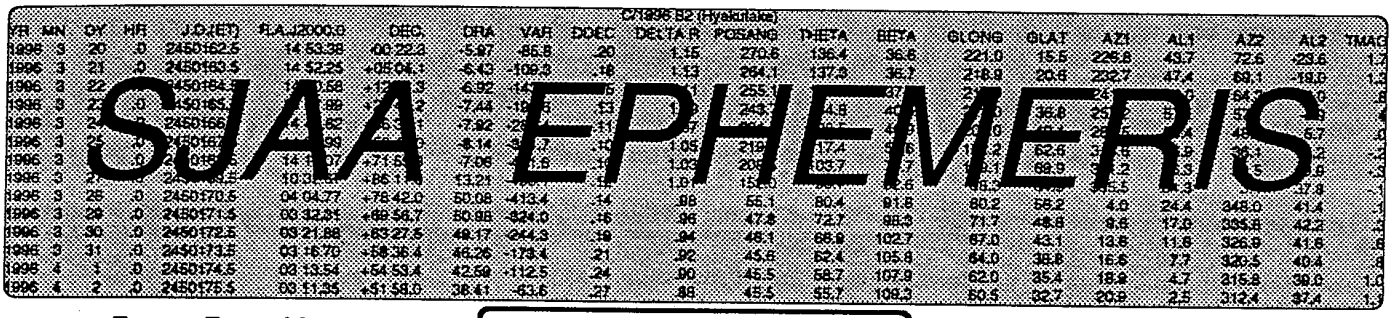

Eye on Everything
by Lew Kurtz

To order your 1997 **RASC Observer's Handbook**, call Bob Elsberry.

All articles except Chuck Vaughn's were written by club members.

More from Mt. Lassen Star Party, 1996
Terry Kahl

Mt. Lassen Volcanic Park is no boring place. This was my second summer for the star party and I hope to make the trip in '97.

Having a reserved capmsite is a plus. You can pitch your tent just about anywhere you choose. One also gets addicted to darker sky after visiting such a place.

On Friday, a group of about 12 left for the Hat Creek Radio Observatory (HCRO) site which is about 15 miles north of Lassen Park. We split up and went in four vihicles. I rode with Robert Shelton, who planned the trip, and led the enTourage in his old "putt-putt" VW van. On the way, we saw many volcanic rocks with trees growing in between. The natural landscaping is beautiful.

It was quite hot at HCRO since it sits in a desert type area surrounded by mountains (see page 14, Sky and Telescope, October 1996). Our host was the facility manager, Rick Forster. He explained to us how the BIMA array worked.

On Saturday, I fulfilled one of my goals to hike to Lassen Peak. It is a 2.5 mile zig-zag trek upward through a

continued on page 5, see **Lassen**

Activities Calendar

October

4 Houge park star party.
5 Star party at Fremont Peak state park. Sun set 6:43 pm, 35% Moon rise 1:59 am.
12 Star party at Henry Coe state park, also Hall's Valley Astronomical Group at Grant Ranch. Sun set 6:33 pm, 1% Moon set 6:50 pm.
18 Houge park star party. Sun set 6:26 pm, 43% Moon set 23:44 pm.
19 General meeting, speaker TBA.
26 Last Observational Astronomy Class of 1996, Houge Park, 8 pm.
27 2 am: Darkness-Squandering time ends. Set clocks back.

November

1 ??Houge park star party??
2 Star party at Fremont Peak state park. Sun set 5:07 pm, 52% Moon rise 11:53 pm.
9 Star party at Henry Coe state park, also Hall's Valley Astronomical Group at Grant Ranch. Sun set 5:00 pm, 1% Moon rise 6:04 am.
15 Houge park star party. Sun set 4:57 pm, 29% Moon set 9:41 pm.
16 General meeting, speaker TBA.

24 hour News and Information:

SJAA Hotline: **408-559-1221**
Home page url
http://www.rahul.net/resource/sjaa
(see current and past Ephemeris issues on the home page!)

Streaking Perseids Over the Bristlecone Pines
by Ernie Piini

Picture yourself at the 8,600-foot level on a hilly plateau inside the Grandview campgrounds east of the majestic Sierras and away from city light pollution. Where the night skies are so dark that you can see the Milky Way from horizon to horizon. Five miles further up the White Mountain Range, nearer to our heavens, the ancient bristlecone pines stand guard. The stars appear so close that they are almost touchable and when a shooting star flashes by you can almost smell the smoke trail! What a way to see the annual Perseid Meteor shower!

