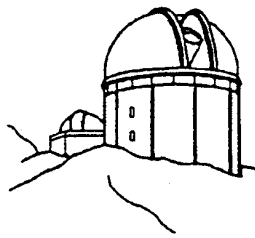

SJAA EPHEMERIS

Recipe for a Telescope

Jane Houston

Take one six inch pyrex mirror and one six inch glass tool. Sandwich a generous sprinkle of silicon carbide between the two. Wet slightly. Stir vigorously for 7 hours. From time to time, check the pyrex and shake on some more abrasive. Once an hour, prepare a warm water bath for the mirror. Decrease size of abrasive each hour, changing to aluminum oxide powders until a smooth and pit free curve is obtained. Take care to keep the two pieces of glass from sticking. If this happens, beat them apart with a wooden or rubber mallet.

This was the beginning of a recipe for Astronomy Day, prepared and served with relish by members of the SJAA at the Tech Museum of Innovation in San Jose a few weeks ago. What a way to honor Astronomy day, and what a treat for the members and guests of the Tech Museum! Several members of the SJAA were on hand to distribute copies of The Ephemeris, and to answer questions about the telescopes on display, the SJAA or about astronomy in general. A better group of Astronomy Day astro-ambassadors could not be found anywhere.

After a full day of grinding the curve, switching the grinders every few minutes, the intrepid telescope makers of the SJAA descended upon the general meeting at Houge Park to proudly show off the fruit of their labors. A spherical F7 curve on a pyrex round was now waiting for its next transformation. Wafting from out behind the Houge Park back door was the aromatic smell of hot gum from a pine tree. Pine-tar pitch, the color of golden brown sugar and the consistency of honey was about to be magically transformed into a plate of butterscotch candy facets. Quickly, the pitch lap was pressed onto the awaiting glass tool. Just as quick, the mirror's curve was pressed into the candy-like pitch lap. The mirror and tool were now left, curves together overnight in a cool dark place.

Bright and early on Sunday morning we were all back at the Tech. The curve we had created by digging away the glass surface of the mirror with abrasives would now be smoothed to a shiny and hopefully parabolic shape with a paste of oxide of the rare earth cerium mixed with water to lubricate the mirror and pitch lap.

Continued on Page 2

SJAA Activities Calendar

Jim Van Nuland

June

26 General Meeting at Houge Park, 8 p.m., Bob Garfinkle, "Observing the Rays and the Bright Spots on the Moon"

July

9 Houge Park star party. Sunset 8:30 p.m., 12% moon rises 3:42 a.m.

10 FPOA/AANC Star-B-Q, Fremont Peak. Star party at Peak. Sunset 8:28 p.m., 6% moon rises 4:33 a.m.

16 Pinnacles Nat'l Monument public star party *(See inside)*

17 Observational Astronomy class, Houge Park, 8 p.m. Catalogues, techniques for finding and identifying objects; such topics as how to find a 12th magnitude planetary in a dense star field, why an OIII filter is no good on the Horsehead, etc.

23 Houge Park star party. Sunset 8:22 p.m., 83% moon sets 3:02 a.m.

24 General Meeting at Houge Park, 8 p.m., Ernie Piini on February eclipse

July (cont.)

30-31 SJAA Weekend at Glacier Point, Yosemite National Park *(Space Available!)*

August

6 Houge Park star party. Sunset 8:09 p.m., 23% moon rises 2:25 a.m.

7 Star party at Peak. Sunset 8:07 p.m., 14% moon rises 3:19 a.m.

13 Pinnacles Nat'l Monument public star party *(See inside)*

14 Star party at Peak. Sunset 7:58 p.m., 15% moon sets 10:13 p.m.

20 Houge Park star party. Sunset 7:52 p.m., 69% moon sets 1:39 a.m.

21 Observational Astronomy class, Houge Park, 8 p.m. Basic astrophotography: star trails, "barndoors," prime focus and eyepiece projection. Brief introduction to CCD cameras.

28 General Meeting at Houge Park, 8 p.m. Speaker TBA

See inside for more information about SJAA star parties.

24 Hour News and Information Hotline: (408) 559-1221
http://www.seds.org/billa/sjaa/sjaa.html

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Astronomy Day at The Tech

Continued from Page 1

During these two days nearly 200 visitors took a turn grinding and polishing our mirror. And every one of them signed the awaiting cardboard tube, destined for the newest addition to the SJAA telescope loaner program.

While grinding and polishing was going on at one table, another group of SJAA members were busily explaining the cut out tube and mount pieces to the many visitors. Looking like huge gingerbread cookie pieces, the cutouts awaited their turn in the spotlight. Soon power drills whizzed, and within an hour the mount was constructed. The tube, mirror cell and spider/with diagonal mirror were inserted in the waiting tube.

