

SJAA EPHemeris

Chasing the shadow of the Sun - Eclipse tales from the SJAA

The August 11, 1999 Total Solar Eclipse As Seen in the Black Sea

Robert A. Garfinkle, F.R.A.S.

At about 7:00 a.m. Eastern European Daylight Time (EEDT), the 800-passenger cruise ship, MV Marco Polo, slowed to a stop in the western Black Sea at the selected center-line location (43° 6.615 north latitude; 29° 43.069 east longitude) for the last total solar eclipse of the millennium (no total solar eclipses will be visible on Earth in the year 2000). This position is about 115 miles north of Istanbul, 75 miles east of Varna, Bulgaria, and 150 miles south of the southern tip of the Ukraine). Many of the passengers and crew members began to prepare to witness the eclipse. By noon, six other cruise ships, a freighter, and a ferry had arrived in the area and lined up near us under completely cloudless skies and dead calm seas. They must have spotted the special eclipse flag that Russell Sipe of Sky & Telescope magazine had flying from the mast and figured that we probably knew what the hell we were doing. Actually, this was Captain Erik Bjurstedt's second eclipse and he in fact did know what to do. He got the ship into exactly the right spot for viewing this eclipse.

Eclipse day started out for me with the sound of scraping. Our cabin was near the bow and a maintenance crewman was sanding down the handrails and stairs on the bow in preparation for revarnishing them that day. Definitely not the right day to be painting rails and

Continued on next page

A Miracle Near Munich

Ernie Piini

Do you believe in miracles? I do. After a cliff-hanger experience in Germany - it can happen.

Early on the morning of August 11th in Einsbach, Germany, our home away from home for the eclipse, the sun rose against a beautifully clear blue sky. It was like India in 1995 and Australia in February 1999. Not a cloud in the entire sky.

After breakfast I made a call to

Continued on page three

Centerline through Bucharest

Daniel Stefanescu

Honestly, I could hardly wait to see this eclipse. For over three years, since my last visit with family in Bucharest, the capital city of Romania, I had known and in fact anticipated the passing of the lunar umbra over the very place I had called home during my childhood. Indeed, calculations had placed the centerline within about a quarter mile south of the apartment building.

With two days to go, fanned in

Continued on page five

SJAA Activities Calendar

Jim Van Nuland

October

- 31** End of Summer time. Set clocks back 1 hour, and apologize to your honest sundial.

November

- 6** Star parties at Henry Coe, Fremont Peak. Sunset 6:37 p.m., 2% moon rises 8:12 a.m.

- 12** Houge Park star party. Sunset 6:30 p.m., 36% moon sets 10:55 p.m.

- 15** Star Party at Pinnacles

- 20** General Meeting at Houge Park, 8 p.m.. Dr. Ken Croswell on *Magnificent Universe*, a follow-on to Timothy Ferris' *Galaxies*

- 25** Thanksgiving

December

- 3** Houge Park star party. Sunset 4:50 p.m., 13% moon rises 3:57 a.m.

- 4** Star party at Fremont Peak. Sunset 4:49 p.m., 7% moon rises 4:51 a.m.

- 11** Star party at Fremont Peak. Sunset 4:50 p.m., 13% moon sets 8:16 p.m.

- 17** Houge Park star party. Sunset 4:52 p.m., 72% moon sets 2:22 a.m.

- 18** Christmas Potluck at Houge Park, 8 p.m. Bring a dessert.

January

- 22** General Meeting at Houge Park 8 p.m.. Michael Light will talk about his book, *Full Moon*.

24 Hour News and Information Hotline: (408) 559-1221

<http://www.seds.org/billa/sjaa/sjaa.html>

Bob Garfinkle on the Black Sea

Continued from previous page

stairs where dozens of people would be standing in a few hours to see the eclipse. I called the pursers' office and had them stop the work before any painting was started.

By 9:00 a.m., people were already staking out viewing spots. A forest of tripods had emerged up from the teak bow and stern decks of the converted Russian troop transport. The Marco Polo started life in the 60s as the Alexandre Pushkin. Orient Lines has done a marvelous job in converting the ship into a first-class cruiser. I added my two tripods to the forest, and then

The temperature progressively dropped to a low of 82 F

proceeded down to one of the lounges to give a presentation on the beginnings of the lunar nomenclature to about 60 people. At the same time, former Space Shuttle astronaut, Jay Apt, was reprising of one of his talks on the view of Earth from the Shuttle. He had ridden into space four times on the Shuttle, and had great stories to tell of being in space.

I use two tripods on my solar eclipse expeditions. One has a special bracket that holds my Minolta 5000 camera with a f/1.7, 400-mm lens and my Nikon F with a 50-mm lens. I also mount a metal air-conditioning thermometer and a microtape audio recorder on the tripod. This tripod stands on a set of Kevin Medlock's antivibration pads. An analog tape camcorder gets mounted on the second tripod. There were several people using new digital camcorders, and they got excellent results of the eclipse. Batteries were replaced and lenses cleaned before I brought the equipment out of the cabin.

One of the disadvantages of viewing an eclipse from sea is usually the rocking of the ship from side to side or bow to stern. The

seas were so calm and windless throughout the entire eclipse that the Sun did not swing back and forth through the camera viewfinder, but held rock steady. No pendulum effect on this trip!

