November 1998

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Please note: TAAS offers a Safety Escort Service to those attending monthly meetings on the UNM campus. Please contact the President or any board member during social hour after the meeting if you wish assistance, and a club member will happily accompany you to your car.

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**Events**

October 1998 calendar of events (~15K bytes)

November 1998 calendar of events (~15K bytes)

November 1998 Solar Almanac (~55K bytes)

November 1998 Lunar Almanac (~55K bytes)

**October 1998**

1. Thu * Board Meeting
   
   Uranus 3 deg. from Moon

2. Fri * UNM

3. Sat * TAAS General Meeting

4. Sun  Pallas 1 deg. from Moon
   
   Jupiter 0.2 deg. from Moon

5. Mon  Full Moon (Harvest Moon) (2:12 pm)

6. Tue  Moon at perigee.  56.1 Earth-radii (7 am)
   
   Saturn 1.8 deg. from Moon

7. Wed

8. Thu  Ejnar Herzsprung born 1873
Draconids meteor shower

9 Fri * UNM
   Aldebaran 0.4 deg. from Moon
   Ceres 0.9 deg. from Moon
10 Sat
   Ceres Stationary
11 Sun Neptune Stationary
12 Mon Last quarter (5:12 am)
   Columbus Day
13 Tue
14 Wed
15 Thu Regulus 0.5 deg from Moon
16 Fri * UNM
   Mars 1 deg. from Moon
17 Sat * GNTO
   Ceres Stationary
18 Sun
   Neptune Stationary
19 Mon
20 Tue New Moon (4:10 am) Start of Luna
   Moon at apogee. 63.8 Earth-radii
   * Gabaldon Elementary School
21 Wed Orionid Meteor Shower
22 Thu Karl Jansky born 1905
23 Fri * UNM
   Saturn at Opposition
   Saturn rises at 6:26 pm, 20 arc seconds, Mag. 0
24 Sat * GNTO
   Turn clocks back 1 hour before going to bed
25 Sun Daylight Savings Time ends. (Did you turn your clocks back last
   night)
26 Mon
27 Tue Neptune 2 deg. from Moon
28 Wed First quarter (4:47 am)
   Uranus 2 deg. from Moon
29 Thu * GNTO Meeting
30 Fri * UNM
31 Sat Halloween
   Jupiter 0.2 deg. from Moon

Sunrise / Sunset
For Latitude 35.08, Longitude 106.65 (Albuquerque, NM)
Sunrise = upper limb on horizon
Sunset = upper limb on horizon

   10/01/98    7:01 / 18:51 (MDT)
   10/15/98    7:12 / 18:32 (MDT)
   10/31/98    6:27 / 17:13 (MST)

Planet Rise (10/15/1998)

   Mercury     8:20
   Venus       6:54
   Mars        3:26
   Jupiter     17:06
   Saturn      18:59
   Uranus      15:07
   Neptune     14:32
   Pluto       10:22
November 1998

1 Sun
2 Mon
3 Tue  Full Moon (10:19 pm)
        Moon at perigee.  55.9 Earth-radii
4 Wed  Aldebaran 0.6 deg. from Moon
        Taurid meteor shower
        JANSKY LECTURE
5 Thu  * Board Meeting
6 Fri  * UNM
        Pallas stationary
7 Sat  * TAAS General Meeting
8 Sun
9 Mon  Carl Sagan born 1934
10 Tue  * Grant Middle School
        Last quarter 5:29 pm
11 Wed  Veterans Day
        Moon at eastern elongation
        Regulus 0.3 deg. from Moon
12 Thu
13 Fri  * UNM
        Aldebaran 0.5 deg. from Moon
        Jupiter stationary
14 Sat  * GNTO
15 Sun  Herschell born 1738
16 Mon  Leonid meteor shower/storm
17 Tue  * Central Elementary School
18 Wed  Moon at apogee.  63.7 Earth-radii 12:01 am
        New Moon 9:27 pm
19 Thu
20 Fri  * UNM
        Mercury 7 deg from Moon
21 Sat  * GNTO
        * Astro 101
        Mercury stationary
22 Sun
23 Mon
24 Tue  Neptune 1.9 deg. from Moon
        Uranus 2 deg from Moon
25 Wed  Uranus 2 deg. from Moon
26 Thu  First quarter 5:23 pm
        Thanksgiving
27 Fri  * UNM
        Jupiter 0.6 deg. from Moon
        Mercury 1 deg from Venus
28 Sat
29 Sun
30 Mon  Saturn 1.8 deg. from Moon

Sunrise / Sunset
For Latitude 35.08, Longitude 106.65 (Albuquerque, NM)
Sunrise = upper limb on horizon
Sunset = upper limb on horizon

11/01/98  6:28 / 17:12 (MST)
11/15/98  6:41 / 17:01 (MST)
11/30/98  6:55 / 16:55 (MST)

Planet Rise (11/15/1998)

Mercury   8:37
Venus     7:02
Mars      1:52
Jupiter   14:00
Saturn    15:50
Uranus    12:07
Neptune   11:31
Pluto     7:25

NOTES:
* = official TAAS Event
GNTO=General Nathan Twining Observatory. Call Gordon Pegue @ 332-2591 to confirm.
UNM=UNM Observatory observing nights. Call the TAAS Hot Line to confirm @ 296-0549
ATM=Amateur Telescope Making. Call Michael Pendley for information @ 296-0549.

