

EPHEMERIS

Vol. 1, No. 11

Official Publication of the San Jose Astronomical Association

November, 1989

DESKTOP PUBLISHING COMES TO THE EPHEMERIS!

SJAA members will notice a major change to the usual format of the Ephemeris this month. The fashion among clubs and associations these days is to use pagemaking software and laser printers to produce professional looking reports and newsletters. Under tremendous pressure and duress, your editor has finally succumbed to using these tools.

SJAA members will certainly welcome back Jay Freeman's "Celestial Tourist Speaks". This month Jay challenges the universe with his "small scope" observations. Your inputs about the new layout are welcomed.

THIS MONTH! A VOYAGE OF DISCOVERY AT NEPTUNE

On August 25th, Voyager the tiny "spaceship that could" raced past the distant, icy world of Neptune. Highlights of this historic encounter including dramatic photographs of the gas giant planet and its enigmatic moon Triton will be the featured subject of our November 18th General Meeting. Dr. Jeff Cuzzi, head of the Voyager imaging team will be our guest speaker. You will not want to miss this rare opportunity to see the latest computer processed images of the Great Dark Spot, a storm vortex the size of the planet Earth! The program will start promptly at 8 pm.

1989 AANC ASTRONOMICAL CONFERENCE

SJAA members will not want to miss the AANC conference to be held November 18 & 19, 9 am to 5 pm at Lawrence Hall of Science, University of California, Berkeley. This years conference promises to be a good one featuring the following speakers: Dr. David Morrison of NASA Ames Research Center will speak on "A deeper look at Neptune results". Jerry Sherlin, professional solar astronomer and former president

of the Astronomical League will speak on "Amateur Solar Astronomy", George Keene, retired after 30 years with Eastman Kodak, the man who "wrote the book" on astrophotography, will speak on "The Differences between Photographic Emulsions and Electronic Cameras", John Gleason noted Bay Area astrophotographer will present "Celestial Images, a Recipe for Success".

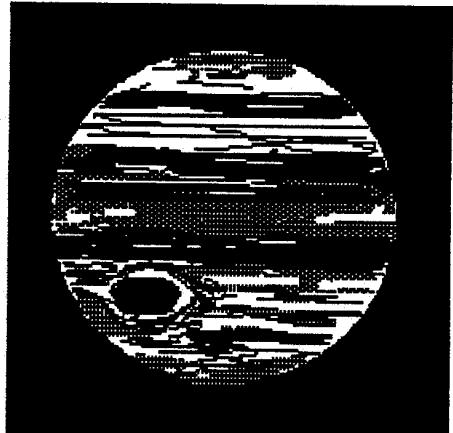
Also...there will be presentations on a variety of subjects by amateur astronomers, information about astronomy clubs from all over Northern California, displays of high quality astronomical products for sale, Astrophotography contest and exhibit (get your best shots ready), cosmic art exhibition, DOOR PRIZES!

If you wish to present a paper at this conference, send an abstract (indicate audio/visual needs) with you name, address, and phone # to the papers chairman, Don Stone (415) 376-3007 Sun-Thur, 7pm-10pm only or write to AANC Conference Committee, Chabot Science Center, 4917 Mountain Blvd., Oakland CA 94619 For more information on entering the astrophoto contest, contact Carter Roberts at the address above. Registration: \$16 for 2 days (in advance until November 8) or \$10/day at the door. SJAA members are encouraged to participate. How about the club setting up a group display about the SJAA? Maybe some of our astrophotographers can gather together a few photos for the contest.

SCHOOL STAR PARTIES

The SJAA is becoming more visible to the educational community -- we are conducting more schoolyard star parties than ever before! This is wonderful, but we need more observers. If you are not participating in these events, give Tom Ahl or Jim Van Nuland a call and volunteer! The usual is 3 to 6 telescopes, and you don't need to be an expert. It's fun to have newcomers look through your scope, as well as raising the astronomical knowledge of teachers and students!