From the time I set up my equipment until after the eclipse was over, I periodically checked the air temperature. The temperature was a steady 96 F for about an hour before first contact, which occurred at 12:49 p.m. EEDT (10:49 UT). The temperature progressively dropped to a low of 82 F a few minutes after third contact (end of totality at 1:16 p.m.; 11:15 UT). It slowly rose to only 88 F about a half hour after fourth contact (2:35 p.m.). The Sun was 62 degrees above the horizon.

We could see the Moon's shadow approaching from the west and the colors of everything began to take on an orange hue about 10 minutes before totality. Shadows became stark, and even individual hairs cast singularly black shadows, which lacked an outlining penumbral shadow. This began in the last few minutes before the main event and occurred again after totality. With a small Moon, Baily's Beads and the Diamond Ring were very fast. I could see a large detached prominence located at about the 8:00 o'clock position (southeast), even during the first diamond ring.

The corona was circular and extended out only about one solar radius. This was the smallest (but most interesting) corona I have seen during totality. The small corona made the skies darker than I have seen before. The inner corona sparkled, because portions of the chromosphere were still visible along

the rough lunar limb throughout totality. The corona had thin yet very bright radial streaks that seemed to emanate all the way around the limb of the Moon. I counted seven prominences that were easy to spot in the camera viewfinders or my 15×54 Canon electronic image stabilizing binoculars. At magnitude 4.2, Venus was



Near second contact over Altomunster, Germany, by Ernie Plini

an easy target to spot and Mercury at magnitude +0.9 was a little harder. I glanced at Spica toward the 360-degree rosy horizon (an advantage of being at sea for an eclipse is an unobstructed view of the horizon all around you). The eclipse lasted 2 minutes 21 seconds at our location. It was fun watching the shadow boil away toward the east, knowing that totality was about to begin over eastern Turkey. Obviously unknown to any of us on board the Marco Polo on the August 11 was the pending disaster welling up under those lands. After the eclipse, we visited Nesebur, Bulgaria, and Istanbul. My family and I left Istanbul about 45 hours before the earthquake hit. Now we need to get ready for Africa in June 2001 for the first total solar eclipse of the new millennium.

Continued from first page

Beth Yule, the tour agent for Amateur Astronomers Inc. (AAI) from New Jersey, for instructions as to where to join her group. I've known Beth and members of AAI since the eclipse expedition to the African Sahara Desert in 1973 and I was pleased that she invited us along, and also had a chance to meet eclipse chasing friends of old.

We met on a soccer field in the small town of Altomunster which lies very close to the eclipse centerline about 30 km (18 miles) northwest of Munich (Latitude: 48°, 23', 05" N; Longitude: 11°, 14', 50" E. to be exact). When we arrived the sky was completely overcast with a threat of rain. My

For the first time in 21 eclipses I was forced to set up while it was raining.

cousin, Meinrado Pifferini, a huge and strong Swiss and youngest of a family of 16, carried my telescope and mount to the site as if they were toys. There we set up next to Joe and LaVonne Shrock, good friends of mine from Mt. View, California.

The telescope at this point was only partially assembled with another half-hour of set-up and alignment to go. For the first time in 21 eclipses I was forced to set up while it was raining. About this time I began to wonder if this was all worth it and did we have a chance to see the eclipse? Totality was still three hours away.

Final assembly of equipment was done under an umbrella and heavy rain. I waited about an hour before I could focus my two telescopes and the camcorder. The sun was playing peek-a-boo with the clouds and moments like this made it possible to focus with the filter off.

First contact was reported at

Ernie Piini from Germany

around 11:12 a.m. With totality scheduled to occur around 12:36 p.m. the hour-plus wait was agonizing. We saw small blue sky openings far to the West and much time was spent studying the distance, direction of travel, and point of possible interception with the eclipsing sun. A couple of these clearings came too soon and moved past our site. More rain and even a sound of thunder off in the distance made our chances even more gloomy.

But one clearing had the necessary ingredients if all conditions held. And they did!

At 12:36:31 p.m., second contact occurred with a show of Baily's Beads and a brilliant "Diamond Ring". I ran off 14 one-second exposures using Kodak Royal-400 print film with my 3-way Telescope equipped with my special U2 filter. This filter is designed to eliminate much of the stray corona around the eclipsed sun and enhance the beautiful coronal streamers. Since this eclipse occurred during a maximum sunspot period, the shape of the corona was quite symmetrical but spiky.

My C-90 telescope, which rides piggyback on the 3-way telescope, captured the fast changing display of Baily's Beads, Diamond Ring, and rosy red prominences, using Kodak Royal-100 print film. I made 27 exposures each at 1/60th second.

My Canon 2000 camcorder is bracketed to one side of the 3-Way Telescope. I use it to record exact timings of totality events plus any other event which might require a wide angle view.

Since all my cameras are remotely controlled, running off over 40 exposures is easily done. I had time to allow several of my cousins to peer into my C-90 Telescope and gaze at the garden of rosy red prominences. I counted eight artistically spaced magnetic storms around the black disc of the moon. One of the prominences had a section that was disconnected and in space.

This eclipse was a real beauty. Was it because we prayed so hard for the sky to clear or was it simply an exceptional sight? The planet Venus was hidden behind some clouds but I finally got to see it moments after third contact. Third contact was recorded at 12:38:48 p.m., making our total eclipse time 2 minutes and 17 seconds.

