

# SIRIUS ASTRONOMER

NEWSLETTER OF THE ORANGE COUNTY ASTRONOMERS  
See our web site at <http://www.chapman.edu/oca/>

October 1999

Free to members, subscriptions \$12 for 12 issues

Vol. 26, No. 10



An 8<sup>th</sup> grade science class from Stephen M. White Middle School in L.A. County visited the Anza site last May and were treated to a tour of the sky by OCA Board Member Tony Obra and OCA Member James Thorp. The excursion was promoted by a member of Mt. Wilson's "Telescopes in Education" program and was organized by school instructor Wayne Johnson (center). Tony and OCA Vice President Jay Glowacki are working toward involving the club in similar projects in the near future. Photo pro-

## CHAPMAN MEETINGS

The next meeting of the OCA is on Friday, October 8, at 7:30pm in the Science Hall of Chapman University in Orange. The free and open meeting will feature multimedia August 11 Eclipse presentations by OCA members as well as a "What's Up" presentation by Chris Butler.

## STAR PARTIES

The Silverado site will be open for observing on Saturday, October 2. The Anza site and Observatory will be open Saturday, October 9. Dress warmly and check weather information before leaving town or call the Anza Observatory at 909-763-5152.

## UPDATED BANQUET INFO

Is there Life in the Universe? The OCA Annual Banquet, to be held Oct. 17, will feature Dr. Laurance Doyle of the SETI Institute, who will discuss this topic from the perspective of the famous Drake equation. Tickets are \$30 and may be purchased at the October meeting. Don't miss this one!

# President's Message

**by Russell Sipe**

## I Could See *Eight* Pleiades!

Well, I did it. In September I had LASIK eye surgery. In ten minutes I went from 20/400 to 20/20. Amazing! So many of you have asked about the experience that I thought I would talk about it in this month's column.

I have watched vision correction surgery since the late 70's when a friend of mine had radial keratotomy performed on an experimental basis. I wasn't an amateur astronomer in those days but it still made my skin crawl. It sounded like a huge risk just to avoid wearing glasses or contacts. All those razor edge cuts into the cornea? No thank you.

Vision correction surgery has come a long way since then. But it wasn't until this year that I felt comfortable with the state of the art. Until fairly recently laser surgery involved roughing up the surface of the cornea then "ablating" away corneal material until the new desired curvature is obtained. This procedure, coupled with the less sophisticated laser device itself, meant for slower healing, sometimes permanent haloing at night and, most importantly, less accurate "cuts" by the laser than with today's cutting edge technology (literally).

Today the state of the art is "third generation LASIK" which involves more accurate lasers and a simple preparation that almost completely eliminates any disturbance to the corneal surface. Rather than "roughing up" the corneal surface and lasering directly on the surface, the new procedure involves a very thin slicing of the corneal surface which is laid back along a hinge of non-sliced cornea. Think of slicing through a thin layer of an apple but not all the way. Lift up the small slice, take a small bit out of the apple, then lay the cover slice back down in the original position. The laser ablates corneal matter BELOW the critical surface area while there flap is raised. The slice is then repositioned and the tiny thin line of the cut heals quickly. Most people can go back to work in a day or so.

The results for astronomy have been fantastic. Whereas I previously could only detect six of the Pleiades, I was able to see eight at the last "Explore the Stars" program. The ten brightest stars in the Pleiades are under 6th magnitude and are in theory visible to the naked eye. However most amateur astronomers can only see six or seven due to the congestion of stars in the cluster. Next month I am going to work real hard and see if I can pick up numbers nine and ten.

The biggest worry about laser surgery for the eyes is the phenomenon of haloing around bright lights at night. Prior to having the surgery done I had pictured this phenomenon in my mind as being like a circle of light around a bright object, sort of like the 22.5 degree circle you sometimes see around the Moon when there is ice in the upper atmosphere. After all, that is what a halo should look like, right? A circle of light like the halo on an angel. However that's not it. The "haloing" is more like a circular glow around the bright object, the glow being of equal brightness from the source object to the edge of the glow. Picture M97 the Owl Nebula for a more accurate image of what the glow looks like.

My biggest question about the haloing was whether it occurred on astronomical objects such as bright stars. My suspicion was that it occurred around bright objects like car lights and traffic signals, but might not be a problem around the relative dim light of bright stars. My suspicions were correct. I can see a hint of haloing around bright stars such as Vega and Sirius. But it is slight, and it is less apparent than the glare I saw on the same stars if I wore glasses that were even the slightest bit smudged or scratched. There is also noticeable haloing around the Moon, but it is not objectionable to me. The haloing around car and traffic lights is there, but it does not bother me. I am told that the haloing effect tends to go away during the healing process in third generation LASIK (although older processes could leave some permanent haloing).

The overall effect of viewing the sky after LASIK is that my eyes have become a magnitude or so more sensitive. I am seeing stars I have never seen before. It's wonderful. And getting rid of the glasses when going back and forth from naked eye to the telescope or binoculars is fantastic.

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# Eclipse 1999 in Turkey

by Aaron Imaoka, OCA Member

## On the “Steps” of Central Asia

When I experienced my first total solar eclipse in Mexico on July 11, 1991, I knew it wouldn't be my last—it wasn't a matter of if, but when, I'd see another. After missing several good eclipses in recent years, my wish finally came true. Exactly eight years and one month later, I experienced two more minutes of totality at the last total solar eclipse of the millenium, on August 11, 1999.

I started planning for this eclipse in February 1998, after that month's excellent eclipse in South America and the Caribbean. The Internet turned out to be a gold mine of information. I looked at a good number of eclipse tours with varying destinations (England, Europe, Turkey) and itineraries (cruises, land tours). It came down to a choice between a self-arranged trip to Germany or a commercial tour to Turkey. The former was a natural choice since I speak German and have friends to visit there, having been an exchange student years before. But, in the end I chose Turkey because of its far better weather prospects. And unlike Europe, it would be a totally new experience for me.



I ended up on a tour organized by the Royal Astronomical Society of Canada. On August 6th, fellow OCA member Steve Roley and I met the 100+ other members of the group in Istanbul. We then spent a few days in that fascinating city. On the 9th we flew to the city of Elazig (ell-ah-zuh) in eastern Turkey, then went to nearby Lake Hazar, source of the Tigris River, where we stayed the next four days. Many other eclipse groups had also come to the Elazig area to observe the eclipse. Our observing site, however, was far away in southeastern Turkey, home to the Kurds and graced with the best weather prospects in the whole country.