Astronomy 101 Cloud Party
by Robert Williams

The third edition of TAAS's Astronomy 101 night was held at Oak Flat on Saturday, August 1st.
I left Albuquerque at about 3:30 and headed to the Sandia Ranger station to pick up the keys for
Oak Flat and was taken in a torrential downpour as I drove through the canyon. I picked up the
keys and left the rain behind in the canyon and headed to Oak Flat. I arrived at Oak Flat and
was pleased to see a clear sky everywhere except the north, that soon changed and it began to
rain. It stopped raining and I began to see some blue sky but again it was short lived. I began to
consider canceling the event but decided to wait it out, within a few minutes people began to
arrive.
At about 6:45 with some 10 to 20 people there we decided to go back down to the ranger station and pick up keys for one of the picnic areas with a shelter. With Rebecca Stoneman, one of the rangers, we headed down to the office to get keys for the other picnic grounds. Upon returning to Oak Flat I was surprised to see that more than half of those who had RSVP had braved the rain and attended the event, we moved to the new site and began the show.

Dee Friesen and Jason Vargas talked about the loaner scope program and how to go about getting a loaner scope. Then Carl Frisch talked about collimating a telescope and the basics of telescope use. Mike Pendley then presented the slide show he does at school star parties and answered questions. We then ended the evening with a slide presentation of constellations by Kevin McKeown, unfortunately it did not clear up so we had to settle with the slides.

Despite the worst rainstorm I can remember this year, thing went well and everyone seemed to be pleased. I would like to thank all those who came out to help and those of you who braved the rain to attend the third Astronomy 101 night, there will be more to come. Some of those who came out to help were; Robert Ortega, Carl Frisch, Barry Gordon, Dee Friesen, Jason Vargas, Kevin McKeown, Rebecca Stoneman, Robin Pimbly, Mike Pendley, Pete Eschman and Brock Parker. If I forgot someone's name I am extremely sorry and if you give me a call I will see that you get the credit you deserve.

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**Presidents Update**

*by Mike Pendley*

**TAAS Web Site Down**

Some of you may have noticed the TAAS web site was down over the weekend of September 5th. The server (which UNM is kindly provides) had hardware problems and Tom Hess, our system administrator, had to move the web site to a new machine. In the process, changes I had made in the previous 48 hours or so were lost and the new machine made some links break. I believe all is back to normal now. Please drop me a line if you come across a dead link.

**TAAS Gossip**

Astronomy Magazine has published the issue reporting on Astro Blast. I saw a copy and noticed that Lisa Wood's solar telescope was included (I believe John Dobson was standing next to it). Since I always wait until the last minute to write this column, and since I don't subscribe to Astronomy, and since Page One did not have a copy on the stand, I am embarrassed to report that I can't even tell you which issue it is in. I think it is October and I will clear this up next month.
TAAS member and UNM Grad Student Tom Pannuti is on an observing trip in Bonn, Germany. We should have a picture of Tom in leiderhosen for our web site soon.

David Blair's telescope mirror (made during the last telescope making class) is back from QSP and is giving wonderful images. I asked Dave what was the origin of the name Uranopan. Dave tells me that Urano is Greek for "sky" (uranography is an arcaic term for celestial mapping). Pan is Greek for "all". Hence the name All-Sky for a telescope he would like to use to complete a full sky survey.

TAAS member, high school student, and (TAAS) Broline Award winner Beth Fernandes has been chosen as one of three "Outstanding Hispanic Science Students" in the greater Albuquerque area. During Hispanic Heritage month, there will be a special display at the National Atomic Museum on Kirtland AFB. This display (opened to the public) will feature some of Beth's achievements in the field of science (most of them being in Astronomy) and will include a large picture of her. The display will run for a month from September 15 - October 15. See a picture of Beth on page 16

T-Shirt Contest

T-Shirt contest entries have been miserable. Not in terms of quality but in terms of quantity. We have had exactly two. I know we have alot of creative people out there so LETS GO PEOPLE. Send in your ideas. TAAS needs a cool T-shirt. If we get going I think we still have time to get them made by the Potluck.

Telescope Making Class

I still have not decided on specific dates and secured a room at the PandA building (that's the Physics and Astronomy building on Lomas and Yale for you new people) so I can't give you specific information at this time. However, I suspect the class will be very close to starting by the time the next newsletter comes out so if you are interested, now is the time to sign up.

For now, assume the class will start in late October. There will be 7 class nights. Classes will be held on Wednesdays from 7-9 pm every other week. This will push the end of the class into early to mid January. There will also be one or more Saturday grinding sessions at my home. Cost is $10 to TAAS members (which will be donated in your name to the TAAS educational fund) and $30 for non members (which will be used to make you a member and a donor to the educational fund). Class notes will be available for the cost of printing ($20 or so) for those that are interested. They are not required to be successful. I would like to limit the class to 10 individuals interested in making 6 to 8 inch telescopes. Cost and total labor will vary but figure 40 hours or so and $300-400. Call now for more info or to reserve a spot. You can also see me at the October general meeting for more information. Starting a new class always makes me update the ATM portion of the web page so keep an eye on it for more info and pictures of telescopes past students have made.

Random Acts of Kindness:
John Sefick for donating a number of very high quality eye pieces for use with the Chaco Canyon telescope.

Anonymous for donating a 6-inch Astrophysics refractor. For those of you new to the hobby—that is a way cool telescope.

Anonymous for donating a great deal of telescope making supplies. This "stuff" will probably be auctioned in November.

**New Members:**

On behalf of the Board of Directors and the general membership, I would like to welcome the following new members to TAAS:

Noel Baca  
Jody Forster  
Pamela Iron  
Rebecca Marshall  
Frederick Mendenha  
Eileen Mendenha

We hope your membership in TAAS is pleasant and rewarding. Please contact any board member if you have any suggestions or if you would like to become more involved in Society activities.