Minutes later the sky became totally overcast with threat of more rain.

The temperature dropped 8°



A Garden of rosy pink prominences encircle the totally eclipsed sun by Ernie Piini

from 69 °F around 11:45 a.m. to 61°F shortly after the end of totality. The humidity varied between 95 and 100 percent as would be expected in rainy weather.

The wind was mild during the entire event with only a slight breeze during totality.

No shadow bands were seen as the green grass of the soccer field made it difficult to see the minute changes in contrast.

That evening, the entire AAI group and our contingent from Switzerland, enjoyed a dinner party hosted by Beth Yule. A one-man orchestra played a variety of German music on his piano and accordion. He even played John Denver's "Country Road" for our group. This was the song played at Meinrado and Sabrina Pifferini's wedding earlier this year. Their wedding party

Continued on next page

Continued from page three

parade of two busses included a donkey that was transported by trailer to the church ceremony. There the animal was side-saddled with traditional wedding candies and was a hit for all who attended.

Our side trips before and after the eclipse included much of the

This eclipse was a real beauty. Was it because we prayed so hard for the sky to clear?

picturesque country where my parents and elder brothers and sister came from. The valleys, shouldered by the shear cliffs of the alps and speckled with homes built totally with rocks, is a sight to behold. We even took a walk up to the home where my family resided and laughed at the second-story balcony in which my brother Enos, then 5-years old, fell off onto the dirt path below.

My mother used to tell us about the thunder and lightning that occurs in the alps. For about three nights in a row they happened. I was petrified at how noisy and scary it gets. It rains simultaneously hard and steady and the clouds diffuse each lightning bolt.

One day we took the train into Milan, Italy and visited the famous Duoma. My folks often talked about their honeymoon trip there. We climbed onto the roof to get a close-up view of the many figurines and statues that make up this majestic cathedral.

In Germany we enjoyed the cleanliness of the country, its vineyards and green fields of corn. We visited the main square in Munich weaving through the crowds

to see some of the historic structures. Finally got to see the Glockenspiel mechanized clock tower but arrived about 20 minutes too late to see the 11 o'clock show. We also took in just a smidgen of the Deutch Museum. I chose to see the Sun Dial garden on the rooftop and later the popular Amateur Astronomy section. The place is like the Smithsonian. Plan on spending several days to see it all properly.

Finally I must say that the eclipse was truly a miracle. I've had the opportunity to see many eclipses in the past but I prayed that my brother and cousins would get to see this one. They may never go to see another but this will surely remain in their memories as long as they live. Viva el eclisse.

The Miracle eclipse in a nutshell,



Symmetrical corona typical for period of maximum sunspot activity by Ernie Piini

by May Coon:

Ernie, video, 3 camera	Invention
Eclipse map	Intention
Weather at first	Attention
Cloudy	Contention
Eclipse clearing	Suspension
Wipe brow	Sustention

I wish to thank Joe Heim and May Coon for their assistance in editing this article. Ernie Piini

Watch "The Big Event"

David North

Well, this is it. November is the big month for meteor types, since that's when the Leonids happen. And as everyone knows by now, they were pretty active last year, and are expected to be even better this year in some regards. The Leonids run for more than one day... basically the week surrounding November 17/18. But they do have a sharp peak. The shower is the product of particles from comet Temple-Tuttle, which reached perihelion in 1998. A great concentration of particles exist near the parent comet. In years when the comet is far from the inner solar system, activity remains low. However, for approximately 10 hours centered on the perihelion passage, rates can skyrocket. So, the possibility of a storm exists, and if it's at all clear the night of the 17th, get out there and look, starting about 11 p.m. and going until nearly dawn the next day (you will, hopefully, know when you've had enough). A peak of 5 a.m. is fairly normal. The favored locations calculated to have the best shot are on the other side of the world, basically (Europe and the Middle East) but this kind of guesswork is not all that precise, so there's a good chance of one heck of a show for any location that night. And after last year's fireball storm...

But the Leonids are not the only shower in November.

There are also the twin-spikes of the Taurids (how apt!) There are really two different peaks, though all the meteors are attributed to comet Encke. Generally they are slow and bright, so

some of them can be quite spectacular.

The first peak is expected the night of November 4/5, and the second the night of 11/12. Both are similar in character.



Leonid Airborne Mission Logo

[Ed. note: Reports from the Leonid Mission soon!]

Daniel Stefanescu in Bucharest

continued from page one

part by media fervor, the excitement was becoming apparent throughout Bucharest. One could find eclipse glasses virtually spilling onto the ground from boulevard kiosks and bazaar tables, yet pins, cups and t-shirts were surprisingly scarce. In retrospect, I suppose that the economic hardships of Romania made such souvenirs prohibitive for most people. I also found foreigners to be almost nonexistent within Bucharest itself. That was until I learned that most international eclipse chasers had camped-out 80 miles to the west of the city by the town of Rimnicu Vilcea, the place of greatest eclipse duration. An exception was the opera tenor, Luciano Pavarotti, who was to remain in Bucharest to view the eclipse by day and to serenade a sold-out crowd by night.