This year's display was not the most prolific in numbers but had to be one of the prettiest of dark sky backgrounds I've ever observed. In a matter of about five hours of "looking up" on August 11, I spotted 51 Perseids and 21 "strays" (meteors not emanating from the constellation Perseus). I had loaded a camera with high speed Konica-3200 film and fastened it onto my Takahashi Sky Patrol mount. I took twenty 10-minute exposures, using a 28mm wide-angle lens at f/4, and got excellent photos of the Milky Way but failed to capture any meteor streaks. As Murphy's Law would have it, as soon as I completed an exposure and moved the setup to observe another area of the sky, a bright streak would appear in the space I had just left. This is why one should use at least three cameras, and positioned them with slight overlap-- the more cameras the better.

I belong to the Cupertino Se-

continued on page 2, see **Perseids**

Perseids, continued from page 1

nior TV Production group and was assigned to video tape a 30-minute program about the famous bristlecone pines for showing on local Cable TV. I was accompanied by an assistant cameraman, Chuck Johnson, and my next door neighbors, John and Jean Stadsvold. A major part of this excursion was the opportunity to interview Monsignor Ronald Royer, world renowned astrophotographer, and lecturer, who is very knowledgeable of the ancient pines. The night before the Perseid Shower peak, Monsignor Ron gave his annual slide show and lecture at a bonfire gathering of campers and amateur astronomers at the Grandview campgrounds where we were all staying. After the show we were treated to a star party featuring Comet Hale-Bopp and many other sky wonders.

The next morning we drove up to the 10,000-foot level of White Mountain to the bristlecone pine forest at Shulman Grove. The grove features a newly constructed museum where we conducted the TV interview, a picnic area, and two self-guided tours which includes a one mile "Discovery Trail" hike and a four and one-quarter mile "Methuselah Walk." The latter hike provides a look at seventeen of the oldest, gnarled and twisted trees including the oldest -- 4,600 years! Because of time limitations, we decided to walk the shorter "Discovery Trail" which still gave us an opportunity to video tape and photograph many ancient trees and beautiful stump formations.

The grove was named after Dr. Edmund Shulman, who studied for 20-years these oldest of living trees in the world as part of his research at the University of Arizona. These trees have been there for over 4,000-years, having survived under the most adverse conditions of limestone soil, arid land, and the rigors of the 10,000-foot plus elevation. Some of these trees were just small plants when Stonehenge and the Pyramids were constructed.

Why are these trees so important to modern scientific studies? Specialist in the field of dendrochronology count tree-rings to determine a tree's age (a new ring forms every year). They study the shape of the rings which provides a history of wet and dry years and found that these trees have recorded the weather for centuries. They perform radio carbon analysis to calibrate and correct methods of Carbon-14 dating. This practice was found to be in error by at least 1000-years or more. Once corrected, ancient European monuments such as Stonehenge were found to be much older than previously thought.

Carbon-14, also known as "heavy carbon", is absorbed from the atmosphere by all living things and, more importantly, C-14 is radioactive. Every living creature is radio active, and since the amount of C-14 in the atmosphere is kept constant by the continual stream of cosmic rays, every living thing keeps renewing its C-14 charge by absorbing carbon. When an organism dies, the proportion of Carbon-12 and Carbon-14 slowly drops at a fixed rate. The half-life of Carbon-14 is 5,730 years which means that at the end of this period, its radioactive charge had diminished by one-half. It continues to drop by one-half for each succeeding 5,730 years. To calibrate C-14 dating, a remnant is extracted from a tree ring of known age and analyzed using special laboratory techniques to determine the actual radioactive charge. By this means, charts using old data have been corrected to reflect a new and more accurate curve.

Tree-ring dating has been extended to almost 10,000 years by cross dating samples from recent 4,000-year old trees with those that existed much earlier. The recording of dry and wet year ring patterns are then matched to other known data, extending this very important time scale.

