

# SJAA EPHemeris

## Ring-of-Fire Over The Outback

Ernie Piini

Of the three types of solar eclipses that occur — partial, annular and total, I consider a total the best. So why travel 12,000 miles to see a second-rate annular (Ring type) eclipse? I did, because on three previous tries my views were partially or totally obscured by clouds.

In 1994 in Southern California, for instance, a marine layer of clouds marred that annular eclipse at sunset. However, if I were to cut and paste strips from my photographs of that event I would end up with a perfect ring. The chance of seeing a perfectly clear annular in

Australia was enticing.

I flew the usual grueling 13 plus hour flight to Sydney and then on to Perth where I teamed up with Joe Cali, who lives in Canberra and whom I met at the 1995 total eclipse in Bolivia.

We spent Saturday morning Feb. 13 looking for another hotel room because we lost our first room due to Valentines Day. This day is very popular in Australia and rooms become a premium. Later, we got to see a little of Perth, a beautiful city with an interesting skyline and the colorful and nearby Swan River meandering through.

We took a 30-minute boat ride over to Rottnest Island, discovered by the Dutch in 1696. They found an abundance of what they thought were rats and named the Island Ratnest. But when they realized the mammals, now called Quokkas, were actually four times larger than rats, the Island was renamed Rottnest. This historic island, attached to the mainland eons ago, is a photographer's paradise and a haven for cyclists with its rugged terrain and deep blue coastal waters of the Indian Ocean. It is a must visit when in Perth. Adjoining Perth is Fremantle, the site of the America's Cup yacht race several years ago.

On Sunday, Valentines Day, we rented a car and drove north 425km (255 miles) to Geraldton, a city on the coast. We arrived early in the afternoon and took time to investigate possible eclipse sites. Joe Cali had an excellent map of that area complete with fences and RR tracks noted. We checked out three locations and with the aid of my Global

## SJAA Activities Calendar

Jim Van Nuland

### April

- 23 Houg Park star party. Sunset 7:51 p.m., 65% moon sets 3:27 a.m.  
24 General Mtg. at Houg Park, Noon, Swap/Auction IXX

### May

- 1 Observational Astronomy class, Houg Park, 8 p.m. Using telescopes: setup, collimation, other maintenance issues. Finding objects with coordinates or star-hopping, magnification, filters.  
7 Houg Park star party. Sunset 8:03 p.m., 56% moon rises 2:00 a.m.  
8 Star party at Peak. Sunset 8:00 p.m., 46% moon rises 2:36 p.m.  
9-16 Texas Star Party  
15 Star party at Coe (no host), Peak. Sunset 8:08 p.m., 1% moon sets 8:35 p.m.  
21 Houg Park star party. Sunset 8:15 p.m., 49% moon sets 2:06 a.m.  
22 Astronomy Day event at The Tech Museum.

### May (cont.)

- 22 General Meeting at Houg Park, 8 p.m., Chris Cody, "Bad Astronomy"  
28-31 Riverside Telescope Makers Conference  
31 Memorial Day
- June**
- 4 Houg Park star party Sunset 8:25 p.m., 71% moon rises 0:39 a.m.  
5 Short Star party at Peak. Sunset 8:22 p.m., 61% moon rises 1:14 a.m.  
12 Star party at Coe, Peak. Sunset 8:27 p.m., 1% moon invisible  
18 Houg Park star party. Sunset 8:31 p.m., 34% moon sets 0:40 a.m.  
19 Observational Astronomy class, Houg Park, 8 p.m. Planetary observing: What to look for on each of the planets, e.g., why Sinus Meridiani is important on Mars; how to look for Encke's division, etc.  
26 General Meeting at Houg Park, 8 p.m., Bob Garfinkle, lunar topic

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

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

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## Ring-of-Fire Over The Outback

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Positioning System (GPS) decided on a centerline position about 60 km (36 miles) east of Geraldton in the Australian outback—complete with plenty of sweat-seeking flies, red and black ants, and some wind. The ants come out of their holes in the late afternoon and early morning.

Tuesday, we packed a lunch, cold drinks, and our equipment and headed for our site around 11 a.m. Peter and Evon Anderson from Brisbane soon joined us. The four of us had the entire site to ourselves except for a billion flies. The temperature was 105 °F when I set up my equipment under the shade of a tree. I was still calibrating my clocks and telescope when Peter announced first contact. It was sooner than the 2:30 p.m. prediction I had jotted down earlier. Despite fighting the flies and acclimating to the heat, we finally had everything under control. There was just a slight, pleasing and welcome breeze.