The week of Oct. 9 - 13th saw a school session **EVERY NIGHT**, from Milpitas to Gilroy! You are needed -- it's not necessary to attend



THE PLANET JUPITER AS SEEN FROM NEWARK CALIFORNIA WITH THE 10-INCH FLUORITE REFRACTOR.

every night; once in a while will be a big help!

The Branham Lane series of star parties is an ongoing success. They have been well attended, both by members and by the public. We expect to continue them in 1990. Don't forget that we have 2 more dates scheduled, November 3rd and December 8th.

ASTRONOMY AND TELESCOPE MAKING RENEWALS -- LAST REMINDER

The renewal period for Astronomy and Telescope Making magazines is upon us. Though Jim has not received the official notification, it appears that Astronomy will cost \$14.00; Telescope Making, \$8.00 for one year (12 months or 4 issues, respectively). If you presently subscribe through the SJAA, you may send a check, preferably including a mailing label, to Jim Van Nuland, 3509 Calico Ave., San Jose CA 95124. Make check payable to Jim Van Nuland (not the SJAA). New subscriptions will begin with the January issue of Astronomy, and with the next issue of Telescope Making.

If you presently subscribe independently, you may convert to the group rate only if your subscription expires during 1990. Send a mailing label and enough \$\$\$\$ to cover the remain-

NOVEMBER 18TH 8 PM DR. JEFF CUZZI - NASA THE NEPTUNE FLYBY!

NOVEMBER 3: PUBLIC STAR PARTY AT BRANHAM LANE PARK.

NOVEMBER 4: SJAA STAR PARTY AT GRANT RANCH COUNTY PARK.

NOVEMBER 11: SJAA BOARD MEETING AT THE RED CROSS, 7:30 PM FOLLOWED BY AN INDOOR STAR PARTY.

NOVEMBER 18 - 19: AANC CONFERENCE AT THE LAWRENCE HALL OF SCIENCE, U.C. BERKELEY.

NOVEMBER 18: GENERAL MEETING AT 8 PM. DR. JEFF CUZZI - NEPTUNE!!!

NOVEMBER 25: STAR PARTY AT FREMONT PEAK STATE PARK.

DECEMBER 2: STAR PARTY AT FREMONT PEAK STATE PARK.

DECEMBER 8: (FRIDAY) PUBLIC STAR PARTY AT BRANHAM LANE PARK. DUSK TILL DAWN.

DECEMBER 9: GENERAL MEETING. SPEAKER TO BE ANNOUNCED.

DECEMBER 16: SJAA BOARD MEETING AT THE RED CROSS, 7:00 PM. FOLLOWED BY AN INDOOR STAR PARTY.

DECEMBER 23: NO-HOST STAR PARTY AT FREMONT PEAK STATE PARK.

DECEMBER 30: SJAA STAR PARTY AT HENRY COE STATE PARK

ing part of 1990. Your subscription will be extended to synchronize it with the group renewal (calendar year).

SJAA EVENTS THIS MONTH

We have several Star Parties lined up for November. November 4th there is a scheduled star party at Grant Ranch County Park. November 25th is our annual "freeze party" at Henry Coe State Park. All events are weather permitting. Don't forget that we have public star parties set up for the nights of November 3rd and December 8th at Branham Lane Park. Your help is need to make these activities a success. Our monthly Board meeting will be held on November 11th at the Los Gatos Red Cross. The meeting starts at 7:30 pm with all members invited to attend. An indoor star party will follow. This is a good opportunity to meet your Officers and Board members.

NOVEMBER STARRY NIGHTS

- RICHARD STANTON

METEORS THIS MONTH

November will show us several meteor showers during the month. Most of them will be minor but there is one major. A couple of these showers may be extinct. The only way to find out is to get outside and do some meteor plotting.

