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nightwatch

Newsletter of the Pomona Valley Amateur Astronomers

Amateur astronomers just get better looking . . .

The June general meeting will be held in Beckman Hall at 7:30 P.M.

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President's ADDRESS

Grandview Campground on White Mountain, east of Bishop, is one of my two favorite observing sites. (The other is Mesquite Spring in Death Valley.) In July, PVAA will be having dual star parties, one of which will be at Grandview. For those who wish to stay closer to home there will also be a star party at Cow Canyon Saddle. I am going to attempt to convince you to give Grandview a try, if you have the time (and can afford the gas).

My first experience observing at Grandview was in the year 2000. I was there in July and August. During each month I stayed four nights. Half of the nights it was cloudy (or raining), two of the nights were good, and two of the nights were great. A pair of objects stand out most in my memory from the two "great" nights of those visits. They are the Veil Nebula (NGC 6992-95) in Cygnus and the galaxy cluster Abell 2151 in Hercules. The Veil was exquisite! I could see every section of the Cygnus Loop that is charted in *Uranametria*. They were easy to see and fine details abounded. As for Abell 2151, I could see at least a dozen galaxies simultaneously through a 16 mm wide-field eyepiece. (The brightest galaxies in the cluster are 13th magnitude.)

White Mountain is about a 260 mile drive, but when the conditions are right, it is the best dark sky site that I have ever observed from. Unfortunately, conditions like those occur on less than half of the summer nights. As summer is monsoon season on White Mountain, I recommend that you make your plans to spend at least three nights at the site if that is at all possible. I am writing about this a month in advance so that those who are interested in going can make the necessary arrangements. I hope to see some of you there.

Ron Hoekwater

Star Party Sites

(MBC) Mecca Beach Campground (see page 4)
(CS) Cottonwood Springs campgrnd, Josua Tree Ntl. Pk
(CC) Cow Canyon Saddle, Mount Baldy Village
(MS) Mequite Springs campgrnd, Death Valley National Pk
(CWP) Claremont Wilderness Park parking lot
(KD) Kelso Dunes
(WM) White Mountains
(CGT) Calico Ghost Towm Campground

PVAA Events Calendar

Month	Star Party	Star Party	General Meeting	Board Meeting
July	CC&WM	17	30	22
August	CS	14	27	19
Sept	CGT	11	24	16
Oct	CS	9	29	21

Meeting of May 2004

Announcements

One new member joined the club during the May meeting. Frank Kahoutek. Please make him welcome. The Roynon Elementary School star party hosted by the PVAA was a popular event, with over 200 in attendance.

We again brought up the proposed addition of a PVAA Family membership catagory and gave time for comments. Lee's What's Up covered the area of the sky around Leo and Virgo.

Featured Speaker

Bob Branch shared with us the history of human observation of the transits of the Sun by planets Venus and Mercury. Kepler was tthe first to realize these events would occur and a book he published in 1627 contained predictions of solar transits by both Mercury and Venus. While Kepler died before 1631, a year when both these planets were to transit the Sun - French astronomer Pierre Gassendi was the first to use these predictions and observed Mercury transit in 1631. A month later, he tried but was unsuccessful in observing the transit of Venus. Later, more accurate calculations showed the transit wasn't visible from his location in Europe.

Jeremiah Horrox, who entered Emmanuel College at age 13 and had studied Kepler's ideas, realized that observing the time the transits occurred from widely spaced locations on Earth would yeild valuable data. He revised Kepler's data to show the geometry of the solar system is such that we have a pair of transits about 8 years apart, followed by around 100 to 130 years without one. The ratio is that almost 5 Earth orbits occur during the time that Venus circles the Sun 13 times. During the 3000s there are some single transits, but not the usual 8 years apart. Mercury transits are more frequent with 13-14 of them occurring each century. He also used Kepler's laws of Planetary Motion to prove that the Moon's orbit around the Earth is an ellipse. Horrox was the first person to see a transit of Venus in 1639. He also was able to observe the event from his home, near Liverpool England, for about 35 minutes before the Sun set and was able to use his measurements ro calculate Venus' path, angular size, and orbital velocity. He also concluded from the size of the parallax that the Earth was farther from the Sun than previously thought. Unfortunately, Horrox died only two years after the transit in 1641, at the age of 22 or his name might be more familiar to us today.

In 1677 Halley saw a transit of the Sun by Mercury and realized it could be used to determine the Astronomical unit and that Venus would be a better object than Mercury for the calculations as the parallax would be larger as Venus was closer to the Earth. having the exact times that Venus entered the Sun's disc would let one calculate the Astronomical Unit - the distance between the Earth and the Sun. We already knew the Sun to Venus distance and would use the parallax seen during a transit to figure the Earth to Venus distance. Adding the two together would give a value for the AU. He had enough data from the Mercury transit and from Horrox's figures to estimate a 54 million mile Earth to Sun distance from his measurements, while the correct value is 94 million miles.