For this eclipse I mounted a Celestron C-90 telescope and my

Canon AE-2000 camcorder side by side on a Takahashi Sky-Patrol equatorial mount. I used a Pentax ZX-5 camera body with a remote controlled cable coupled to the C-90 telescope. I used Fuji Sensia-100 transparency film for exposures of 1/2000th second.

It is a great feeling to have nothing but clear blue skies on eclipse day. As the partial eclipse progressed towards annularity, the surrounding sky became a deep blue with the planets Venus and Jupiter sparkling to the East. At last, the first of my four annulars to be perfectly clear!

Second Contact, when the ring of the annular is complete, occurred at 3:28:41 p.m. according to the time recorded on my video. At mid-annularity the perfect ring (indicating we were right on the center line) occurred as predicted at 3:28:55 p.m. Third Contact, when the ring

begins to break up, was recorded at 3:29:09 p.m.

According to my video record, annularity lasted for 28 seconds.

As for animal behavior, the big thing I noticed were the appearance of ants all over the ground as the eclipse progressed. Few were around before this event.

The temperature decreased from 105 °F to 88 °F just after third contact for a total drop of 17 °F. No humidity recordings were attempted.

The winds were a mild 5-10

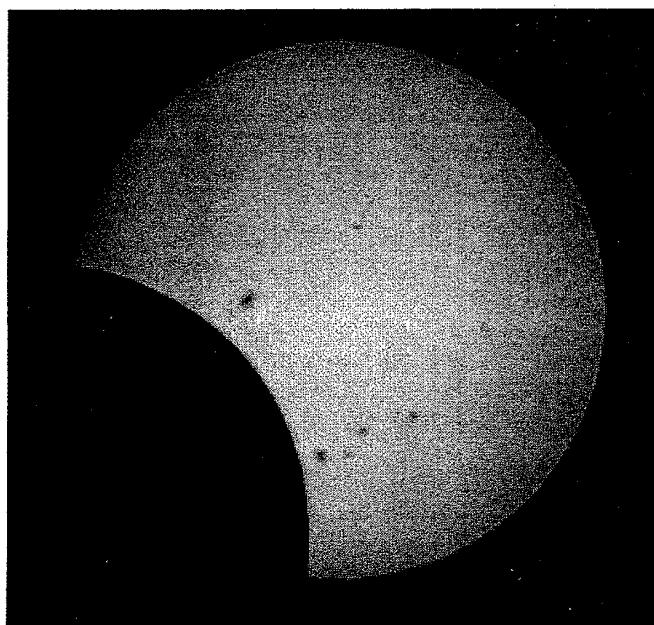
mph throughout the period up through annularity, but increased to about 50 mph about 4 minutes later. Thank God they did not appear earlier as they would have seriously hampered my results.

That evening NASA's Fred Espenak hosted a post eclipse dinner at the Skeeta's Garden Restaurant in Geraldton. Present were about 100 eclipse chasers from various parts of the world. Of great interest, besides the delicious dinner, was the attention Fred received. He was the celebrity and many people jockeyed for a chance to shake his hand and have

their photos taken with him. I've known Fred for over 25 years and have been to several eclipses with him during our early involvement with eclipse chasing. He has generously provided me with valuable information about future eclipses to include in my books and anything else I asked for. He is a close personal friend and I'm happy to see him become the respected astrophysics legend he has.

Wednesday, February 17, we headed north to an area called Sharks Bay World Heritage about 400 km (240 miles) north of Geraldton. Our first stop was Hamlin Pool where beds of Stromatolites lie on the beach. These are some of the oldest living organisms in our world and began their reef like buildup a billion years ago. Close by are beaches filled with small shells which have coalesced into solid, rock-like formations and are now being sawed into blocks and used for building.

Further north at Monkey Mia, wild dolphins interact with people for food. Visitors line the beach from 9 to 11 a.m. and again at 1 p.m. to see about a half-dozen selected people walk out a few feet into the



Encroaching Moon, February 16, 1999. Annular Eclipse, taken 60 km East of Geraldton, Western Australia. C-90 telescope (f/11), and Pentax ZX-5 camera body using Fuji Sensia-100 film, 1/2000 second exposure. Note large sunspots present that day. Photo by author.