Readers interested in visiting the Bristlecone Pine area and camping at the Grandview site may write to: United States Forest Service, Inyo National Forest, White Mountain Range District, 798 North Main Street, Bishop, CA , 93514 or call: (619) 873-2525. The 230-mile trip takes about seven hours driving time from the Bay Area. I recommend the scenic Tioga Pass through Yosemite and down Highway 395 through Bishop to the U.S. 168 cutoff north of Big Pine. Go east for 13 miles to the summit of Westgard Pass where you will see the Ancient Bristlecone Pine Forest sign. Here at Cedar Flat, turn left on White Mountain Road. Grandview Camp is 5 miles up hill and Shulman Grove is another 5 miles further. After visiting the Shulman Grove you may continue on White Mountain Road for 12 miles to visit the Patriarch area of bristlecone pines at the 11,000 foot level. This last leg is through open highlands that gives you sweeping views of the Sierra Nevada Range to the west and Owens Valley and the city of Bishop below you.

The entire trip to the Shulman Grove is on paved road. Normally this area can be visited from June 1 to October 30, but early or late in the season check the road conditions before leaving Highway 395. Both Tioga Pass and the road up to the Grandview campgrounds are closed during snow season. There is no water or electricity at the Grandview Campsite and no bugs, bears, or raccoons but plenty of friendly chipmunks, stray blue jays, and chickadees.

New Event: Dark Sky Star Party at Houge Park October 4,1996

Bill O'Shaughnessy

Ever wish you you could show some of those beautiful nebulas to those interested observers that come to our Houge Public Star Parties. Well now you will have your chance to show off those nebulas and Hale-Bopp too. We are scheduling the first of what we hope are many dark sky star parties at Houge on October 4,1996. Come help make it a success. We are a large and active club and I am sure we can successfully hold two easy-access star parties a month.

See you there.

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Knife-Edge Focusing for Astrophotography

By Chuck Vaughn

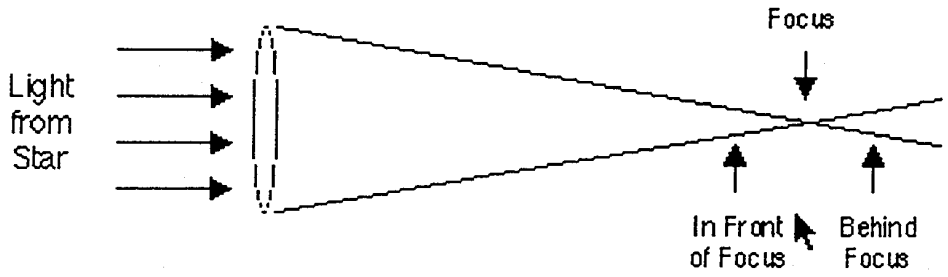
From Chuck's Web Page

[http://www.aa6g.org/astro.html]

This article describes how to use knife-edge focusing to achieve best focus for all your astrophotos. I have used this method for all telescopes that I have owned and have found it to be quite reliable. When using camera lenses for astrophotography another method is best for focusing and I hope to describe this in another article.

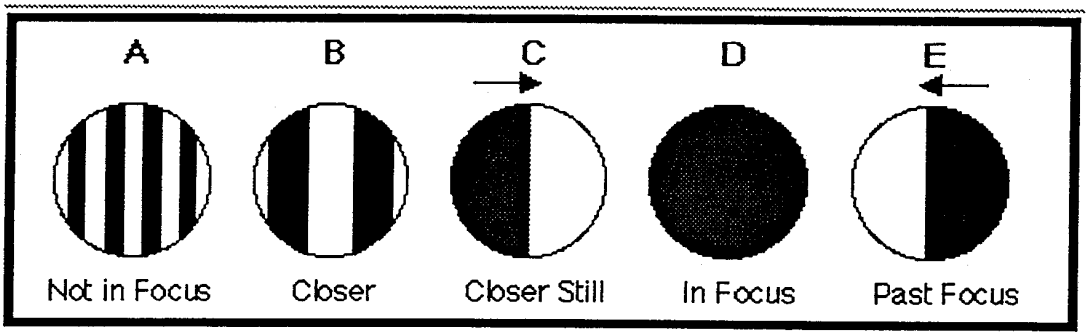
What's the Idea Here?

The basic principle of knife-edge focusing is simple. The diagram at right shows a simple telescope with parallel light from a star entering the objective and coming to focus some distance behind. The telescope is centered on a bright star and a sharp edged object (often a Ronchi screen) is placed in the light path in front of or behind focus. Focus is then adjusted until the edge cuts the light exactly at focus.