## Eclipse Day!



Late on the evening of August 5th, fellow OCA member Steve Roley and I arrived in the fascinating city of Istanbul. The next day was spent exploring the city on foot. as we saw the Spice Market, caught a commuter train at Sirkeci Station (end of the Orient Express), walked atop Constantine's Wall as the midday call to prayer echoed over the rooftops, and toured the Archaeological Museum. We even sampled the local junk food -- Turkish Delight, at the original shop of its 18-century inventor, and dondurma, or Turkish ice cream. The following day, August 7th, we joined the 100+ other members of our tour, which was sponsored by the Royal Astronomical Society of Canada. The next few days were filled with more sightseeing, dining, shopping, and cruising the Bosphorus.

**Sultanahmet Camii (The Blue Mosque), Istanbul**

On the 9th we flew to the city of Elazig (ell-ah-zuh) in eastern Turkey, staying at nearby Lake Hazar, source of the Tigris River, for the next four days. The day before the eclipse, we toured the archaeological site of Harput, just outside of Elazig. On the way there, one of our buses was in a little accident; a small passenger car 's front end was crushed as it tried to pass on the left while the bus was negotiating a roundabout (see picture). It sounds serious, but no one was hurt, the bus had hardly a scratch to show for it... At Harput we saw other eclipse groups who had come to Elazig to observe the eclipse. Our observing site, however, was far away in southeastern Turkey, the area with the best weather prospects for the whole country.

The morning of August 11, we drove to the town of Hasankeyf (hah-san-keef), located on the Tigris River about 60 miles upstream from Syria and Iraq. Founded in ancient times, Hasankeyf was later a Roman outpost, then capital for successive conquerors of the area. The four-hour bus ride took us over a varied landscape: forested mountains, river gorges, endless farmland (Turkey is one of few countries with a net export of food), and a lot of military roadblocks.



**Town of Hasankeyf (left) and clifftop ruins of Hasankale (center)**

All of eastern Turkey has a very strong government military presence, due mainly to the PKK, a group of Kurdish terrorists. (Earlier in the year, its leader was captured and sentenced to death, leading to a number of bombing incidents. These in turn caused a major dropoff in tourist bookings for the summer). However, our guides assured us that, though we were in PKK territory, measures had been taken to ensure our safety. As we found out, that meant soldiers armed with loaded machine guns. We never had any problems with the soldiers, though; at almost every checkpoint, they just waved us through. (But, we were always reminded of where we were when, on occasion, we saw U.S. military fighter jets high above enforcing the no-fly zone over southern Iraq.)

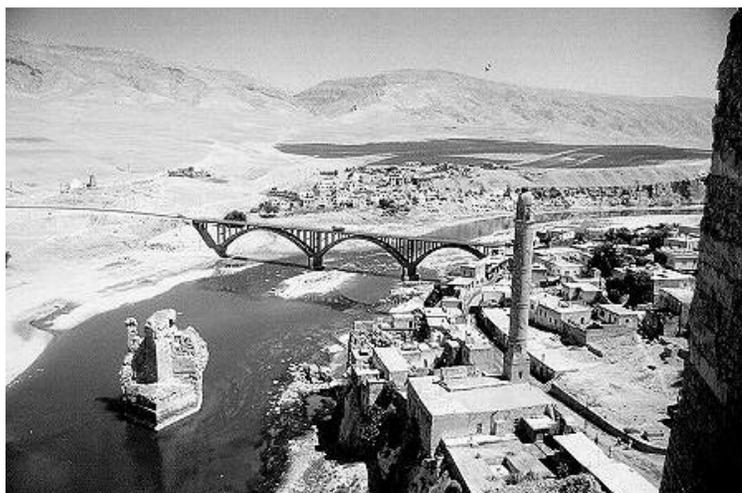
Of greater concern was the “traffic” on the rural highways. We encountered all sorts of obstacles: army tanks, mule-drawn carts, herds of livestock. I thought of my last eclipse and how we got delayed in transit, almost missing first contact. Fortunately, our driver was determined to keep us on schedule, passing each obstacle and leaving it in our dust.

### Arrival at Hasankeyf

At about 11:30 a.m., we finally reached our destination. We crossed the Tigris River and entered Hasankeyf. As armed soldiers looked on, our buses squeezed through the narrow old streets, past the town mosque and its ancient minaret, and dropped us off at the cliff-lined river banks. Emerging from our air-conditioned cocoons was a shock—it was 117 deg F. But, much to our relief, we saw that the skies were totally cloudless. Hooray!



**Climbing the path to Hasankale**

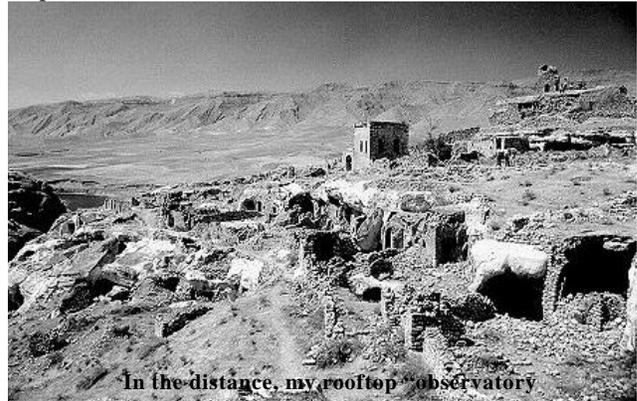


**View from top: Tigris River, old and new bridges, Hasankeyf**

Sprawled out above the cliff-tops was our observing site. This part of Hasankeyf, called Hasankale (hah-san-kah-leh), was covered with ruins reflecting its rich history: palaces, temples, churches, mosques, and various dwellings, from hollowed out caves to masonry structures. Sadly, Hasankeyf and Hasankale will soon be submerged beneath a reservoir filling in behind a new dam downstream—ironically, this fact may have worked in our favor, as we were allowed us wander Hasankale’s ruins unescorted.

Getting up to Hasankale was a small adventure in itself. We had two choices: the “quick” route and the “easy” route. The “quick” route was a steep, centuries-old staircase carved into the rock, zigzagging up the sheer wall a couple hundred feet. The alternative was taking the bus into a side canyon and walking up a gentler but much longer path. Being impatient, I picked the quick route. The heat and crumbling, crudely cut steps limited my speed, but on the way up we were treated to spectacular views of the town and river.

Once on top, I explored a bit, then found a place to set up, the flat roof of a house-like structure near where Steve was set up, and well away from most of the crowd, who were set up in a flat, open area and in the ruins of the large mosque to the north. My “observatory” had a good view of the ruins around me and of the river valley far below. I thought the flat walls would be good to watch for shadow bands, which I’d seen in Mexico (they were quite spectacular). I also planned to use the view across the valley to watch for the arriving shadow (which I’d missed in Mexico) sweeping in from the northwest.