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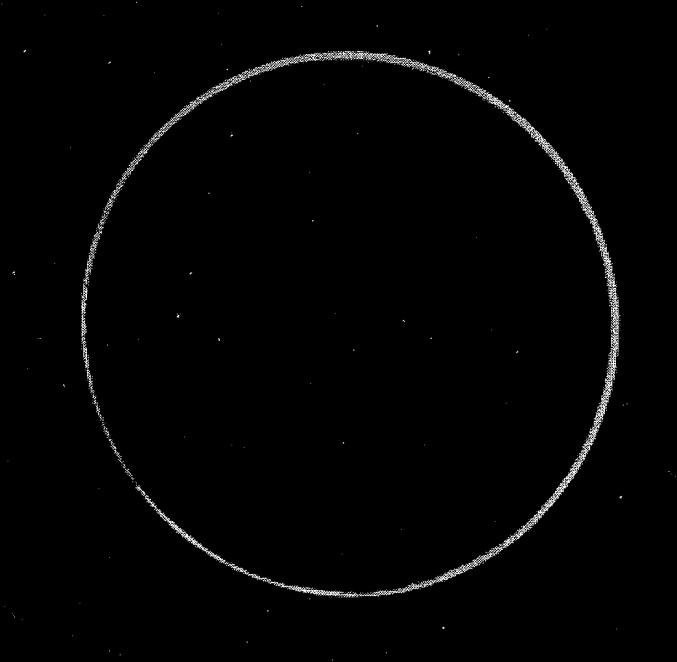
sea to hand-feed a dolphin a fish. I spotted about eight bottle nose dolphins in this group. Thursday we began our return journey. We stopped overnight at the Kalbarri National Park to study ancient red rock formations along canyons and sea cliffs. Interesting color changes on the scenery occur at sunrise and sunset and are a delight to watch.

On Friday afternoon we were treated to an interesting sight of upright stone formations known as "Pinnacles of the Desert" near the town of Cervantes. Here a forest of trees washed away leaving only the roots which petrified in an upright position. As eons passed, limestone formed around the roots and became groves of standing stones. I felt like I was in nature's stonehenge. Each stone was of different shape and size ranging from a one foot to eight feet tall. Long shadows cast by the setting sun made the scene even more dramatic.

The biggest treat other than seeing the dramatic "Ring-of-Fire" on Tuesday was another view of the Southern Skies. It is so dark in the outback of Western Australia that the view of the night sky is unbelievable. The Southern Milky Way with the Southern Cross, Eta Carina,

Alpha and Beta Centauri, embedded in it (to name a few) is like seeing heaven. The Magellanic Clouds, large and small, do look like clouds. Our Northern constellations Orion and Leo appear high in the sky, upside down. I love those skies down under.

The roads we traveled were mostly two-lane. In the oncoming lane, three-trailer "truck trains" pass by with a gush of wind nearly pushing you off the road. It's scary. And you hope that a kangaroo does not leap out in front of you as you drive these lonely stretches. We saw dead "roos" lying in the middle of the road and wondered how the cars involved made out. I did some driving on the "wrong side of the road" but mostly in the outback. I remembered my



*Near Mid-Annularity. Photo by author.*

previous trip to Australia for the 1993 Transit of Mercury with friend Joe Shrock. Dead tired after a 13-hour flight to Sydney, we rented a car for our trip to Canberra. I lost the coin flip and got to learn how to drive "on the wrong side." Within 20 minutes I had an accident in Sydney. I was trying to make a left turn from the inside lane. The young lady I hit was very nice to us. She helped us get to the police station for our report and later to the airport to pick up another car. She even sent us a Christmas card that year.

Saturday Morning, February 20 began at 4 a.m. as Joe Cali and I both had early flights out of Perth. We bade farewell and headed home on our separate paths. I once again "Waltzed my Matilda (telescope)" and new found memories back to California.

*[Editor's Note: Join Ernie at the General Meeting of the SJAA on July 24 for slides and more from his trip.]*



*Past 3rd contact magnified. Note lunar profile showing "beads" caused by lunar valleys and mountains. Photo by author.*

## Mooning

### David North

Continuing with my theme of "when does the moon get high" we'll take a look at an early moon this month — only four days old.

Normally, this means the moon will soon set and there is not much you can see. But on this day in which it will be at its highest northerly declination, it will still be 40 degrees above the horizon at sunset. That means it will linger for hours, but also that you only have a very short window for good viewing. Tonight, sunset viewing is a must.

Sunset is a fine time to view the moon. Often, the seeing is very steady, and it's easily dark enough to see our bright companion.

Why look at the moon at a time like this, when it's just going to drop down into the soup in an hour? Because this particular part of the moon is usually seen after full moon, as it rises late at night or in the early hours of the morning when it is well placed. But at those times, the light comes from the other side. This month, we can see it in morning light!

So off we go. What is there to see?

Something of a treat, actually. The libration at this time will be fairly strong, showing much of the eastern limb that isn't often visible ... and that will be just a setting for the action along the terminator. A

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***“...That will be just a setting for the action along the terminator. A frame for the painting.”***

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frame for the painting. You'll be able to see large sections of the Humboldt Sea and Mare Smythii, along with very good views of Mare Spumans, Anguis and etc. Make sure you take a look along the limb.