Total membership is now 404, down 5 from last month :-(

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**Board Meeting**  
*by David Blair*

President Mike Pendley called the September 1998 Executive Board meeting to order at 7pm Thursday, September 3, at the UNM Physics and Astronomy Building. Establishing a quorum were David Blair, Carl Frisch, Alan Green, Bruce Levin, Robert Ortega, Gordon Pegue, Ruth Pendley, Dave Sukow, Robert Williams, and Lisa Wood. Present as an observer was Tom Pannuti (of Lodestar and the Astronomy Department, UNM). Kevin McKeown and George Pellegrino were both ill.

In the absence of the secretary, August minutes were not read. David Blair recorded minutes during the current meeting.

Robert Williams updated Treasury balances, reporting total funds on deposit at $8,366.84, an increase of $200.88. Education funds on deposit stood at $2,244.02, no change since August. Observatory funds on deposit decreased $24.00 to 5,764.30. General funds on deposit increased $224.88 to $358.52.
Observatory Committee Chairman Robert Ortega reported successful completion of the GNTO Eagle project conducted by Theodore Schuler-Sandy. He moved that special thanks and a complementary membership be extended to Robert Chavez for his extensive work. The motion was seconded by Ruth Pendley and passed. Robert Ortega further reported:

- Delivery of rotary rings for the Isengard telescope could be expected in about forty-five days;
- That he is conducting an inventory of observatory equipment and materials;
- Failure of the controller for opening the dome above the Isengard telescope; and
- He circulated a drawing of a more reliable manual system for opening and turning the dome.

He also reported the anonymous donation of a research-grade 6-inch Astrophysics refractor. Gordon Pegue circulated drawings he made for an addition to General Nathan Twining Observatory (GNTO) that would house the telescope under the two-meter dome recently donated to the society by Steve Snider. He stated that the refractor is an ideal tool for CCD and film imaging. Robert Ortega stressed that pouring the peer should be a priority.

Mike Pendley reported that he had submitted a request to Motorola for a grant toward the purchase of a Starlab. He expressed optimism about that grant, for up to $10,000, and about the PNM proposal to electrify GNTO. David Blair reported progress toward a grant application to Target to supplement the Starlab project. Meanwhile, Alan Green has collected Starlab information, including prices and a descriptive video, and Robert Williams and Kevin McKeown are preparing a project description. David Blair is also exploring McDonald's as a funding source.

Carl Frisch indicated that Lodestar's museum and planetarium for Albuquerque remain on track.

Lisa Wood reported star party bookings for the 1998-99 school year: Sept. 15, Annunciation Elementary (confirmed); Oct. 20, Gabaldon Elementary (confirmed); Nov. 10, Grant Middle (confirmed); Nov. 17, Central Elementary (confirmed); Dec. 1, Los Lunas Elementary (pending); Jan. 27, Onate Elementary (pending); Feb. 10 or 17, Rio Grand Elementary (pending); Mar. 2, Marie Hughes Elementary (confirmed); Apr. 15, Collet Park Elementary (confirmed). One opening for a May star party remains. Lisa Wood said that parties would be limited to ten for the year—at least for now—to give her a chance to assess docent availability.

Carl Frisch presented the TAAS 1998 Calendar and proposed calendar for 1999. He moved that Astronomy 101 and Chaco Canyon viewing become standard events. Seconded by Gordon Pegue, the motion passed.

Bruce Levin reported that TAAS members had visited Carlsbad Caverns National Park on Aug. 22-25, with David Blair conducting a program on asteroids for about 80 park visitors on Aug. 23. A star party that followed was largely spoiled by cloud cover, but TAAS members enjoyed limited viewing the night before and superb viewing the night after. They were treated to a tour of the Slaughter Canyon Cave in exchange for their program.
Coming events are scheduled for Placitas Open Space, Sept. 12; Chaco Canyon, Sept. 19; and the Rio Grande Nature Center, Sept. 23. Dave Sukow reported that UNM nights are weekly again, but that he will be away for the nights of Sept. 12, 19, and 26. Those planning to attend should call the hotline for confirmation. Mike Pendley indicated that speaker Dave Westpfahl is the confirmed speaker for the September general program, speaker Kevin McKeown for October, and the TAAS auction for November. Bruce Levin said that arrangements for the December potluck have been firm up.

Under old business, Gordon Pegue circulated a draft letter to the Salinas Pueblo Missions National Monument re-requesting return of a $100 fee, which TAAS interprets as a fee for a permit (rejected by the society due to impractical restrictions), but which the monument interprets as an application fee. The board directed him to send the letter with minor changes.

Ruth Pendley circulated drawings for proposed TAAS T-shirts.

Under new business, Mike Pendley suggested formalizing procedures for handling donations to TAAS. Gordon Pegue suggested that (1) two TAAS members be present for the receipt of "complex" donations, (2) that an inventory be made of such donations, and (3) that board members be notified of all such donations. Lisa Wood suggested that the appropriate committee head should write a thank-you note to donors and that the treasurer should provide a receipt. Discussion on all aspects of donations was tabled for reflection until the October board meeting.

Mike Pendley moved that the treasurer be allotted $100.00 for stationery and generic society business cards. Seconded by Gordon Pegue, the motion passed.

Carl Frisch reported a Random Act of Kindness: that John Sefick had donated $900.00 for eyepiece complements at Chaco Canyon.

Gordon Pegue called for establishment of the annual Nominating and Awards committees. Volunteers for the Nominating Committee were Mike Pendley (chair), Ruth Pendley, Robert Ortega, and Alan Green. Volunteers for the Awards Committee were Mike Pendley, Ruth Pendley, and David Blair, with no chair designated.