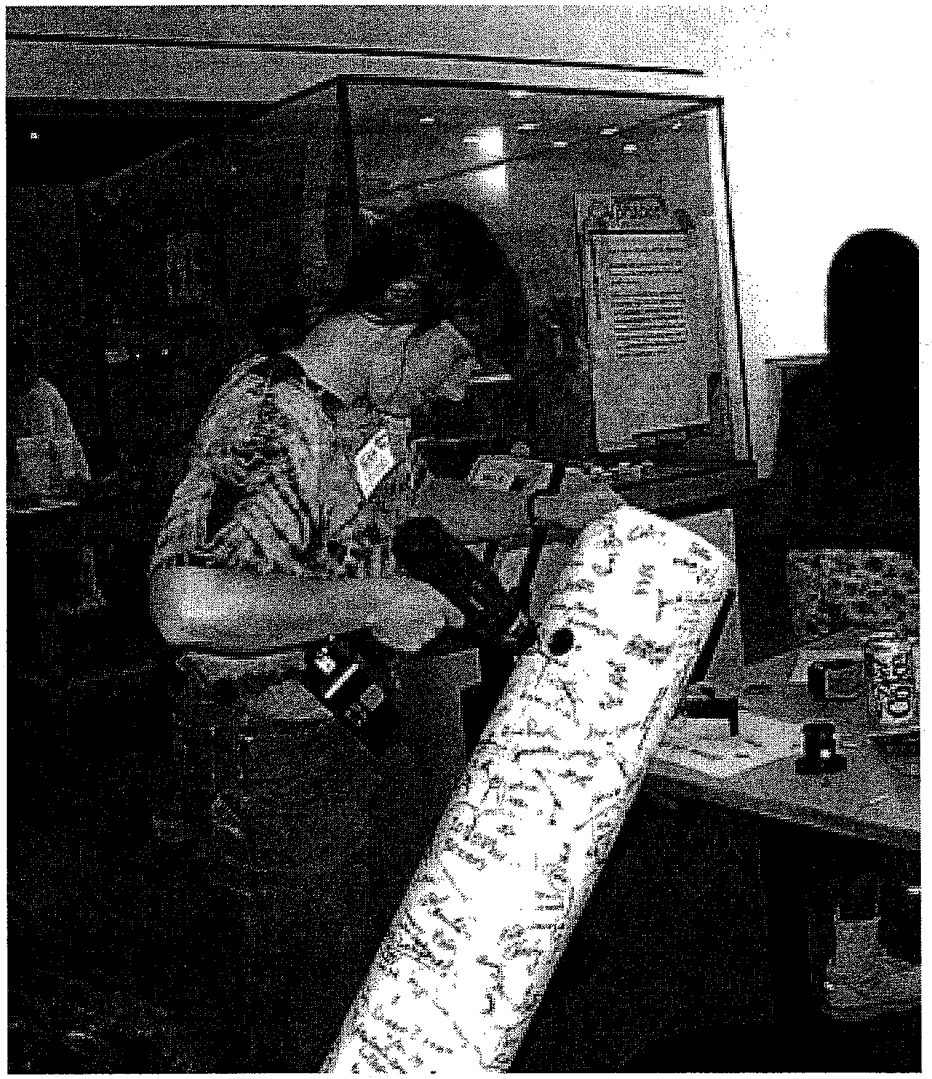
Our emotions were high as we aimed the tube out the far window to catch a glimpse of roof tile, and align the optics. It was so brilliantly clear it took our breath away! We could see the cracks on the tile!

Next, the "signature scope" was taken out on the Tech balcony and aimed accross to the pristine white domes atop Mount Hamilton. Lick Observatory was destined to be our first real view through the telescope. Above Lick, the first quarter moon shone brightly in the afternoon light. This is what Astronomy Day is all about, showing the first quarter moon to those who wish to see. Sharing the universe in many and diverse ways. As we each took our turn and saw first light through our two day telescope, and through an inexpensive 25mm Kellner eyepiece, the same eyepiece several of us used for our own very first tentative looks at the universe so many years ago, we gasped in amazement! "Clavius! I see Clavius!", marvelled Bill Arnett. High-fives and hugs were shared. Then we knelt at the eyepiece and all took a turn as we looked though our new time machine, autographed by countless new telescope makers-for-the-day in San Jose, California.

Loaner telescope number 32, dubbed the "Signature" scope, our astronomy day telescope will be a humble addition to the impressive SJAA loaner program. But it will always be a favorite to those of us who touched it and transformed it from a pile of wood and metal, cardboard and glass over a two day astronomy day weekend.

For those of you with internet access, the SJAA website has a great pictoral essay depicting our days at the Tech Musum. Take a look at http://www.seds.org/billa/sjaa/aday99/aday.html and see if you don't agree - this was one heck of a great recipe for astronomy day.

Bill Arnett summed it up so well. "But by golly, you really can make a working telescope in 14 hours! John Dobson ought to be proud."



Akkana Peck adds her unique touch to the Astronomy Day telescope built at The Tech Museum in San Jose. Visitors who worked on the telescope signed their name on the tube.

Short-lived Lunar Views: The Lassell Stripe

Akkana Peck

On Saturday night, April 24, at the SJAA public Houge Park star party, a few of us were idly cruising the terminator in preparation for shutting down for the night, when David North commented on an odd dark line near the Straight Wall. "I don't think I've ever seen that before", he said. I took a look, and neither had I, though we both have looked at the area of the Straight Wall at sunrise quite a few times.

The line, just as straight as the Straight Wall and longer, but thicker and seeming not as dark (looking like the shadow of a wrinkle ridge), angled west from the north end of the straight wall, at its halfway point crossing an odd oval object which looked like nothing I had seen before.

We checked Rukl, but there was no hint in his atlas of either the dark stripe or the oval area; he shows wrinkle ridges running orthogonal to the stripe, but not meeting in a way which seemed likely to explain the oval area.

Our first Transient Lunar Phenomenon (TLP)! I made a sketch of the area (see attached). I used my VX102 refractor, but after scanning I flipped the image digitally so the orientation should match a chart or a reflector view. The straight wall is the vertical dark gash near the bottom center of the sketch, with Birt and Birt A to its left; the stripe and the oval area are above. The crater Lassell is not shown, but would be just off to the upper right.

The stripe was already fading by the time I finished my sketch at 11:15; it seemed to be a very short-lived phenomenon.

