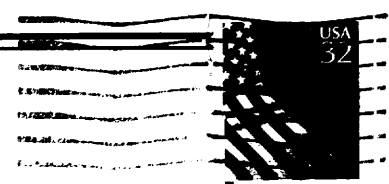
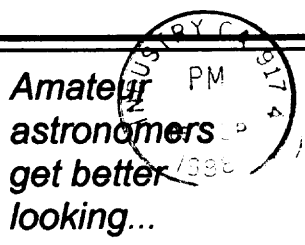


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Janis Seaton

Volume 18 Number 9

nightwatch

September 1998

President's Message

The first event coming up is our special joint camping/star show with the Desomount motor home camping group. Those of you who live and around Claremont will probably know at least some of this group. The Desomounters are all of mature age, but you would never guess it from their many activities and their active interest in learning new things. They are very much looking forward to a preliminary "fireside chat" around their traditional dusk campfire, followed by an evening of "sharing the view" as we introduce them to a "first hand" look at the sky. The following day, many of them--and many of us, most likely--will take advantage of the proximity to visit or re-visit the Palomar observatory. I hope to include a map of "how to get there" in this month's *Nightwatch*. If you don't find it, ask for it at our September General Meeting. Also, let me repeat once again, we need to provide names and vehicle license plate numbers for those who are going, so the Desomount members can save us space. Cost will be \$8.00 per space used (there's room for 2 vehicles per space): half that, if you have a "Golden Age Passport" (we'll need the number).

Looking further afield, we still have not selected an appropriate location for winter Star Parties. Ron Hoekwater and Joe Hillberg have checked out a few sites, but none seemed very promising. On the other hand, we have received some encouraging feedback about Yesterday Ranch, indicating that that site could be available and usable. The Board will follow that lead, along with all others.

This is my last message to you as President of PVAA. I want to take this opportunity to thank all of you for the support and cooperation you have given me, and to ask you for your patience and forbearance as we enter a "leaderless" year, with no elected president. Not a great idea, but, together, we can make it work!
Patrick Nicholson

All About the Sun

The July General Meeting featured a talk on "Observing the Sun" by Bob Branch, who observes the sun every clear day from his observatory in Upland. Bob has a Solar Spectrum chart on the wall of his bedroom (which opens directly into his observatory).

A book entitled The Sun by Charles Young was published in 1897. It presents the sun almost as a god, reflecting the view of primitive cultures who wisely regarded the sun as the source of life on earth. The scientific understanding of the sun began with the discovery of a mysterious spectral line in 1868--a line in the green that turned out to be an element called chromium.

The sun has a volume of 1.3 million times that of earth, although the average density is low. Content is 71% hydrogen, 27% helium, and 2% heavier elements. The sun contains substantial amounts of metallic elements, including metallic hydrogen, which accounts for its powerful magnetic field. Temperature at core is believed to be about 15.6 million degrees Kelvin. The chromosphere 4300 to 50,000 degrees K, whereas the corona (the tenuous luminous cloud we see only

PVAA Events Calendar

Month	Star Party	General Meeting	Board Meeting
September	19	11	4
October	24	9	2
November	28	13	6
December	26	11	4

uring eclipses) is 800,000 to 1 million degrees K. The big unsolved mystery is: why do the gases get hotter as we move farther from the core, source of the thermonuclear furnace that drives it all? Theories abound, but of proof there is none.

Output power of the sun is about 4×10^{26} ergs. The solar constant--the amount of solar power that reaches the earth--is 1367.5 watts per square meter. Spectral class is G2V, close to the hot end of the range for a G-type star. "Surface" temperature is 5680 degrees K. The sun is classed as a "metallic star" containing lots of metallic lines, which indicates that it is a late-generation star, not one of the first ones formed. It is believed to be in about the middle of its expected life span, with about 5 billion years left as a "main sequence" star.

Among the first observations of Galileo were his discovery of spots on the sun. Galileo did not pursue his observations of the sun long enough to discover that the sun spots follow a regular cycle.