How to Do It

At this point I'm going to assume a Ronchi screen is used as the knife-edge and is mounted at the position of desired focus. I'll discuss the practical aspects later. Refer to the diagram below for this discussion. Center a bright star in the field and look up the tube through the Ronchi screen. This procedure works best for me if the Ronchi screen is rotated so that the lines are parallel to the direction of Right Ascension and I assume your's will be adjusted so. You will see a disk of light with black lines through it as shown in "A" of the diagram. There may be a few lines or many lines depending on how far from focus the screen is. Adjust focus so that the number of lines decrease as shown in "B". Keep Adjusting focus until there is only one wide line as shown in "C". Use the declination slow motion control or nudge the telescope in dec so that you see the black line move across the field. Note the direction of movement. Keep adjusting focus until it is no longer possible to determine the direction of movement of the black line and the whole bright disk grays out evenly when dec is moved. This is the focus point as shown in "D". If you keep adjusting focus you see the black line return and appear to move in the opposite direction as shown in "E". This indicates you have gone to the other side of focus.



An Imperfect World

When you are far from focus what you see in the telescope will always look like the diagram. When you are at or very close to focus things may look different. Less than ideal seeing will cause the black line to waver and less than perfect optics will cause an uneven graying of the disk which may lead to confusion as to where the exact focus is. Go back and forth on each side of focus and pick the best spot in the middle. This should get you there. The f/ ratio of your telescope will also change what you see during knife-edge focusing. At faster f/ ratios like f/4 or f/5 the focus point will be very critical

because the depth of focus is very small there and it will be easier to see the exact spot where the disk evenly grays out. As you move towards slower f/ ratios like f/10 the depth of focus increases and there is a small range in which the graying out of the disk appears to be the same. Pick the middle of this range if you can.

Some Practical Aspects

Now that you have a good idea of how to do knife-edge focusing, how do you set this up on your telescope? The most frequently used method is to use a device that substitutes for your camera and has a Ronchi screen mounted exactly where the film lies in the camera. There are several commercial devices that do this, and for most people, I would recommend buying one. If you're so inclined you can make your own. Just be aware that the screen needs to be mounted to within .001" of the film plane position for most commonly used telescopes.

If you buy a commercial knife-edge focuser, how can you be sure that it is manufactured properly? An easy way to check this is, is to use your camera as the knife-edge focuser. All you need to make is a small piece of metal that will sit inside the camera where the film goes and has a beveled sharp edge that sits right at the film plane. Start with the camera back open and the shutter locked open, look up the telescope through the camera and carefully slide the knife-edge so that it cuts the light cone. Adjust focus as before so that the disk evenly grays out. Now you know you are in focus at the film plane. Put on your knife-edge focuser and check to see that it also shows perfect focus. If it does not, the Ronchi screen is not in the right place. You should examine it for mechanical problems. If the focus needs to be moved out you can probably shim it as necessary, but if it needs to come in, you'll probably need to return it to the manufacturer.

Some Final Thoughts

Knife-edge focusing can reveal some problems with your telescope. You should check focus after each exposure to be sure it didn't change. If it did change, your last photo is probably out of focus. This is a problem that should be addressed. When you perform knife-edge focusing, especially under good seeing, you can get an idea of the quality of the optics in the telescope. The lines of the Ronchi Screen should be straight. As you move closer to focus, the edge of the line moving across the bright disk will reveal flaws in the system as a non-straight line. The closer you are to focus the more sensitive this test becomes. Remember that no optics are perfect and some irregularities can be detected in almost any system. This is not a quantitative test.

**** STAR WARE 2 SURVEY ****

A Request from Phil Harrington

In 1994, I released my book STAR WARE: THE AMATEUR ASTRONOMER'S ULTIMATE GUIDE TO CHOOSING, BUYING, AND USING TELESCOPES AND ACCESSORIES. The purpose of this book is twofold. First, it explains various terminology and concepts that those who are new to astronomy often find confusing. It also surveys, in an unbiased and objective way, the astronomical equipment marketplace in an attempt to answer the question that so many stargazers ask: "Which telescope is right for me?" Unlike most other telescope books, STAR WARE names names! Which telescopes are good, and which are not?

I've had some wonderful conversations with people who have found STAR WARE useful, plus a heated argument or two with telescope companies complaining about the book's "frankness." But the bottom line is that STAR WARE seems to have made a difference.

Sales of STAR WARE have been great, but to keep it up-to-date, it is time to re-examine the market, and see what has changed. There are a lot of new telescopes out there! Are the good telescopes still good, or is there something better?