After heading home, we checked the Times Atlas (which is much more detailed than Rukl); it showed Rima Lassell (not mentioned in Rukl) in that area and heading the right direction, but the rille is a very small, fine feature which doesn't seem to explain the prominent dark stripe we had seen.

Off to search other references. The Kopal "atlas" (really just a random collection of nice photos) has one shot of the straight wall area, but the terminator is well past the position where we saw it and there's no hint of the Lassell stripe. But Harold Hill's "A Portfolio of Lunar Drawings" (my favorite moon book! Hill has a wonderful eye for lovely scenes as well as a beautiful drawing technique) mentioned

"Lassell and environs" in the table of contents, so I eagerly flipped forward to pages 102-3. There I found three sketches (in addition to Hill's own, he includes a sketch by T.S. Elger from a British publication *The Moon*, and another by W.L. Rae from a later issue of the same publication confirming Elger's observation) looking almost exactly like my own! Elger first observed this phenomenon on January 13, 1886, and called it "a long straight dark line ... In its course it traverses a curious curved oval-shaped ring ... The object resembles a fault, or the shadow of a steep ridge."

Hill believes the line to be a fault, because at one point he was able to make out a break in the wall of the line as it crosses the north wall of the oval.

I was amazed at how short-lived this apparition was, and at how invisible it becomes when the light isn't just right. I look forward to looking again for the Lassell stripe in future months.

Meteor Watch

David North

We have one shower this month (sort of): the South Delta Aquarids.

The major activity is best seen from the Southern Hemisphere where the radiant lies high in the sky during their long winter nights, so our local interest is not necessarily at a fever pitch for the July peak.

To add to your viewing pleasure, this year's S. Delta Aquarids peak on the same night (July 27/28) as the full moon. So you can expect rates of about 4-8/hour.

But there is a bonus! Like many streams that lie close to the ecliptic, this one possesses a double radiant. The southern branch provides most of the activity and reaches maximum activity two weeks earlier than the northern branch. So, though we will have a weaker peak that's more visible up here, it will be at the new moon!

Not too bad a deal.

In late July the combined count of these radiants approaches 30 meteors per hour under dark skies... so really the entire period may show some good activity.

This shower signifies the beginning of Summer meteor observing since sporadic activity also kicks in during the last half of July. The shower must be expected to peak near 3 am local time (as almost always).

Three Letter Shower Code: SDA

Minutes of the Meeting of the Board of Directors

Morris Jones

The meeting was called to order at 6:34 p.m. Present were Mark Taylor, Michael Koop, Akkana Peck, Bill Arnett, Jim Bartolini, Morris Jones, and Bill O'Shaughnessy. David North presiding. Jim Van Nuland absent and excused.

Motion approved unanimously to appoint Mark Taylor as treasurer.

Minutes of the previous board meeting were approved as published in the May Ephemeris.

The meeting times of board meetings were discussed. Five members were in favor of the existing meeting times, but discussion was productive. The next meeting was agreed to be as usual: 6:30 p.m. at Houge Park before the general meeting.

Email voting on nonfinancial matters was discussed. The following guidelines for email discussion were approved: Reports, of any kind, are okay. Discussion of previously budgeted activities are okay. Discussion of new financial matters must be deferred to announced meetings.

Dave North reported on the auction and swap meet. Moved to try "auction first" next year, with the following schedule: auction at 11 a.m., swap meet at 2 p.m, registration for the auction at 10 a.m. The motion was tabled in order to allow more feedback from the membership and participants. Akkana agreed to write something to request comment from the membership and key participants.

More business regarding Mark Taylor's treasurer duties and transfer of materials. Signature cards are being arranged and records need straightening out. Sanction was granted by the board for the transfer, and the necessary signatures were obtained on transfer documents.

Dave North would like to trade a Super Polaris mount with motor for the non-motorized one on the SJAA loaner solar scope. The switch was approved.

Following our successful Astronomy Day event at The Tech Museum, the board agrees to entertain future ventures with The Tech on an ad hoc basis.

Dave North reports that Accuprint may be able to improve the copy quality of "The Ephemeris" with some newly installed equipment that would not change our printing budget. Morris Jones agreed to investigate.

An officer duty list has been prepared. Mark Taylor has started the list. The board agreed to review and comment by email.

Morris Jones offered to create an email alias for the SJAA Board at whiteoaks.com.

The board would like to have an official logo for the SJAA. Designs will be solicited from the membership and made available on the web page for consideration.

Moved to approve expenses to make some business cards and sign-up sheets for new members. Motion was approved.

Much discussion was held on the subject of promoting SJAA star parties at Henry Coe state park. It was moved and accepted that Jim Van Nuland, as keeper of the activities calendar, only list Henry Coe star parties for which he has arranged a committed host to be present.

Dave North announced to the board that as a gesture of inter-club cooperation, the Fremont Peak Observatory Association has approved a "checkin" location (The Observatory) for SJAA members at our star parties at Fremont Peak. SJAA membership information and materials will be provided at the observatory, and FPOA members conducting FPOA public observing events will be on the lookout for SJAA guests. This arrangement will work during the normal FPOA public astronomy season, but other arrangements will have to be made for the off season.

Discussion was held about the print quantity for issues of The Ephemeris. As a trial, it was moved and approved to print 350 copies of the next issue, and keep track of how the extra copies are used for future planning.

Some unofficial discussion was held about the pending construction and safety at Fremont Peak observing sites.

The meeting was adjourned at 7:54 p.m.

/s/ Morris Jones reporting on behalf of the Secretary.

