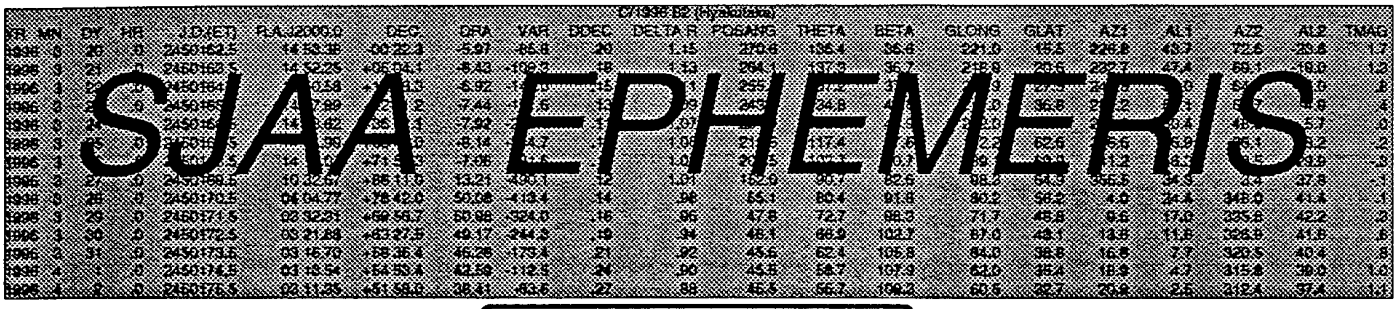

Eye on Everything
by Lew Kurtz

The June 1 meeting is a slide, equipment and member night. If you have something you want to talk about, step right up. If you have a question, ask it. We will have a slide projector for those Hyakutaki shots and anything else you have that you think would be of interest. The July meeting's speaker isBob Garfinkle on "Lunar Nomenclature". Note that the July general meeting will be on June 29. The August 3 meeting speaker will be Rod Norden talking about Kitt Peak

SJAA's star party nights at **Yosemite** are July 26 (85% Moon sets 3:02 am) and 27 (92% Moon sets 4:04 am, twilight 4:14 am both days). Contact Jim Van Nuland to sign up and for more details.

The Amateur Astronomers of Northern California's annual **star-b-q** is August 10 at Fremont Peak state park. SJAA is a member of AANC. AANC provides the burger's and dog's, you provide a side dish and your own drinks.

SJAA's Observatory Committee needs members. The observatory fund has $6,000 to spend on building an observatory. If you are interested, please contact any board member (phone numbers are on page 7).

Ed Erbeck reports that Crazy Ed's is now the exclusive US distributor for the Herald-Bobroff AstroAtlas. So, if you didn't win yours in the raffle at the swap meet, and you just gotta have one, give Ed a call.

Activities Calendar

June

1 General meeting at Houge Park, 8:00. Slide, Equipment, and Member night. Board meeting, 6:30 pm is open to all members.

8 No Activity. Moon up too early.

15 Star parties at Henry Coe and Fremont Peak state parks. Halls Valley Astronomical Group at Grant Ranch. Sun set 8:28 pm, no Moon.

20 Summer begins at 7:25 pm PDT.

21 Houge Park star party. Sun set 8:32 pm, 30% Moon set 11:59 pm.

22 Observational Astronomy Class, Houge Park, 8 pm.

29 General meeting for July, vote on new by-laws, Bob Garfinkle on "Lunar Nomenclature", Board meeting, 6:30 pm is open to all members.

July

6 No Activity.

13 Star parties at Henry Coe and Fremont Peak state parks. Halls Valley Astronomical Group at Grant Ranch. Sun set 8:27 pm, 2% Moon rise 5:19 am.

19 Houge Park star party. Sun set 8:25 pm, 17% Moon set 10:35 pm.

20 Observational Astronomy Class, Houge Park, 8 pm.

26-27 SJAA Yosemite star party, Sun set 8:12 pm; 85 and 92% Moon set at 3:02 and 4:04 am.

24 hour News and Information:

SJAA Hotline: 408-559-1221
Home page url **http: //www.rahul.net/resource/sjaa**

Extra, Extra!! Read All About It!! Bits of Lunar Crater Fall to Earth!!
by Craig D. Wandke

Tektites are natural silicate glasses which were formed, it is believed, during high-speed flight through the earth's atmosphere, following the impact of large meteorites on Earth. In 1967 Dean R. Chapman unsettled the world of science by suggesting that certain tektites are actually ejecta from the lunar crater Tycho which survived their fiery descent to Earth and which were formed "in a single event about 700,000 years ago." The mass of glass estimated to have fallen to Earth in this tektite event was calculated to be on the order of 100 million tons. Quite naturally, the idea has not been embraced by all scientists, though Chapman makes a solid case for his theory and offers intriguing mathematical models to support his ideas.