In the distance, my rooftop observatory

### How Do You Say “No, thank you” in Turkish?

While we were setting up, we were joined by some of the local Kurdish people, the predominant ethnic group in this part of Turkey. With these folks, the PKK was the farthest thing from our minds; they were all very friendly and helpful (as people generally are in Turkey).



Looking northwest across the Tigris River valley

Luckily, I had brought along a little Turkish dictionary, which allowed us to communicate beyond mere sign language. After we’d gotten acquainted with one another, one of them explained to me that Hasankale’s “ruins” had been inhabited until 30 years ago. I couldn’t imagine living in such primitive dwellings on these exposed, parched cliffs while Neil Armstrong was walking on the moon!

Our new friends had come specifically for the eclipse. Some even had their own mylar solar filters. Together we saw first contact and the partial phases, and projected images of the crescent sun, a familiar shape to them (the Turkish flag has a crescent moon motif). I showed them how their shadows now looked different than usual (sharp on some sides, diffuse on the others), and tried to explain about shadow bands. We also took group pictures and exchanged addresses; I promised to send pictures

once I returned home.

Alas, our friendship hit a snag. At one point, grabbing my 2-liter Hayat (bottled water) for a drink, I found that my new friends had drunk it all by mistake. They apologized, then in friendship offered me a bottle of not-so-clean-looking water... I’d already been sick twice, and couldn’t risk getting sick now in the middle of Central Asia. Wanting to be diplomatic, I poured some of the water into a rag, wiped my face and neck, and thanked them. I then went to get more bottled water from our tour group, but they were all out. Luckily for me, Steve, who was being smart and staying in the shade, had an extra bottle of drinking water to spare.

### Second Contact At Last!

About twenty minutes before totality, the sky to the northwest began to look slightly darker. At ten minutes to go, that part of the sky was definitely getting darker, and by five minutes to go, it would have been hard not to notice. But, this being a short eclipse, it wasn’t as dark as I had expected (certainly not as dark as it had been in Mexico, where it turned a deep cobalt blue).



Awaiting totality: (l to r) Serkan, me, Murat, Metin

However, there was another visual effect that I found quite striking: objects in the landscape stood out more and more clearly as the partial phases progressed; even people looked different. The glaringly bright, “flat” lighting of the full sun was replaced by a softer light that gave the landscape much more depth and dimensionality than before. I could easily tell the high spots from the low spots on the ground. Colors also seemed more saturated. Seeing all this and knowing that the sun was overhead in a cloudless sky gave a definite sense that something “weird” was happening.

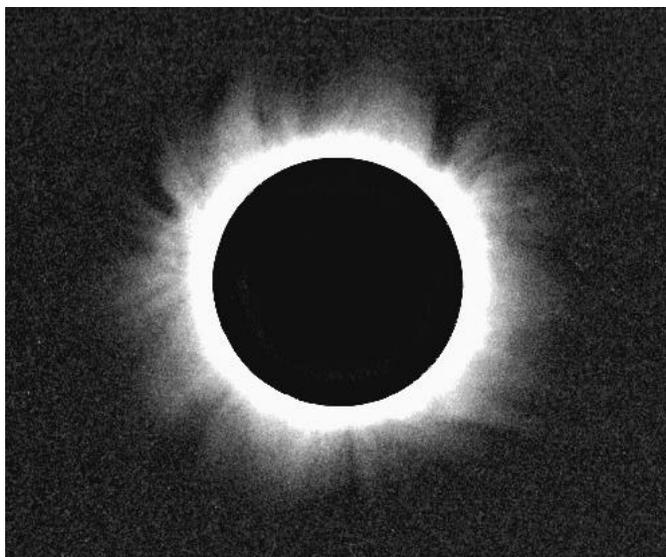
Since first contact, the temperature had been slowly dropping, and the heat was now tolerable, almost comfortable. At about five minutes to go, a stiff breeze began blowing steadily. I hoped it would die before totality arrived... In the last couple of minutes, I watched the ground for rippling shadow bands. Unfortunately, I never saw any definitive signs of them, but others around our site reported seeing them and said they were very striking. As the final seconds approached, the wind started blowing even stronger—just my luck—a totality wind! Now I was really worried about the wind ruining my pictures, so the final seconds before totality are a bit of a blur in my mind...

But, I do recall seeing the last thin arc of the sun, then turning to look northwest across the valley, before Bailey’s Beads and the Diamond Ring for the chance to see the oncoming lunar shadow. This time, I didn’t miss it. As the sun’s light dimmed, a subtle yet very definite darkening rapidly descended over the landscape. My sense was that the imperceptibly slow darkening since first contact had now accelerated to where it could be seen in real time—as though someone had just turned down the big dimmer switch in the sky.

And finally—I was in the moon’s shadow!

### **The Shortest Two Minutes of My Life**

While taking pictures (between gusts of wind), I tried to keep my eyes on the sun and take note of what I was seeing. It was very different from the last eclipse I’d seen. My eyes were drawn to a fringe of red on the left side of the sun - a nearly continuous line of prominences. I hadn’t expected to see such pure red prominences; in Mexico, they were more of a dazzling pinkish color. Also, instead of a couple of huge prominences like in 1991, there were many smaller ones glowing all around the sun, contrasting beautifully against the moon’s black disk. Quite a breathtaking sight.



**Totality (1/8 sec 500mm f/8 ISO 100)**

The corona was even more different this time. It was very round and symmetrical, with many wide, overlapping streamers all around like flower petals. More striking was that many of the streamers ended in faint, delicate filaments. They reminded me of long hairs sticking out of the sun. I tried to estimate their length; the longest ones were easily 3 solar diameters (not radii) long. Once again, I was mesmerized by the corona’s ghostly glow. (Unfortunately, the delicate details in the corona, easily seen visually, are difficult to capture fully on film.)

I also looked at the sky itself. It was quite bright, a lot more than in Mexico (as expected, being a short eclipse). I saw the soft golden glow ringing the horizon and pointed it out to the others standing nearby. Venus was impossible to miss to the sun’s left—it was spectacularly bright, being close to inferior conjunction. I looked for Mercury on the other side of the sun but couldn’t find it. I also didn’t see any stars, but with the sky so bright, I didn’t make an effort to find them. Finally, the temperature, which had been dropping since first contact, bottomed out at around 90 deg F, which to us felt downright cool. Unfortunately, the blistering heat would slowly return after those blessed two minutes—which felt like the shortest two minutes of my life...!

### **Here Comes the Sun**

Just as I was about to take my last picture, one of my companions pointed up at the sun. Sure enough, third contact was about to arrive. No way—I couldn’t believe two minutes had elapsed already! (Apparently I’d wasted too much precious time by shooting during lulls in the wind.) I stood there in disbelief watching the sun slowly emerge. My memories of third contact are vague; I was too stunned to remember anything. For me, the end of totality is one part joy and two parts disappointment; while others are cheering, I’m totally dejected. Totality seems far too short, as if time had somehow speeded up.