With one day to go, I had decided to tie up loose ends regard-

ing my equipment and observing site. I had chosen to view the eclipse from the top of our twelve-



story apartment building for as much pictorial as sentimental reasons. I feel that witnessing an astronomical event of such intensity from familiar surroundings would add so much to the experience. Some of the activities that I had planned include: recording the temperature drop between first and second contact and changes in wind intensity and direction; photograph the partial phases, totality, pinhole crescents; and observe shadow bands, bright stars and the inferior planets; and oh yeah, actually to look at it too. Months before, experienced observers warned me not to do too many things: "you'll forget to see it!" they said.

With an hour to first contact, a crowd of family, friends and neighbors started to appear around me. A grill was lit on the lower terrace and soda and beer started to flow generously. I supposed that word had spread that I was up there and that I knew what was happening. Not really, I had only read or heard from others what to look for and what to expect from a total eclipse. Nevertheless, I felt pretty confident. After all, I had in my possession two premium eclipse glasses, three #14 welding filter plates: two for visual observation and one for my 7x20 Nikon binoculars, a Sony digital video (DV) camera fitted with a small welding-type glass filter from a

department-store refractor and with a 2x tele-extender that had yielded 40x, my 35mm Nikon with its 400mm lens covered by an 80mm Thousand Oaks Type 1 glass filter, and another Sony video camera (Hi8), left with its exposure setting in a fixed position and situated to record ourselves throughout the eclipse. In addition, I brought an eclipse ephemeris by NASA's Fred Espenak with the exact lunar transit timed for Bucharest and a watch



synchronized to the UT. For a qualitative wind measurement I fashioned a small, yellow foam ball with a five-foot fishing line and tied it to a roof antenna element in clear view of the Hi8 video camera. For recording temperature fluctuations, I used a room thermometer carefully wrapped in reflective paper placed in the relative shade of the Hi8 video camera.

With less than 30 minutes before first contact, I discovered a camera instability when viewing the sun's disk through the 35mm Nikon. It seemed the weight of camera was not sufficient to dampen vibrations caused by sporadic winds. I then loaded its tripod with about 20 pounds of concrete roofing plates previously loosened by heavy winterers. Now, come what may, I felt ready!

With first contact now imminent, I found it difficult to believe how synchronized the clouds were

Continued on next page

Stefanescu from Centerline

continued from page five

with the advancing penumbral edge. Just after 12:41 p.m., I confirmed first contact at my location. Looking at the little bite through tenuous clouds made my heart sink a little. I photographed the lunar progression every ten minutes. As the air cooled and contracted with increasing rapidity, a remarkable change in air movement was felt. The wind direction was now directed toward



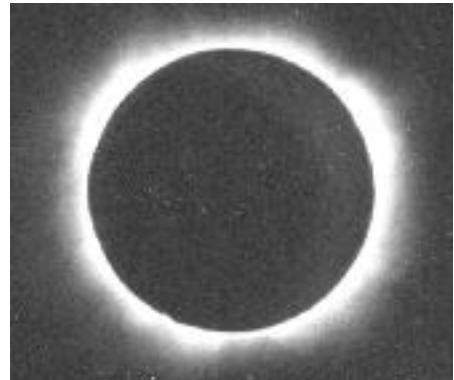
the advancing darkness as it rushed past us in a strong, laminar flow. All agreed that the breeze was quite revitalizing. After all, we had endured 100F temperatures since noon.

The sun's crescent had gradually decreased to less than 5%; an eerie yet pleasing effect occurred—one might compare it to a dark storm cloud passing in front of the sun, yet instead of dissolving, if you can imagine, all shadows retain a razor-sharp quality. Shadows of buildings, people and things had become so sharp and distinct that the entire scene took on a surrealistic appearance. Thin clouds remained on the scene, but a reassuring opening had lingered around the sun for quite some time. By then, the temperature had dropped by 20 degrees since first contact; it felt really good.

I could sense my pulse rate climbing as the remaining rays of sunlight trickled past the moon's eastern limb. "Mai sunt zece

secunde!" (Ten seconds left!), I shouted. Already, I had a feeling that I was missing it for some reason. It was too quiet, too fast, and too smooth to be real! Suddenly, Baily's beads appeared. Like distant welding arcs, they lit up the thin clouds with their bluish-white brilliance. Then, within two seconds, they merged to form the first diamond ring. For an instant, the diamond increased in brightness due to heightened contrast with the darkened sky. Three, two, one! Wow, Totality! I tried to give special attention to the visual extent and structure of the sun's coronal streamers as well as to its numerous prominences. The inner corona was bluish-white and was punctuated by small crimson nodes. A half of a solar radius beyond, most of the gossamer streamers was obscured by haze. I was fascinated by the change in light of the inner corona as it was occulted first by the trailing edge and then by the leading edge of the moon. I was also moved by the unusual look of Bucharest at this time. Streetlights turned on as did the large neon billboards, which were affixed to buildings just south of the centerline.

That evening, as an addendum to a glorious spectacle, the U.S. ambassador to Romania extended an invitation to American citizens to his



residence in commemoration of this great event. Present were astronomers of the Romanian Academy Astronomical Institute including Dr. Magda Stavinschi with whom I had previously conversed. In addition, a Romanian cosmonaut who had flown on a space shuttle mission accompanied Dan Goldin, NASA's principal director. After meeting with the hoards of American tourists and fellow astro-nerds, Dan gave a brief speech describing present missions and future space telescope projects. His presence was made even more remarkable by his declaration of having significant Romanian ancestry.

The remainder of my stay in Romania included visiting with family as well as more sight-seeing in Bucharest and a trip to the ancient port city of Constanza by the Black Sea.