Along the terminator (where night meets day) you'll probably notice a large crater at sunrise in the north: that will be Hercules. Right next door in very good light you'll see Atlas, a cracked and beaten crater with some very nice rilles in

the floor.

Further south, the area of Mare Crisium will be in very good light. In particular, you'll be able to inspect the area known as Palus Somnii, just to the west of Crisium (which Jay Freeman thinks of as a teddy bear, but reminds me of the head of a flatworm). Try to memorize what you see of Somnii in this light, when you can make out the topography somewhat — then compare it a few nights later when you can see the odd rays from the crater Proclus, which seem to go everywhere but over Somnii. This is its defining trait. (It's presumed the ray structure is due to the angle of impact of the object that formed Proclus).

Where Mare Fecunditatis is near the terminator, you may have a shot at some nice rilles that edge the mare. The easiest is the Goclenius complex, which are long and multiple and may show well. Near the middle of the moon you may also see the fingers of Rima and Rupes

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## Minutes of the Meeting of the SJAA Board of Directors

1999 March 27

Bill Arnett

The meeting was called to order by President Ed Erbeck at about 6:38 pm at Houge Park. All directors were present except Jim Bartolini, who was excused.

Dave North was elected as our new President and Mike Koop as VP. With that the gavel was passed to Dave with a big round of thanks for Ed.

We still need a Treasurer! In the meanwhile, Dave North will consult Bob Elsberry as to proceed with the treasury.

It was agreed that Morris Jones would take the remainder of Terry Kahl's term.

As it seems to be completely moribund, the Observatory Commit-

tee was officially disbanded.

Morris Jones agreed to take over the coffeepot and slide projector.

There was much discussion of the upcoming Swap/Auction: First, both Jay and Kevin have agreed to be auctioneer. Kevin was asked first, but JVN also accepted Jay's offer, having missed the mention by Ed that Kevin would auction. After discussion, the feeling was that we should not have dueling auctioneers, nor sell the job as was done in 1998. JVN to write Jay.

Second, the general feeling is that noon is an okay starting time, but the Auction should be moved up,

perhaps to 3 pm as that last hour is dead. But we can't do it this year as the publicity says 4 pm.

Finally, a suggestion was made that the Auction should be run first, then the swap meet later to sell the oddball stuff. JVN feels that the buyers would much rather have it the present way. But since we can't change the format this year anyway, the issue was tabled to be discussed at a later meeting. Members who have opinions on how future auctions should be run should communicate with the board members or come to a board meeting.

The meeting was adjourned at 7:44.

## The Shallow Sky

Akkana Peck

As May opens, Mars is a week past opposition, and May 1 will be its closest approach to the earth, only a little over half an AU from us (i.e. Mars is only half the distance of the sun right now) and showing an apparent diameter of just over 16", about the same size as Saturn. It's visible all night, and the weather should be improving —this is a great time to roll out that telescope and take a look at the red planet.

How is it that closest approach is a week past opposition? The eccentricity of Mars' orbit (the same irregularity which makes some Mars oppositions so much closer than others) is the culprit.

I've collected links and information on observing Mars at [www.shallowsky.com/mars.html](http://www.shallowsky.com/mars.html). There's a new version of Mars Previewer out (still free, unfortunately only available for Windows); it's reportedly much better than the old version, though some people have had trouble installing it. Get it at [marspreviewer.cjb.net](http://marspreviewer.cjb.net) (not the skypub site where the old version was).

What features should you look for on Mars? The polar cap has been hit-and-miss; it's reported to be unusually small this year, but apparently polar haze or clouds sometimes make for a very visible polar whitening, as some SJAA observers have reported. Bright Hellas is prominent (don't mistake it for the polar cap!), as is Chryse. Quite a number of dark features have been reported, including the obvious Syrtis Major, Acidalia, and Mare Erythrium. One observer reported seeing relatively subtle features including Sinus Sabaeus/

Sinus Meridiani with a 4.5" reflector. Don't give up just because you don't have a big or expensive telescope!

Here are some recent comments from SJAA observers:

Bill Arnett: "Acidalia and the north polar cap were obvious as were some white areas on the equatorial parts of the limb which I interpreted as clouds (though one might have been Hellas). Also saw a large dark feature south of Acidalia which is probably Mare Erythraeum and its two "bays". South of there I thought I caught a glimpse of a

### *Don't give up just because you don't have a big or expensive telescope!*

white region from time to time; that would be Argyre. Mars is fun when it's close to opposition!"

David North: "Something is definitely showing where the polar cap should be ... it's pretty obvious. Mare Serpentis is pretty easy, as is Iapygia Viridis, but Deltoton Sinus is not. "Sinus Sabaeus/Meridiani/Margeritifer is thicker than pictured in Mars Previewer, and Acidalium more pronounced... but both Niliacus Lacus Boreum are very slight if at all showing. "Mare Erythrium seems bifurcated from Vulcani Pelabgus rather than joined as shown."

