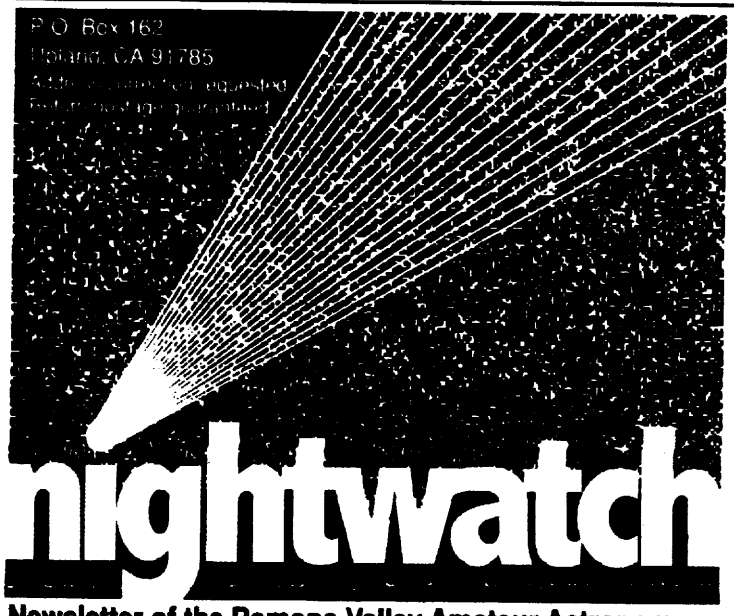

Newsletter of the Pomona Valley Amateur Astronomers

Amateur astronomers just get better looking . . .

Janis Seaton

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President's Message

My unintentional rise to President was uneventful.

You will probably notice the President's message is shorter than normal. The reason is that I hate to write.

The October star party is at Yesterday Ranch.

I will be coordinating alternate star parties to Death-Valley for November 20-21, January 15-16, February 12-14, and March 12-13.

Our Halloween Star Show will be at the Claremont Center (Griswold Old School House) back parking lot.

Our December General meeting will be a Holiday Dinner Party.

Our Mt. Palomar trip was a success, more from Patrick Nicholson.

October 8 meteor shower Draconids. Could be a storm?

Joe Hillberg

September General Meeting

September is the start of the new fiscal year for PVAA. Accordingly, President Patrick Nicholson called the meeting to order, then, after two quick announcements, introduced Vice-President Joe Hillberg as "Interim President", since we have no elected president. Joe presided over the rest of the meeting.

Business/Announcements:

1. Joe is planning for several winter star parties at Death Valley: January, February, March, with November possible. Those interested, please talk to Joe.
2. Watch for what may be a spectacular meteor shower on October 8th: the 13-year cycle of the Draconid (or Giacobinid) meteors is due on that date. Best time is **before** midnight; duration only about 3 hours. See Sky & Telescope for October, page 100, for details.
3. Members were reminded of September 19th Star Party at Observatory Campground, near Palomar. Space must be reserved in advance; provide name & license number to Patrick Nicholson, at least by September 15th.

What's Up?

Bob Marvos, new member of the Board, presented the What's Up? Bob reminded us that all 9 planets will be visible at the September 19th Star Party; he then provided detailed maps, showing where to look for them (and when). Bob then went on to direct our attention to some of his personal

PVAA Events Calendar

Month	Star Party	General Meeting	Board Meeting
October	17	9	2
November	21	6	Oct. 30
December	19	18	4
January	16	8	29

favorites: Globular clusters M13 and M92 in Hercules, and M56 in Lyra. In Lyra, of course, one must visit the famous "Smoke Ring" nebula, M57. Then, too, there is Lyra Epsilon, the famous "Double Double". (Can your telescope split the close secondary doubles?). Then, speaking of double stars, there is famous blue and gold Albireo near by in Cygnus. Finally, and also in Cygnus, are the two parts of the Veil Nebula and the North America nebula. Any of you who complete that listing should let us know!

After a coffee break featuring Ray Magdziarz' traditional coffee and beautiful doughnuts provided by John Viselli, Joe Hillberg introduced our Speaker of the evening: our own Bob Branch. Bob completed his talk of "Observing the Sun", started at the July meeting.

Source of energy:

An image of Albert Einstein introduced the topic: What powers the sun? The original thought was that the heat and light was produced by fire, burning much like coal in the presence of oxygen. By the eighteenth century, however, another theory came to the fore, championed by the then-head of England's Royal Society, Lord Kelvin: The heat is generated by gravitational stress on the gaseous structure of the sun. The calculated age of the sun, however, based on either method, made it much younger than the apparent age of the earth! ("Those calculations are wrong!", growled Lord Kelvin, who was not short on self-esteem--Ed). The issue was finally solved in 1905, when Einstein published the *Special Theory of Relativity*: the enormous power represented by the heat and light of the sun stems from the small amount of leftover mass, when four atoms of hydrogen are converted by fusion into one atom of helium. It was the "pencil & paper" astronomer, Arthur Eddington, however, who calculated the displacement of star images near the eclipsed sun that was first used to test the theory of relativity. The final explanation of the nuclear process that fuels the sun, however, only came in 1939.