Dr. Chapman worked at the Ames Research Center in 1967, where he first proposed his revolutionary hypothesis. He was associated with Stanford University until his death in the fall of 1995, and several years ago I wrote him requesting a copy of his conclusions. In the document he sent me, he details the fascinating theory that tektites from one location on Earth—those sprinkled across a wide swatch extending from Southeast Asia to Northwest Australia— share certain common chemical and physical features among themselves and bear a relationship to the direction of Tycho's rays. The abstract for his research paper states, "Their overall pattern is not radial as would be required for terrestrial origin, but is systematically curved. Numerous moon-to-earth trajectories were

continued on page 2, see **Tektites**

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Tektites, continued from page 1

computed for ejecta leaving various lunar craters in a search for compatible places of origin. It was found that the complex tektite distribution pattern is matched by the trajectory landing pattern for ejecta leaving Tycho, and the required heading direction for this ejecta coincides with Tycho's most prominent rays."

Curiously enough, Apollo 17 was originally to have landed on the north rim of Tycho to sample the material ejected from great depths that formed the great crater itself and which subsequently created the rays that extend outward for almost a thousand miles across the face of the moon; the rays are most prominent in amateur telescopes at full moon, where they give the inexperienced eye the impression of being the moon's "South Pole."

I have often wondered if Chapman's thesis might have played a part in the NASA's original intent to set the lunar module down on Tycho's rim, before the Valley of Taurus-Littrow was chosen as the actual landing site in 1972. In any case, for those of us who own tektites from Australia or Vietnam, it is fun to speculate that they might be, indeed, pieces of the moon. For this reason, whenever the mildly curious ask me how I know that mine are bits of the moon, I rest an elbow on Chapman's article, give them an icy stare, and, voice dripping with indignation and self-serving arrogance, ask bluntly, "How do you know they aren't!"

(Those wishing to review Chapman's paper in greater detail will find it the September 10, 1971, issue of the Journal of Geophysical Research (volume 76, number 26).)

[Craig has been a consummate amateur lunar astronomer since July 20, 1969, when he was a Peace Corps volunteer in Honduras and the proud owner of a magical, if nondescript, dimestore telescope. He considers himself a visual astronomer in the classical tradition of early lunar observers and has since graduated to a 4" fluorite refractor for his lunar studies. As a member of the Lunar Section of the British Astronomical Association, the American Lunar Society, the Association of Lunar and Planetary Observers, and the Santa Cruz Astronomy Club, his primary passion in astronomy is the moon. When he grows up he hopes to visit the crater Gassendi on the north shore of the moon's Mare Humorum; he welcomes astronomical exchanges at CWandke@aol.com! (Craig wrote this too but it's a good bio and I wasn't about to touch it). Ed.]

Obsession 15" First Light
by Rich Neuschaefer

Last Saturday was the first time I used my new Obsession 15" f4.5 truss tube Dob for more than just a brief look. I took it to Fremont Peak State Park about 70 miles south of San Jose, California. A number of amateurs gather at "the Peak" twice a month. The seeing was very good but the sky was relatively bright since the fog forgot to come off the ocean and cover the towns below the Peak.

The 15" Obsession is very well designed. It goes together in about 10 minutes. It also looks great. The wood parts look like fine furniture. It is very well balanced. It moves very smoothly. The mirror is 2" thick. The mirror box is light enough to be easily carried around by one person.

For a 6' observer there is no need for a ladder. With a tall observing chair you can use it as a "sit down scope" much of the time.

The stars were very small points rather than the blobs often seen in light buckets. Jupiter showed very nice detail. M13 with a 13mm Nagler (about 130x) was a beautiful ball of small stars. The NGC galaxy next to M13 was very easy to see. I did make a half hearted attempt to see the IC galaxy between NGC galaxy and M13. The contrast is in this scope is excellect. I played around in the Coma/Virgo area but no "serious" observing. I was hoping to do some "serious" observing this comming Saturday but it looks like we will have nothing but clouds, rats. ;)

Clear skies (one of these days)
[Rich wrote this May 15 - Ed.]