Apollo 11 Commemoration Set

Bob Garfinkle

The 30th anniversary ceremony commemorating the splashdown of Apollo 11 will take place on the USS Hornet at the old NAS Alameda on Saturday July 24, 1999, sometime around 9:30 a.m.

Buzz Aldrin and Alan Bean (Apollo 12) are confirmed. Bean will display some of his Moon art. Mike Collins has another engagement and Neil Armstrong is still a question mark. (Armstrong does not like to do these kinds of events.) The other Apollo 12 astronauts have been invited, but are unconfirmed. Ed Nixon will represent his late brother, and the now retired Admiral who was the Captain of the Hornet when Apollo 11 was picked up will be there. Members of Chabot Observatory will be setting up solar telescopes and NASA is sending a large collection of Apollo items for a display that day.

Mooning

Dave North

This is a month of extremes: the "prime events" of the month happen at new and full Moons!

First, the new moon.

Of course, you won't be able to see it because it's buried in the glare of the sun. But "new" is also the time of the greatest northern declination of the moon this month, which means this will be one of the best opportunities to play the "early moon game." The idea is to see how soon after new you can spot the moon.

Actual "new" will be just before 7:30 p.m. on the 12th, but of course the sun will still be in the sky.

I highly disrecommend trying to spot it this evening. For one thing, you probably won't. For another, it's just too dangerous even if you do know what you're doing.

But the night of the 13th is another story. Then the moon will still be up (though very near the horizon) just after sunset — when the sun cannot hurt you.

There will be quite a bit of glare yet, but you should be able to get a peek. A one day moon is not any kind of record, but it is fun, and sometimes you can even get detail through the murk and brightness, which is a small reward unto itself. On the next night, success is virtually assured, and the view even better!

But what's happening at the full moon?

Right on the day of the full moon, in the early morning of the 28th, there will be a partial lunar eclipse visible from around here. The hour is a bit inconvenient (about 4:25 am) and there isn't a great deal to see in such a minor partial, but it still should afford some interesting views.

The best "trick" is to use some magnification and get the brighter (northern, in this case) part of the moon out of your eyepiece field, so the most "color" can be seen. This does present something of a paradox though: color is usually best seen at low magnification. So another technique is just to "shove" the bright part out of the field at low mag.

The night before, however, is the most interesting event from my point of view. During the best viewing hours (around 10 p.m. on) the moon will be as high as it will get near full this time of year (which is not very high at all) but it will also have a pretty good libration of the western limb... where the Eastern Sea (Mare Orientale) lives. The terminator should be almost perfectly placed around midnight for a look at this incredible impact basin, along with its "shock ring" Rook and Cordillera mountains.

It's not unusual to see some truly weird formations ...

It's not unusual to see some truly weird formations, including a seemingly huge mountain sticking up into the sunlight. For those of you who haven't yet hunted Orientale, it's almost unbelievable how cool this looks.

And for those of us who have, it's an event to anticipate all year.

Alternate months around this time afford the best opportunities due to the "incremental" half-day differences in terminator placement each month, so the next really good shot will be in September. But that is no reason to avoid an August attempt, which will be mentioned next month.

Otherwise, just enjoy the early days of the moon this month — placement will be good, and first quarter should still be fairly high.

Oh, there is one "pseudo" event too: on the 15th there will be a tight grouping of the Moon, Venus and Regulus, best seen in the early evening.

Well worth a look!

SETI@Home with SJAA

Morris Jones

The SETI@Home project is underway and overwhelmed with participants. In its first month of public operation, over a half million participants have downloaded the software and logged data!

With such a huge and unexpected demand, naturally there have been some glitches. The server has been difficult to reach at times, and there hasn't been enough data from Arecibo to go around to everyone who wants some. This week we learned that all 500,000 of us have been crunching the same few data packets for the past few weeks!

New donations of server equipment from Sun are expected to help ease the demands of hungry ET searchers. Project investigators say that new data should be flowing soon from Arecibo as well.

Meanwhile the competition is fierce among SETI@Home participants to see who can crunch the most data. SETI@Home has enabled individual participants to register with groups of various sorts, such as clubs, schools, and companies. If you download and install the SETI@Home screen saver, you might enjoy joining the SJAA group and contributing your statistics to our club totals.

SETI@Home requires only a personal computer and a network connection. To participate in SETI@Home, visit their web page at setiathome.ssl.berkely.edu. To join the SJAA group, click on the "Groups" link, and search for a group named "SJAA."

The Shallow Sky in July

Akkana Peck

Mars, still visible in the western sky from sunset to about midnight, is shrinking as it recedes from us. Its disk should be obviously gibbous now in most telescopes; some features should still be visible, but the view won't be as detailed as in previous months. Keep trying, though — you can probably still get good views of the more obvious features, like Syrtis Major, Hellas, Acidalia, and the north polar cap (which is now expanding as the Martian northern hemisphere moves into autumn and the polar cap cools and begins to collect cloud cover.

You can ease your sorrow over the loss of Mars ... by looking forward to Jupiter's return....

You can ease your sorrow over the loss of Mars, though, by looking forward to Jupiter's return to our night skies. It's a morning object as the month opens, but by the end of July, the giant planet will rise near midnight, right about the time Mars sets.