Mooning

Dave North

First, some lunar events: The strongest eastern libration will occur around November 2 and 30 (twice!), which will be near third quarter (both times). There won't be any terminator over there, but it should be a very good opportunity to look over the eastern Maria (such as Anguis, Humboltianum, etc). The western libration will be November 18, which is more or less a mirror image of the eastern libration, and should afford a good glance of the actual Mare Orientale. This one happens at a convenient hour (starting right about sunset) so it's a definite "consider looking." The moon will pass very near Venus, Uranus, Neptune and Aldebaran at various times this month, but none of the occultations will be visible from the SF Bay Area (though it looks like Africa will get some real treats).

I get mail, oddly enough. And question/comments about the column, the moon, and the state of observations. Some of it was pretty interesting this month, so I think I'll do a "talkback" column this month. One of the more interesting questions was posed by Bill Arnett, who asked me if I knew anyone who would know where everything with a name in Rukl's atlas would be on the moon. Having not thought about it before, I realized I didn't... and in fact didn't know anyone personally who knew more named moon locations than me (though I forgot them all the time). He was curious if there was a "Jack Zeiders & deep sky" of the moon around here. The answer is, no. And that's something of a sorry state of affairs, when you think about it. Here in the shadow of Lick, where looking at the moon was so well executed... However, just for ducks I tried counting how many things I could identify on the moon, and gave up (got tired) at 150. Lest you find this monumental, think about how many people around here can easily match that in Messier and

NGC numbers. Probably hundreds! But how many named items are there on the moon? I don't know. Rukl lists (if I count right) over 800 craters alone! Plus eight catenae, 34 lakes, 34 dorsae, 40 seas, 23 individual mountains and 18 ranges, three marshes, 80 rilles, an ocean... I don't think I'm up to it. It's not as tough as memorizing the NGC, maybe, but more than I'll ever do. And perhaps we shouldn't be surprised that there aren't that many around after all...

A note from Frank VanSlager



Three of the many lunar features known to the author: craters Walter, Regiomontanus and Purbach. Sketch by Jane Houston 7/1/98 6 inch reflector at 133X

pointed out that my explanation of the libration in latitude was incorrect; that the bunk about the ecliptic was just rumor and innuendo and the real reason was much more simple and direct: that the moon's equator is inclined to its orbit, just like ours is (which causes the seasons and, you guessed it, exposes first one of our poles—then the other—to the sun. Yow! Not only did that make sense, it made more sense than the old explanation I read some thousand years ago and repeated in last month's column. That prompted me to look it up, and sure enough he's dead right. The inclination (for nitpickers) is 6.41 degrees by most sources, which matches closely (but not quite) to the actual librations. There are other factors, but they simply don't add up to much. Public

peer review: what a concept! You get to air your silly ideas where everyone can see them. But this one is particularly onerous in that the wrong explanation is much harder to understand than the right one. Anyone who has read a history of dissemination of misinformation knows "innocent" (unthinking) parrots like myself are usually the biggest single factor in the continuation of such goofy folklore. Good call, Frank! Besides, it's nice to know someone reads the column.

Another point worth mentioning: the guy who put together an incredible collection of moon photos in a recently released book, Michael Light, will be our January speaker. This should be extremely interesting. He spent four years scanning the archives of the National Aeronautics and Space Administration in Houston, reviewing photographs taken from the six Apollo missions to the moon. He then employed digital technology to enhance the original NASA "master dupes." His book, Full Moon, inspired the SF Museum of Modern Art to put on an exhibition of very large copies of his photos until January 4, 2000. Don't worry, the moon is Y2K compliant....



Sinus Iridum, the Bay of Rainbows, sketched 7/4/98 by Jane Houston. using 6 inch "Red Dwarf" at 133X.

Show and Tell 1999

Jane Houston

Slide and Equipment night is by nature a showcase event in the SJAA. This year was no different. Well it was a little different, actually. How many astronomy slide shows begin with the *Pastorale* from Handel's *Messiah*, and end with the *Adagio* from Mahler's Second Symphony? If you attended the September 25th meeting you'll know what I'm talking about. If you didn't, my description cannot begin to portray the visual and aural feast we were served. Paul Graves began his incredible Solar Eclipse slide presentation with moon and music. Paul travelled to Hungary for the eclipse, and his slides from the air were almost as spectacular as his eclipse slides! First the moonrise was visible all the way across the continents and oceans from the airplane, compliments of the polar route. The clouds were so spectacular! Across the English channel and on he flew. His final destination was the town of Balatonfured on Lake Balaton in Hungary. Mike Koop and his group were staying at the same hotel as Paul and his group! What a small world this is!

The slides showed so much more than the eclipse. Haystacks at the centerline. The views Paul showed of the eclipse, from the dramatic cloudy sky just a few hours before the event, to the darkening sky during, and through to the end of the eclipse kept the audience spellbound. We all shared the joy as the clouds moved away to reveal our sun. First contact through to totality, from the diamond ring to prominences and corona, the slides flowed from one to the other, revealing the unfolding majesty of the solar eclipse. Each special slide was punctuated by an appropriate and regal musical selection. Near the end of his slide presentation, Paul selected Hungarian composer Antonin Dvorak's Symphony "From the New World" composed in New

York in 1893. The movement, entitled "Going Home" was emotionally powerful, as were the slides. As Paul was "Going Home", he spent as much time as he wanted in the cockpit, snapping pictures of the icy white continent of Greenland. The images of glaciers and icebergs through the cockpit window were breathtaking! He finally had to relinquish his birds-eye view about the time for decent and landing. It was time to go home at last.