Fight Light Pollution: Join the I.D.A.
by John Dellinges

Perhaps an amateur astronomer's biggest problem is light pollution (L.P.). It degrades the night sky's darkness, forcing us to pack up our equipment and drive to a dark sky site - a real hassle. Sometimes that strategy doesn't work, as you may end up driving towards another source of L.P. So, it should be every stargazer's business to fight L.P., whether its source is commercial or simply a neighbor's bad light.

Enter the International Dark Sky Association (IDA). This non-profit organization was created a few years back by Tuscon astronomer David Crawford to hopefully slow and ideally stop L.P. The IDA has been instrumental in making the problem of L.P. known to counties, cities, lighting engineers, etc., resulting in an ever-growing awareness of the subject to society.

I believe it's in every stargazer's interest to belong to IDA. The more members a group has, the more clout they wield. So why is our membership only 1786? An estimated 200,000 amateur astronomers reside in the U.S. Another 300,000 are in Japan, Australia, and Europe (Mercury magazine, Jan/Feb 1996, p. 32). Rather than address that question, I simply urge all gazers out there to join IDA. Dues are $20 a year, and it will probably be the best 20 bucks you've ever invested in your hobby. You'll receive a bi-monthly newsletter and have access to over a hundred information sheets and slides pertaining to L.P. for a nominal fee. There are also IDA sponsored meetings through the year around the country.

Maybe you're not the activist type. Fine. Let IDA fight L.P. for you! Light pollution is slowly killing our beloved hobby. It's our responsibility to fight it and save our dark starry skies not only for us, but for future generations of stargazers. To contact IDA:

International Dark Sky Association
3545 N. Stewart
Tuscson, AZ 85716
http://www.darksky.org
e-mail: crawford@noao.edu

Observing Report, Fremont Peak, May 11, 1996
by Mark Wagner

Contrary to the forecasts of several television meteorologists, Saturday morning's sunrise revealed a good layer of middle to high level cloudiness. I chuckled to myself that it must be true... moonlight dissipates clouds, and now at third quarte, the increasing lack of Moon was making a clear evening questionable. I also noted what clear skies we had for a beautiful full moon a week earlier. Oh well... if it's not total overcast or raining, my curiosity drives me to the Peak, and this Saturday would be no exception.

I had a guest this day, and at noon I picked up Dan Gordon, owner of Spectra Astro-Systems, at the airport. After a lunch in Gilroy, we proceeded up the Peak. Ahead of us on the road was Jim Bartolini, and we were the first three observers to arrive. Soon, Rich Neuschaefer, Richard Navarrete, John Hales, Alan Nelms, John Gleason and John Kuklewicz pulled in. Everyone set up at the "all nighter's" are, by the observatory.

As afternoon headed into evening, the clouds dissipated, revealing clear above, with noticeable low level haze. A short walk to the overlook, and I saw the sun reflecting clearly on the Pacific, indicating that we would not benefit from fog covered cities this night.

By early evening, before sunset, a few others arrived and set up by us. Over by Coulter, an assortment of telescopes were set up. I was glad to see Orion Telescope Company at the Peak again this year, providing valuable training for their employees on their latest equipment.

From memory, here are the scopes I saw... two JMI NGT-18;s, a Juno (is it a 14"?), a few of Orion's Dobs, a 14.5" dob, several Meade 8 and 10 inch SCTs, a 15 and 18 inch Obsession, Takahashi 9" SCT, Takahashi 3" APO refractor, a 6" AstroPhysics APO and a Traveler 4" APO, and several other scopes that were unidentifiable without closer inspection.

Sunset came with surprising rapidity, and by 8:30 Arcturus, Spica, Castor, Pollux and Sirius were all evident. Soon, M3 was in my eyepiece, then M13. Dark fell quickly... M51, M65 and 66, M101, M53, 4565, M81 and 82. Craig Wandke, who spoke about the Moon at a recent club meeting, joined me for several spectacular views of these bright gems. Dan Gordon was comparing views through several scopes, but seemed to like Neuschaefer's 15" Obsession. The two talked equipment for a while, until the night darkened and the bright objects gave way to the dimmer ones now within reach.

Nelms and I worked on the Herschel list again. We logged 30, mostly in Virgo, Ursa Major and a few in Cygnus. Others were busily chatting, moving from one scope to the other, and enjoying the light warm breeze that made this the first summer-like star party evening of the year.

