" f/7 Dobson	Sandy Mohan	12/8/00

Extended Scope Loans

These are scopes that have had their loan period extended. If you are interested in borrowing one of these scopes, we will contact the current borrower and try to work out a reasonable transfer time for both parties.

# Scope	Description	Borrower	Due Date
1	4.5" Newt/ P Mount	Tim Roberts	12/9/00
2	6" f/9 Dob	John Paul De Silva	?
6	8" Celestron S/C	Lee Barford	1/7/01
7	12.5" Dobson	Doug Hendricks	1/8/01
9	C-11 Compustar	Paul Barton	Indefinite
21	10" Dobson	Ralph Seguin	Repair
24	60mm Refractor	Al Kestler	1/7/01
29	C8, Astrophotography	Bruce Horton	12/29/00
31	8" f/8 Dobson	Robert Morgan	12/17/00

Waiting List

Star Spectroscope, Steven Nelson; XT6 dob, Li-Chung Ting, David Findley; 8" dob, Gerard Braun; Solar scope, Jack Kellythorne; 6" newtonian, Ed Greenberg; 13" dob, Michael Dajewski

Submit

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