This was the main event at slides and equipment night, but there were other shows and tels. I had the misfortune to follow Paul's slide show with a few slides of sunset at Ayers Rock, Australia. Luckily, Paul let me use his smooth slide projector and cool music to accompany my show, so the audience didn't get too edgy.

On the Equipment end of things, Paul Mancuso showed his

digital camera setup and some images he took with it at Fremont Peak using his C-8. Orion demonstrated the new Nextstar scope. Gary Mitchell showed his solar filter, and I'd better stop now because I lost my notes of who else had stuff to show. Let's see...Dave North and Akkana Peck showed their amazing 3-D spackle moon, complete with thirty or more geologically correct lunar features. Rich Neushaefer showed his new AP scope. Another AP, Rich? The 92.5mm F4.9 "Stow-away" with a flourite triplet objective is another of Roland's creations. What else is new?? Oh yeah, Jay Freeman had a puzzle for us to unravel. Any luck finding the edges yet, Jay?

If I forgot anything, just drop a note to the Editor at Ephemeris@whiteoaks.com and I'll cover it next time.



Mark Taylor and Jane Houston look over new mirrors from last year's SJAA mirror grinding class.

The Shallow Sky

Akkana Peck

The big news this month is the Mercury transit on the afternoon of November 15. This is a fairly rare event — once a decade or so — so break out your solar filter and take a look! (Of course, the usual warnings about solar viewing apply — don't look at this without a safe front-aperture solar filter or a projection setup.)

Mercury will be very close to the sun's northern limb, and because of limb darkening (the tendency for spherical objects to appear darker at the edges), some observers predict that it may be somewhat difficult to see the silhouette of the small planet (only 9.9 arcseconds) against the sun's limb, so seeking out clear skies and good seeing may be worthwhile. Use a relatively high magnification, rather than the low power full-sun view many people prefer for sunspot and general solar viewing.

Viewed from San Jose, the planet should first hit the sun's northeast limb at about 1:11pm PST, and end its transit almost exactly an hour later. Some observers of past transits have reported seeing Mercury slightly before first contact, silhouetted against the inner corona.

What do you do at night while you're waiting for the 15th? Well, look at Jupiter and Saturn, of course! The biggest planets are both high in the sky, visible all night, and perfectly placed for observing this month. Jupiter just passed opposition on October 23rd — as close as it will be to us for the next decade — while Saturn's opposition, a nice one with its rings tilted a generous 20 degrees to us, will occur on November 5th.

On Jupiter, the Great Red Spot (more like light pink) and the white ovals following it are interesting

targets, as are the festoons (long pink streamers running from the bands into the equatorial zone) and transits of its moons and their shadows. You can get transit times for Jupiter's moons and for the GRS in magazines like *Sky & Telescope*, or use my Java applet: <http://www.shallowsky.com/jupiter.html>

On Saturn, look for Cassini's division, a narrow gap between the two main (A and B) rings, and for the semi-transparent C or "Crepe" ring inside the main rings. In steadier seeing, try for the much

more difficult gaps in the outer A ring.

Mars is low in the western sky, and isn't well placed for observing surface details, but a telescope will show it as a red, gibbous disk, perhaps with a few smudges of lighter and darker color. Neptune and Uranus follow a bit behind Mars, while the shrimps of the solar system (hey, I resemble that remark!), Pluto and Mercury, are both lost in the sun's glare. Venus shines high in the morning sky, showing exactly half phase as November opens.

Comet Comments For November 1999

Don Machholz

Comet LINEAR (1999 J3) heads south rather rapidly, while Comet Lee fades in our evening sky. Periodic Comet Machholz 2 reappears on its first return since it was discovered from Colfax, California in August 1994. At that time it outburst, and four secondary comets, labeled Components B-E, were found by amateurs using photography and CCD. In 1994 the comet was ahead of us in our orbit, this time it trails behind us, remaining at a declination of -11 for several months. It was recovered by Robert McNaught on Aug. 3 at magnitude 21.

In the past month the SOHO satellite found two more comets entering the solar vicinity. One was found on Sept. 4, the second on Sept. 16. A new comet was found by Robert McNaught and F. Watson using the U.K. Schmidt Camera in Australia. It will remain faint as will a couple of instrument-discovered

comets found recently. But another comet, 1999 S4 (LINEAR), is presently at magnitude 15 but may brighten up to naked-eye visibility by the middle of next year.

COMET HUNTING NOTES:
Until three years ago, the search for Near-Earth Objects (NEO's) was carried out in both the Northern and Southern Hemispheres. Then, in 1996 the Australian government stopped the funding so the Southern Hemisphere search was shut down. In the meantime the Northern Hemisphere increased its search capabilities, especially with the addition of LINEAR, in New Mexico, about a year ago. Now the Southern Hemisphere search has been re-funded and should begin soon. Robert McNaught will manage it and all the equipment is being updated.