Worse, I had wanted to spend quality time observing totality with binoculars and the best observing instrument of all—the human eye, which sees far greater detail than can be recorded photographically. But this eclipse was a bit too short. Now that totality had ended, that precious opportunity was gone—forever.

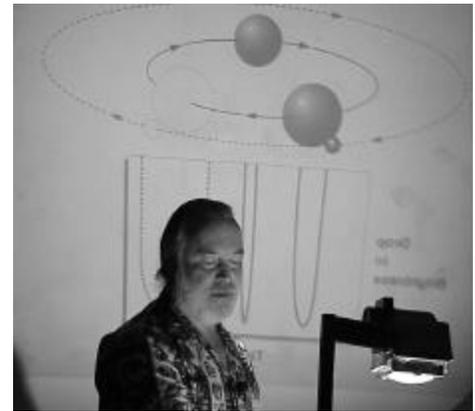
But my post-eclipse depression soon turned to joy. I felt very fortunate and greatly relieved that the object of so much effort, expense, and expectation had come to fruition. After all, no eclipse is guaranteed! Soon after that, the celebrating began, as champagne was poured and passed out in plastic glasses. Everyone was elated—including me.

Post-eclipse note—We were still in Turkey on the morning of August 17, when a severe earthquake struck the northwestern part of the country. Fortunately, we were far away and never felt it. As we left Turkey, relief planes from all over the world were landing at the airport. I hope that Turkey will continue to get the assistance it needs to recover from this disaster. I know I'll always have many nice memories of my visit to Turkey, and of the friendly people...

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## OCA BANQUET FEATURES DR. LAURANCE R. DOYLE FROM THE SETI INSTITUTE!!

Banquet speaker Dr. Laurance R. Doyle comes to us from the Center for the Study of Life in the Universe of the SETI Institute in Mountain View, CA. Dr. Doyle obtained his Ph.D. from Universitaet Heidelberg in the area of radiative transfer modeling as applied to planetary rings. He has investigated the effects of small changes in solar mass on the habitability of the early solar system. He is editor of the recently-published volume 'Circumstellar Habitable Zones', a collection of planetary, astrophysical, and biological papers addressing the multi-disciplinary aspects of planetary habitability. He is presently working on the ground-based photometric detection of habitable-sized planets around small-mass main-sequence eclipsing binary stars. Recently, Dr. Doyle spoke at the Sixth International Bioastronomy Conference in Hawaii in August. His talk will be a look at humanity and its unique ecological niche in the Galaxy.



Dr. Doyle will address the science of Drake's Equation terms from the galactic perspective to our home planet. The equation is:  $N = R^* F_p N_e F_i F_c L$

where:

- $R^*$  is the rate of star formation in the Galaxy
- $F_p$  is the fraction of planets around stars
- $N_e$  is the number of those planets that would be habitable
- $F_i$  is the fraction of habitable planets where life actually starts
- $F_i$  is the fraction of life that is intelligent
- $F_c$  is the fraction of intelligence life that develops technology
- $L$  is the lifetime of technological civilizations
- $N$  is the number of interstellar communication civilizations

He will discuss everything from habitable star systems and extrasolar planet detection, to the circumstellar habitable zone (defined by Venus and Mars) and the early history of biology on Earth. He will also discuss present & future SETI searches. For more information, see: [www.seti.org](http://www.seti.org), <http://seti1.setileague.org>, <http://sag-www.ssl.berkeley.edu>.

# Virtual Astronomy

by **Dave Kodama**

## More Eclipse Images

Another month has elapsed, allowing more of the eclipse chasers to post their shots on web pages, so a few more links are listed below. And of course, don't miss the collection of OCA member shots in the Image Gallery and the special eclipse feature on our own club web page (<http://www.chapman.edu/oca/>).

<http://digilander.iol.it/bares/Solsys.html>

Piermario Gualdoni (Austria)

<http://space.tin.it/sport/micdipas/eclisse99.htm>

Roberto Volsa (Austria)

<http://www.hszk.bme.hu/~os203/nap/en.html>

Andras Ora (Hungary)

<http://www.geocities.com/CapeCanaveral/Hangar/7192/Eclisse99.htm>

Gambaro Alessandro (Hungary)

<http://www.ligo-la.caltech.edu/~jkern/eclipse99/>

Jonathan Kern (Romania)

<http://www.MrEclipse.com/TSE99reports/TSE99Espanak.html>

Fred Espenak (Lake Hazar, Turkey)

<http://www.eclipse99.org/fr/reportage/images/html/mir.html>

Moon's shadow from Mir

Of particular note among the links above are Fred Espenak's images and Jonathan Kern's images which show detail in the corona beyond what is visible to the eye. The Espenak's images are created by compositing photos (22 in this particular case!) taken at different exposures, while Kern's images are done by compositing as well as the use of a special radial gradient filter. The results are stunning!

## More Special Events

A friend of mine likes to tell me that he's not impressed by rare astronomical events – they happen all the time! Well, there's a certain truth to that because in November we have two more of these rare (or at least uncommon) astronomical events happening – a transit of Mercury, and part II of the Leonid storm (we hope!). Information on the transit of Mercury is available at:

<http://sunearth.gsfc.nasa.gov/eclipse/OH/transit99.html>

NASA/Fred Espenak

<http://www.geocities.com/CapeCanaveral/7137/transit.htm>

Predictions for the Leonid shower are on the Sky & Telescope page in the form of a reprint of an article by Joe Rao which appeared in March:

<http://www.skypub.com/sights/meteors/leonids/9904awaitstorm.html>

If you plan to try and photograph the Leonid shower, now would be a good time to start planning your strategy for covering the sky. Take a look at the link below, where Robert Reeves describes how he gathered up eight 35mm cameras lying around the house (!) and mounted them on a tracking platform normally used for a Dobsonian scope:

<http://www.ConnectI.com/~rreeves/meteor.htm>

## Flights of Fantasy

And finally, from the "neat picture" department... Those of you who attended the OCA/Cal State Fullerton sponsored AstroImage '99 talks might have seen Tony and Daphne Hallas speak back in February. One of the slides they presented was a fanciful view of M31 entitled "Through the Picture Window" which was created using one of their astrophotos and a lot of work in Photoshop (this can be seen on their website at <http://www.west.net/~ahallas/Picture.htm>). A few weeks ago, they came out with another striking composition called "Arizona Skyways", which is a view of the Milky Way out the window of a car driving down the open highway. This latest creation is definitely worth checking out! You will find it at <http://www.west.net/~ahallas/AZSKY.htm>

# The Eclipse in Italy

by John Sanford

I arrived at Milan after flying to London via Toronto on August 6 and was met at the airport by Giuseppe Sala (OCA) and Jeanne Dean, a woman with whom I had arranged to travel (she came in from Atlanta). We stayed a night at a local hotel and then went to Giuseppe's observatory at a private campsite in the Alps in the Aosta Valley, about 50 miles northwest of Varese. Also with us were Wayne and Arlene Johnson and Billie and David Chandler, my neighbors here in Springville. The weather didn't look too good for observing so we returned to Varese and found out that our hotel room had been given to somebody and our belongings were sort of strewn about another room! The hotel was full so they moved us to a nearby property they owned.