NOVEMBER METEOR SUMMARY

NOV 02 - SO. TAURIDS - MINOR
NOV 12 - PEGAIDS - EXTINCT?
NOV 13 - NO. TAURIDS - MINOR
NOV 14 - BIELIDS - EXTINCT?
NOV 17 - LEONIDS - MAJOR

ENCYCLOPEDIA GALACTICA - For those who have forgotten the visual magnitude limit of their telescope or its theoretical resolving limit and don't want to bother looking it up, here are two very simple calculations for determining them. You will need a garden variety pocket calculator that has a key on it that says "LOG". (Available at K-Mart for about \$10.) The steps to find the visual magnitude limit are: divide your telescope mirror diameter in inches by .039. When this answer appears on the screen then press the key that says "LOG". After a brief pause a new answer will appear on the screen; multiply this number by 5. To the new answer add 2.7. This final number is the limiting visual magnitude of your telescope under ideal transparency conditions. ($M = \log D$ (in millimeters) $\times 5 + 2.7$). For the theoretical resolution limit of your telescope divide your telescope mirror diameter in inches by .039 (this converts it to millimeters). Divide 120 by your diameter in millimeters and it tells you the resolution limit in arc seconds for your telescope under perfect seeing conditions, perhaps on the dark side of the moon. ($R = 120/d$). In an effort to make these instructions idiot-proof I tested it on myself and only had to correct one misstake.

DEEP SKY CHALLENGE - this month we'll drop in on Aquarius and search out a galaxy called "Atoms for Peace". My research has not yet lead me to the source of the name as yet but perhaps one of our members can tell us. "Atoms for Peace" is in the RNGC as NGC 7252. Its size is 0.8' x 0.7' and it shines at magnitude 13. It is described as faint, roundish, brighter towards the center with a high surface brightness and easily resolvable...certainly doesn't sound very appealing does it? So why the name?

NOVEMBER OCCULTATION - Get up in the wee hours of Saturday, November 18th, and you can watch the waning gibbous moon meander through the "Beehive", M44, in Cancer. This is a good opportunity for some astrophotos. You should haul yourself out early to be set up and observing by about 4 am to catch the event. Since this is national "Be Kind to Someone" week, wake up one of your friends and make them come along with you. Where's Dale Carnegie when you need him?

MISSING NEPTUNE - No, the Klingons have not stolen or destroyed it but if you've never been able to find it, now's the time. On the evening of November 12th you'll be able to see it 30 arc seconds straight up from Saturn. The simplest why to see it is with your 7X50 binoculars, all you have to do is find Saturn. It doesn't get any easier than this folks.

JUPITER'S CHANGING FACE

Two astronomers at Lowell Observatory have found that while Jupiter's South Equatorial Belt has faded dramatically in visible light, it is still quite prominent at longer wavelengths. Barry Lutz and Craig Gullixson note also that the Great Red Spot, which is rather indistinct at visible wavelengths, stands out obviously when photographed through deep red and near-infrared filters. Telescope observers should continue to monitor Jupiter for further changes in its appearance. The planet is the brightest star-like object in the morning sky this month, blazing at -2.3.

NOVA SCUTI 1989

On September 20th astronomer Paul Wild of Bern University in Switzerland discovered a 10th-magnitude nova in Scutum. Follow-up observations by astronomers worldwide suggest that Nova Scuti 1989 is a couple of weeks past maximum light. Its equinox 2000 coordinates are R.A. = 18h 49m 39s, Dec. = -6d 11m 16s. Since nothing appears at this position on the Palomar Sky Survey, the star must have brightened by 13 magnitudes or so - a factor of 160,000. Users of large binoculars or small telescopes should look for the nova in the early evening sky.

AMAZING NEW ASTRONOMY PRODUCTS DUE SOON!!!

According to my inside sources there are some exciting new products coming out soon from the R&D departments of several of the more obscure astronomical manufacturing companies. These are certain to enhance our enjoy-

ment of Astronomy!

The new Winchester 30-30 LPR device.
Visual hypersensitization eye drops.
Cloud reduction filter.
Hubble Space Telescope decoder ring.
Adhesive Messier object templates (please specify corrector plate diameter).
Solar eclipse simulation dirigible.
Black hole illuminator (1.25")
Dark sensitive film (35mm, 24 and 36 exposure rolls)
Inverse Barlow.
Western Vernal equinox collimator.
Anti-quark DC battery pack.
6-inch Teflon refractor from Kagahashi.