The lack of fog became very apparent later at night. The light dome of San Jose was particularly noticeable, and limited our observing to the brighter diffuse objects, or the small compact targets. This was not the evening for larger low magnitude diffuse galaxies. On the positive side, the sky was very steady, and we had very good transparency.

Later in the evening, Jupiter rose, and showed wonderful color, and very well defined banding. I overheard several observers commenting that the equatorial zones were much more highly defined than what was observed last year. There was also an enormous "bar" parallel to the northern equatorial belt, which at low power looked like a large spot. This was very noticeable even at low power. I especially enjoyed the view of Jupiter in my 35mm eyepiece (58X), as the surface color was almost golden, the banding obvious, it's moons nicely showing, all set in a beautiful star field on black background. What a view.

Later that night, someone looked at Comet Hale-Bopp. Well, as you can guess, after the "Hyakutake Fever" that swept up anyone who knows where to find the sky, all scopes in our area turned to the next approaching visitor. The comet was an easy target, halfway between Jupiter and the stars Algedi and Dahbih in Capricornus, right next to Barnard's Galaxy (ngc 6822) and the planetary nebula ngc 6818. The comet looked like a larger version of Hubble's Variable Nebula. If it continues to brighten, this will be one big, bright comet.

By 3:15 a.m., I was pretty tired, and the crescent moon was rising peeking over the eastern hills. Scopes were beginning to be torn down, and the evening was coming to a close.. It had been a very enjoyable night, giving hints of those wonderful warm summer nights to come. Good-bye winter!

If you have not come to one of the SJAA dark sky star parties before, you should make the small effort. It is a short and easy drive to either Fremont Peak or Henry Coe State Parks, south of San Jose. The difference in sky is astonishing, even when the fog cover is absent. During the summer, there are always plenty of telescopes available to look through, and their owners are always pleased to let you do so. If you plan to come to Fremont Peak on the weekend of June 15, stop by the 30" Challenger telescope and say hello to your fellow club members Rich Neuschaefer, Rod Norden and myself, who will be helping run the public program at the observatory that evening.

Clear skies!

1996 Mt. Lassen Star Party now Full
by Mark Wagner

Mt. Lassen 1996 Dark Sky Star Party reservations are confirmed for campers at Lost Creek Group Campground. This year we will be at sites C and D (2nd and 3rd on the right). Confirmation arrived from Lassen Park just prior to publication of the Ephemeris.

The Mt. Lassen Star Party is now officially full. We will be contacting all participants regarding feast arrangements during the month of June.

Eyepiece Types
by Jim Van Nuland

[in the February Ephemeris, there was an article Jay Freeman posted to sci.astro.amateur. Jim posted this shortly after Jay's article appeared. - Ed.]

Even in my 8 inch f/6, the traditional Abbe Orthoscopics perform well. Most of my eyepieces are Meade "Research-Grade" oculars which are no longer sold, more's the pity.

There is one whizzy ocular that I strongly recommend: the 28mm Pretoria for use in a rich-field scope such as my 4-1/4 inch f/4. Gives nice pinpoint stars across a 15 power, 3 degree field, since it compensates for the off-axis aberrations of the fast paraboloid. The Pleiades must be seen to be believed with this combination! (Note: this has a 2 inch barrel).

Jay splits his magnifications into two groups, with low-power observations at 4 to 5mm exit pupil. My own experience with eyepieces differs somewhat. For low-power, deep-sky observing, I find it useful to have a closely-spaced series to vary the field and/or contrast when observing galaxies, globulars, and even open clusters. I like my 20mm Erfle (61x, 3.3mm exit pupil) for initial finding; but then I will try a 16, 12.5, 10, and perhaps even the 6.6mm to find the optimum contrast vs. field size. The latter oculars are all Orthoscopics of 45 to 50 degree apparent field.

I have a 28mm Ortho (4.7mm e.p.), and I sometimes step down from the 20 Erfle, but it yields a slightly smaller true field. For whatever reasons, it is seldom a real improvement over the Erfle.

For high power, I use 4, 5, and 6.6mm Orthoscopics. The 5 gives 245 power and 0.8mm exit pupil, well within Jay's recommendations. Unless the air is poor, I will use the 5mm and sometimes the 4mm for planets. Mostly I use the 5mm and wait for the moments of best seeing to pick out details on Saturn or Jupiter.

You may have noticed that my eyepieces give small steps across the range of useful magnifications, with about 1.25::1 between them. That is: 28, 20, 16, 12.5, 10, (8), 6.6, 5, and 4mm. The corresponding magnifications are 44 to 305 power, and the exit pupils are 4.7 to 0.67mm. The (8) is in parens as I do not own one, still trying to find it cheap. They are parfocal or nearly so, to facilitate jumping up and down the range to obtain the best view.