Comets continued on next page

Ephemerides

C/1999 H1 (Lee)	Date(00UT)	R.A. (2000)	Dec	El	Sky	Mag
10-09	23h50.6m+42d22'	141d	M	8.7		
10-14	23h21.8m+35d16'	142d	E	9.1		
10-19	23h02.0m+28d51'	140d	E	9.4		
10-24	22h48.4m+23d23'	135d	E	9.8		
10-29	22h39.0m+18d51'	129d	E	10.2		
11-03	22h32.6m+15d10'	123d	E	10.5		
11-08	22h28.4m+12d09'	117d	E	10.9		
11-13	22h25.8m+09d43'	111d	E	11.2		
11-18	22h24.4m+07d43'	105d	E	11.5		
11-23	22h24.0m+06d06'	99d	E	11.8		
11-28	22h24.3m+04d46'	94d	E	12.1		
12-03	22h25.2m+03d41'	89d	E	12.4		
12-08	22h26.7m+02d48'	84d	E	12.6		

141P/Machholz 2

Date(00UT)	R.A. (2000)	Dec	El	Sky	Mag
10-09	17h23.5m-11d37'	66d	E	15.2	
10-14	17h32.8m-11d44'	64d	E	14.5	
10-19	17h42.9m-11d49'	61d	E	13.8	
10-24	17h54.0m-11d53'	59d	E	13.1	
10-29	18h06.0m-11d54'	57d	E	12.4	
11-03	18h19.0m-11d53'	55d	E	11.7	
11-08	18h32.9m-11d50'	54d	E	10.9	
11-13	18h47.8m-11d46'	53d	E	10.1	
11-18	19h03.8m-11d39'	52d	E	9.4	
11-23	19h20.8m-11d33'	51d	E	8.7	
11-28	19h39.0m-11d27'	50d	E	8.2	
11-03	19h58.5m-11d25'	50d	E	7.7	
12-08	20h19.5m-11d29'	50d	E	7.4	

1999 J3 (LINEAR)

Date(00UT)	R.A. (2000)	Dec	El	Sky	Mag
10-09	07h53.5m+06d13'	77d	M	8.3	
10-14	07h41.9m-08d55'	82d	M	8.2	
10-19	07h26.8m-26d03'	87d	M	8.3	
10-24	07h06.1m-42d25'	91d	M	8.6	
10-29	06h37.1m-55d39'	92d	M	9.0	
11-03	05h55.8m-65d07'	91d	M	9.5	
11-08	04h59.2m-71d08'	90d	M	10.0	
11-13	03h50.8m-74d18'	88d	M	10.5	
11-18	02h43.2m-75d16'	85d	E	10.9	
11-23	01h48.8m-74d54'	83d	E	11.4	
11-28	01h10.4m-73d52'	80d	E	11.8	
12-03	00h44.8m-72d35'	78d	E	12.1	
12-08	00h28.2m-71d16'	76d	E	12.5	

Elements

Object:	Lee
Peri. Date:	1999 07 11.1725
Peri. Dist (AU):	0.708101 AU
Arg/Peri (2000):	040.7006 deg.
Asc. Node (2000):	162.6490 deg.
Incl (2000):	149.3533 deg.
Eccen:	0.99974
Orbital Period:	142,000 yrs.
Ref:	MPC 35553
Epoch:	1999 08 10
Absol. Mag."/n":	6.5/4.0
Object:	P/Machholz 2
Peri. Date:	1999 12 09.2752
Peri. Dist (AU):	0.748905 AU
Arg/Peri (2000):	149.2991 deg.
Asc. Node (2000):	246.1434 deg.
Incl (2000):	012.8116 deg.
Eccen:	0.751075
Orbital Period:	5.22 years
Ref:	MPC 35815
Epoch:	1999 12 08
Absol. Mag."/n":	12.0/7.5
Object:	LINEAR (1999 J3)
Peri. Date:	1999 09 20.1699
Peri. Dist (AU):	0.9774750AU
Arg/Peri (2000):	161.9509 deg.
Asc. Node (2000):	229.0006 deg.
Incl (2000):	101.6670 deg.
Eccen:	1.0
Orbital Period:	63,000 yrs.
Ref:	MPC 35553
Epoch:	1999 09 20
Absol. Mag."/n":	9.4/4.0

Don Machholz (530) 346-8963

DonM353259@aol.com.

Web Page: <http://members.aol.com/cometcom/index.html>**Celestial Calendar**

November 1999

Richard Stanton

LUNAR PHASES:

	Date	Rise	Trans	Set
NM	19:53	PST	07	06:03 11:43 17:18
FQ	01:03	PST	16	13:19 18:48 00:22
FM	23:04	PST	22	16:59 00:01 05:57
LQ	05:19	PST	29	00:03 05:56 12:45

NEARER PLANETS: R. A. Dec.

Mercury	—	0.68 A.U.	Mag. 2.2
07	08:08	12:55 17:44	15:55.0 -22:36
17	06:29	11:36 16:43	15:16.0 -17:21
27	05:23	10:41 15:59	14:57.3 -14:12

Venus — 0.82 A.U. Mag. -4.9

07	02:49	08:58 15:06	11:54.7 +01:35
17	03:02	08:59 14:56	12:35.2 -02:03
27	03:17	09:02 14:47	13:17.3 -05:57

Mars — 1.60 A.U. Mag. +0.4

07	11:29	16:12 20:55	19:08.7 -24:09
17	11:17	16:05 20:52	19:41.2 -22:59
27	11:04	15:57 20:51	20:13.4 -21:25

Jupiter — 4.06 A.U. Mag. -2.8

07	16:13	22:45 05:22	01:46.3 +09:22
17	15:31	22:02 04:37	01:41.9 +08:59
27	14:49	21:19 03:54	01:38.3 +08:41

Saturn — 8.22 A.U. Mag. +0.5

07	17:01	23:47 06:37	02:48.1 +13:27
17	16:19	23:05 05:54	02:44.9 +13:13
27	15:38	22:23 05:11	02:41.9 +13:01

SOL Star Type G2V

Intelligent Life in System ?