And don't miss Venus! During the month of July, Venus' phase changes from roughly half to a slim crescent, as the planet "catches up" to the earth and moves between us and the sun. Watching its phase change over the course of the month should be a nice show in any telescope (and its dance with Regulus through the first half of the month, with the moon joining in to make it a trio on the 15th). As Venus' crescent gets thinner, the planet's apparent size increases, and so does its brightness, at least up until the 14th when it reaches greatest brilliancy at magnitude -4.5. Of course, as its size increases and phase slims, its elevation in the sky will decrease, so it will become harder to find as it sets progressively earlier each day. For a different challenge, try finding it a little before sunset, or even at midday (but of course, be careful not to look accidentally at the sun! It often works well to position yourself in the shade of a building or other large object, so that the building blocks your view of the sun but not of the area where Venus should be). Binoculars help, and a single polarizing filter might be even more help (rotate it until the sky seems darkest in the area where you're looking for the planet).

If you get unusually steady air while looking at Venus telescopically, see if you can see detail in the terminator on Venus, or any markings in the dark side of the planet the ("ashen light"), as some observers have reported.

Neptune reaches opposition on July 26th, in Capricornus. It's low in the sky but should be visible to the persistent binocular user or any telescope user. Uranus, in the same constellation, is also well placed for observing and will reach opposition next month. If you get an exceptionally steady night, try for surface details on Uranus; some observers have reported seeing brown blotches.

Early risers can catch a glimpse of Saturn in the morning sky, about twenty degrees up as dawn begins.

Mercury is too close to the sun to be visible this month.

The third planet reaches aphelion (debate rages on whether this should be pronounced "ap HEE lee on" or "ay FEE lee on"), its farthest point from the sun, on July 6th. It's well placed all month for observing with telescopes, binoculars, or the naked eye, and lots of surface detail should be visible — and you can even observe it in the daytime!

About SJAA Star Parties

Houge Park: This is the star party recommended for first time SJAA visitors. The Houge Park star parties, near Campbell and Los Gatos, always draw a good variety of astronomers and telescopes. The skies at Houge Park are better than you would expect for a mid-city location. Houge Park star parties are scheduled twice a month —once during first quarter Moon when excellent lunar views are available, and once during third quarter Moon for more deep sky observing.

Henry Coe State Park: This location has good dark skies and sometimes better weather than Fremont Peak, but is much less frequently visited these days by SJAA observers. The observing area is on a grassy knoll behind a gate near the visitor center. Come before sunset if you can, and you may find some observers setting up their gear. They'll be happy to escort you behind the gate and share views through the telescopes.

Fremont Peak State Park: Just south of San Juan Bautista at Fremont Peak State Park you'll find some of the darkest skies within 100 miles of San Jose. Finding the park down county road G1 could mean making a wrong turn if you're not careful at the bottom of the hill by the San Juan Inn, but once you've made your way to the top, you've arrived at the local mecca for amateur observing. On warm new moon weekends, it's not uncommon to find forty or fifty amateur telescopes set up at several locations. Through cooperation with the Fremont Peak Observatory Association, SJAA guests have a meeting place at the well-marked Fremont Peak Observatory. If you don't plan to stay the night, you'll want to park where you can depart without headlights.

For directions to SJAA star party locations, call our hotline at (408) 559-1221.

Seeing Stardust - A Deep Sky Project for the Novice

Jane Houston

The Milky Way looks like a river of tiny diamonds sprinkled with dark stardust this month. Follow this ribbony river from the northeast, near the "W" shaped constellation Cassiopeia across the sky to the constellation Sagittarius above the southern horizon. Notice how the Milky Way divides into two streams overhead. Between these two streams lies a dark band of starlight-obscuring dust. Also notice that the Milky Way stream thickens and brightens as it races southward toward the horizon near Sagittarius. This clumpy cloudy bulge is called the Sagittarius Star Cloud. In this direction lies the galactic center of the Milky Way.

July is the best time of the year to observe the Galactic Center. It's a brilliant area of the sky in more ways than one! Not only is it a great area to scan with binoculars and small telescopes, it is chock full of starry clusters and bright dusty glows interspersed with snakey black dust. There are some magnificent clusters and nebulous objects that you are already familiar with. We'll use them as guideposts. But this bright cloud also holds many surprises - one of which will thrill you and give you something to show the more experienced observer near you at your next star party!

We'll begin our journey with a visual scan of the Sagittarius Star Cloud and get familiar with the neighborhood. The constellation Sagittarius is prominent in the south/southwest this month. It is easier to locate the teapot asterism rather than try to see the whole constellation figure Sagittarius the Archer. It really does look like a teapot, and the Sagittarius Star Cloud really does look like the steam spewing forth from the kettle.

First, follow the larger fork of the Milky Way river east of the dust band where they split overhead. This dust features prominently in our observing target this month. The spout of the teapot is identified by the star Gamma Sagittarii. To the north and west of this bright star lies the richest star cloud in the sky containing millions of stars all clustered in this central bulge of our galaxy. Dr. E. E. Barnard, who made the first wide-angle photographs of our Milky Way at Lick Observatory atop Mount Hamilton in San Jose California in 1889, pondered the dark regions visible among the mass of stars. Barnard 86, an incredible dark nebula, is one of his discoveries. Earlier astronomers thought these dark regions were simply areas where there weren't any stars. Barnard thought the opposite - that these empty areas were actually concentrations of matter blocking our view. He was correct.

Millions of stars are clustered near the center of the Milky Way in the Sagittarius Star Cloud. Black snakey lines of dark clouds obscure some of the brilliant center of our galaxy. Right smack in the center of this brilliant starry backdrop lies a unique object. Dark nebula Barnard (shortened to B) 86, rimmed by the beautiful and symmetrical open cluster 9th magnitude NGC 6520. This little cluster of 25 stars range from magnitude 9 to 12, and form a perfect little circle with B-86 on its western side. "It appears as a

Continued on Page 8

NGC6520 and B-86 from the Palomar Observatory - Space Telescope Science Institute Digital Sky Survey of the northern sky, copyright © 1993-1995 by the California Institute of Technology, distributed herein by agreement. All Rights Reserved.