Carl Frisch called for ZIP disk donations for use at Chaco Canyon. Mike Pendley made newsletter assignments and the meeting was adjourned at 8:15 pm.

Observatory Committee
by Robert Ortega

No report this month

All observatory committee meetings are open to the general membership. Call Robert Ortega for location information if you are interested in attending—ed
September Meeting Recap

No recap this month

October Meeting Preview

The TAAS Regular meeting of Saturday evening, October 3rd, will be at Regener Hall, on the UNM campus, at the usual 7 pm. Our special guest speaker will be Kevin McKeown. Kevin received his BS in Geological Engineering from the Colorado School of Mines. Kevin is a member of TAAS, and a very avid amateur astronomer who specializes in the observation of meteors and meteor showers. The October talk will center on the phenomena of meteor showers and meteor storms, and sporadic fireballs, and bolides. Kevin will discuss how to effectively observe these phenomena. Learn all the handy tricks tonight (that they don't tell you about in Sky and Telescope) such as how to tell space junk meteors from natural meteors. Find out the best strategy for observing the two upcoming potential meteor storms: the October Draconids on the 8th, and the Leonids on about November 17th. Find out what Art Bell's "green fireballs" are all about. Kevin will also briefly talk about some of the interesting phenomena associated with meteors such as sonic booms, and electrophonic sounds. This will be a great discussion! We will have the usual Trivia contest, a Show and Tell item, and the usual social hour will follow. Don't forget the goodies and cookies! A map to Regener Hall appears on the back of the Sidereal Times.

Observer's Page

by Kevin McKeown

November Musings

With the unaided eye, how many stars can you count inside the Great Square of Pegasus? You might try this exercise while you set up in a very dark location in anticipation of the Leonid meteors (see below). Around 9 pm, well into a dark November evening, the Great Square stands high overhead. The "Great Square" is actually a nearly square quadrilateral formed of four stars of 2nd magnitude, and it averages some 15 degrees on edge, and covers about 228 square degrees.

The "Great Square Star Test" is both a measure of the quality of your sky and your visual acuity. With dark adapted eyes, one should have no trouble spying nu and tau Pegasi, the two brightest stars in the Square. Nu and tau both shine at about magnitude 4.5, and they form a sort of naked eye double star. Next, 5th magnitude psi Pegasi is faint, but pretty easy from a dark site. Beyond nu, tau, and psi, it is all downhill from here! The next brightest star in the Square shines at about magnitude 5.5, and most of the faint "salt grains" one sees on the velvet black background of the
Square shine at about 6th magnitude. But within the Square, the number of 7th, 8th, and fainter magnitude stars really increases! The German astronomer Argelander claimed to have counted 30 stars in the Square, while his countryman Schmidt (of Schmidt-Cassegrain Telescope fame) claimed 100! About 86 stars of magnitude 7.5, or brighter, exist within the Square. As for myself, the best I've ever done is something like 24 stars, under clean, black skies of the Colorado Rockies. But after a point (say 20 stars?), the tiny starry salt grains are impossible to keep track of! This is perhaps why the Great Square is not a suitable test for sky quality. Anyway, try it out, but there will be no awards, and I can't say that it will keep you warm as you wait for the Leonid radiant to rise in the east. Also, be careful to not get carried away! I'm a little skeptical of Schmidt's claim of 100. Nobody has that good a memory.

Speaking of the Leonids, this year represents the first good chance for a return of a meteoric storm. I think the import of such an event- a Leonid storm- is heightened when you consider the now legendary status the 1966 storm has attained. It's almost as if it didn't happen. But it did! As for myself (who did not see the event), it is especially rewarding to hear what it was really like from those who saw the event first hand. And there weren't too many witnesses, or at least as many as there should have been! You see, the 1966 storm really caught a lot of astronomy people off guard, amateur, and professional alike. From reports in Sky and Telescope, I know that the remarkable Vi Hefferan, then a Science teacher at Albuquerque High School and tireless observer of the heavens, witnessed the event. I wonder how many of her students were there to? And talk to Robin Pimbley, one of TAAS's own hardcore DSOers. He saw the damned thing from Los Alamos! I believe TAAS's Sydney Stone was another of the lucky ones. And then there was the time last year when I spoke to folks in a Dunkin' Donuts about having seen the big October 9th, 1997 daylight fireball. After carefully listening to my meteor story, one elderly lady had to relate to me "the most unusual thing that happened over Albuquerque in late 1966". To which I added, "November 17th, right?" "Yes, November 17th, exactly", she replied. You see, Mrs. Smith and her husband would open their downtown Albuquerque restaurant at 5 am every morning, and on that chilly November morning, they could not help to notice the increasing meteoric activity. By 5:30 am, Mrs. Smith said the sky was full of huge, blue green meteors raining down everywhere! She said the deliveryman didn't even need his headlights, so bright was the light from the show!!!

In some respects, the 1966 storm is anachronistic. When you consider the level of media coverage, and the relatively little knowledge astronomers then possessed of the nature and dynamics of the Leonid meteor stream, the 1966 event really seems more like one of those amazing astronomical events of the 19th century "that just showed up without warning". Just as the contemporary war in Viet Nam was misunderstood and ignored by so many, the 1966 Leonid event went mostly unobserved for about the same reasons. The 90's belong to the information age. Just ask Bill Clinton.