William Herschel (1738 to 1822) discovered that sunlight contains rays invisible to the human eye. Using a prism, he used a thermometer to demonstrate the heating power of infrared light. He thought the sun had a solid surface surrounded by luminous clouds, and that sunspots were breaks in the clouds, showing the solid surface below. His son, John Herschel (1792 - 1871) tried (with limited success) to measure the solar constant by measuring the rate of water being heated.

Heinrich Schwabe discovered the sunspot cycle in 1843. He had been observing the sun for 17 years, trying to find the planet "Vulcan", postulated as an explanation for deviations in the orbit of Mercury. He never found Vulcan--because it isn't there--but he did discover the solar cycle.

Sunspots are about 1800 degrees cooler than the surrounding areas, and appear dark only by contrast to the surrounding hotter areas. The spots come in pairs, because they consist of areas where the hot gases follow magnetic field lines up from the surface, through a loop, then back down. Langley (he of the "Aerodrome" that ended up in the Potomac) used a spectroscope to find a strange spectral line, which turned out to be the then-unknown element, helium. Langley, who was head of the Smithsonian, worked for years on the solar constant, getting close to the present value. Meanwhile, Cogsden, an amateur astronomer, kept detailed data on sunspots that eventually allowed him to discover the sun's differential rotation. (It was not then known that the sun consists only of gases).

Until the very recent discovery of the process of nuclear synthesis, scientists had great difficulty in explaining the source of the sun's tremendous energy output. Lord Kelvin, for example, explained it as the result of gravitational forces as the sun slowly contracted. Unfortunately, that explanation yielded a maximum age of the sun of only a few thousand

years. When earth scientists objected that they had ample evidence that the earth is much older than that, Kelvin, who was not lacking in self-esteem, answered, blithely: "They are wrong."

George Ellery Hale is primarily famous for having built five major observatories in his lifetime, three of which were the greatest in the world at the time they were built. However, Hale was primarily a solar astronomer. As a senior project at MIT, he came up with the spectroheliograph, an instrument capable of photographing the sun in the light of a single spectral line, such as Hydrogen alpha.

The influence of magnetism is obvious in the sun: sun spots are created by magnetic lines arching up and back down into the chromosphere. Filaments, prominences hanging just above the chromosphere for weeks, and also a function of magnetic fields. Likewise, the most spectacular prominences, form a huge loop, carrying enormous rivers of glowing gas far out from the sun. Hale was interested in finding out how much magnetic force was involved. In 1908 he used a special instrument to check for the split in spectral lines caused by the magnetic field. He was able to measure a field strength of 3500 to 4000 gauss, an enormous value. In 1912, Hale built the 150 foot solar tower on Mount Wilson, still in use measuring magnetic field strength.

(To be continued in September)

Patrick Nicholson

PVAA Officers and Board

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Secretary.....	Janis Seaton.....	909/899-2197
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Kennedy Meadows Star party August 22 1998

It was high , cold and dry, which made for some good observing on the last club visit to Kennedy Meadows for the year. Only five of us made the trip. Ron Hoekwater and his brother Chris, outgoing Club President, Patrick Nicholson; Lee Collins; and myself. The drive up from Glendora was very hot (thank goodness for air conditioning!). I stopped at Kramer Junction for a quick bite and discovered Ron and his brother had the same idea. They were as surprised to see me as I was to run into them. It's not often club members cross paths on their way up to a star party. They were just finishing eating when I pulled up, so they continued on their way while I waited for my cheeseburger and ice cream .

When I finally arrived at Kennedy Meadows, about an hour before dark, Ron and Chris were setting up Ron's 24 inch scope. Patrick and Lee had arrived earlier. The sky was cloudless, promising what would prove to be a good night of seeing. There was no Moon, so the evening was devoted to deep sky objects. Later in the evening, we had some nice views of Jupiter and it's Galilean moons, two of which emerged from behind the planet as we watched. A little later, Saturn made it's appearance, beautiful as always