ASTRO ADS

ASTRO ADS are free to all non-commercial advertisers wishing to sell astronomically related products or services. Please send your ad directly to the Editor, John P. Gleason, 5361 Port Sailwood Dr. Newark, CA 94560 NO LATER THAN THE 15TH OF EACH MONTH. Your Astro Ad will run approximately 3-months.

20-INCH F/4.5 NEWTONIAN on machined aluminum German equatorial mounting. Optics made by Earl Watts, Surrier truss tube assembly. Many extras including: Meade 620 3-inch refractor finderscope, Telrad, secondary heater, quartz drive corrector, Lumicon off-axis guider, Sure Sharp focusing device, Meade computer aided telescope computer, and more! \$11,000 or best offer. Contact: Dan Beck 408-439-6020 days, 408-338-3001 evenings. 10/89

MEADE 6-INCH F/6 reflecting telescope on equatorial mount w/ motor drive. \$550 or best offer. David Richmond 408-378-3635 10/89

FOR SALE: CELESTRON 14 with wedge, tripod plus many C14 specific accessories: permanent pier plate, latitude adjust, heated dewcap, electric focus, f/5.6 to f/3.5 RFA, dual-axis drive corrector/slew, etc. No eyepieces. \$6000 or best offer. 408-353-4781 10/89

FOR SALE: 10" Newt/Cass. f/5-f/20 with superb optics. 90mm f/15 refractor guide scope and 10x70 finder. Super solid Schaffer mounting with quartz digital drive corrector. \$3800. Huge selection of accessories; eyepieces, filters, including Lumicon solar prominence filter, cases etc. Will sell accessories separately or with scope for \$4500. Call for list and photo. Jim Baumgardt (415) 574-1500 days or (415) 692-5337. 9/89

FOR SALE: 4" f/30 professional solar prominence telescope. Missing Ha filter. Great for this active solar cycle. \$150.00. Jim Baumgardt (415) 574-1500 days or (415) 692-5337. 9/89

from Lockheed in Sunnyvale in a specially modified C-5 transport airplane. A couple of years ago, the plan was to barge it through the Panama Canal.

MEADE, Model 320 refractor, 80mm, telescope with equatorial mount and tripod, several eyepieces and acc's. Like new. Call Dan, (408) 736-1827 \$500 firm.

SUPER C8+ with starbright and 2" accessories including Orion 2" adapter, star diagonal, skyglow and ultra-block rear cell filters, Parks 2X Barlow, 55mm, 40mm, 32mm, 25mm, & 10mm 2" eyepieces, counterweights, dew shield, accessory tray, accessory case (large Orion), Celestron single axis drive corrector (12 VDC operation) declination motor w/hand control. All for \$1200 firm. Call or write Mike Schartman at (408) 946-8395, 2262 Yosemite Dr. Milpitas, CA 95035.

FOR SALE: ASTRO-SCAN 2001 by Edmond Scientific, Celestron 2X Barlow, and 12.5 mm Orthoscopic eyepiece. All like new. \$300. Contact Mrs. Burns. 408-984-1409 8/89

CELESTRON 8, with wedge, Meade tripod, 6x30mm finder, diagonal, filter set, Nikon photo adapter, 40mm Kellner, 25mm Kellner, 20mm Wide-Angle Kellner and 9mm Kellner 1 1/4" eyepieces. Hardly used. \$995 or Best Offer. Chris Kralik, Home: (702) 851-2140 (Reno), Work: 415-877-5094. 8/89

SPACE PROGRAM UPDATE

- BOB FINGERHUT

GALILEO LAUNCH RESCHEDULED FOR OCTOBER 17TH

By the time you read this, the Galileo spacecraft should be on its way to explore Jupiter and its moons. The launch must take place by Nov. 21 or the mission will be put off two years so that Venus, Earth and Jupiter are in proper alignment. After release by the shuttle orbiter, Atlantis, and IUS booster will put Galileo on a course to arrive at Venus on Feb. 9, 1990. Galileo will return to Earth on Dec. 8, 1990 where it will receive a gravity boost that will take it past the asteroid Gaspara on Oct. 29, 91. Galileo will return to Earth again on Dec. 8, 92 to receive another gravity boost. Galileo will fly by the asteroid Ida on Aug. 28, 93, release its probe on July 7, 95 and arrive at Jupiter on Dec. 7, 95. On arrival at Jupiter the spacecraft will relay the data from the probe's descent into Jupiter's atmosphere to Earth. From Dec. 1995 to Oct 1997 Galileo will study Jupiter's atmosphere, magnetosphere and moons.