Monday, we started out for Salzburg, which was to be our base in Austria. It took about 7 hours on the excellent freeways and we arrived tired but exhilarated. Wednesday morning we arose early and went to a small town called Altmunster about 40km east of Salzburg. There, Giuseppe had been invited to observe with some Italian high school students at a private school contained in part in a 19th century castle, overlooking the Trauen See (lake). This area is permeated with glacial lakes and sharp and impressive mountains.

As some of us were setting up, a dark cloud appeared and it rained hard for a few minutes. This was a good sign, as it cleared up to about 50% cloudy right afterwards, and there were cries of "First Contact"! I took a few images, and all the observers finished setting up. We were pleased to encounter a group of Californians from the Oceanside Telescope and Camera club at the site.

It darkened and the high schoolers got increasingly excited. One group had set up a shadow-band experiment and were watching it intently. I was trying to get my video and still cameras boresighted so they would both be on the eclipse at totality (but I didn't quite achieve that...).

Then the last bit of Sun was at the edge of the Moon and it was "Off filters!" as we ripped the partiality filters off and saw the corona for the first time. There were prominences all around the limb of the Moon/Sun! As I recall, someone counted 16. The corona was small and spiky, almost even all the way around the active Sun. Venus was to the southwest but I really didn't look too much more, as I was trying to vary the video exposure to get the corona both close-in and far out.

All too soon (well, 2 minutes and 10 seconds), totality was over and the Sun started to peek out from the western edge of the Moon (filters back on!). Totality was over, as the Moon's shadow fled eastward to meet other eclipse watchers in Romania, Turkey, and in the Mideast. There was a cheer from the audience, and calls for an instant replay! But that didn't happen. What did happen, though, is that some German girls played a few bongo numbers (Ghanian music). We had also had a classical quartet and a Tyrolean quartet before the eclipse. They were there because a music school was starting the next day and the students were arriving for that. It was the most unusual eclipse setting I've ever experienced (and this was my 6th).

The sponsors had also set up a beer and wine location around the corner of the castle, and they were busy cooking schnitzle and wurst for sale. There was "eclipse beer" in pretty blue bottles and everybody wanted some as souvenirs. I bought 2 and gave one away later. My suitcase was already resembling a rock of the same size in weight... We all went back to Salzburg happy and joined the Chandlers and the Oceanside group for a dinner at their hotel in the heart of the shopping district.

I managed to get a fairly good video and some fine stills, and I am making a 10 minute edited version which I'll duplicate onto 10 minute VHS tapes from my digital video camera. footage. Hopefully, it will be shown at the Eclipse roundup even if I don't make it there to present it in person.



## President's Message

Continued from page 2

On the other hand, there is a downside to the procedure for many middle-aged amateur astronomers. When you reach your mid-40's your eyes lose their ability to focus on near objects. Thus the need for reading glasses as you get older. However people who are nearsighted get a nifty little perk from nature. Nearsightedness masks the near focus problem. So that middle-aged nearsighted people can often go without their glasses altogether to read objects up close. Books, instructions, small print on medicine bottles, etc. LASIK takes away your nearsightedness and thus removes the masking effect. So your aging eyes need the reading glasses that you may have avoided before. LASIK is no guarantee that you will be totally free of the need of reading glasses. There is a technique called monovision that you can ask your optometrist about which would completely eliminate the need for glasses. Basically it involves setting up one eye for close vision and the other eye for far vision. This is not for everyone.

In the October issue of *Sky & Telescope* Barry Santini (Tele-View) wrote a letter to the editor in which he gives advice concerning LASIK for amateur astronomers. I have spoken with Barry several times, both before and after my procedure. His main point in the letter is that you want your treated area to be as large as your dark adapted pupil size (7-8 millimeters for most adults). Since the FDA only approves out to 6mm, this can be a problem. However, you can go larger than that if the procedure is done on an "experimental" basis. This is NOT as scary as it sounds. The FDA is a very conservative organization and has pegged six millimeters as its current approved range. All procedures beyond that limit are legally called experimental because they don't have that FDA stamp of approval. In my case, my surgeon is one of the few FDA investigators. He gives his approval to new machines and techniques. He has performed more than 12,000 LASIK procedures. My procedure was done based on a seven millimeter dilation (I sat in a completely darkened room for twenty five minutes before my pupil size was measured).

Barry's other big concern is that the person doing the procedure on your eyes have LOTS of experience at it. He indicated 1200 procedures as a good guide. When I told him of the experience of my surgeon (12,000 procedures, FDA investigator, third generation procedure) he felt very confident for me. He wrote the S&T letter, in part, because he wanted people to be sure they got the best care they could and that they should not assume their surgeon knows about the special needs of the amateur astronomer. Do your homework.

One final word of advice: while I went to 20/20 right after the surgery, one week after surgery my eyes were slightly farsighted. I went from a minus 5.0 diopter (moderately nearsighted) to plus 0.75 diopter (slightly farsighted). They told me beforehand that in the healing process, the eyes will tend to come back slightly toward the zero diopter range. That seems to be happening and I have another week before my one month checkup. The goal, of course, would be to be dead-on zero diopter. Santini confirms that there is often a drift back toward zero, but that there is not enough of a track record to state with confidence that this is the definitive pattern. I'll let you know next month what happens.

Bottom line: If I had it to do over again. I would... definitely.

Club News: Our Banquet Speaker, Laurance Doyle of the SETI Institute is a well thought of spokesman for the SETI project and will certainly give us some wonderful insight at our upcoming Annual Banquet. It is our hope to get as many former presidents of the club in attendance for special honors. You won't want to miss it.

The club is moving slowly but surely forward on research and educational plans for the future. Hopefully we can tell you more next month.

Don't miss the October meeting. There will be some fantastic images, videos, and stories concerning the spectacular prominence studded total eclipse from last August.