What would I buy if I had to do it over? Just about the same, with the addition of an 8mm Ortho. I suppose I would consider the similar focal lengths in the Teleview Plossl series, after first trying to find the old "Research Grade" on the used market.

I have a 40mm Kellner in 1.25 inch barrel, but it is not so much fun due to the narrow 43 degree apparent field. Useful for terrestrial observing, sometimes. And a Meade 25mm "MA" which I find unpleasant to use, partly due to the rather narrow field, but it lacks something else.

So far as advising a beginner as to eyepiece selection, I would want you to get in with your local astronomy club, and try out eyepieces before buying any.

For myself, I would start with a wide-field Erfle (my 20mm) giving about 3.3mm exit pupil, and for planets, an Ortho or Plossl (my 5mm) giving 0.8mm e.p. After that, the 12.5, 6.6, 10, 16, 4, and 28 or 32mm. This is simply my frequency of use. And for the 4" f/4, of course, the superb 28mm Pretoria.

This is a highly personal selection! Jay's C14 gathers 3 times the light of my 8 inch Newtonian, and his eyes are about half the age of mine. I have not recently measured my dark-adapted pupil, but at age 60, it is surely smaller than 7mm. These factors, along with personal preference, must make a considerable difference.

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San Jose Astronomical Association
5380 Pebbletree Way
San Jose, CA 95111-1846

Houge Park Status Report
by Jim Van Nuland

On May 7, I stopped at Houge Park. The fence surrounding the tennis courts is in place, and painted black (some of you saw this on Auction day). The sod is in place along the east side of the courts, but the temporary fence is still in place, keeping people off the new grass.

A crew was planting trees (about 8 - 10 feet tall) along the west and north edges of the courts. One of them told me that the fence will be left around the grass for about a month, to give it a good start.

So those who have not gone to RTMC may need to use the basketball court for one more star party.

Swap Meet and Auction Results
by Bob Elsberry

SJAA took in $793.50. Breakdown is:

Raffle (Eyepiece Fund)		$68.00
Auction		
	Bidders Fees	$29.00
	Commissions	$92.70
	TOTAL	$121.70
Swap Meet		$603.80

In addition we added 5 new SJAA members during the Swap Meet and Auction.

All in all a very good day for the SJAA.

Members are encouraged to submit articles for publication in the SJAA Ephemeris. Send articles to Lew Kurtz (via e-mail to lewkurtz@aol.com; fax - 720-9726; or a text file on a 3-1/2" diskette; or typed or hand written to 1336 Bobolink Circle, Sunnyvale, CA, 94087). Articles received by the 10th will be put in the following month's newsletter. Please include your name and phone number.

The Probe Story: Secrets and Surprises from Jupiter

by Larry Palkovic

[This article is from the April 1996 issue of the Galileo Messenger, the official newsletter of the Galileo mission to Jupiter. This issue covers mission's activities through the Jupiter orbit insertion and the successful probe mission. The entire issue is also available on the Galileo home page: http://www.jpl.nasa.gov/galileo/]

After a 6-year journey replete with nail-biting trials and eye-popping triumphs in space, and after a frustrating 6-week delay back on Earth, the Galileo Probe's bounty of scientific data was finally presented, on January 22 at the Ames Research Center, by a panel of Probe science investigators headed by Probe Scientist Rich Young. Their preliminary report summarized the condensed memory readout from the Orbiter's solid-state memory downlinked in December and January. In the months since that meeting, subsequent analyses have changed some of the scientists' earliest views on their data. Probe investigators are still waiting for the complete playback from the Orbiter's tape recorder, but that won't be finished until mid-April.

While the picture of Jupiter that has emerged is, generally, similar to what was expected, the details are sufficiently different to merit some serious rethinking on the origin and structure of the planet and its atmosphere. The Probe was certainly well prepared for its brief but celebrated exploration of the Jovian atmosphere. Radio contact with the Orbiter was solid for almost an hour, and every instrument performed perfectly through the nominal mission.

The approach and entry were not without some surprises. The space between Jupiter's rings and atmosphere was expected to be fairly quiet, but Harald Fischer's energetic particle instrument discovered a new, powerful radiationbelt here---populated by high-energy helium ions and ten times stronger than Earth's Van Allen belt.