I can't offer predictions, except to say that one had better maintain a vigil of the Leonid radiant (the point where the meteors "radiate" from) on the nights of November 16-17, and 17-18. The Leonid radiant lies approximately in the Sickle of Leo, the Lion. It rises at about 11:30 pm local time, and continues to rise until it stands nearly overhead at dawn (6 pm). NOTE: if the Leonid radiant has not yet risen, there is no chance to see any Leonid meteors! Thus, one has access to about 6 of the 24 time zones on Earth in which a Leonid storm can occur. This is only about 1 in
4 odds- not too good. Realistically however, a Leonid storm is going to be well seen within a time swath only 2 to 3 time zones (hours) wide: this is 3 am to about 5:45 am MDT. SO, be monitoring your 6 hour swath with diligence: start at 11:30 pm, for both November 16th, and 17th! IF a storm is in progress at the time the radiant rises, you will still see activity, albeit quite attenuated. With the radiant near the horizon, the meteors you see overhead will graze the upper atmosphere, and this might be quite dramatic! Since the best chance of strong activity seems to be around 2 pm MST, November 17th, you might even monitor the daytime sky for daylight Leonids before the radiant sets in the west! The other ways to "skin the cat" include a trip to central Asia (where it will be dark at 2 pm MST), or a trip to the arctic. Recall that north of the arctic circle, the Leonid radiant never sets! But it doesn't get very high up either. Call me at 254-9117 for questions and Society plans.

The Uranopan

Dave Blair reports that his new 6 inch f/5.8 reflector, called the "Uranopan", gives very excellent images. On September 7, Dave tried the Uranopan on the planets Jupiter and Saturn, and was amazed at the fine, bright images! Jupiter showed much belt detail, along with a festoon, and he could detect the discs of the moons of Jupiter. The Cassini division of the rings of Saturn showed wide and clear! With the new Uranopan, Dave also showed some asteroids (including Ganymed, Sabine, Emma, and Pallas) to several of us at recent star parties.

GNTO, August 22, 1998

A humid, hazy airmass produced some fantastic observing conditions this Saturday night. Because of the humidity, it soon became apparent that the planets available that night- Jupiter, Uranus, and Saturn- would be seen with exceptional clarity! And the fact that some of the Society's finest planetary scopes were present tonight really helped. These included Bill Tondreau's new, home made 12 inch reflector, Gordon Pegue's fine 20 inch Tectron, Mark Nagrotsky's 4 inch Astrophysics, Robert Ortega's 16 inch Dob, Jeff Bender's 18 inch Dob, and Kevin McKeown's 10 inch Jaeger's Dob. First, Jupiter showed beautiful detail! In addition to the two big dark belts, many finer belts, and shading detail, could be made out in the temperate, and polar regions! The two hemispheres of Jupiter are not at all alike! We watched the Galilean satellite Io, and an inky black moon shadow (of Callisto?) transit Jupiter. At first, only the tiny inky black shadow was picked up. But then someone noticed that there was a moon (Io) transiting! Io looked like a tiny, round "white" spot! But it was the startling clarity of the Galilean moons that we'll never forget. They showed clean, largish disks! The view of Callisto hanging just off the south (as I recall) pole of Jupiter was amazing. All four satellites had disks of different sizes. Unfortunately, we could not detect surface detail in any of the four Galileans. Next, we tracked down Uranus located in north central Capricornus. Planet #7 showed a good, clean disk, four satellites in Gordon Pegue's 20 inch, but no surface detail. Towards midnight, Saturn next totally amazed us! All I can say is that the majority of published Saturn drawings are not accurate, especially those figured in the excellent article by found in Sky and Telescope, September, 1998. First, in the 10 inch and larger scopes, Saturn's crepe ring was very easy. In Bill's scope, it clearly looked like a bluish, frosty ring inside the B ring. Secondly, I was amazed at the subtle contrast variations that exist within the A and B rings. What I gleaned from Bill's 12 inch was that the intensity of both the A and B rings, where they border on the Cassini division,
is actually at maximum. That is to say, the "darkness" of the Cassini division is partly due to the greater brilliance- and presumably density- of both the A and B rings where they contact the Cassini division. Thirdly, I had my first good look at the Encke division of the A ring. This was best seen in Gordon's, and Bill's scopes. Essentially, what I saw was a contrast gap. I saw no trace of the gap in the outer A ring that Keeler reported from Lick Observatory in the 1880's. Jeff Bender and friend, Gordon and Alejandra, Mark Nagrodske, Bill Tondreau, Robert Ortega, Pete Eschman, Kevin McKeown, and others attended this rare night.

**TAAS 200**

Even as late as November, Cygnus the Swan still soars high up enough to catch some TAAS 200's within its boundaries. Way up in northern Cygnus, right on the border with Cepheus, can be found two remarkably similar appearing, but wholly different TAAS 200 objects: galaxy NGC 6946, and open cluster NGC 6939.

First, NGC 6946 is a large, face on, four armed Sc spiral that lies in a very rich field. At magnitude 8.8, it is an easy binocular object. But in scopes larger than 8 inches, the spiral structure becomes evident! Next, move about a degree to the northwest, and locate cluster NGC 6939. While NGC 6939 roughly looks like the galaxy, it resolves into a rich, triangular cloud of stars in larger scopes. Both objects contrast with one another nicely in the LP field!

Continuing the northerly trend, planetary NGC 40 lies way up in northeastern Cepheus, not too far from gamma Cephei, the top star of the "house" of Cepheus. This fine planetary consists of a thick, round ring or annulus of nebulosity surrounding a faint star. Even farther into northernmost Cepheus, open cluster NGC 188 lies only about 4 degrees south of Polaris. This ancient, rich open cluster is a wonderful round cloud of very faint stars. In small scopes, it appears as a faint, round, ill defined haze. It needs a clean, black sky. Lastly, moving down into Cassiopeia, open cluster NGC 129 is easily found midway between beta and gamma Cassiopeia. This is a large, bright, coarse cluster having 3 bright stars that nearly form an equilateral triangle. It is best seen with large finders, and RFT's. Good Luck!