How do YOU like your telescope? I want to know, so I'd like to invite you to participate in the STAR WARE 2 survey. To help standardized replies, I have created a simple, one-page survey form that asks various questions about you and your astronomical equipment. Rather than take up space here, however, I'd like to ask all who are interested in participating to drop me a line. Then, I'll send along the survey by return mail. Just return it to me when you're done. AND REST ASSURED, AS WITH STAR WARE 1, ALL REPLIES WILL BE KEPT STRICTLY CONFIDENTIAL!! Addresses are shown at the end of this message.

PROJECTS WANTED, TOO!

Do you have a homemade project that enhances your time out under the stars? It might be an observing chair, or a special eyepiece case, or maybe even a complete observatory. If so, I would like to hear about it, and possibly feature it in STAR WARE 2. No project is too small to be considered! And if your project is selected for the book, you will receive a free copy when it is released in mid-1998. Take a moment and send me a description of the project.

Please mail all replies to: STAR WARE 2, c/o Phil Harrington, 54A Dillmont Drive, Smithtown, New York 11787 USA. E-mail is gratefully welcomed at either STARWARE@JUNO.COM, 103055.2357@COMPUSERVE.COM, or STARWARE1@AOL.COM.

THANKS IN ADVANCE FOR EVERYONE'S COMMENTS. Together, maybe we can help manufacturers better serve our needs!

[This came to me by way of Ernie Piini. In Phil's note to Ernie, Phil says "I need to submit my revisions by mid-1997, which in turn means I have to start gathering data and information NOW!" - Ed.]

STRANGE BUT TRUE...

Mark Wagner

It was a hot new moon summer evening at Fremont Peak. Every amateur astronomer within driving distance seemed to be there. We had, without exaggeration, well over 100 telescopes on just our one side of the park. Beside it being much to crowded, this means you also contend with people who are, let's say, less informed when it comes to observer's etiquette.

One such individual parked his car and trailer on the road in such a way as to block access. And then, he proceeded to leash his doberman pincer on too long of a leash, to the corner of the trailer. Everytime someone would come within biting distance, the dog would launch itself, only to be strangled when it ran out of rope.

Well, it turns out that Daniel from Castro Vally knew the pincer's owner. He headed over to talk, but came within striking range of the dog. Soon, Dan's trousers were in the jaws of death. Fortunately, the only fabric sustaining damage was that of the clothing (no meat). The pincer's owner got the idea that he was creating a hazard, but only after the ranger visited him.

So, there was the beginning of Daniel's unnerving evening at Fremont Peak.

Next, he began setting up his 8" SCT. Everything was going great, tweaking the equipment most intently, when, without warning.... a squirrel leaped onto the tripod tray, taking Daniel by complete surprise. I had never before seen a human levitate without some hocus-pocus, but Daniel came very close. He was frantic, and stayed on-edge for the remainder of the evening.

So, the night passed, and Daniel sacked out in a sleeping bag next to his scope. Those of us who stayed up all night were fortunate enough to witness the final straw in Daniel's adventures....

Just after sunrise, a loud buzzing sound was heard speeding over our heads. We looked around but could not see anything. Sleep dep can succeed in making one dingy, but there was no mistake about the sound. Then... right after the sound passed, there was a scream that would curdle momma's milk, coming from Dan's direction! It was the attack hummingbird! Daniel had been sleeping on his back, when the bird positioned itself a foot over his snoozing face. Waking up, after the frightening occurences of the past 12 hours, Daniel heard the loud

bbbbbbbbbbbbzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzzz

of the hummer, sounding like some demented flying chainsaw... and, unable to recognize the bird at such close range, began thrashing and screaming wildly.

I have seen Daniel there only one time since that episode...

Fremont Peak is a great place to observe. You really never know what you will see.

Perhaps I'll write up the story of John Hales and the tarantula. But, that one is not for those of a delicate nature.

Lassen, continued from page 1

rock rubbled trail. From the top, you could see the layer of smoke from the forest fires. Observing at night was still great since the wind had blown most of the smoke away.

The public star party was enjoyable, especially when the skies are exceptional and one can brag about it. I started showing the Butterfly Cluster (M6) and people were impressed with its brilliance and thought it looked more like a bee.

Ken Muira made some interesting red mini-blinker lights and attached them to his tripod with velcro (so he would not trip over the feet). They were also velcroed to several rocks on the periphery of the parking lot so we wouldn't run into the rocks on our way out.