Probe deceleration in the upper atmosphere as measured by Al Seiff's atmospheric structure instrument was greater than expected, indicating a much denser (100 times) and hotter (227°C) atmosphere 340 km above the 1-bar level. Unexpected, too, was parachute deployment 53 seconds late and 26 km below the planned 0.1-bar level.

When the heat shield dropped off and the instruments started recording, Larry Sromovsky's net flux radiometer (NFR), designed to measure the energy balance between Sun above and the planet below, showed variations in sky brightness that indicated scattered clouds. At this 0.4- to 0.6-bar level (-150°C to -130°C and 20 km above the 1.0-bar level), these were likely ammonia clouds.

Boris Ragent's nephelometer, which reads a reflected laser beam for cloud particles, saw none at this altitude, suggesting the ammonia clouds were distant, or at least scattered. Maybe 45 or 50 km further down, however, at about 2 bars (-70°C), it did record substantial concentrations of what were believed to be ammonium hydrosulfide clouds. While well defined, even these clouds were not nearly as thick as postulated; the NFR did not report them. Even further down, 60 to 80 km below 1 bar, at the 5- to 8-bar level where temperatures support liquid water (0 to 40°C), the nephelometer found no evidence for water clouds, though these should have been the thickest of all.

Glenn Orton's ground-based, infrared telescopic observations showed the Probe's entry site to be on the edge of a prominent "hot spot." This broad patch of clearer, drier atmosphere looked to be a region of thinner, even absent clouds. This certainly confirmed the nephelometer readings and suggests that, at least in its upper atmosphere, Jupiter is a very heterogeneous planet. One of the principal tasks of the investigators will be to distinguish those data that measure local phenomena from those that measure the global.

Hasso Nieman's neutral mass spectrometer, which determines the compositionof the atmosphere, also revealed the atmosphere to be drier than expected---much drier than predicted from Shoemaker-Levy 9 data, and even drier than predicted from Voyager data! Initial results suggested generally Sun-normal values for many other atmospheric constituents, but later work has changed that picture. Solar values would suggest little change in Jupiter's evolution from the original solar nebula, but increased concentrations of any element (besides hydrogen and helium) would suggest a history of cometary accretions. Concentrations of methane and hydrogen sulfide were greater than solar values. Ammonia values, even at this date, still puzzle researchers. Concentrations of the noble gases krypton and xenon were much greater than solar values, but isotopic ratios were near solar. Fewer organic molecules and substantially less neon than expected also characterized the Jovian atmosphere sample.

Ulf von Zahn's helium abundance detector measured the concentration of helium at 0.24 by mass, close to solar abundance. Low levels of helium indicate depletion in the atmosphere of Saturn, but this is not seen at Jupiter, probably because of Jupiter's larger size (three times more massive) and higher internal temperatures.

Lou Lanzerotti's lightning and radio emission detector looked for both optical flashes (from near discharges) and radio waves (from more distantones). The expected thick cloud decks suggested lots of cloud-to-cloud bolts. In retrospect, considering the lack of water clouds, it's not surprising that no flashes were seen. On the other hand, the Probe did record the radio signatures of perhaps 50,000 strikes---up to an Earth'sdiameter away. These numbers translate to very powerful discharges but to only a third (or even a tenth) the occurrence rate of lightning on Earth. Fewer strikes are also consistent with fewer organic molecules (which the strikes generate).

Dave Atkinson's Doppler wind experiment tracked the Doppler shift in the Probe's radio signal to measure the speed of the Jovian winds. Wind speed at the cloud tops was thought to be 360 to 540 km/h, and this was expected to drop to zero at some point---if, as on

continued on page 7, see **Probe**

COMET COMMENTS
by Don Machholz

Comet **Hale-Bopp** (C/1995 O1) and periodic comet **Kopff** are withing a few degrees of each other in the southern morning Milky Way. Both should be visible in binoculars. Much fainter is periodic comet **Schwassmann-Wachmann 1**, which often shines at magnitude 16. It has recently outburst, attaining magnitude 11. Try to get out to see it before it fades. You'll find it in the evening sky, south of Regulus

C/1995 O1 (Hale-Bopp)