The goodness of the night upon you

-- Othello Act 1 Scene 2

Russell Sipe



# Space Update

**Gathered by Don Lynn from NASA and other sources**

(To find out more on these topics, or those of past months' columns, through the World Wide Web, send your Web browser to our OCA website <http://www.chapman.edu/oca/> and select Space Update Online.)

**Meteorite water** - Researchers have cracked open 2 different meteorites in a period of 11 days and found tiny pockets of briny water trapped inside. The first was the Monahans meteorite, actually a pair of rocks that fell from space onto a west Texas town last year. It contained purple salt trapping water, which would have traveled through the solar system for millions of years as tiny ice crystals. They may reveal the details of early solar-system chemistry, and of how and when the water formed. The second was the Zag meteorite, a 300-pound space rock that landed in a remote area of Morocco last year. It is thought that water may be common in meteorites, but water has not been found previously because meteorites lose their water after weathering for some time on Earth.

**Digital Palomar Sky Survey** - Astronomers think they have identified a mystery object found 3 years ago by the Digital Palomar Sky Survey. Most objects found by this and other sky surveys are immediately identified, but this one did not have the visible spectrum of any known kind of star, galaxy, or quasar. Previous efforts at identification have included taking radio images and spectra of the object, and continued visible-light observations to see if it faded like a supernova does. Finally, an infrared spectrum taken by one of the Keck telescopes in Hawaii showed that the object is almost certainly a quasar. Because it has a quasar-like infrared spectrum, but not a quasar-like visible spectrum, it represents a new variety of quasar, and will warrant much further research. The Digital Palomar Sky Survey, now nearing completion, has collected data on more than 50 million galaxies and about 2 billion stars.

**Mars Polar Lander** - NASA announced the landing site of Mars Polar Lander for its December 3 touch down on the Red Planet. It is a strip of gentle, rolling plains near the edge of the layered terrain of the Martian South Pole, at 76 degrees south latitude and 195 degrees west longitude. The location was chosen for slopes no steeper than 10 degrees and no cliffs or jagged peaks, for safe landing, but still near surface features of interest. The layered terrain is believed to be a record of climate changes on Mars, so digging will be like reading tree rings or ice-core layers on Earth. The presence of fine layers of dust and ice will indicate changes in weather patterns and layer formations.

**Chandra (X-ray observatory)** - has produced its first images since launch, which included the aftermath of a gigantic supernova explosion, that of 320-year-old Cassiopeia A, showing what may be evidence of a neutron star or black hole, and a powerful X-ray jet blasting 200,000 light years into space from a distant quasar. Chandra's ability to measure X-ray spectra allows us to identify elements in very hot gas, and investigate how the elements necessary for life were created and spread throughout the galaxy by exploding stars, such as Cassiopeia A. Observing projects to begin soon by Chandra include further pinpointing the age of the universe, measuring the temperature of the crab nebula, observing the ultra-hot gases in far-off clusters of galaxies and studying the edges of black holes.

**Galileo (Jupiter mission)** - has found tiny dust particles around 3 of Jupiter's giant moons: Ganymede, Callisto and Europa. The particles were detected by their impact on the dust detector instrument, since they are far too sparse to be detected optically. The velocities impacting the spacecraft are fairly low—about 5 miles per second—which suggests that the grains originate from the moons themselves. The dust is probably produced by high velocity impacts of interplanetary grains onto the moons' surfaces. Most of such ejected material would fall back onto the surface within a few hours or days. Apparently continuous bombardment resupplies the cloud of dust as fast as it falls back.

Galileo has found, after numerous encounters with Europa, no direct evidence for liquid water, just tantalizing hints, such as the apparent ice rafts. Circumstantial evidence for subterranean liquid water continued to mount with the recent images of large chaotic areas where a liquid ocean or warm ice may have welled up and disrupted the moon's icy shell. A new experiment is looking for hexagonal ice crystals, since they form only at temperatures higher than the current surface, above 170 degrees Kelvin. This would mean that the ice formed fairly recently (geologically speaking) from liquid water or warm vapor. Hexagonal crystals will produce a ring-like glow in infrared, much like the visible halo seen around our Moon on nights with atmospheric ice. So infrared observations were taken recently of Europa when the angle of solar glint was correct.

Results are expected soon. Firm proof of liquid water may have to wait until the proposed Europa Orbiter mission to be launched in 2003, which will use a radar sounder to measure the thickness of Europa's icy crust, and an altimeter to measure heights and tidal surface movement.

**Gamma Ray Burst** - According to a new theory, the formation of the Solar System was hurried along by a nearby gamma-ray burst. This flood of energy may have melted primordial dust grains, seeded the formation of meteorites, and helped form the rocky planets, including Earth. For over a century, astronomers have tried to understand what made clumps of dust circling the young Sun melt into chondrules—rocky beads rich in iron and silicon minerals that make up the bulk of stony meteorites. The new theory suggests that all the chondrules in the Solar System formed in a matter of minutes 4.5 billion years ago when a gamma-ray burst—one of the most powerful explosions in the Universe—seared the dust and gas circling the Sun with intense X-rays and gamma rays. If the theory is right, it makes the Solar System more unique than many scientists would like. The astrophysicists who announced the theory believe that only one Sun-like star in a thousand would have been close enough to a gamma-ray burst to form chondrules. Because they think that the dense chondrules settle quickly into the plane of a protoplanetary disc and speed the formation of planets, their theory implies that solar systems such as ours are rare. More research will have to be done to show if the theory can explain other features of chondrules, such as their size and abundance.

**Leonid Meteors** - Yet another study has been made on the Leonid meteor shower, the one that sometimes in November displays massive meteor storms every 33 years or so. This study predicts good displays, but not storm levels, this year and next, followed by fairly strong storms for the next 2 years. The time predicted for this year's peak, unfortunately for us in the U.S., will occur too early for us, but ideal for Europe. The prediction is for 2:00 am Greenwich time early on November 18, to hit 1200 meteors per hour. The new theory claims that the above-average displays occur when we on Earth intersect a piece of Comet Tempel-Tuttle that broke off in the year 1333, and predicts that the streams of meteoroids move in braided structures.

**Mars Climate Orbiter** - snapped its first picture of Mars from a distance of 2.8 million miles as it approached the planet in early September. It is scheduled to arrive, fire its main engine, and put itself into orbit in late September, after this column goes to press. It is the first satellite specifically to study weather on the red planet, and will do so for 1 Martian year, which is 687 Earth days. NOTE: on September 23, MCO failed to respond to signals from NASA and is believed to be lost. A programming error caused the spacecraft to achieve orbit too close to the planet to survive. NASA engineers are continuing to investigate the unfortunate occurrence.