HUBBLE SPACE TELESCOPE MOVED
The telescope was moved quietly on Oct. 4

REDUCED FUNDING RESULTS IN SPACE STATION CHANGES AND DELAYS

NASA requested \$2.05 billion in fiscal 1990 for the space station. The House voted to cut the station budget by \$400 million and the Senate by \$200 million. The final cut will be determined by a conference committee. NASA has also been told that they will not get all of the \$3 billion 1991 request. As a result, NASA has made design and schedule changes to the program. The first shuttle launch with station hardware will still be in March 1995 but station completion will be delayed 3.5 years to 1999. Design changes include switching from an A.C. power system to a D.C. system and use of hydrazine attitude control thrusters instead of hydrogen/oxygen thrusters. Man-tended capability will slip six months to April 1996 and with only 50% of the solar arrays installed. Permanent manned capability will slip six months to July 1997 but only for four astronauts without the shuttle attached. An eight member crew is not planned before 1998 or 1999. The Japanese Experiments Module will be delayed nine months to Feb. 1998 and the European module one year to July 1998. The new 8 psi space suit will be deferred requiring station construction with the shuttle 4 psi suits. The 4 psi suits require prebreathing before every space walk with oxygen to prevent the bends.

ESTABLISHMENT OF A LUNAR BASE WILL REQUIRE SPACE STATION IMPROVEMENTS

NASA has been studying modifications required to support the White House lunar/Mars initiative. The station would initially be used to support flight tests of a lunar transfer vehicle and later as Earth's transportation depot for missions to and from the Moon. The station would have to support 14-16 astronauts and power requirements would double to about 160 Kw. The station would need an elongated lower truss and a lower keel with lunar rover and shuttle-C servicing bays. An area to service and orbital maneuvering vehicle must also be added.

THE CELESTIAL TOURIST SPEAKS

- JAY REYNOLDS FREEMAN

Despite a scheduled SJAA Star Party and superb conditions, I almost had Fremont Peak to myself September 23. An hour past sunset, I drove part way down the east-west road in Coulter Camp and had my choice of where to

set up. Usually I can scarcely find a place to stand on that road, much less drive in. There were only about ten telescopes in the park, and fewer than 20 people in Coulter Camp, though I heard there had been another 20 people at the FPOA's 30-inch.

What a lovely night! A temperature inversion made conditions comfortable and dewless. Widespread dense low fog and clouds blocked city lights from the coastal plain and the Bay Area, so it got pretty dark. The sky was very transparent: with the naked eye, I could see M33 with averted vision early in the evening, when it was 50 or 60 degrees off the zenith, and could hold it steadily with direct vision later on, when the fog was thicker and the galaxy higher. With my 4-inch Celestron refractor at 50X, I could see the Pleiades nebulosity when the cluster was still partly blocked by trees at the end of the road. The Merope nebula was easy, as was a smaller wisp of nebulosity that extends from Maia toward Alcyone. Later on, all the bright Pleiades stars appeared embedded in irregular balls of diffuse nebulosity. I thought I saw the Pleiades nebulosity with the naked eye as well - I often think so - but when stars are near, it is hard to distinguish irradiation within the eye from nebulae, so I am never quite sure.

Someone had a finder chart for Uranus. I chased it down in the four-inch. The tiny greenish disk was unmistakably non-stellar at 111X. A nearby star of similar magnitude provided an interesting comparison - I was able to show some relative newcomers the difference between a star image and a planetary disc not much bigger. (By the way, do you all know that your deep-sky observations don't count unless you have looked at all the planets first?)