For those who have not been able to visit Lassen Volcanic Park, I highly recommend it. This summer was exceptional since most of the snow melted and flowers were abundant. There are many short hikes a person can take, in spite of keeping late hours the night before. One must remember that it takes a few days for the body to adapt to the higher elevations.

So you there next summer.

Celestial Calendar - Oct 1996

by Richard Stanton

Lunar Phase	time (utc)	date	rise (pdt)	trans	set
LQ	12:06	04	23:53	07:06	14:17
NM	14:14	12	07:16	12:54	18:35
FQ	18:10	19	14:01	19:23	00:42
FM	14:11	26	18:39	00:41	07:29

Mercury	Dist: 1.28 AU			Mag: -1.6	
date	rise	trans	set	RA	Dec
07	05:44	11:57	18:08	11:53.2	+02:42
17	06:24	12:17	18:08	12:52.3	-03:38
27	07:10	12:40	18:09	13:54.8	-10:45

Venus		Dist: 1.13 AU		Mag: -4.5	
07	03:48	10:26	17:03	10:23.1	+10:36
17	04:06	10:32	16:56	11:08.0	+06:41
27	04:25	10:37	16:47	11:52.7	+02:21

Mars		Dist: 1.83 AU		Mag: +0.8	
07	02:22	09:21	16:20	09:18.7	+17:01
17	02:12	09:05	15:57	09:42.0	+15:18
27	02:01	08:48	15:34	10:04.3	+13:30

Jupiter		Dist: 5.3 AU		Mag: -2.1	
07	13:57	18:42	23:27	18:41.9	-23:19
17	13:22	18:08	22:53	18:46.9	-23:15
27	12:48	17:34	22:20	18:52.8	-23:08

Saturn		Dist: 8.55 AU		Mag: +0.7	
07	18:15	00:19	06:18	00:15.9	-01:08
17	17:34	23:32	05:35	00:13.2	-01:24
27	16:53	22:51	04:53	00:10.8	-00:39

SOL Star Type G2V Intelligent Life in System ?

07	07:08	12:55	18:42	12:52.8	-05:39
17	07:18	12:53	18:28	13:29.8	-09:24
27	07:28	12:52	18:15	14:07.7	-12:55

Astronomical Twilight		Begin	End
JD 2,450,363	07	05:42	20:08
JD 2,450,373	17	05:51	19:54
JD 2,450,383	27	06:00	19:42

Sidreal Time				
Transit Right	07	00:00	=	23:57
Ascension at	17	00:00	=	00:36
Local Midnight	27	00:00	=	01:15

Darkest Saturday Night:	12-Oct
Sunset	18:35
Twilight End	20:01
Moon Set	18:52
Dawn Begin	05:45

COMET COMMENTS

by Don Machholz

Comet Hale-Bopp, brightening as expected, has been displaying a "J"-shaped tail nearly a degree long. It passes near the globular cluster M 14 during the last week of October. Comet NEAT and Comet Brewington remain in the evening sky, both are slowly fading in brightness. I've also included an ephemeris for Periodic Comet Machholz 1, which passes closer to the sun than any other periodic comet. It will be a difficult object in twilight, but may also be brighter than suggested here. Periodic Comet Kopff has faded from view.

A new comet was visually discovered on August 19 by Vello Tabur of Wanniassa, of the Australian Capital Territory. The comet was very diffuse, magnitude 11, and near the constellation Orion in the morning southern sky. Comet Tabur may reach naked-eye visibility in the morning sky in October. Its orbit is similar to that of Comet Liller, discovered in 1988. Apparently the two comets were one in the past, they take 2900 years to orbit the sun.

A new comet was discovered on Sept. 7 by Carl Hergenrother on plates exposed by Timothy Spahr of the University of Arizona. No orbit has been determined and it is presently known as simply Comet 1996 R1. The 12th magnitude object was found near the Andromeda Galaxy and moving westward at about two degrees per day.

The NEAT program, mentioned here last month, discovered an object that appears asteroid-like (stellar) but it's in a comet-like orbit. Known as 1996 PW, it takes 6900 years to orbit the sun and was at perihelion this Aug. 8 at 2.5 AU. At its most distant point it is 360 AU away. It is not expected to get brighter than magnitude 16

On the flip side of that story, in early August, Eric Elst reported the discovery of a comet on photos taken in mid-July by Guido Pizarro. This object shows a tail, but no coma, and it is in an asteroid-type orbit between Mars and Jupiter, taking 5.6 years to circle the sun. In 1979 it was announced to be an asteroid (1979 OW7), but now that it shows cometary activity, it is renamed Comet P/1996 N2 (Elst-Pizarro). It remains near magnitude 17.