Bill Arnett again: "I caught most of the things Dave mentioned and they seemed pretty much as he described them except that I didn't think I was seeing as far south as Erythraeum. But I did get a good look (i.e. I saw it clearly for a few

seconds several times over a period of half an hour) at Oxla Palus. It is a long linear feature going from Margaritifer up toward Cydonia. I didn't see The Face, though :-)"

Tired of Mars yet? Well, there are a few more planets to look at. Venus is still high in the sky after sunset, nearly 40 degrees up and magnitude -4. Its phase decreases from gibbous to last quarter. On May 5th, the largest asteroid, 1 Ceres, will pass seven tenths of a degree north of Venus. Another asteroid, 4 Vesta, is also worth hunting down near the Cancer/Leo border, at magnitude 8. The May issue of Sky & Telescope magazine has a good finder chart for Vesta and many other asteroids (but not Ceres, oddly enough).

Pluto, back in its normal position as farthest planet from the sun, reaches opposition on the 31st, in Ophiuchus. Use a finder chart or planetarium program to locate and identify the magnitude 13.7 object; the one in the RASC Observer's Guide is a good one.

Jupiter moves into the dawn sky in the latter half of March. Uranus and Neptune, too, are most easily observed in the predawn hours; they're in Capricornus and bright enough (magnitudes 5.8 and 7.9, respectively) to be found with binoculars.

Mercury and Saturn are both too close to the sun this month for easy observation.

Don't forget the lunar occultation of Regulus, just past sunset on May 21st! It should be a pretty event even in binoculars or a small telescope.

## The Central Bulge — From Central Australia

Jane Houston

The spectacular shapes of Uluru (Ayers Rock) and Kata Tjuta (The Olgas) dominate the surrounding flat desert of Central Australia. They are the culmination of geologic events stretching over millions of years.

Human settlement in this region dates from at least 22,000 years. Earlier still, 900 million years ago, most of Central Australia lay at or below sea level, forming an arm of the sea known as the Amadeus Basin. 550 million years ago this basin was raised up, squeezed, crumpled, buckled into folds. These folds fractured along faults. The country uplifted and was subjected to erosion. Ayers Rock and the Olgas are the result we see today.

Ancient Australian Aborigines inhabited and worshiped here. They camped out beneath the stars for thousands of years before the invention of light pollution. They slept and dreamt under the stars. They took the night stars for granted. They embraced the darkness. It is woven into their culture through song, dance, ritual, art and myth.

The Magellanic clouds and dark patches we call dark nebulosity figured into aboriginal mythology. Some say the Coal Sack is a watering hole, surrounded by the ancestral

heroes. The great stars Alpha and Beta Centaurus, and the beautiful stars of the Southern Cross, for example, represent these heroes.

The Magellanic clouds appear as twilight ends. Appearing first as soft glows, they remind me of passing clouds. The LMC is highest and 22 degrees away from the SMC. It is difficult to discern the barred spiral shape. Most of the light and mass of the LMC is concentrated around the bar. It is rich with star clusters and nebulae. There are hundreds of planetary nebulae, supernova remnants, and gas

### *A month of Ayers Rock nights would not be enough to do observing justice.*

bubbles within the LMC. A month of Ayers Rock nights would not be enough to do observing justice. My five nights offer but a glimpse!

The single most interesting object in the LMC is the giant HII region NGC 2070, the Tarantula Nebula. Also called the 30 Dorados Nebula, it is a vast area of ionized gas 900 light years in diameter. Its mass is 500,000 suns. It owes its power to over 100 supergiant stars. To me the round dark patches,

circled by wispy arms of gas, are beautiful and flower-like. I found myself returning often to the Tarantula.

The Keyhole Nebula section of NGC 3372, Eta Carina, is a dark rift dividing the petal-like sections of the massive nebula spanning over 1 degree in diameter. Eta Carina, the star, is involved in the most interesting transformation. It is an exceptional class of supernova, surrounded by dense nebula, which is expanding at 500 km per second. Through the 20-inch, 15-inch, and 12.5-inch telescopes we could observe ropy dark knots in the nebular on either side of the unstable star.

I could go on and on. Omega Centauri, the spectacular cluster, looks like lace in the 20-inchers. Perhaps the most spectacular sights so far (after three observing nights) are the arm of the Milky Way, the Southern Cross and Coal Sack dark nebulae overhead, Scorpius and Sagitarius being pulled out of the horizon, or maybe Mars rising on one horizon and Venus setting on the opposite side — the slow tango on the ecliptic plane.