Seeing Stardust

Continued from Page 7

distinct inky spot against the surrounding star-shimmer", wrote Robert Burnham, Jr. when describing this object in his Celestial Handbook.

These dark nebulae are visible in amateur telescopes. Using low power and a wide field even the smallest telescope will reveal dark nebulae. The best place to look for dark nebulae, sometimes referred to as coal sacks, is the Milky Way with its seemingly unending supply of background stars. The finest example of a dark nebula lies just 2.7 degrees North of our starry guidepost, Gamma Sagittarius! It's found at RA 18 02.7 Dec -27 50. The size of the dark nebula is 4.5' by 3', and the cluster measures 5' in diameter. Together they are about the size of many of the nearby Sagittarius Messier clusters. The nearest one for comparison is globular cluster M24 located nearby - 0.8 degrees (a little more than one index finger width) above Lambda Sagittarii, the top of the "Lid" of the teapot. M24 measures 11', comparing to B86 and it's companion open cluster which together measure 9.5'. Another way to easily find B86 is to hop down 5 degrees from M8, the Lagoon Nebula, the finest diffuse nebulae in the summer sky, and easy to see naked eye above Sagittarius. The nucleus of the Milky Way is only 4 degrees west of B86, making this patch of dark all the more remarkable. Dark nebulae do not jump out at you like other deep sky objects. It helps to be observing in a dark sky. It also helps if the nebulae have a distinctive shape. Luckily, B86 does have a distinctive shape. It's round, like a neat splotch of ink, which is why it is nicknamed Barnard's Ink Spot. It is shocking to see this small symmetrical batch of black surrounded by stars and starclouds in the Milky Way brightness.

To get your bearings and to learn a quick method of determining distances between stars or between stars and targeted objects, hold your fist at arms length and sight past it. Young viewers have smaller hands and shorter arms but their hands stay in proportion. A clenched fist measures about 10 degrees from thumb to pinkie. And an index finger held at arm's length will cover 1/2 degree and will cover the full moon. Know the field of view in your telescope's finder and you will have no trouble hopping up to this magnificent object from Gamma Sagittarii. It reminds some of a black widow spider with a dark inky body and a smaller shimmering head.

If you enjoy discovering B86, Barnard's Ink Spot, there are a dozen more to enjoy within the Sagittarius Star Cloud. Well known and easiest to see is B85, the dark regions in the Trifid nebula M20. Several dark nebula B88, 89 and 286 are the dark regions of the Lagoon Nebula, M8. And just 4.5 degrees south of cluster NGC 6520, (the dainty circle of stars on the edge of the Ink Spot nebula) is B76, known as the Parrots Head nebula. There are another dozen or so Barnard dark nebulae next door in Ophiuchus. Not all atlases show dark nebulae. *Uranometria 2000.0* is a popular atlas which does show dark nebulae such as B86 (on page 339) and the Tirion Atlas shows it on chart 22.

Now, when you look at the dust lanes within spiral galaxies such as M31, the great Andromeda Galaxy, you'll be able to compare it to the great rift overhead in the summer Milky Way. Imagine how our "dust lane" might appear to an observer on a far off world. Dr. Barnard's beautiful little black Ink Spot, B-86 is a glimpse of real stardust. Dusty primordial matter - the stuff of future stars.

Summer Star Parties at Pinnacles

Pinnacles National Monument is seeking amateur astronomers from the San Jose Astronomical Association to help bolster its summer star party program. Following is a press release describing the events:

Pinnacles National Monument will be expanding its night time programs to include astronomical viewing. Beginning this summer, "Pinnacles Starry Nights" will compliment our popular full moon hikes. The Park is normally closed during nighttime hours, but provides ranger led programs so that visitors may enjoy the quiet nights and starry skies. Pinnacles is fortunate to have relatively pristine skies away from city lights. This "Pinnacles Starry Nights" program will feature viewing through telescopes, talks on astronomy, and ways to guard the night sky against light pollution.

The first program of 1999 will be on Friday, July 16th. Meet shortly after sunset at the east entrance station accessed via Hwy 25. Autos will be directed to an area suitable for nighttime viewing. Visitors are welcome to stay for Ranger Chad Moore's 9 p.m. program, or stay up well into the night. Even summer nights at Pinnacles can be cold, so dress warm. Overcast weather at the park cancels; please call ahead for last minute information.

Other Starry Night Programs are planned for Friday August 13th, Saturday September 11th, Saturday October 2nd, and Wednesday November 17th. These dates coincide with the new moon for the best astronomical viewing, or with meteor showers. For recorded park information and to find out last minute weather status, call 831-389-4485, extension "2".

Comet Comments

Don Machholz

Many new faint comets have been discovered in the past few weeks, nearly all by automated equipment designed to find near-earth asteroids and comets. Meanwhile, Comet Lee swings into our morning sky while Comet LINEAR (1998 T1) and Periodic Comet Tempel 2 pass through opposition.

The LINEAR program in New Mexico has found eight more comets, all faint and some with large perihelion distances. Lowell Observatory's LONEOS program found two, one named for Brian Skiff and one for Bill Ferris. The SOHO satellite discovered three sungrazer comets headed into the sun.