Finally, I surpassed 6,000 hours of visual comet hunting last month. I began in January 1975. I still enjoy it.

Ephemerides

C/1995 O1 (Hale-Bopp)

DATE	R.A.	Dec	EL	Sky Mag
00 UT	2000			
09-29	17h29.7m	-05°04'	77° E	5.0
10-04	17h29.9m	-04°50'	72° E	4.9
10-09	17h30.6m	-04°35'	68° E	4.8
10-14	17h31.8m	-04°20'	63° E	4.8
10-19	17h33.5m	-04°04'	59° E	4.7
10-24	17h35.6m	-03°47'	55° E	4.6
10-29	17h38.1m	-03°29'	51° E	4.5
11-03	17h41.0m	-03°09'	48° E	4.4

C/1996 N1 (Brewington)

09-29	17h23.7m	+58°06'	84° E	11.1
10-04	17h59.9m	+58°04'	88° E	11.3
10-09	18h36.3m	+57°27'	92° E	11.5
10-14	19h11.6m	+56°16'	96° E	11.8
10-19	19h44.6m	+54°36'	99° E	12.0
10-24	20h14.9m	+52°33'	102° E	12.2
10-29	20h42.2m	+50°15'	105° E	12.5
11-03	21h06.5m	+47°48'	107° E	12.7

C/1996 Q1 (Tabur)

R.A.	Dec	EL	Sky Mag
2000			
06h54.1m	+28°53'	84° M	6.2
07h53.5m	+41°31'	80° M	5.7
09h31.4m	+52°25'	73° M	5.5
11h35.3m	+55°55'	68° M	5.5
13h12.2m	+52°44'	63° M	5.7
14h10.0m	+47°32'	59° E	5.9
14h44.2m	+42°34'	57° E	6.2
15h05.8m	+38°16'	54° E	6.4

C/1996 E1 (NEAT)

19h04.7m	+55°57'	98° E	10.5
19h19.2m	+48°17'	100° E	10.6
19h30.8m	+40°58'	100° E	10.8
19h40.6m	+34°12'	99° E	11.0
19h49.2m	+28°08'	98° E	11.3
19h57.0m	+22°48'	95° E	11.5
20h04.3m	+18°11'	92° E	11.8
20h11.2m	+14°12'	88° E	12.0

96P/Machholz 1

DATE	R.A.	Dec	EL	Sky Mag
00 UT	2000			
10-04	12h31.7m	-30°35'	26° M	8.5
10-06	12h31.8m	-27°13'	22° M	7.7
10-08	12h32.3m	-23°20'	18° M	6.8
10-10	12h33.7m	-18°48'	14° M	5.6
Too close to the sun for observation				
10-24	14h34.5m	-02°27'	14° E	8.4
10-26	14h49.6m	-03°23'	15° E	9.3
10-28	15h03.0m	-04°18'	16° E	10.0
10-30	15h15.1m	-05°12'	16° E	10.7
11-01	15h26.2m	-06°03'	17° E	11.2
11-03	15h36.4m	-06°52'	17° E	11.7
11-05	15h45.9m	-07°37'	18° E	12.2

Orbital Elements

Object	Hale-Bopp	Brewington	NEAT	Tabur	Machholz 1
Peri. Date	1997 03 31.86770	1996 08 03.42395	1996 07 27.36189	1996 11 03.56197	1996 10015.06962
Peri. Dist (AU)	0.9170703	0.9257232	1.3585919	0.8420208	0.1247178
Arg/Peri (2000)	130.40061°	043.96932°	81.12936°	057.23424°	014.58608°
Asc. Node (2000)	282.46983°	234.90202°	149.84329°	031.51643°	094.53200°
Incl (2000)	089.38442 °	052.14766°	114.47220°	073.23424°	60.07415°
Eccentricity	0.99674010	1.004799	1.0005638	1.0	0.9586366
Orbital Period (yrs)	4700	long period	long period	long period?	5.24
Source	MPC 26879 (7-96)	MPC 27690	MPC 27428	MPC 26690 (1991)	

Astro Ads

6" f/8 Newtonian reflector, equatorial mount, clock drive, aluminum tube and 27mm eyepiece. Asking $250.
David 408-732-1489.