*[Dispatched by fax from Ayers Rock Australia, April 15, 1999. — ed.]*

## Keep on Mooning

*Continued from Page 4*

Cauchy emerging from shadow, which should be the name of a sitcom couple...

Perhaps the most spectacular view will be near the south, where the terminator will cut across Janssen (with the monsters Fabricius and Metius just north). Janssen has a messy floor with a large rille system inside that should show well in any scope. This is one of the

neatest craters on the moon!

You'll probably have only about an hour or less to drink it in, so come thirsty and don't waste a minute.

In other news, full Moon will be May 30, and the strongest libration of the northern limb will be only two days before that. This means the 28th (and even the night of full) should be very good for taking a look at this area, and if you're lucky you'll catch the terminator crossing

an edge-on crater. This gives you an excellent shot at seeing the terraces from the side...

For those of you who go to the seashore, May 15th will see the second strongest tides of the year, due to a particularly close perigee. So be careful.

## Meteor Watch

David North

We have two meteor showers this month, both running for quite some time. So any evening you may get to see some activity. The first shower may be disappointing for us northerners, but the second can be a real barn burner. One year I saw three big boomers on this night...

The Eta Aquarids are the outbound (post-perihelion) particles of Halley's comet. This shower is active from mid-April through the end of May with most activity occurring May 3 through May 10.

The Eta Aquarid peak is between 3 am May 5 to 4 am May 6. This year the moon is not going to be very cooperative during the entire period of most activity.

This shower is not well seen from the Northern Hemisphere due to the low radiant altitude. For latitudes around 33 deg North, observations should begin near 2:30 local time. In years with clear dark skies, you would be able to see

about 15-20 meteors/hour.

On these nights, an observer may see nearly 60 meteors per hour at shower maximum from tropical latitudes, decreasing to invisibility as you approach 50 degrees north latitude.

From the Southern Hemisphere the Eta Aquarids are by far the strongest annual shower at maximum.

Three Letter Shower Code: ETA

The Sagittarids are made up of the former Scorpions, Ophiuchids and other Sagittarid radiants. These are ecliptical radiants combined as one. They take the place of the Virginids on April 15.

This year for peak night (May 19-20), the moon will be somewhat favorable by being a couple days shy of Quarter moon phase. Noted for many fireballs!

Three Letter Shower Code:  
SAG

## Auction XIX

On Saturday, April 24, an astronomical swap meet and auction will be conducted at Hough (city) Park in San Jose. Sponsored by the San Jose Astronomical Association, this is our only fund-raiser.

Doors open at noon (or only slightly before) for the swap meet. For big items, there's a cap of \$50/item. Each buyer pays the seller. Sellers are to keep track of their sales, and pay a 10% commission.

At about 3:30 we'll break down the tables and set up for the auction. Items for auction must be registered, but there's time for that during the day. Auction starts at 4, usually done by 6. Settle-up is done afterward by one check to (or from) SJAA, then the items may be claimed. The same commission applies. Seller specifies minimum bid; if not met, it goes back to the seller with no commission applied.

There are no table fees other than a \$1 requested donation for the auction bidder/seller number. We do not handle charge cards. The commissions are tax-deductible, as SJAA is a 403(c)(3) educational organization.

### DIRECTIONS:

From Hwy. 17, take the Camden Avenue exit. Go east 0.4 miles, and turn right at the light, onto Bascom Avenue. At the next light, turn left onto Woodard Road. At the first stop sign, turn right onto Twilight Drive. Go three blocks, cross Sunrise Drive, then turn left into the park.

From Hwy. 85, take the Bascom Avenue exit. Go north about 0.2 miles, and turn right at the first traffic light, onto White Oaks Road. At the first stop sign (another 0.2), turn left onto Twilight Drive. You will now be passing the park. Turn right at the first driveway, into the parking lot.

## Yosemite Star Party

The date for the SJAA star party at Glacier Point, Yosemite National Park, has been changed to July 30-31. This has much moon, but will permit use of the Bridalveil campground.

The guideline asks for one scope for two people. There are some individuals going up, so some of you can take two guests — this hasn't been a problem.

Sunset: 8:09 p.m.

Astronomical twilight: 9:53 p.m.

Moon up 9:47 p.m., 10:21 p.m.;

92%, 86% illuminated

Sun up: 6:01 a.m.

There are more details on my web site in the school directions page, [www.svpal.org/~jvn/school.txt](http://www.svpal.org/~jvn/school.txt).

To sign up, contact Jim Van Nuland at [jim.van.nuland@sjpc.org](mailto:jim.van.nuland@sjpc.org), or phone at (408) 371-1307 after 10 a.m. and before 10 p.m.