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**What's Up for November**

*by Kevin McKeown*

The planet Mercury can be seen in the west after sunset for the first three weeks of November, but this is a difficult elongation. The moon slides under Saturn on the night of November 2 - 3, and later in the month, it slips just above Mars before dawn on November 13th.

The big event for November is the Leonid meteor shower, which could possibly produce a meteoric storm on November 17th. A meteoric "storm" occurs when a meteor "shower" briefly becomes so intense that the meteors seem to fall like snow! This year, Asia seems to be the
favored area on Earth to see the storm. Recall that in 1996 several TAAS members witnessed the fine outburst on the morning of November 17th, from Oak Flat. Last year, we saw little activity, again on the morning of November 17th, and this suggests that the peak occurred after dawn, Nov. 17th, for New Mexico. If this trend holds, New Mexico's next view of Leo, and the radiant, at the critical time, is the year 2000. BUT . . . Leonid activity is often greatly enhanced for a full day on either side of the peak activity, due for mid day, Nov. 17th. While we might miss the big storm, we might get to see strong activity, especially on the night of November 16 - 17, 1998. However, Leonid storms can't be predicted with any certainty, so it is imperative to maintain a "vigil" on the nights of November 16-17, and November 17-18. The October meeting will be dedicated to observing meteors, so attend if interested, or call Kevin McKeown at 254-9117 for details.

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**Ask the Experts**

by Bruce Levin

**How Far Can You See Through That Telescope?**

This is more of a philosophical question than you might think! In a way one would think that the real question is "How faint can you see with that telescope?" But the questions and answers go a bit deeper than that. It's kind of like the great beer commercial debate—"Less filling" vs "Tastes great". In certain respects, the answers relate to both questions. How far and how faint you can see depends upon several factors. These factors are instrument aperture, quality of the optical system, atmospheric conditions such as air stability, amount of atmosphere being looked through, sky brightness and clarity, weather conditions, brightness and size of objects being looked at, and sensitivity of the observer's eye to light.

All things being equal, generally instruments of larger free aperture or greater free aperture area collect more light than smaller similar instruments. The better the resolution of the instrument, the higher the instrument contrast. The greater the optical system contrast between the observed object and the surrounding field, the fainter the objects that can be seen by the eye. Well made refractors have very high contrast compared to telescopes with secondary optics, giving the edge of seeing faint objects to the refractor for the same size and somewhat larger telescopes with obstructing secondary optics. Beyond a certain comparable size, the obstructed optical telescopes collect enough light to make up and exceed the difference.
Air stability depends upon whether there is air turbulence or whether the air is still. Temperature differences and wind can effect that air stability or steadiness. Ground that is heated up by the hot sun, radiates its heat to space, especially just after the sun sets and thereafter for several hours until thermal equilibrium is reached. Any heat convection through the atmosphere can cause the atmosphere to "boil" or become wavy, especially during the early nighttime. Also air currents can exist in telescopes that have been exposed to warm temperatures and are then are cooling off when early night time observing starts until temperature equilibrium is reached with the outside air.

Depending on where an observer is looking in the sky will determine the quality of what is seen and the faintness of the object. When looking near the horizon a person is looking through a lot of atmosphere. Even though the atmosphere is relatively thin compared to the size of the earth, viewing across the horizon is like slicing through the skin of an apple. Fainter objects tend to disappear when closer to the horizon—this is called atmospheric extinction. By comparison, when looking in a direction closer to the zenith or straight overhead, one is looking through very little atmosphere. Objects tend to appear brighter, clearer and steadier the further they are away from the horizon. Elevation also plays a part. The higher you are, the less atmosphere you are looking through. Also the atmosphere is less dense the higher up you are. There is a limiting factor for visual observers though. There is also less oxygen at higher elevations. The eye needs a certain amount of oxygen to function properly, and a person's vision actually degrades above very high elevations—say 10,000 to 12,000 ft. and higher. Sky clarity or contrast is dependent upon how clear the sky is. Dust and/or moisture, air pollution or other particulates in the sky will reduce that clarity as well as high or diffuse clouds. Light pollution or a bright moon only accentuates the contrast problem by the light being scattered by the particulates. Atmospheric moisture does tend to make the sky steadier though—particularly for planetary observing.

How bright are the objects being observed? In spite of brightness, are the objects being obscured? Interstellar gases, dust, and dark nebulae can block, attenuate, or disperse light from objects behind it. Objects in our own galaxy tend to relate more to how faint you can see rather than how far you can see. Nebulae, open star clusters, planets and other objects in our solar system such as comets and asteroids would be more of a function of faintness. The more distant globular clusters, being on the fringes of our galaxy can be a function of both distance and brightness. What I mean by this is that relative distances of known objects with the same absolute brightness density and size can be determined by observing the relative differences of their brightnesses and sizes. Compact globulars with many stars can be discerned even though they may be tens of thousands of light years distant. Galaxies tend to be a function of distance—or "How far is the most distant galaxy you can see with your telescope?" Again, apparent brightness density and size of a known type of object translates to distance. One may be able to see a very distant galaxy with a large telescope, yet not be able to see a very faint object in our solar system using the same instrument. Observed brightness wins out regardless of distance.

Finally, each person's eyesight is different. One person may have a greater concentration of rods in his or her eyes than another person. The rods are sensitive to light, dark, and associated light/dark contrast. Also are your eyes night adapted? One person's night adapted pupils may open up wider than those of another person. It takes a good twenty minutes to one half-hour or longer in a dark environment to become fully night adapted. Rhodopsin is also produced in the
eye. This chemical is a red photosensitive pigment in the retinal rods which aids in dim light vision. In dim or dark conditions, this pigment has a chance to build up. This is why astronomers and pilots use red lights in order to maintain their night vision. So the answer to the posed question is relative to what objects a person is looking at, the seeing conditions, the dim light sensitivity of that person's eye(s), and the instrument being used.