DATE 00 UT	R.A. 2000	Dec	EL	Sky	Mag
05-27	19h32.5m	-15°11'	133°	M	7.1
06-01	19h28.6m	-14°44'	139°	M	6.9
06-06	19h24.2m	-14°17'	144°	M	6.8
06-11	19h19.3m	-13°50'	150°	M	6.7
06-16	19h13.8m	-13°21'	155°	M	6.6
06-21	19h07.8m	-12°52'	161°	M	6.5
06-26	19h01.5m	-12°23'	165°	M	6.4
07-01	18h54.7m	-11°53'	168°	M	6.3
07-06	18h47.7m	-11°23'	168°	E	6.2
07-11	18h40.5m	-10°54'	165°	E	6.1

22P/Kopff

DATE 00 UT	R.A. 2000	Dec	EL	Sky	Mag
05-27	19h02.4m	-15°46'	140°	M	7.7
06-01	19h07.2m	-15°51'	144°	M	7.5
06-06	19h11.2m	-16°00'	148°	M	7.2
06-11	19h14.6m	-16°14'	152°	M	7.4
06-16	19h17.2m	-16°33'	156°	M	7.1
06-21	19h19.6m	-16°58'	160°	M	7.0
06-26	19h20.7m	-17°28'	165°	M	7.0
07-01	19h21.7m	-18°03'	169°	M	6.9
07-06	19h22.3m	-18°41'	174°	M	6.9
07-11	19h22.7m	-19°22'	167°	E	6.9

29P/Schwassmann-Wachmann 1

DATE 00 UT	R.A. 2000	Dec	EL	Sky	Mag
05-27	10h18.5m	+05°15'	89°	E	12?
06-01	10h19.6m	+05°09'	84°	E	12?
06-06	10h21.4m	+05°01'	80°	E	12?
06-11	10h23.1m	+04°52'	75°	E	12?
06-16	10h25.0m	+04°42'	71°	E	12?

DATE 00 UT	R.A. 2000	Dec	EL	Sky	Mag
06-21	10h27.0m	+04°31'	67°	E	12?
06-26	10h29.3m	+04°18'	63°	E	12?
07-01	10h31.7m	+04°05'	59°	E	12?
07-06	10h34.2m	+03°50'	55°	E	12?
07-11	10h36.8m	+03°35'	51°	E	12?

Orbital Elements

Object	Hale-Bopp	Kopff	Schwassmann-Wachmann 1
Peri. Date	1997 04 01.14561	1996 07 02.1998	1989 09 09.63574
Peri. Dist (AU)	0.9140971	1.5795617	5.7484583
Arg/Peri (2000)	130.59227°	162.83487°	046.24130°
Asc. Node (2000)	1282.47087°	120.91329°	312.82689°
Incl (2000)	089.42807 °	004.72143°	009.38499°
Eccentricity	0.9950784	0.5440739	0.0440579
Orbital Period (yrs)	3000	6.45	14.75
Source	MPC 26879 (3-26)	MPC 22032 (1991)	MPC 23105 (1994)

Celestial Calendar - June 1996
by Richard Stanton

Lunar Phase	time (pdt)	date	rise	trans	set
FM	13:48	01	20:23	00:37	05:52
LQ	04:06	08	01:15	07:18	13:27
NM	18:48	15	05:43	12:58	20:14
FQ	22:25	23	12:50	19:00	00:33

Mercury Dist: 0.95AU. Mag: -2.2

date	rise	trans	set	RA	Dec
07	04:40	11:33	18:26	03:29.3	+15:02
17	04:31	11:36	18:42	04:11.2	+18:21
27	04:44	12:05	19:26	05:17.7	+22:15

Venus Dist: 0.29AU Mag: -4.9

07	06:04	13:26	20:47	05:26.0	+23:30
17	05:11	12:22	19:32	05:00.7	+20:43
27	04:24	11:28	18:31	04:45.4	+18:35

Mars Dist: 2.34AU Mag: +1.2

07	04:32	11:39	18:47	03:35.8	+19:10
17	04:16	11:29	18:43	04:05.5	+20:48
27	04:01	11:20	18:38	04:35.5	+22:05

Jupiter Dist: 4.52AU Mag: -2.6

07	22:20	03:12	08:01	19:09.4	-22:29
17	21:37	02:29	07:16	19:04.9	-22:38
27	20:53	01:44	06:31	18:59.7	-22:47

Saturn Dist: 9.65AU Mag: +0.9

07	02:24	08:28	14:32	00:25.7	-00:22
17	01:46	07:51	13:56	00:27.9	-00:34
27	01:08	07:13	13:18	00:29.6	+00:41

SOL Star Type G2V Intelligent Life in System ?