## NCHALADA Meets

June 5, 1999, Oakland, California: Northern California Historical Astronomy Luncheon and Discussion Association, 49th meeting. 9:30 a.m.: refreshments and conversation. 10 a.m.: "Prehistory and History of Calculus", led by Alan R. Fisher, Chabot Observatory. Then lunch at a local restaurant. 2 PM: "Lunar Probes", led by Nancy Cox, San Francisco Amateur Astronomers. Meet at Chabot Observatory, 4917 Mountain Blvd., Oakland, CA 94619. For NCHALADA information, contact Norman Sperling, Everything in the Universe, 185 John Street, Oakland, CA 94611. Phone & fax: +1 510-547-6523. eMail: [nspirling@california.com](mailto:nspirling@california.com). Starting March 31: [www.everythingintheuniv.com](http://www.everythingintheuniv.com).

NCHALADA is informal, with participants pointing out perspectives from many disciplines, sometimes wittily. There are no formal officers, by-laws or dues. Contributions are appreciated to offset refreshments and postage. People who bring munchies are very popular.

## Comet Comments

Don Machholz

Comet Linear (1998 T1) is in the morning sky while Comet Linear (1998 M5) fades in the evening sky.

The SOHO satellite found a new comet on images taken Feb. 6. Comet SOHO (C/1999 C1) was a Sungrazer seen only from space. Meanwhile the Lick Observatory Supernova Search found a new comet on March 17. Comet Li (1999 E1) remains faint and is dimming.

**Comet Hunting Notes:** Of the 79 comets visually discovered since 1975, 36 were found in the southern sky. These southern discoveries were not evenly spaced throughout the year. Exactly half (18) of them took place in about three months-between Nov. 23 and Feb. 25. (During that same time only eight Northern Hemisphere finds occurred.) Good summer weather in the Southern Hemisphere does not account for all the finds; eight of those 18 discoveries were made by Northern Hemisphere comet hunters searching the southern skies. So when did Northern Hemisphere finds prevail? Between mid-March and mid-June, 11 of the 12 finds occurred in the northern sky.

## Ephemerides

### C/1998 M5 (LINEAR)

Date(00UT)	R.A. (2000)	Dec	El	Sky	Mag
04-07	08h09.3m	+67d21'	90d	E	9.6
04-12	08h14.3m	+62d51'	89d	E	9.7
04-17	08h19.1m	+58d38'	87d	E	9.9
04-22	08h23.9m	+54d41'	84d	E	10.1
04-27	08h28.7m	+51d02'	81d	E	10.2
05-02	08h33.5m	+47d39'	79d	E	10.4
05-07	08h38.2m	+44d31'	76d	E	10.6
05-12	08h43.0m	+41d37'	73d	E	10.7
05-17	08h47.8m	+38d55'	69d	E	10.9
05-22	08h52.5m	+36d25'	66d	E	11.1
05-27	08h57.2m	+34d06'	63d	E	11.2
06-01	09h02.0m	+31d55'	60d	E	11.4
06-06	09h06.7m	+29d53'	56d	E	11.6
06-11	09h11.3m	+27d57'	53d	E	11.7

### C/1998 T1 (LINEAR)

Date(00UT)	R.A. (2000)	Dec	El	Sky	Mag
04-07	23h32.5m	-02d07'	24d	M	11.6
04-12	23h33.7m	-02d18'	29d	M	11.5
04-17	23h34.8m	-02d31'	33d	M	11.3
04-22	23h35.6m	-02d48'	38d	M	11.1
04-27	23h36.3m	-03d08'	43d	M	10.9
05-02	23h36.6m	-03d33'	48d	M	10.7
05-07	23h36.5m	-04d04'	53d	M	10.5
05-12	23h35.9m	-04d44'	58d	M	10.2
05-17	23h34.7m	-03d53'	64d	M	10.0
05-22	23h32.6m	-06d36'	69d	M	9.7
05-27	23h29.3m	-07d58'	76d	M	9.4
06-01	23h24.4m	-09d45'	82d	M	9.1
06-06	23h16.9m	-12d09'	90d	M	8.8
06-11	23h05.6m	-15d28'	98d	M	8.4

## Elements

Object:	LINEAR (M5)
Peri. Date:	1999 01 24.5753
Peri. Dist (AU):	1.742203 AU
Arg/Peri (2000):	101.2881 deg.
Asc. Node (2000):	333.3762 deg.
Incl (2000):	082.2279 deg.
Eccen:	0.995988
Orbital Period:	9,000 years
Ref:	MPC 32866
Epoch:	1999 01 22
Absol. Mag."/n":	5.5/4.0
Object:	LINEAR (T1)
Peri. Date:	1999 06 25.2578
Peri. Dist (AU):	1.468118 AU
Arg/Peri (2000):	226.3361 deg.
Asc. Node (2000):	153.3540 deg.
Incl (2000):	170.1601 deg.
Eccen:	0.99915
Orbital Period:	71,000 years
Ref:	MPC 33451
Epoch:	1999 01 22
Absol. Mag."/n":	6.8/4.0