During the next century, the transits occurred in 1761 and 1769. About 120 observations were made and recorded in 1761. As part of a sea voyage, Captain Cook took some Venus transit observations during 1769. In addition to his measurements of Venus, Cook also discovered the coast of Australia and the Great Barrier reef. By the time of the third set of transits in 1874 ans 1882 the United States had a Naval Observatory which sent out observers. The 1874 obsevation wasn't any more accurate than those made in the 1700s due to a phenomenon called the black drop effect. Due to the turbulent atmosphere of Earth the planet appears to be connected to the Sun's limb, making precise timing impossible. By 1882, telescopes were accurate enough and the parallax of objects other than Venus were used to

PVAA 24 HR. Hotline.
Get the latest news on the star party, club meetings, special events and astronomy happenings.call **909/596-7274**

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measure the Earth/Sun distance. While the observations are no longer of scientific value they are rare enough that many will try to see this unusual event. The one on June 8th, 2004 will only be the sixth observable by our species and is a sight not seen by anyone living today. While the current transit on June 8th will not be visible from the western United States, We'll have a better view during the next one in 8 years, on June 6th, 2012. Mark your calendars now!

Claire Stover

I VISIT METEOR CRATER AGAIN

The joke is that some tourist says, "Lucky it didn't hit Interstate 40." Actually it was 50,000 years ago that a flaming meteor about 150 ft. across, weighing millions of tons, moving at 43,000 miles an hour smashed into what would be Arizona with an explosive force of 20 millions tons of TNT. Some fragments were driven 3000 ft. beneath the ground, but about 80% turned into dust on impact, about 10% rained down as fragments in a ten mile radius, and 10% still remains scattered underground.

It was almost 50 years ago I first visited what is the best preserved and first officially recognized meteor crater on planet Earth. There was a dirt road to a lot with a decrepit building (later destroyed in a windstorm) and a guy who wanted a buck.

Still privately owned, today I pay $11 to view a two story museum devoted to impact geology. Extensive computer programs display visual shows on every impact crater on Earth. There are almost 200 of them. Additional displays include craters in the rest of the Solar System. There's a great visual program telling you absolutely everything about the Shoemaker - Levi 9 Comet impact on Jupiter in 1994. Also on display is the largest 1,450 pound fragment as well as other types of meteorites.

An Astronaut Hall of Fame and a Apollo test capsule celebrate the time when astronauts used the crater for lunar rehearsal. Called the Museum of Astrogeology, this is really an excellent museum. One demonstration allows you to create your own sized meteor and crash into Earth at various angles and speeds. The results range from burned up in the atmosphere to total planetary destruction! I almost forgot to look at the crater.

The crater is more than 4,000 feet wide and 750 ft. deep. When it was first studied meteorite fragments in the area suggested an impact crater. But because of nearby volcanic activity and the fact that no underground iron could be detected by magnetic studies the crater was officially called a volcanic steam explosion crater like Ubehebe Crater in Death Valley. But in 1902, a rogue geologist Daniel Barringer invested in a mining claim. He spent the rest of his life trying to find the iron-nickle outer space treasure hidden underground. The fragments proved all too small and he only succeeded in proving that the crater was indeed meteoric. It is often called Barringer Crater because of his determined efforts to find his fortune.

In the 1960's astronomer Eugene Shoemaker did extensive studies showing that the impact generated a geologic crushing force of two million pounds. He awakened a new interest in the awesome destructive power of meteor impacts. Today a closer watch is being kept on nearby meteors so that we can receive an early warning and hopefully do something in time. Remember what happened to the dinosaurs.

Meteor Crater is located about 35 miles east of Flagstaff, Arizona.

Lee Collins

The Globulars of Summer

The warm evenings in June bring into view some of the sky's best globular clusters. When most observers in the northern hemisphere think of globular clusters they think of Hercules and M13. M13 is one of the premier telescopic objects in the sky. It was first mentioned in 1715 by Halley who discovered it the previous year. Charles Messier, describing it in 1764, said it appeared as a round "nebula containing no stars". Fortunately we have much better optics at our disposal and M13 can be resolved into hundreds of stars. Under a dark sky, M13 can be glimpsed with the naked eye as a 5.9 magnitude fuzzy star located in the "keystone" of Hercules, about a third of the way along a line drawn from Eta to Zeta. M13 ranks among the most spectacular objects in the sky despite it's huge distance of 24,000 light years. Astronomers estimate M13 contains nearly a million stars within a sphere 100 light years across, although some of the outer wanderers extend it out to nearly 200 light years across. Although it appears incredibly crowded, calculations estimate that the density is no greater than about one star per cubic light year.