07	05:44	13:07	20:30	05:02.9	+22:47
17	05:43	13:09	20:34	05:44.4	+23:23
27	05:46	13:11	20:36	06:25.9	+23:18

Astronomical Twilight		Begin	End
JD 2,450,242	07	03:51	22:23
JD 2,450,252	17	03:49	22:29
JD 2,450,262	27	03:52	22:30

Sidreal Time				
Transit Right	07	00:00	=	15:56
Ascension at	17	00:00	=	16:34
Local Midnight	27	00:00	=	17:14

Darkest Saturday Night:	June 15
Sunset	20:33
Twilight End	22:28
Moon Rise	05:43
Dawn Begin	03:49

Telescope Loaner Status
by Paul Barton

No.	Scope Description	Borrower	Due Date
1	4.5" Newt/P Mount		**available**
3	4" Quantum S/C	(in storage - call)	**available**
6	8" Celestron S/C	Allen Cogdell	6/19/96
7	12.5" Dobson	Tim Sanstrom	7/9/96
8	14" Dobson		**available**
9	C-11 Compustar	Ed Voss	indefinite
15	8" Dobson	Bob Elsberry	6/9/96
18	8" Newt/P Mount	Jerry Lovelace	6/6/96
19	6" Newt/P Mount	Stephen Shoup	6/8/96
21	10" Dobson	Jacob Anderson	7/4/96
23	6" Newt/P mount	Shelly McAleese	indefinite
24	60mm refractor	Sridhar Lakshmikanthan	6/25/96
26	11" Dobson		**available**
27	13" Dobson		**available**
28	13" Dobson		**available**

Probe, continued from page 5

the Earth, such winds are generated by sunlight and release of latent heat by condensation of water vapor. Not unexpectedly, Jupiter is not like the Earth. Winds are faster than expected, clocking 720 km/h below the cloud-top level, and show no tendency to slow with depth. Jovian winds are apparently generated by heat coming from below.

The helium abundance detector stopped recording at 14 bars, as designed,after 40 minutes of activity. At this time, signals from the nephelometer and net flux radiometer also became useless as they degraded to noise. After 48 minutes of recording, 110 km down, the instrument shelf temperature inside the Probe was much closer to the outside 15-bar temperatures of 100°C than the expected 50°C. The lightning detector and neutral mass spectrometer stopped sometime after this point.

Only Al Seiff's atmospheric structure instrument was still operating when radio transmission stopped after 57.6 minutes at the 23-bar level (152°C,140 km down). This instrument measured the atmospheric temperature, pressure, and densities during the entire 160 km or so (20 km above 1.0 bar to 140 km below) of descent. During the entry phase, it showed hotter temperatures and higher densities than expected in the upper atmosphere, and numbers much closer to those expected in the lower atmosphere. Also consistent with Doppler data, it showed that the Probe dropped through a very turbulent atmosphere. And consistent with the other instruments, it measured a lapse rate or change of temperature with altitude that showed a very dry atmosphere in the 6- to 15-bar range and convective transfer ofheat, which powers the wind systems and keeps the deep layers well mixed.

After its last transmission, the Probe, we imagine, continued to sink into the Jovian depths. Without a surface to hit, the Probe lost its Dacron parachute, its aluminum fittings, and even (by the 5000-bar level, 1700°C) its titanium shell to melting and evaporation. Ten hours after entering the atmosphere there would have been nothing left to see, and the Probe would have become a part of the planet that its sister Orbiter will be watching so closely.

The Probe science team eagerly awaits the return of the last bits of the taped Probe data set. These data, along with additional atmospheric data from the Orbital tour, will keep the team busy for years unwrapping the secrets of this mysterious giant.

Astro Ads

Meade12.5" Starfinder Dobsonian with Meade MA 25mm eyepiece, Telrad, 50mm finder, counterweight. Asking $500 or will trade for Meade 10" Starfinder Dob.
Dave 408-946-8563

Astro-Physics 155mm f9 EDT APO, opitcal tube assembly. Great condition, beautiful images. This is a Super ED triplet APO. Comes with case, 2" and 1 1/4" Astro-Physics adapters.
Rich (w)408-285-0730

Orion 12.5" Premium (Deluxe) Reflector. Accessories include a scope bag (carrying case), scope cap (dust cap). It is six months old (I am in the process of purchasing a larger telescope). $900 obo for everything. New price from Orion with the added accessories would run around $1200.00. It is clean throughout. NO eyepieces are provided. The one it came with fell to the Earth and well, you know what happened.
Glenn Dawes (415) 812-8822

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