While the rest of us scanned the southern regions of Scorpius and the "Teapot", Patrick concentrated on exploring the club's "What's Up" constellation described so well at the last meeting, Scutum. He located M11 and NGC6712. He and Ron tried to identify M46, but were unsure if they found it. It was a good night for me, too - first time solo hunting with my 8-inch Celestron Schmidt-Cassegrain. I started out looking at M13 and M92 in Hercules, then turned to M57, the Ring Nebula in Lyra. From there I went to Scorpius, finding M4, M80, M19, M6, and M7. Turning to Sagittarius, M70, M54, M69, M22 and M28 were added to my list. By this time Jupiter was well above the horizon so I tried some prime-focus photography. Andromeda, M31, now made her appearance and faced my camera. Next was M52 near Cassiopeia, then I moved on to the Pleiades, just clearing the northeastern horizon. Ron trained his scope on M81 and M82. You can see both galaxies in his field of view. They were a little tricky to find because the bottom stars in the bowl of the Dipper were below the skyline

The cold started to settle in around 2AM , so I crawled into my sleeping bag (intending to get up before dawn to finish off the night). I didn't make it. The sun woke me up. Patrick was already up and packing. We chatted a bit and he "volunteered" me to write a synopsis of the evening. He pointed to a layer of ice in the water bottles he left out during the night ? verification that it was indeed a bit nippy. After he left, I had a quick breakfast of fruit cocktail and leftover chocolate chip cookies, washed down with Mountain Dew. By the time I got the car loaded, the others were still sound asleep so I started my own return trip down to the triple-digit temperatures and home.

Bob Marvos

The August Star Party**(Part Deux)**

One night under the dark skies of Kennedy Meadows is never enough. While half of our contingent returned home early Sunday morning, Lee Collins, and Chris and Ron Hoekwater decide to stay a second night. Surely, the others would have preferred to remain above the heat and smog, but for other commitments.

Sunday those of us that stayed slept late. About 9:00 AM we arose and set about looking for something to do. Lee went out exploring and looking for rocks for his yard. Chris looked up baseball statistics on his computer and Ron made the long trek to the restroom. Later we discussed movies. Lee is an avid film buff. We also observed Venus and a barely one day old Moon and made lists of things to observe after dark.

When darkness arrived we started in on globular clusters including M4, M5, M13, M15, M92, M22, and NGC 288 which is near the galactic south pole. Next we looked at planetary nebulae M76, M27, and NGC 7662, the blue snowball in Andromeda. Also in Andromeda was the colorful double star Gamma Andromeda. We observed the galaxies M33, M31, M51, and NGC 253. We hunted but failed to find a faint group of nine galaxies in Andromeda and another faint group of four galaxies in Pegasus. We finished with Jupiter and Saturn.

At 1:45 AM we started packing up and at 2:30 AM we bid adieu, for another year, to the beautiful Kennedy Meadows.

Ron and Chris Hoekwater

A message from the editor

If any members have news or items that would be appropriate for this publication, send them to me.

I may have to edit the item to fit the available space. If a controvertial article is submitted, it will be brought up to the Board to decide if it will be published.