Don Machholz (530) 346-8963  
 DonM353259@aol.com.  
 Web Page: <http://members.aol.com/cometcom/index.html>

## Celestial Calendar

### May 1999

Richard Stanton

(Times are Pacific Daylight)

#### Lunar Phases:

Dt.	Rise	Trans	Set
LQ	10:29	08	01:59 07:18 12:41
NM	04:05	15	06:30 13:30 20:37
FQ	22:34	21	12:21 19:17 01:28
FM	23:40	29	19:55 00:26 05:48

#### Nearer Planets:

Dt.	Rise	Trans	Set	R. A.	Dec.
<b>Mercury - 1.28 A.U. Mag. -2.4</b>					
07	05:23	11:55	18:27	01:44.4	+08:19
17	05:30	12:27	19:25	02:55.5	+15:40
27	05:54	13:15	20:38	04:22.2	+22:35

**Venus - 0.91 A.U. Mag. -4.9**

07	08:28	16:03	23:37	05:53.1	+25:53
17	08:39	16:12	23:46	06:42.2	+25:45
27	08:51	16:20	23:47	07:29.1	+24:34

#### Mars - 0.60 A.U. Mag. -1.5

07	18:25	23:55	05:30	13:51.1	-10:33
17	17:32	23:04	04:41	13:39.3	-09:55
27	16:46	22:18	03:55	13:32.3	-09:40

#### Jupiter - 5.75 A.U. Mag. -2.2

07	04:57	11:22	17:46	01:14.2	+06:40
17	04:24	10:51	17:18	01:22.6	+07:29
27	03:50	10:19	16:49	01:30.7	+08:16

#### Saturn - 10.1 A.U. Mag. +1.0

07	05:51	12:33	19:15	02:25.2	+12:07
17	05:15	11:58	18:41	02:30.4	+12:31
27	04:39	11:24	18:08	02:35.2	+12:53

#### SOL Star Type G2V

Intelligent Life in System?

#### Hours of Darkness

Dt.	Rise	Transit	Set	R.A.	Dec.
06:38	07	06:04	13:04	20:05	02:55.3 +16:43
06:11	17	05:55	13:04	20:14	03:34.5 +19:15
05:48	27	05:48	13:05	20:22	04:17.0 +21:14

#### Astronomical Twilight:

JD	305	07	Begin	End
2,451,			04:24	21:46
		315	17	04:10
		325	27	03:59

#### Sidereal Time:

Transit Right Ascension at Local Midnite

Transit Right 07 00:00 = 13:51

Ascension at 17 00:00 = 14:30

Local Midnit 27 00:00 = 15:09

Darkest Saturday Night: 15-May-1999

Sunset 20:12

Twilight End 21:56

Moon Set 20:39

Dawn Begin 04:13

Hours Dark 06:16

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**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](mailto:ephemeris@whiteoaks.com).

**SJAA Loaner Scope Status**

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

**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
1	4.5" Newt/P.mount	Darryl Lambert
8	14" Dobson	Ralph Seguin
24	60mm Refractor	Akkana Peck
26	11" Dobson	Raymond Brinson
28	13" Dobson	Ramin Ghafouri
29	C8, Astrophotography	Alexander Koczur
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
6	8" Celestron S/C	Slone Wiktorowicz	04/30/99
7	12.5" Dobson	Phil Robba	06/27/99
15	8" Dobson	Darryl Lambert	05/27/99
16	Solar Scope	Akkana Peck	03/05/99
18	8" Newt/P Mount	Darryl Lambert	06/27/99
19	6" Newt/P Mount	Nilesh Shah	04/22/99
27	13" Dobson	Bud Wittlin	05/01/99
31	8"/f8 Dobson	John Templeton	04/30/99

**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	Notes
2	6" f/9 Dob	John Paul De Silva	?	
3	4" Quantum S/C	Manoj Khambete	6/5/99	
4	60mm Refractor	Del Johnson	Indefinite	
9	C-11 Compustar	Paul Barton	Indefinite	
21	10" Dobson	Eric Anderson	6/5/99	
23	6" Newt/P Mount	Monica Patterson	5/13/99	

**Notes:**

Do you have some space to store a scope or two? Please E-mail Mike.

**Waiting List:**

#	Scope Description	Borrower
16	Solar Scope	Bill Maney

**Periodical Publication Statement**

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