10" f/4.5 Newtonian reflector, optical tube assembly (no mount). Fiberglass tube, spider and diagonal. Asking $250.
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Celestron 5 Telescope: Execellent Celestial Photography, special coatings, 12 & 25 mm oculars, tripod, wedge, case, Camera Adapter, Spotting Scope. Makes excellent 1300mm Camera lens, paid $1400 in 1987, Asking $850.
Rick 408-377-3717

Celestron 5-inch Schmidt Camera w/ mtg rings, including Kevin Medlock's improvements. Firm at $1000.
Bob Madden 408-264-4488.

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

Celestron Super Polaris Mount with dual-axis quartz drive and adjustable tripod, excellent condition, $425 or best offer. Also, **Celestron C8 fork mount** with Byers Drive, wedge, adjustable tripod, and dual axis quartz drive, $325 or best offer.
Dave 415-859-3742 (day)
415-858-0327 (evenings).

Wanted: 10 inch Coulter (must be a Coulter, so base will fit in my car's trunk).
David 510-756-7232

6"f/5.6 Newtonian Reflector, Optical Tube Assembly $200.
Takahashi EM-10 Eq. mnt, with hardwood tripod, $1,500.
New Vixen GP Eq. mnt (Head) with Polarscope $475.
Used Vixen GP Eq.mnt (Head) with Polarscope $395.
Used Aluminum tripod with a new half-pier ext. tube $125 (with GP mnt only). Two sets avail.
DD-1 Dual axis controller with two stepping motors. $275 (with GP mnt only).
Vixen GA-4 illuminated guiding eyepiece (.965"size) $95.
Takahashi Tube mounting bracket for 16mm O.D. tube, $85.
Eyepieces. Unitron WS 20mm, $75. WS13mm,$65. WS10mm.,$65. Unitron 55mmPL (2" size), $65. Vixen LV2.5mm, $110. Vixen 26mm PL, $45. Vixen 15mm PL, $45. Pentax XL40mm (2" size)$245. XL21mm, $235. XL10.5mm, $235. Meade 40mm Super Plossl, $55. Televue 7.4mm PL.
Many other items.
Ken Miura 408-456-7408 (work)
408-867-8689 (home)

Orion Spaceprobe 4.5" Reflector Telescope with Equatorial Mount, wooden tripod; Set of 4 Sirius Plossl eyepieces(7.5,10,17,25mm);Set of 4 filters(blue,green,red, yellow); 30mm finder scope; 9 and 25 mm Kellner eyepieces. All like-new condition, bought in 1993, original cost 700, will sell for 295 (or make offer).
Gary Klinkman 408-453-9005
e-mail grkrk@aol.com.

Celestron C-8 orange tube, hardly used $500
Rita Miram 510-797-9916

Astro Ads are free to all noncommercial advertisers selling astronomically related products or services. Please send your ad directly to the Editor, (via e-mail to lewkurtz@aol.com; fax - 720-9726; or a letter to 1336 Bobolink Circle, Sunnyvale, CA, 94087).

Telescope Loaner Program Status
by Paul Barton

No.	Scope Description	Borrower	Due Date
1	4.5" Newt/P Mount	Glenn Yamasaki	10/06/96
3	4" Quantum S/C	Stephen Shoop	10/23/96
6	8" Celestron S/C	Michael Law	10/11/96
7	12.5" Dobson	Tim Sanstrom	11/09/96
8	14" Dobson		**available**
9	C-11 Compustar		see note
15	8" Dobson		**available**
16	Solar Scope	Jack Peterson	indefinite
18	8" Newt/P Mount (fresh coatings)		**available**
19	6" Newt/P Mount	Steve Wurzburg	10/03/96
21	10" Dobson	Ravi Tembhekar	10/23/96
23	6" Newt/P mount	Mike Bennett	11/06/96
24	60mm refractor	Sridhar Lakshmikanthan	11/25/96
26	11" Dobson	John Linthicum	due back
27	13" Dobson	Bob Bart	10/26/96
28	13" Dobson	Doug Snyder	11/26/96
29	SP-C8 Optical Tube	Bob Madden	indefinite

Note: Need a regular operator for club's C-11. This is a fine scope. Some patience required.
Waiting list: Rick Pan needs a small dob (#15 is too long for his auto).

All scopes are available to any SJAA member. Call Paul at 377-0148.

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