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Ray Magdziarz

Observatory Campground Event

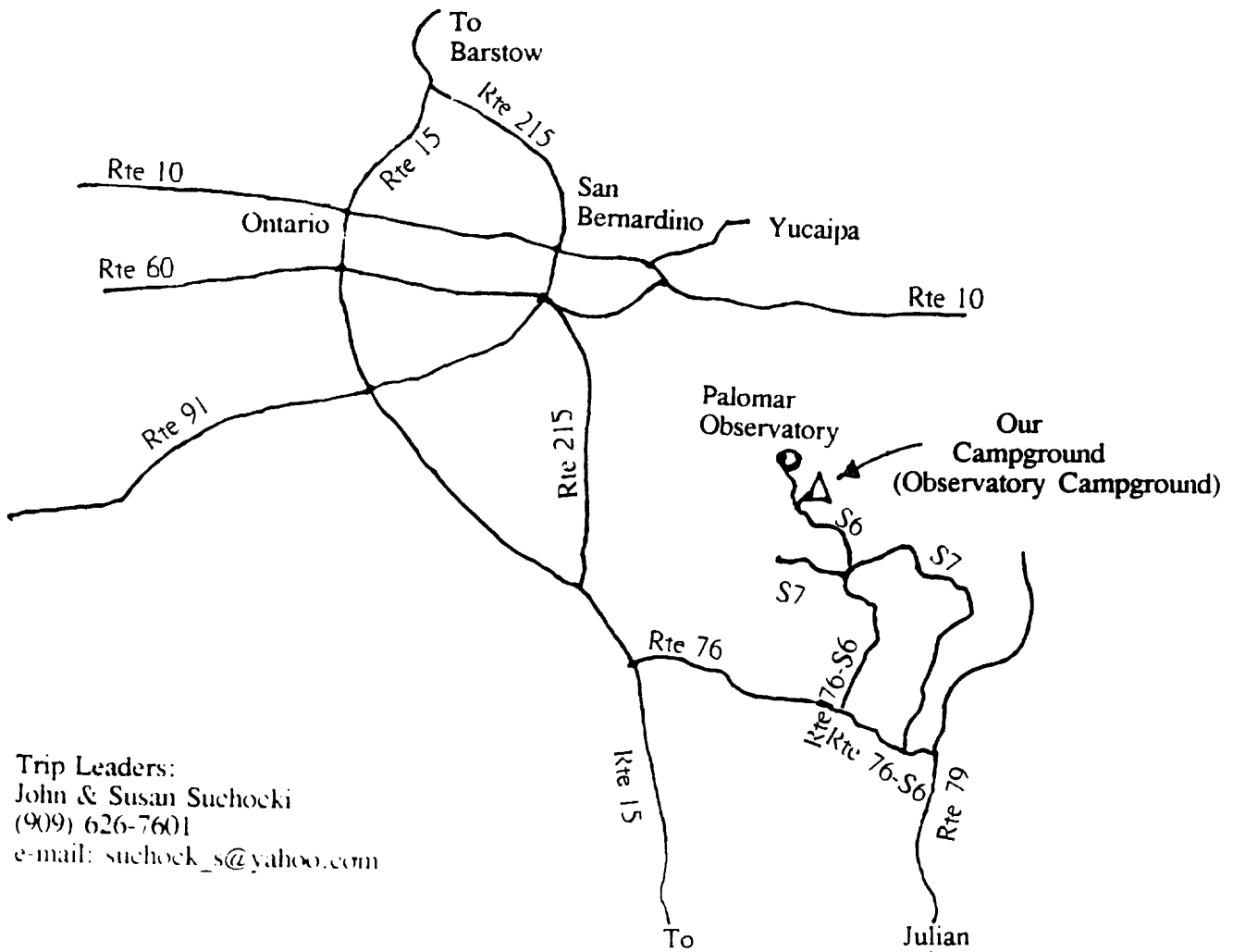
September 19, 1998

PVAA will be joining the Desomount RV Camping Club for an evening at Observatory Campground, near Palomar Mountain Observatory, on September 19, 1998.

The Desomount (Desert-Ocean-Mount) group is a group of enthusiastic RV campers who go out to camp and enjoy the out of doors in all the many and varied environments that are available in our beautiful state and beyond. They have been together for many years, and have a great deal of experience with camping and enjoying nature. Now, they want to extend that experience to include enjoyment of the starry skies as well. And that's where PVAA comes in...

The Desomounters normally have a campfire evening during each of their outings, where the whole group comes together around the campfire, and they enjoy a program together. This time, the PVAA is asked to provide a program of "Introduction to the Stars" during the campfire, which will be followed afterward by a traditional "Star Show", where we will invite them to join us at our telescopes. That way, they can experience first hand what we astronomers were talking about, and what we enjoy so much. What better way to introduce a bunch of interested and interesting people to astronomy!

Those who plan to go are requested to provide their names and vehicle license numbers in advance--preferably at the September General Meeting, so our friends in Desomount can hold spaces for us. There are no reservations--it's first come, first served, but these people will be there at least one day ahead of us, so our chances should be good. Don't forget to provide that information!



Trip Leaders:
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