COMET HUNTING NOTES: Steve Lee's comet discovery in April was the third accidental find of the past six Southern Hemisphere visual comet discoveries. That is a high percentage considering that there are only two other accidental finds among the 80 discoveries visually found since 1975. What does this mean? Are comet hunters getting lazy?

If the comets were outside typical comet hunting areas, then comet hunters would tend to miss them. For two of the comets this may be true, as the discovery elongations of all three were 72, 103, and 120 degrees from the sun. And if the comets brighten rapidly before discovery, then the usual comet hunting methods may miss them. A third reason for more accidental finds is an increase of activity among non-comet hunters. With the Internet making it easier to report suspicious objects, and the Wilson award motivating the reporting of new comets, it is likely that accidental comet discoveries by amateurs will continue at a brisk rate in the Southern Hemisphere, which is not covered well by the automated search programs.

Ephemerides

C/1999 H1 (Lee)

Date(00UT)	R.A.(2000)	Dec	El	Sky	Mag
06-06	08h29.2m	+08d38'	53d	E	7.4
06-11	08h24.8m	+12d38'	46d	E	7.3
06-16	08h20.8m	+16d05'	39d	E	7.1
06-21	08h16.6m	+19d07'	33d	E	7.0
06-26	08h12.3m	+21d51'	27d	E	6.9
07-01	08h07.5m	+24d22'	21d	E	6.7
07-06	08h02.3m	+26d42'	15d	E	6.7
07-11	07h56.7m	+28d52'	11d	E	6.7
07-16	07h50.6m	+30d55'	10d	E	6.7
07-21	07h44.2m	+32d52'	13d	M	6.9
07-26	07h37.6m	+34d44'	18d	M	7.0
07-31	07h30.6m	+36d33'	24d	M	7.2
08-05	07h23.3m	+38d23'	30d	M	7.4
08-10	07h15.4m	+40d16'	36d	M	7.6

C/1998 T1 (LINEAR)

Date(00UT)	R.A.(2000)	Dec	El	Sky	Mag
06-06	23h16.9m	-12d09'	90d	M	10.8
06-11	23h05.6m	-15d28'	98d	M	10.4
06-16	22h47.9m	-20d06'	108d	M	10.0
06-21	22h18.7m	-26d42'	121d	M	9.6
06-26	21h27.6m	-35d32'	137d	M	9.2
07-01	19h57.8m	-44d36'	153d	M	9.0
07-06	17h54.3m	-47d47'	152d	E	9.0
07-11	16h12.9m	-43d42'	136d	E	8.3
07-16	15h13.5m	-37d47'	121d	E	8.8
07-21	14h40.0m	-32d51'	109d	E	9.2
07-26	14h20.0m	-29d10'	100d	E	9.7
07-31	14h07.5m	-26d28'	91d	E	10.0
08-05	13h59.4m	-24d28'	84d	E	10.4
08-10	13h54.0m	-22d58'	78d	E	10.7

Periodic Comet Tempel 2 (P/55)

Date(00UT)	R.A.(2000)	Dec	El	Sky	Mag
06-06	17h23.8m	-04d40'	161d	M	11.5
06-11	17h20.4m	-05d06'	162d	M	11.3
06-16	17h16.7m	-05d42'	162d	E	11.1
06-21	17h12.8m	-06d29'	160d	E	11.0
06-26	17h09.2m	-07d26'	157d	E	10.9
07-01	17h05.8m	-08d33'	153d	E	10.8
07-06	17h03.1m	-09d50'	150d	E	10.7
07-11	17h01.1m	-11d15'	145d	E	10.6
07-16	17h00.2m	-12d46'	141d	E	10.6
07-21	17h00.3m	-14d22'	137d	E	10.5
07-26	17h01.7m	-16d00'	133d	E	10.5
07-31	17h04.3m	-17d40'	129d	E	10.5
08-05	17h08.3m	-19d20'	125d	E	10.5
08-10	17h13.7m	-20d59'	122d	E	10.5

Elements

Object: Lee

Peri. Date:	1999 07 11.1657
Peri. Dist (AU):	0.708308 AU
Arg/Peri (2000):	040.6689 deg.
Asc. Node (2000):	162.6375 deg.
Incl (2000):	149.3558 deg.
Eccen:	1.00
Orbital Period:	Long Period
Ref:	MPC 34421
Epoch:	1999 07 11
Absol. Mag/"n":	7.0/4.0

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":	8.8/4.0

Object: P/Tempel 2

Peri. Date:	1999 09 08.41663
Peri. Dist (AU):	1.481683 AU
Arg/Peri (2000):	195.02016 deg.
Asc. Node (2000):	118.21147 deg.
Incl (2000):	011.97662 deg.
Eccen:	0.5228125
Orbital Period:	5.47 years
Ref:	NK640
Epoch:	1999 08 10
Absol. Mag/"n":	9.0/5.0

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DonM353259@aol.com.
Web Page: http://members.aol.com/cometcom/index.html

Music of the Spheres at Lick Observatory

Mike Koop

Lick Observatory's Music of the Spheres and the Summer Visitors Program websites have been updated with the dates for the 1999 season. Tickets will be available through the UCSC Box office. Remember that tickets quickly sell out for all the events. There is also a challenge pledge for renovation of the 36" dome. If $25,000 can be raised before June 1st, 1999 then the Barkley Foundation will match the sum. It's interesting to note that the Music of the Spheres concerts are on New Moon weekends while the Summer Visitor's Program is on the First Quarter Moon weekends. For more information see Music of the Sphere's website: www.snapnet.com/HVAG/resources/lick/music/ or Summer Visitor's Program Website: www.snapnet.com/HVAG/resources/lick/svp/svp.html.