The modern view is that nuclear fusion takes place in the small central part of the sun, where the temperature reaches 15.6 million degrees K. and density is barely sufficient to support the process. The next and largest layer of the sun transfers that energy outward by radiation. Finally, the outer layer, 28% of the sun's mass, transfers energy by convection. The complex process results in a given calorie of heat taking up to 1 million years to transit from the nuclear core to the visible "surface" of the sun, where it is radiated.

The Neutrino Problem.

One of the results of the fusion process is the production of neutrinos, sub-atomic particles that have no charge, are believed to be without mass, and interact hardly at all with other objects. However, our detectors consistently find only about 1/3 the number of neutrinos the physicists calculate would have to be produced. Recent results, however, indicate that the neutrinos may have mass, after all. If so, they would be capable of changing from one type of neutrino to the other (how do they know all that?--Ed).

Acoustic Oscillation.

About 30 years ago, measurements indicated that the sun is vibrating acoustically, at frequencies about 10 times lower than the human ear can hear. Recently, they have developed an instrument called GONG to detect and measure the acoustic radiation, so that it can be used for seismic analysis of the interior of the sun. This information is beginning to unravel some of the mysteries about what goes on inside our sun.

Visual Characteristics.

The outer visible layer of the sun--that part that appears to be solid, is called the photosphere. Above that lies the chromosphere, which is basically an atmosphere. Finally, above the chromosphere lies the corona, visible only during eclipses. Prominences are usually mostly hydrogen, usually viewed in hydrogen alpha light. They are created, like most other phenomena on the sun, by magnetic fields. They typically are quiescent, lasting several hours or days. Solar Flares are larger but less durable than prominences. They, also, are usually viewed in hydrogen alpha light. In 1857, English astronomer R. C. Carrington was able to view a solar flare in ordinary white light, indicating that it was of ultra-high energy. The Corona, the tenuous outer layer of the sun, is visible only during total eclipses, or with special equipment. The Corona actually extends past the earth. Although Prominences are

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usually quiescent, they are occasionally Explosive, which means they break loose and move away from the sun, becoming part of the solar wind. This increase in radiation affects both spacecraft and earth-bound electrical operations.

Effects of Solar Radiation.

In addition to its benign effect of providing the light and heat that makes life possible on earth, the sun may also produce detrimental effects. During periods of "Solar Maximum"--maximum numbers of sun-spots--there may be significant effects. Explosive prominences creat mass ejection that goes out into the solar system. Astronauts are endangered by this radiation, and orbiting spacecraft, such as the Hubble telescope may be damaged. The Power Grid in Canada failed some time ago, due to Solar emissions. Prominences usually show in Iron 14 (heavily ionized iron). Formerly identified as Coronium, this element was correctly identified in 1942 as Fe 13.

Observational Methods.

X-Ray images are only taken from space; the atmosphere absorbs X-rays. The atmosphere also absorbs by ultraviolet and infrared, although Radio Telescopes, working at the longer wavelengths of infrared are able to operate very well from the surface. The Coronagraph was developed in the 1930's, to provide a special instrument, able to photograph the corona without waiting for an eclipse. This system requires very clear air. The largest solar telescope in the world is at Kitt Peak in Arizona. It provides a solar image 34' in diameter!

Space Observation.

SOHO is a spacecraft parked at the first La Grangian point, where it is balanced between the gravity of earth and sun. There, it can observe the sun 24-hours a day, 365 days a year. This is of particular value in observing the acoustic oscillations, because long-term observations are needed to detect the patterns in these long wavelengths. Unfortunately, during a command transmission, SOHO was recently mis-oriented, so that its solar panels point away from the sun. That may mean the end of its useful life. There is a ray of hope, however, because communication has been restored.

Ulysses is a spacecraft that was launched in a long, looping orbit around Jupiter, in order to establish a polar orbit around the sun. All of our observations have been of the equatorial area of the sun. We need the polar view, in order to verify certain scientific assumptions, especially those regarding magnetic lines. Ulysses is currently able to reach about 85 degrees in solar latitude, which should be sufficient. Unfortunately, is a very long orbit, so it will take a while for results to come in.

Bob's presentation was greeted with warm and well-deserved applause, and the meeting adjourned at 9:45 p.m.

Patrick Nicholson

A note of interest about the flight STS-95

The flight is scheduled for October 29. John Glenn at the age of 77 will be one of the crew.

He even plans to do a space walk. This is incredible!

I am very excited about it because the pilot, Steven Lindsey, was in my Boy Scout troop in 1977 when I was a Scout Master. To know Steven as a kid and help him get his merit badges, I felt that I had a small part in his life. Today he is an astronaut, and I'm so proud of him.