One fun thing to do with telescopes is to observe faint objects with small apertures. I have had a thing about doing so with Stefan's Quintet. I tried the 4-inch, and sure enough, at 81X, with averted vision, I could intermittently glimpse haziness at its position. Averted vision is not the best for details, but what I suspect I was seeing was the brighter nuclear region of one of the galaxies. I saw no structure in the blur. The magnification - 20 per inch of aperture, with a 1.25mm exit pupil - is a lot higher than most authorities recommended for observation of faint fuzzies, yet the Quintet was much harder to see at lower powers. This observation is not my record: I have similarly detected the Quintet with Frank Dibbell's 90mm fluorite refractor.

Presently I put away my own equipment and wandered over to the FPOA observatory. About five people were looking at the Saturn Nebula. The 30-inch gave a beautiful view of

this planetary. The ansae - the "rings" of the nebula - were easily seen and were markedly wider and brighter at the tips. There was structure visible in the elongated disc, and a hint of the central star.

I was getting ready to leave when I noticed a telescope I had not seen, at the east edge of the big parking lot in Coulter Camp. Here was SJAA member David Enos, with his 5-inch f/6 apochromatic Astro-Physics refractor. I had heard a lot about these instruments, and was eager for a look through one. David let me observe for a bit. This unit is a near-perfect rich-field telescope, and was doing a magnificent job on faint, extended objects. The dark sky and excellent telescope were just begging for a real challenge, and the FPOA had just given its coveted "No One's Gonna Believe Me But..." award to someone other than me, so I asked David a leading question.

"Have you ever tried for the Sculptor System?"

"No."

I had. During the early 1980's I attempted to observe this large, faint dwarf galaxy with several instruments, including my 8-inch f/5 Newtonian and my 11X80 binocular, without success. The galaxy is over a degree wide yet fainter in apparent magnitude than a 9th-magnitude star, so it's a toughie. I know of only one visual observation of it, by Steve Coe in Arizona, with a 4.25-inch reflector at 16X, reported by Walter Scott Houston in the November 1988 Sky and Telescope. I gave up, not because I believed it was impossible, but because I had learned the nearbystar field too well - while observing at the limit of human perception, it is all too easy for your mind and eyes to play tricks when you know where something ought to be. But that was years ago, and on September 23, all I could remember about the position of the Sculptor System was that it was somewhere (ta-da!) in Sculptor. Now was the chance for an honest retry.

I got a description of the location from Burnham's Celestial Handbook - four degrees south of alpha Sculptor - but carefully did not look at any charts. (I know where alpha was because I had used it to star-hop to NGC 253 and NGC 288 earlier in the evening.) We put a 55mm Plossl eyepiece, with 2-inch barrel, into the 5-inch, and I started looking a couple of fields south of alpha. I saw nothing I could call an object, but presently it occurred to me that with averted vision, there was a place perhaps half a degree to a degree in diameter where the sky background seemed a little brighter than elsewhere. I centered the area and asked Enos to confirm. He agreed that at times that region

did appear a bit more luminous than the neighboring sky.

This particular telescope/eyepiece combination is underpowered, in that fourteen diameters is too little magnification for a five-inch aperture. The resulting 9mm exit pupil is some 2mm larger than the pupil of the eye of a typical adult. By observing with this eyepiece, we were effectively stopping the instrument down to about four inches, wasting light, but ensuring that the pupils of our eyes were filled with light, so that the image of any extended object on our retinas was as bright as it could possibly be.

It was exciting to see a glow, but not particularly convincing. We tried more magnification. With a 32mm Erfle in a 1.25-inch barrel, I could see no glow, though the problem might merely have been that the narrower field did not allow me to see enough of the darker background to make the bright area apparent. Back to the 55mm. The glow was still there, and when I moved the telescope rapidly back and forth by hand, by ten or twenty percent of the field width, it was easier to see.

It was time for charts. I had my AAVSO Variable Star Atlas with me, but was too lazy to dig through the huge stack of pages for the right one, so I checked my old Norton's Star Atlas to see if I had ever plotted the Sculptor System. Sure enough, I had. It's hard to read Norton's to better than a degree, so the position was not very accurate, but I returned to the telescope and star-hopped from alpha to sigma Sculptor, and thence to my pencil-mark, and found myself looking squarely at our glow.