Hours of Darkness

Date	Rise	Trans	Set	R.A.	Dec
10:37	07	06:38	11:51	17:04	14:48.0 -16:11
10:53	17	06:49	11:53	16:56	15:28.6 -18:54
11:06	27	06:59	11:55	16:51	16:10.6 -21:04

Astronomical Twilight:

JD	Begin	End
2,451,489	07	05:10 18:33
	499	17 05:19 18:26
	509	27 05:28 18:22

Sidereal Time:

Transit Right 07 00:00 = 02:56

Ascension at 17 00:00 = 03:36

Local Midnit 27 00:00 = 04:15

Darkest Saturday Night: 06-Nov-1999

Sunset 17:05

Twilight End 18:33

Moon Set 16:47

Dawn Begin 05:09

Hours Dark 10:35

Officers and Board of Directors

Pres David North (408) 297-5257
VP Mike Koop (408) 446-0310
Sec Jim Van Nuland (408) 371-1307
Tres Mark Taylor (408) 972-2719
Dir Bill Arnett (650) 780-9645
Dir Bill O'Shaughnessy (408) 984-3985
Dir Jim Bartolini (831) 394-7795
Dir Akkana Peck (408) 297-5257
Dir Morris Jones (408) 369-1710

Ephemeris Staff

Editor Jane Houston (408) 369-1710
Editor Morris Jones (408) 369-1710
Circulation
 Bob Brauer (408) 292-7695
 Lew Kurtz (408) 739-7106
Printing Accuprint (408) 287-7200

Mentoring Program Chairman

Ed Erbeck (408) 379-5413

Observational Astronomy Teacher

Doug Davis

School Star Party Chairman

Jim Van Nuland (408) 371-1307

Telescope Loaner Program

Mike Koop (408) 446-0310

Web Page

Bill Arnett billa@znet.com

Periodical Publication Statement

SJAA Ephemeris, newsletter of the San Jose Astronomical Association, is published monthly, 12 times a year, January through December. San Jose Astronomical Association, c/o CEO P.O. Box 110566 Campbell, CA 95011-0566

SJAA Loaner Scope Status

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

Stored 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
3	4"	Quantum S/C	Manoj Khambete
30	7" f/9	Newt/Pipe Mount	Mike Koop

Current 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 till the scope becomes available after the due date.

#	Scope	Description	Borrower	Due Date
1	4.5" Newt/ P Mount	Michael Masten	09/30/99	
6	8" Celestron S/C	David Artiga	11/06/99	
7	12.5" Dobson	Jeff Crilly	10/10/99	
8	14" Dobson	Darryl Lambert	09/04/99	
15	8" Dobson	Tim Roberts	12/03/99	
16	Solar Scope	Bill Maney	08/23/99	
18	8" Newt/ P Mount	Gordon A McClellan	10/09/99	
21	10" Dobson	Ralph Seguin	09/04/99	
23	6" Newt/ P Mount	Glenn Yamasaki	09/04/99	
24	60mm Refractor	Scott McGrew	09/04/99	
26	11" Dobson	Nilesh Shah	08/01/99	
28	13" Dobson	Bill Sweeney	07/25/99	
29	C8, Astrophotography	Dean Sala	09/04/99	
31	8"/f8 Dobson	Lee Barford	10/23/99	

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
2	6" f/9 Dob	John Paul De Silva	?	
4	60mm Refractor	Del Johnson	Indefinite	
9	C-11 Compustar	Paul Barton	Indefinite	
19	6" Newt/P Mount	Hsin I Huang	11/21/99	
27	13" Dobson	Bud Wittlin	08/01/99	

Notes:

If you know how to contact John Paul De Silva please call Mike Koop.

Submit

Members are encouraged to submit articles for publication in the SJAA Ephemeris. Send articles to the editors via e-mail to ephemeris@whiteoaks.com.

To subscribe to or unsubscribe from the SJAA Mailing List send email to sjaa-request@seds.org with a blank subject line followed by a single text line that says "subscribe" or "unsubscribe"

San Jose Astronomical Association Membership Form

New Renewal

Membership - \$15

Junior (younger than 18 years old) - \$6

Sky and Telescope - add \$30 to membership

(Sky & Tel will not accept multiyear subscriptions)

Make checks payable to "SJAA"

Bring this form to any SJAA Meeting
or send (along with your check) to

San Jose Astronomical Association
c/o CEO
P.O. Box 110566
Campbell, CA 95011-0566

Name: _____

Address: _____

Phone: _____

e-mail address: _____

SAN JOSE ASTRONOMICAL ASSOCIATION
c/o CEO
P.O. BOX 110566
CAMPBELL, CA 95011-0566

NON-PROFIT ORGANIZATION
U.S. POSTAGE PAID
PERMIT NO. 5381
SAN JOSE, CALIFORNIA