John Jacobs

The Palomar Experience

It didn't start out like the great experience I was anticipating. True, the weather was beautiful! True, I got my vehicle loaded up early; I didn't forget anything, and I headed out at the planned time. Then... I had my first experience with Road Rage. When I came wheeling around one of those sharp bends on Highway 76, there, in the middle of my lane of that 2-lane highway, appeared an angry individual. He started out by throwing a steel rod at my windshield--which missed. Then, as I swung past him, he swung a heavy stick and knocked a small hole in my camper shell. I've never seen such rage on the face of a human being. I didn't stop... Does that surprise you? When I phoned the deputy sheriff, I found that two other motorists had already reported him. Evidently, he said: "I was only trying to stop someone to get help with my truck." There was a call box within 1/4 mile, either direction.

Once arrived at Observatory Campground, there was another surprise: Our Desomount friends had been unable to hold enough sites for us. Forest Service volunteers, who had had a star party there the previous week-end, made an unscheduled return trip, and grabbed off most of the available sites. Desomount people had done the best they could, picking off double sites, which they later shared with one or several others. My friend Bob Haage, for example, saved me half his site, which I later shared with Dave

Gardner and Joe Hillberg. All 11 vehicles that were registered for the trip showed up, and cooperative sharing eventually housed everybody, although not always in the most convenient way. Some of the Forest Service people shared space with PVAA, as well.

Desomount has a tradition that I would like to see PVAA consider emulating: they have a campfire at Dusk, where everyone introduces himself and guests, any appropriate announcements are shared, and the group enjoys a pot-luck dessert. It makes for a very convivial evening, and provides a convenient method for integrating newcomers into the group. Think about it!

Dave Gardner topped off the campfire meeting with a slide show that played to an appreciative and interested audience. I enjoyed it, along with the Desomount people, and all of us were thoroughly impressed at Daves smooth and knowledgeable presentation. Thanks, Dave.

It was a beautiful evening, if a bit chilly. Before dessert was over, Jupiter was shining high and bright in the east. Once serious viewing began, Desomount people and casual campers had lots of scopes to choose from: PVAA, Forest Service, and unattached astronomers who chanced to be there. The word got around, however, and for most of the evening the longest lines were queued up before Ron Hoekwater's 22-inch StarSplitter, and one of the Forest Service volunteers, with a 16-inch computerized Meade.

My planned investigation of "dim fuzzies" was quickly abandoned in favor of showing old familiar M-objects and other easy and beautiful objects, appropriate for piquing the interest of non-astronomers. M13 and M92 were well received, and Albireo got its usual "oohs" and "ahs" in response to the glorious blue and gold of that easy double star. M27 tended to result in a discussion about star evolution and death, but my viewers didn't find M57 particularly exciting, possibly because it's relatively dim. So, let's forget the dim ones, and celebrate the beauty of globular clusters and open clusters. Open clusters, when viewed against a good, black sky (away from the milky way) are truly gorgeous. Like my friend, Bob, said of the Double Cluster: "It's like a couple of bags of diamonds poured out on black velvet." I quite agree.

By midnight, most of our Desomount friends had long-since deserted us for the comfort of their motorhomes and trailers. The temperature was down to the high thirties or low forties, but there was no wind--and I had on every layer I had brought along! It made me appreciate my snow boots and heavy socks! Too bad I can't manipulate eyepieces and pencils with my warm gloves on! Even though it was pretty cold, the beautiful dark sky made me reluctant to go in.

My sole accomplishment of the evening, insofar as new observations is concerned, is that I finally got a good view of M33. Recognizing that Messier saw it with a telescope far inferior to mine, I had wondered for years why I couldn't see it. Well, of course, it's a large, face-on galaxy, so its brightness is spread out over a very large area, making for low surface brightness. But guess what! At Palomar, the sky was so dark that M33 jumped right out at me, as soon as I looked where Harv Pennington's handbook told me to look! But could I trace out the spiral arms? Not with my 10-incher. And I couldn't truly trace them with Ron's 22-incher, either, although I could see a glow in the area of the arms. They just weren't very clearly defined. But Ron's atlas he was referencing showed the arms as rather poorly defined, too. Maybe I just didn't know what to look for.

After the thrill of observing M33, everything else seemed to lose its zest. What to do? Hit the sack! I crawled into my camper, thankful that my enraged assailant had not succeeded in his apparent intention of breaking the window. Voices continued vaguely in the night every time I woke up. I surmised that more ambitious members were trying to hit all 9 planets in the course of the night. Not me. When the grayness of dawn woke me, there was Venus in the east, glaring into my eyes like a searchlight. Mercury was supposed to be nearby, but by the time I was dressed, it was too late. Besides, I was more interested in my morning coffee! Since Joe Hillberg and Dave Gardner were both packing up, I joined them, and we all pulled out before any of the Desomount people stirred. A fun trip! In spite of a bad start...

Patrick Nicholson