Then I remembered that I had with me another excellent instrument for observing faint low-contrast objects, namely my Orion 10X70 binocular, with enhanced low-reflection coatings on all surfaces where light moves between air and glass, and with BAK-4 prisms. I once compared this instrument to a binocular that was identical but for having conventional coatings and regular prisms, and found the enhanced unit noticeably better. I got it out and took a look. I could see the glow. It helped to pull my jacket up over my head and poke the binocular out the neck. I carefully noted the glow's position with respect to to a 6th magnitude star south of sigma Sculptor, and with respect to a handful of 8th or 9th magnitude stars a degree or two generally west of the 6th magnitude one. Then and only then did I dig into the AAVSO atlas, whereon I had long ago plotted the Sculptor System with more accuracy.

We were right on. Actually, my estimate of the center of the glow was about ten or fifteen arc

minutes north of the center of the plotted position, but the galaxy is more than a degree wide, and it is hard to determine positions when observing with averted vision. (And I have not yet found a photograph of the Sculptor System suitable for checking for possible asymmetric brightness.)

Determining a position first, then going to the charts for confirmation is about as convincing a detection as you can get. I was pleased to log this observation, and most grateful to David Enos for the opportunity to use his fine telescope.

But I seem to have missed my calling. I should have taken up spiritualism. After this experience, seeing ghosts would be easy.

Hope you have - or had - a happy Halloween.

GREAT RED SPOT

- JIM VAN NULAND

Continuing observations of Jupiter and its Great Red Spot have verified the surprising findings of last month. The South Equatorial Belt is exceedingly faint or absent, changing the appearance of the planet considerably; the Spot, on the other hand, has not looked so nice in a dozen years! Nicely orange or pink, it is reasonably distinct, floating along royally on a white background.

At the predicted times, the Spot will be facing nearest the Earth, and so will appear on the central meridian of the apparent disk of the planet. The Spot moves its own length in about 30-40 minutes.

Good seeing and power of about 200-300 are needed. Begin half an hour before the given time. Focus carefully, then scan the southeast quarter of Jupiter. Watch carefully for those moments when the air is especially stable, and the Spot will show itself in all its glory. Let me know of your results, especially if you are using an instrument smaller than 8-inches, or if you try various filters.

JUPITER'S RED SPOT

Great Red Spot on Meridian PST																	
da	mo	d	h	m	da	mo	d	h	m	da	mo	d	h	m			
W	11	1	0	32	am	F	11	17	3	37	am	F	12	1	5	14	am
Tb	11	2	6	25	am	F	11	17	11	34	pm	Sa	12	2	1	6	am
F	11	3	2	7	am	Su	11	19	5	17	am	Sa	12	2	8	53	pm
F	11	3	10	5	pm	M	11	20	1	15	am	Su	12	3	6	50	am
Sa	11	5	3	48	am	M	11	20	9	5	pm	M	12	4	2	36	am
Sa	11	5	11	35	pm	M	11	22	2	53	am	M	12	4	10	27	pm
Tu	11	7	5	29	am	W	11	22	10	40	pm	W	12	6	4	15	am
M	11	8	1	16	am	F	11	24	4	26	am	Th	12	7	0	14	am
F	11	10	4	25	am	Sa	11	25	0	14	am	Th	12	7	7	59	pm
F	11	10	10	51	pm	Sa	11	25	8	8	pm	F	12	8	5	57	am
Sa	11	12	4	35	am	Su	11	26	5	59	am	Sa	12	9	1	50	am
M	11	13	8	30	am	M	11	27	1	57	am	Sa	12	9	9	42	pm
Tu	11	14	6	14	am	M	11	27	9	47	pm	M	12	11	3	28	am
W	11	15	2	8	am	W	11	29	3	35	am	M	12	11	11	14	pm
M	11	15	9	56	pm	W	11	29	11	29	pm						

SJAA EPHEMERIS

Due to my confusion as to when Darkness Squandered Time ended, I'd failed to change the latter part of last month's table. (The headings were correct). My apologies to any who were out there an hour late. How I envy the people in Arizona, with stable clocks!