Music of the Sphere's 1999 Schedule A, benefit concert, followed by a Lecture, and viewing through the 36" Telescope

Date: July 9th Music by: Golden Bough, Tales interwoven with unique renditions of Celtic songs. Lecture by: Alex Filippenko Titled: Einstein's Biggest Blunder? The Case for Cosmic Antigravity

Date: July 10th Music By: Yiannis Chronopoulos and the Spartans, traditional and contemporary Greek music. Lecture by: Raja Guhathakurta Titled: The Universe of Galaxies

Date: August 6th Music by: Clairdee , Pianist Ken French with vocalist Clairdee Lecture By: Burt Jones Titled: Cosmic Catastrophes

Date: August 7th Music By: Susan Craig Winsberg and Friends: Celtic traditional Music featuring flutes and whistles Lecture By: Mike Bolte Titled: The Age of the Universe

Date: September 10th Music By: Into the Woods: Woodwind chamber music in classical and jazz styles. Lecture By: Steve Vogt Titled: The Search for Extra-Solar Planets

Date: September 11th Music By: Great Guitars! Daniel Roest hosts an evening of guitar magic Lecture By: Douglas Lin Titled: The Genesis of Planetary Systems

Summer Visitor's Program Dates: Viewing through both the 36-inch refracting telescope and 40-inch reflecting telescope with Astronomy and History Lecture June 18, June 19, July 16, July 17, August 13, August 14

Future loaner scope #32.

Celestial Calendar
July 1999

Richard Stanton

(Times are Pacific Daylight)

Lunar Phases:

		Dt.	Rise	Trans	Set
LQ	04:57	06	00:02	06:15	12:36
NM	19:24	12	04:35	11:57	19:17
FQ	02:00	20	12:50	18:36	00:13
FM	04:25	28	19:40	00:58	05:20

Nearer Planets:

Dt.	Rise	Trans	Set	R. A.	Dec.
Mercury - 0.60 A.U. Mag. +1.5					
07	07:50	14:48	21:45	08:41.0	+16:44
17	07:18	14:06	20:54	08:40.5	+14:17
27	06:12	13:02	19:52	08:15.6	+14:42
Venus - 0.43 A.U. Mag. -5.3					
007	09:20	16:03	22:46	09:56.1	+12:32
17	09:10	15:42	22:13	10:14.6	+09:10
27	08:47	15:09	21:31	10:22.0	+06:21
Mars - 0.91 A.U. Mag. 0.6					
07	14:37	19:59	01:24	13:52.7	-12:52
17	14:17	19:34	00:54	14:07.3	-14:21
27	14:01	19:13	00:27	14:24.7	-15:57
Jupiter - 4.99 A.U. Mag -2.5					
07	01:28	08:06	14:43	01:58.5	+10:47
17	00:53	07:31	14:10	02:03.5	+11:12
27	00:16	06:56	13:36	02:07.5	+11:31
Saturn - 9.54 A.U. Mag -.8					
07	02:11	08:59	15:48	02:52.1	+14:06
17	01:34	08:23	15:12	02:55.2	+14:18
27	00:57	07:46	14:36	02:57.8	+14:27

SOL Star Type G2V

Intelligent Life in System?

Hours of Darkness

	Dt.	Rise	Transit	Set	R.A.	Dec.
05:32	07	05:51	13:13	20:34	07:04.0	+22:37
05:50	17	05:57	13:14	20:30	07:44.8	+21:15
06:13	27	06:05	13:14	20:23	08:24.6	+19:18

Astronomical Twilight:

		Begin	End
JD 2,451,	366 07	03:58	22:26
	376 17	04:08	22:19
	386 27	04:20	22:07

Sidereal Time:
Transit Right Ascension at Local Midnite
07 00:00 = 17:51
17 00:00 = 18:30
27 00:00 = 19:10

Darkest Saturday Night: 10-July-1999
Sunset 20:33
Twilight End 22:34
Moon Rise 03:39
Dawn Begin 04:01
Hours Dark 05:36

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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.

SJAA Loaner Scope Status

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

Stored Scopes

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

#	Scope Description	Stored by
1	4.5" Newt/P.mount	Darryl Lambert
3	4" Quantum S/C	Manoj Khambete
18	8" Newt/P Mount	Darryl Lambert
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
7	12.5" Dobson	Mike Rupe	06/27/99
8	14" Dobson	Darryl Lambert	09/04/99
15	8" Dobson	Phil Robba	06/27/99
16	Solar Scope	Bill Maney	08/23/99
19	6" Newt/P Mount	Hsin I Huang	08/21/99
21	10" Dobson	Ralph Seguin	09/04/99
23	6" Newtonian	Glenn Yamasaki	09/04/99
24	60mm Refractor	Scott McGrew	09/04/99
26	11" Dobson	Nilesh Shah	08/01/99
28	13" Dobson	Bill Sweeney	07/25/99
29	C8, Astrophotography	Dean Sala	09/04/99
31	8"/f8 Dobson	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	?	
4	60mm Refractor	Del Johnson	Indefinite	
6	8" Celestron S/C	Slone Wiktorowicz	07/30/99	
9	C-11 Compustar	Paul Barton	Indefinite	
27	13" Dobson	Bud Wittlin	8/1/99	

Waiting List:

#	Scope Description	Borrower
Empty at the moment!		

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New __ Renewal __
Membership - $15
Junior (younger than 18 years old) - $6
Sky and Telescope - add $30 to membership
(Sky & Tel will not accept multiyear subscriptions)

Make checks payable to "SJAA"

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

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