All things considered, its not so much how far you can see as it is how faint you can see!

Future related topic: Apparent magnitude—or "How is the brightness of an astronomical object measured?"

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**The Kids Corner by Barry**

**Goodbyes and Hellos**

I am sorry to say that this will be my last Kids' Corner article. I have enjoyed writing this column. My first column was published in May of 1996. Lately I have been very busy, and I think it is time to stop and hand the "Kids' Corner" over to my brother, Barry.

I have enjoyed writing all of these articles. It has been very interesting. My favorite article has been the article on Lick Observatory. I am sorry that I have to go. Goodbye, Lindsay Wood

Hello, I'm Barry Wood. I am going to be in the Kids' Corner column. I am 7 1/2 years old. I just started second grade two weeks ago. I like the stars and planets. I like to look in our sun telescope; I see lots of sunspots.

I like to help make comets. Here is the recipe for making a comet. You have to have your mom or dad help. You need very thick gloves.

**Comet Recipe**

1 large bowl lined with plastic bag  
Add 2 cups water  
Add 1/4 c dirt, 2 squirts of Windex (ammonia) and a splash of rootbeer (complex carbon chains.)  
Add 2 cups crushed dry ice. Don't touch it. Stir well until mixture gets stiff. Wearing thick gloves, close the plastic around the mixture. Shape it into a ball with your hands.
DO NOT EAT THIS! Don't let anyone touch it.

Most comet centers are about 6 miles across. This one will be about 6 inches across.

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Star Myths Goes Star Facts
by Robert Williams

No report this month.

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ATM Corner
by Michael Pendley

No report this month. See presidents update for info on the next telescope making class.

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UNM Campus Observatory Report
by David Sukow

<table>
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<th>Date</th>
<th>Report</th>
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<tr>
<td>8/28</td>
<td>This was the first night of the academic year, marking our return to the usual schedule of every Friday evening. The sky was clear, but it was a breezy evening. About 40 people came out to the observatory to enjoy celestial views. Todd Burdullis, a new UNM astronomy graduate student, has taken Pete Zimmer's old position as head honcho in the dome, so be sure to say hello to him when you come out.</td>
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<tr>
<td>9/4</td>
<td>The skies cleared off in time for a lovely warm evening at the observatory. The sky was bright with the almost-full moon, and once again about 40 visitors attended. Jupiter and its moons were the favorite targets by far, although we once again received many requests for Saturn. Other good views included the Ring Nebula, and the globular clusters M13 and M22. By night's end, the Andromeda Galaxy was visible, lying low in the light pollution.</td>
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9/11 A reasonably good night with average seeing. Attendance was up a bit at approximately 60. Clouds were a bit of a problem but not a show stopper. Late comers were treated to great views of Jupiter and a low in the east view of Saturn.

9/18 Skies were not too bad at sunset but became more problematic as it got later—especially from the zenith to the west. Attendance was up again at approximately 100—including members of the newly formed Valley High School Astronomy Club.

Docents this month included: Robert Ortega, Bill Tondreau, Jay Harden, Brock Parker, Kevin McKeown, Robert Williams, Mike Pendley, Gordon Pegue and Bruce Levin.

If YOU are interested in being a UNM observatory docent, please contact me. You don't need to bring a telescope (we have extra at the observatory), just a willingness to share your enthusiasm about the night skies.

School Star Party Update
by Lisa, TAAS Education Coordinator

Upcoming School Star Parties
(Docents, mark your calendars)

October 20—Raymond Gabaldon Elementary

November 10—Grant Middle School
November 17—Central Elementary

December 1—Los Lunas Elementary

Annunciation School Star party
Mary Gannon, Annunciation Cub Scout Pack 280

Our Lady of the Annunciation Cub Scouts hosted a Star Party on September 15 that was a great success! There were over 200 people in attendance, 138 being Cub Scouts and Girls Scouts. The children were enjoying themselves so much with the comet demonstration by Lisa Wood, the Star Lab hosted by Robert Williams, Dan Richey and G.B. and the slide show with Mike Pendley, that we hardly noticed the rainy weather and, therefore, no telescopes. We hope to invite some telescopes and their owners to one of our monthly Pack Meetings so the children can experience that, but, again, no one had a chance to miss them with all the excitement going on! We'd like to sincerely thank all the Astronomical Society volunteers who were so patient with helping us produce this special chance to wonder at God's creations, and we hope to make this an annual Cub Scout event at Annunciation. By the way, if the "recipe" for the comets is available, many parents have had requests for daily shows at home, and quite a few Girl Scout and Cub
Scout leaders thought it would be a nice project for den meetings (it is, see the Kid's Corner – ed.). Thank you again, we would forward to working with you all again. Sincerely, Mary Gannon, Annunciation Cub Scout Pack 280.

Docents this month were (in random order) Kevin McKeown; Robert Williams; Dan Richey; Robert Ortega; Bill Tondreau; Lisa Wood; and Jon, Ruth, and Mike Pendley.

School Star Party #2
Tuesday Oct. 20, 1998
Raymond Gabaldon Elementary
7 pm - 9 pm

A Poetical Request
by Lisa

Oh, Raymond Gabaldon
Has called us on the phone.

We travel near and fars
To show the kids the stars.

So won't you bring your scope?
Don't at your TV mope.

To avoid the mad and surly
Please try to get there early.

Please take a pm nap
And don't forget your map.