The predictions are corrected for the changing aspect, phase, and light time. At the given times, the Spot will be facing nearest the Earth, and thus will appear on the central meridian of the apparent disk of the planet, about halfway from the equator toward the south pole. Observations may be made for about an hour before and after that time. The times are given in local time, and include transits for which the planet is at least 1 hour up, with the Sun at least 3 degrees down. A random amount from 0 to 10 minutes has been subtracted, to prevent anticipation when timing a transit.

COMET COMMENTS

- DON MACHHOLZ

Comet Okazaki-Levey-Rudenko (1989r) will be in the morning sky during November, possibly visible to the unaided eye. An unusual event takes place on the morning of November 24, when the crescent moon and the comet will be less than one degree apart. On Nov. 23 and 25 they will still be within eight degrees of each other.

Comet Helin-Roman (1989s): This comet was discovered on Sept. 5 by Eleanor Helin and Brian Roman with the 18" Schmidt at Palomar. The comet was magnitude 12.5 at discovery; it was closest the sun (1.33 AU) in August and is now getting fainter.

Periodic Comet Wild 2 (1989t): Recovered by K. Meech at Mauna Kea and J. Gibson of Palomar, this comet is more than a year away from perihelion. Now it is magnitude 20, by this time next year it will be visible in amateur

scopes.

SEEKING COMETS

At what elongation are comets found? That is, as seen from the Earth, how far, in degrees, from the Sun are comets upon discovery?

My study of the 45 comets found visually by amateurs from 1975 through 1988 shows the average elongation for both morning and evening comets to be 62 degrees. The main difference between the two skies seems to be this: those found in the morning are generally moving away from the Sun, those found in the evening are moving toward the Sun. In both skies, however, those comets found near the Sun are often brighter than those found some distance away.

Comets are not visually found within 20 degrees of the Sun, the solar glare is just too bright there. If a comet is fainter than magnitude 10, it will be difficult to find when within 40 degrees of the Sun.

Incidentally, comets are found in areas opposite the Sun (elongations greater than 150 degrees) by photographic searches, often by professional astronomers engaged in other projects. Comets very close to the Sun (less than 5 degrees) are sometimes discovered during solar eclipses or by Earth-orbiting satellites monitoring the Sun.

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COMET EPHEMERIS

Comet Okazaki-Levy-Rudenko (1989r)							
DATE (UT)	RA (1950)	DEC	RA (2000)	DEC	ELONG	SKY	MAG
10-26	14h08.4m	+27°06'	14h10.6m	+26°52'	39°	E	5.9
10-31	13h59.1m	+25°13'	14h01.4m	+24°59'	39°	M	5.5
11-05	13h48.5m	+22°19'	13h50.9m	+22°04'	40°	M	5.0
11-10	13h37.0m	+17°51'	13h39.4m	+17°35'	40°	M	4.7
11-15	13h24.9m	+11°04'	13h27.4m	+10°48'	41°	M	4.4
11-20	13h12.8m	+01°07'	13h15.4m	+00°51'	41°	M	4.2
11-25	13h01.1m	-12°33'	13h03.7m	-12°49'	44°	M	4.2
11-30	12h49.5m	-29°20'	12h52.2m	-29°36'	48°	M	4.3
12-05	12h37.0m	-46°42'	12h39.8m	-46°59'	55°	M	4.7

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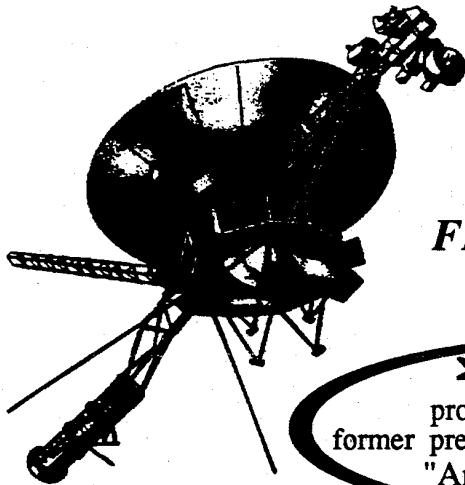
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