Although M13 gets most of the attention, Hercules contains two other very nice globulars. M92 is a beautiful rich globular cluster which in almost any other constellation would be a major show object, but in Hercules it is overshadowed by M13. M92 is almost as big and as rich as M13 but lies 2000 light years farther away so it appears fainter at magnitude 6.5. NGC 6229, a much more distant globular at 100,000 light years, rounds out the globular clusters of Hercules. It shines at magnitude 9.4.

There are many other examples of spectacular globulars in the summer constellations. M5 in Serpens, M3 in Canes Venatici, and M22 in Sagittarius are some of the finest after M13. And then, if you are blessed with a low southern horizon, there is the greatest of the globular star clusters, the magnificent Omega Centauri. It is one of the nearest to earth at 17,000 light years. Although usually considered a show

piece of the southern sky, it is possible to see Omega Centauri from the southern United States. It was observed by many of the RAS members that attended last June's star party at Mt. Laguna just above the horizon after sunset. It should also be visible from Joshua Tree. Whether you have seen these objects for the first time or the hundredth, they are inspiring each time.

Allen Whang

May Star Party

On May 22 several of us were up at Cow Canyon Saddle looking at the sky. Walter Brown was there when I arrived. A little later, we were joined by Ric Ault and Joe Hillberg. Mike Walker had gone down to the village for refreshments and returned when it became dark.

The transparency was less than ideal. High thin clouds and moisture in the atmosphere interfered with the observing of deep sky objects. We did have fun looking at the crescent Moon, Venus, and Jupiter. But the high spot of the evening was Comet NEAT. It was well placed for observation. I believe Mike Walker was the first to find it. After looking through his Telrad, I was able to locate it. Through the telescopes we could see a stellar like nucleus and a large coma. No one reported seeing a tail. This was probably due to the seeing conditions.

The June star party will be on the 19th at Cottonwood Springs in Joshua Tree National Park.

Ron Hoekwater

Benadums Moving

At the May general meeting Paul and Leah Benadum announced that they will be moving. Paul has accepted a job offer in Washington State. The Benadums have maintained the PVAA hotline for the last several months. They have also been strong supporters of our public outreach activities, especially the yearly Scout Camporee at Glen Helen Regional Park in Devore and the Rancho Cucamonga Barnes & Noble star parties. **They will be missed.**

Membership By laws Change

The PVAA Board would like to add a new membership classification. The bylaws regarding membership are as follows.

Article III- Membership: Fees and Classification

Section 1.0
Membership in the Pomona Valley Astronomical Society..... members in good standing, endowment members, and one year complimentary members .....

Section 2.0
Individual member
Endowment member
Junior member
One Year Complimentary Member

Section 2.1
The board of officers shall set the membership fees.....

Section 2.2
The classificarion of member shall be extended to any person paying the yearly membership fee. Members shall have the right to vote on all matters of Pomona Valley Amateur Astronomers business presented by the board of officers of the pomona valley Amsteur Astronomers at regular meetings and to vote for officers of the Pomona Valley Amateur Astronomers. Members shall have the right to make use of any resources, equipment or facilities of the Pomona Valley Amateur Astronomers, subject to all rules set forth by the Board of Officers. The term of membership commences the first day of the month in which the member is eligible to attend a regular meeting and extends for one calendar year thereafter.

Section 2.3
Endowment member

Section 2.4
Junior member

Section 2.5
One Year Complimentary Member

Proposal:

Amend Section 1.0 to add "Family Membership".

Add new section 2.6:

The classification of Family Membership shall be extended to any family at a single address paying the yearly membership fee established for such membership. A family membership shall have no more than two votes on matters described in section 2.2. A family membership entitles the members of the family to the resource, equipment and the facility rightrs described in section 2.2. The term of membership is as described in section 2.2. Only one copy of tje club mailings will be sent to each address under family membership.

For the change in bylaws to take effect the following steps must be taken.

Section 1.0
the bylaws can only be changed by a vote of the general membership.

Section 1.1
Prposals must come from two board members or petition of 10 general members.

Section 1.2
The board may approve proposals for bylaws changes, if so, the proposed change will be published. If not, the issue may still be presented by a petition of 10% of the general membership.

Section 1.3
If approved per section 1.2, changes will be published in the newsletter and discussed openly at 2 regularly scheduled monthly meetings.

Section 1.4
Final vote at the third regularly scheduled meeting requires approval by 2/3 of the members present.

This is the third and final printing of the bylaws change for family membership.