**SDSS (Sloan Digital Sky Survey)** - the automated survey of the sky being done in New Mexico has discovered its first comet. Computer software identifies stars and galaxies and adds them to its catalog, but objects that don't fit the patterns are examined by people. One such object was visually identified by astronomer Julianne Dalcanton as a comet, now named Comet Dalcanton C/1999 F2. It turns out that other sky surveys had already imaged the object and reported it, but since they had noticed no comet head or tail, they had reported it as an asteroid rather than a comet. The new comet has a predicted period of 186,000 years, and has a tail that is prominent for its distance from the Sun, no nearer than about Jupiter's distance. Prominent tails for the solar distance usually mean that this is a comet's first trip into the Sun's vicinity. SDSS is mapping out the structure of the universe by cataloging millions of galaxies, and has distinguished itself by discovering many of the most distant quasars known.

**New Millennium missions (technology test spacecraft)** - NASA has selected a 3-spacecraft mission for the Millennium series. The 3 craft, called Nanosat Constellation Trailblazers, will explore the Earth's magnetosphere while holding formation in flight. New technologies being tested in this 2003 mission include miniature communications system, use of Global Positioning System, automatic operation software on the spacecraft, low-power communications system, new microelectronics, and a spacecraft coating that electronically tunes how much Solar energy is absorbed for heating.

**Space Shuttle** - All shuttles have been grounded for wiring inspections and repairs after the short circuit that knocked out power to two engine-controlling computers during Columbia's launch in July. Besides the defective spot in insulation that caused that failure, many other worn and bare spots have been found in Columbia and other shuttles. Repairs are expected to be completed during October. Each shuttle has more than 200 miles of wiring. With various payload delays and shuttle repairs, 1999 will probably see only 4 launches, the leanest since 1988, when flights resumed after the Challenger disaster.

# COMET COMMENTS FOR OCTOBER 1999

## by Don Machholz

**Comets 1998 T1 (LINEAR) and 1999 N2 (Lynn)** are fading in our evening sky, but three other comets are visible in our instruments. We have been watching **Comets Lee and Temple 2**, now we can see the new **Comet LINEAR (1999 J3)**. Discovered on May 12, it has left the polar region and entered our morning sky, brightening rapidly. Imagine my surprise when I recently swept it up while comet hunting, not knowing it would be so bright. Only one new comet has been found, and this was by SOHO on August 5. No comets were found during the total solar eclipse of August 11.

**COMET HUNTING NOTES:** The tilt of the comet's orbit is called the inclination, and it is measured in degrees. A comet going in earth's orbit has a 0 degree inclination, while one going in the opposite direction has a 180 degree inclination. An object traveling perpendicular to earth's orbit (as does Comet Hale-Bopp) has an inclination of 90 degrees. The average inclination for the last 81 visually found comets is 84 degrees. There is a slight grouping of comets in the 40-50 degree range and a dearth of comets near 100 degrees. I suspect this is a true picture of comet orbit distribution, since comet hunter sweeping patterns would not seem to favor (and unfavor) these particular inclinations.

### EPHEMERIDES

#### C/1999 H1 (Lee)

Date(00UT) R.A. (2000) Dec El Sky Mag  
 09-09 05h33.3m +54d58' 82d M 8.4  
 09-14 04h50.1m +57d36' 92d M 8.4  
 09-19 03h51.4m +59d13' 102d M 8.5  
 09-24 02h40.3m +58d43' 114d M 8.6  
 09-29 01h29.8m +55d19' 125d M 8.7  
 10-04 00h32.2m +49d27' 135d M 9.0  
 10-09 23h50.6m +42d22' 141d M 9.2  
 10-14 23h21.8m +35d16' 142d E 9.6  
 10-19 23h02.0m +28d51' 140d E 9.9  
 10-24 22h48.4m +23d23' 135d E 10.3  
 10-29 22h39.0m +18d51' 129d E 10.7  
 11-03 22h32.6m +15d10' 123d E 11.0  
 11-08 22h28.4m +12d09' 117d E 11.4

#### C1999 J3 (LINEAR)

Date(00UT) R.A.(2000) Dec El Sky Mag  
 09-04 08h39.9m +49d15' 50d M 10.1  
 09-09 08h34.9m +46d29' 53d M 9.8  
 09-14 08h29.5m +43d11' 56d M 9.5  
 09-19 08h23.7m +39d05' 59d M 9.3  
 09-24 08h17.5m +33d54' 63d M 9.0  
 09-29 08h10.7m +27d08' 67d M 8.8  
 10-04 08h02.8m +18d09' 71d M 8.5  
 10-09 07h53.5m +06d13' 77d M 8.3  
 10-14 07h41.9m -08d55' 82d M 8.2  
 10-19 07h26.8m -26d03' 87d M 8.3  
 10-24 07h06.1m -42d25' 91d M 8.6  
 10-29 06h37.1m -55d39' 92d M 9.0  
 11-03 05h55.8m -65d07' 91d M 9.5  
 11-08 04h59.2m -71d08' 90d M 10.0

#### Periodic Comet Tempel 2 (P/10)

Date(00UT) R.A. (2000) Dec El Sky Mag  
 09-09 18h11.8m -29d01' 107d E 10.7  
 09-14 18h25.2m -29d54' 105d E 10.8  
 09-19 18h39.3m -30d37' 103d E 10.9  
 09-24 18h54.1m -31d09' 101d E 11.0  
 09-29 19h09.4m -31d31' 99d E 11.1  
 10-04 19h25.0m -31d41' 98d E 11.2  
 10-09 19h40.9m -31d41' 96d E 11.3  
 10-14 19h56.9m -31d31' 95d E 11.4  
 10-19 20h12.9m -31d11' 93d E 11.6  
 10-24 20h28.9m -30d41' 92d E 11.7  
 10-29 20h44.6m -30d03' 90d E 11.8  
 11-03 21h00.0m -29d16' 89d E 12.0  
 11-08 21h15.2m -28d23' 88d E 12.1

CC254.TXT 09-07-99 Don Machholz (530)  
 346-8963. DonM353259@aol.com. Web Page:  
<http://members.aol.com/cometcom/index.html>.  
 Go to:  
<http://members@aol.com/donm353259/index.html>  
 for comet positions through December 1999.

### ELEMENTS

#### 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

#### Object: Lee

Peri. Date: 1999 07 11.1725  
 Peri. Dist (AU): 0.708101 AU  
 Arg/Peri (2000): 040.7006 deg.  
 Asc. Node (2000): 162.6490 deg.  
 Incl (2000): 149.3533 deg.  
 Eccen: 0.99974  
 Orbital Period: 142,000 yrs.  
 Ref: MPC 35553

#### Object: LINEAR (1999 J3)

Peri. Date: 1999 09 20.1699  
 Peri. Dist (AU):  
 0.9774750AU  
 Arg/Peri (2000): 161.9509  
 deg.  
 Asc. Node (2000): 229.0006  
 deg.  
 Incl (2000): 101.6670 deg.  
 Eccen: 1.0  
 Orbital Period: Long Period  
 Ref: MPC 35553  
 Epoch: 1999 09 20  
 Absol. Mag/"n": 9.4/4.0

# IMPORTANT NOTICES

## Dues Renewal

The month and year shown at the bottom of the address label indicates when your OCA membership is due for renewal. OCA dues may be paid at the meeting or by mailing your remittance, made out to "**Orange County Astronomers**" to Charlie Oostdyk, PO Box 1762, Costa Mesa, CA 92628. Your cancelled check will serve as your receipt. Dues are \$50 annually for general members. Full-time students, retirees, charter members and those under 16 are \$30 annually. Additional family members can be added to a membership for \$7 annually.

**Address changes, missing newsletters and similar problems should be directed to Charlie Oostdyk at (714) 751-5381, PO Box 1762, Costa Mesa, CA 92628. E-Mail: Charlie@CCCD.EDU.**

## Magazine Subscriptions

Subscriptions to the astronomy magazines are now due for renewal, if you subscribed for one year or would like to subscribe at the club rate. You may also extend an existing subscription that does not end in December for one year at the club rate. We need at least five people per magazine. Bring your check made out to the OCA to the meeting or mail it to:

**Charlie Oostdyk, Orange County Astronomers, PO Box 1762, Costa Mesa, CA 92628. Checks made out to the magazine publishers cannot be processed and will be returned to you.**

If you already subscribe, please provide the mailing label or the billing invoice with your check. One year rates are as follows:

	<b>Club Rate</b>	<b>Regular Rate</b>
Sky & Telescope.....	<b>\$30.00</b>	\$39.95
CCD Astronomy .....	No longer published	
ASTRONOMY.....	<b>\$29.00</b>	\$39.95
ODYSSEY .....	No longer published	
Telescope Making .....	No longer published	
Deep Sky .....	No longer published	

**The DEADLINE for subscribing at the club rates will be the October monthly meeting, October 8.**

Expiration notices will be sent by the publishers to all current club subscribers about November 1 even if you renew through the club. It takes the publishers a few weeks to process renewals.

# ASTROLLANEOUS

## The 3rd Annual Starry Nights Festival

will be held in Yucca Valley (near Joshua Tree National Monument) on October 15 and 16, 1999. Sponsored by the Western Region of the Astronomical League, the star party features many exciting speakers and superb night-sky viewing. For more information, contact SNF Registrar Bob Gent at: 325 Cloudes Mill Drive, Alexandria, VA 22304-3080. E-mail: [BobGent@aol.com](mailto:BobGent@aol.com)

## A Learning Center

According to **OCA member Bob Sackett**, one good local source of astronomy education is Orange County's own Saddleback College. In his letter to the Sirius Astronomer, he writes: "

Last year I completed the sequence with Observational Astronomy and applied what I learned to my 10" LX200. The school has a solar observatory with a 7" folded refractor that outputs to several monitors around the campus for student viewing. They recently acquired a 24" LX-5 open-cage Newtonian that is being modified for student use. Nightly class sessions employ Celestron 8" SCTs on the school roof, which has a dozen semi-permanent mounting piers. They also have a C-11, a Parks 16" equatorial, and 16" and 10" Dobsonians. The class schedule contains a night at Ortega-Blue Jay and another at Anza, not too far from the OCA site. Plans are presently underway to include a class next fall in Astro-imaging using a new SBIG ST-8E with color wheel.

What I'm saying is, if there is something you'd like to know about the hobby, this is a good place to check in. With the equipment, facilities and staff available you can't help but get something good out of the experience. Dr. Mitch Haeri, an OCA member since the OCA Anza building days, heads the department. Check out your catalogue for classes and times or call him at the college (949)-582-4815. You may be too late for the fall semester, but spring will soon be here. Once-a-week classes are normally held on Tuesdays and Wednesdays (your choice) from 7:00-11:00 P.M.

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## CLASSIFIEDS

**FOR SALE---** Fujix (Sony) Hi8 video camcorder. Has pistol grip/table top tripod plus remote. Refurbished at factory 3 years ago. Also uses regular 8 tapes. 7.8-62mm zoom lens, stereo hi-fi sound. Will record 2 hours on a tape. With several batteries and charger/AC cord. Orig. \$1400. Asking \$300. John Sanford, 559-539-3900 or [johnsan@sosinet.net](mailto:johnsan@sosinet.net).

**FOR SALE---** Celestron "Great Polaris" 8" f/10 Schmidt-Cassegrain Telescope. Purchased new 1 year ago at Oceanside Photo and Telescope. Includes: GEM, one eyepiece (36 mm Celestron Plossl - 56x at f/10), focal reducer (Celestron f/10 to f/6.3), telrad, 6x30 finder scope, wood tripod, visual back and 1-1/4" star diagonal. Very good optics. Call Bill Johnson at (949) 855-0508. or e-mail me at: [ecaep007@aol.com](mailto:ecaep007@aol.com).

**FOR SALE---** Coulter Optical 13.1 inch, F4.2 dobsonian including the following accessories: 32mm Plossl, 22mm Plossl, 9mm Ortho, 7.4mm Plossl, 4mm Ortho, variable 8.4 to 21mm Ortho and Barlow 2X eyepieces; 5 1/2 inch Thousand Oaks Solar filter; Orion No. 80A blue, No.25 Red and No. 15 Yellow filters; Orion variable polarizer filter; Meade #908 Nebular filter; Telrad Viewfinder and Sky Atlas 2000. The package price is \$1200 (approx. 25% below retail excluding sales tax). Please plan to pick it up (in Banning, CA) since shipping is expensive and risky. Contact Bill Brandt at (909) 849-5858 or email [bbmovnonup@aol.com](mailto:bbmovnonup@aol.com).

**FOR SALE---** Ceravolo HD 216 Mak/Newtonian w/custom rotating rings and custom hard case. Losmandy G-11 mount. TeleVue Panoptic 22mm, Nagler 9mm and Pentax 5.2mm eyepieces. The Sky version IV. Telrad finder. \$8500.00. Everything is new used only once. The scope was shipped to me in April this year from Ceravolo Optical. Contact Larry at 949-651-5019.

# ASTRONOMER



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Star Member Training.....	Chuck Lodoza .....	flyman@ix.netcom.com .....	909-699-4699
Anza House Coordinator.....	Roy Weinberger.....	oneleaf@earthlink.net .....	949-768-5205
Telescope Loaner Prog.....	Henry Fry.....	.....	714-635-6056
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