I thank you kindly all
We're gonna have a ball!

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Fall Astronomy 101
by Robert Williams

Well for those of you who have been waiting for the next 101 night—your wait is just about over. TAAS' next Astronomy 101 night will be held in the planetarium at Santa Fe Community College in Santa Fe. For those TAAS members who live in the Santa Fe area and who have asked for events in the area—this one is for you. We are still working out the details of this event and are checking with Santa Fe Community College for available dates. For now, assume the next 101 night will be late October or early November. We should have the date worked out by the next newsletter.

New TAAS members: You have probably guessed that this event is geared towards the beginner . . . call me for details.
We will begin the evening with a planetarium show that will last about 40 minutes. We will then take a break and return to the planetarium for some questions and answers under the dark planetarium sky. This event will not be canceled due to weather because if it is cloudy and raining outside it will be perfectly clear inside. If you have trouble finding some constellations then come out and learn a few tricks for finding them. We will also have some telescopes there for those who would like to view after the planetarium work is done—provided it is clear at the time.

Seating is limited in the planetarium so it is important to RSVP for this event. If you would like to RSVP now you are more than welcome to. As soon as the date has been set I will call you back and let you know. Phone me at 323-0172 or e-mail me at rawilliams1@compuserve.com. We will have more information available in the next newsletter, so keep an eye out for Astronomy 101 and we will see you there.

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**September Trivia Question**

*by Mike Pendley*

TAAS has a trivia contest at each general meeting. The September winner was David Blair. His prize was a Shuttle Camp “fanny pack”.

Karl Jansky is considered to be the father of radio astronomy. As a radio engineer at Bell Laboratories, Jansky was tasked with finding the source of interference that was disturbing transatlantic radio communication. Jansky saw that the interference had a period of 23 hours 56 minutes, the length of the sidereal day, which meant that the signals had to be coming from outside the earth. He located this source in the direction of the center of the Milky Way Galaxy. Jansky presented his findings at the meeting of the International Scientific Radio Union held in April 1933 through his paper Electrical Disturbances Apparently of Extraterrestrial Origin.

Karl Jansky died in Red Bank, New Jersey in February 1950 at the age of forty-four.

Today we remember him through a unit describing how strong a radio signal is. One jansky (Jy) = 10^-26 W/(m^2 Hz). Now for the trivia—what was Karl Jansky's middle name?

a) Guthe  
b) Dewy  
c) Hanson  
d) Barnard

Answer  Answer
Age of the Moon: Knowing the age of the Moon is important when planning viewing sessions. "What?" you say, . . "How does knowing the Moon is billions years old help me plan a viewing session?" you ask. Well it doesn't of course. In this case, the age of the Moon refers to the number of days past new. Since the average time between new Moons is 29.53 days, the age of a new Moon is 0 days, a first quarter Moon is ~7 days old, a full moon is ~15 days old and a Moon in it's last quarter ~22 days old.

Here is a little trick to mentally calculate the age of the Moon for any day in 1998 or 1999.

1. Add the month to the day (e.g. June 12 would be 6 + 12 = 18).
2. If the month is January or February, add 2 more.
3. Subtract 1 if the year is 1998 or add 10 if the year is 1999
4. If your total is more than 30, subtract 30.

The result is the approximate age of the moon.

Example:

What is the age of the Moon on July 20, 1999?

Answer:

Month (7) + Day (20) +10 (because it is 1999) = 7+20+10 = 37. Since the number is greater than 30, we subtract 30 to get 7. The Moon is approximately 7 days old (first quarter) on July 20, 1999. Consulting an almanac will show that the Moon will reach first quarter on July 20, 1999 at about 9 am UT (3am MDT).

I distilled this little trick from a more complete "in your head" algorithm described by John Horton (the creator of the game of Life) in the book "Winning Ways", Volume 2.

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At Oaks End

by Carl Frisch

Another summer has come and gone with many a successful star party. Those at Oak Flat (5 this year, plus astro-101) proved to be among the successful. If you read the board meeting minutes, you may have noticed that the Oak Flat summer star parties have become a standing event(s). This says a lot for all those involved. It means a higher regard among club members—an event to be counted on year after year. My heartfelt thanks goes out to the Sandia Ranger District, Tijeras volunteers, the board, and all of you that have made the Oak Flat events so great.
Jansky Lecture set for November 4th  
*by Dave Finley*

We'll have more info later, but here's enough to mark your calendars.

This year's Jansky Lecture will be on Wednesday, November 4, 1998, at 8:00 PM, at Macey Center on the New Mexico Tech campus in Socorro. The speaker this year is Prof. Bernard Burke of MIT. The title of the lecture is "Radio Telescopes: Reaching for the Astronomical Frontiers."

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TAAS 200 at Lick Observatory  
*by Ellie Gates*

What would you do with a 36" refractor for a few hours? I had that opportunity at Lick Observatory (20 miles outside of San Jose, CA) and decided I'd work on the TAAS 200 list.

The 36" refractor at Lick Observatory is the second largest refractor in the world (second only to the 40" at Yerkes Observatory in Wisconsin). The 36" was completed in 1888 and has been in use for research ever since. You can imagine what a thrill it is to use this historic instrument for viewing the sky! As many of you know I recently finished my Ph.D. at UNM and started working at Lick Observatory as a support scientist. Part of my job involved learning to use the 36" so I can use it to show objects to the public. We aren't allowed to use the 36" for casual observing, but I did get a "training" night and used it for observing some objects on the TAAS 200 list.

Because the telescope is 110 years old, it is an equitorially mounted refractor, like all large refractors from that time period. This means that it is mounted at the middle of its 60-foot tube and the back end with the eyepiece will swing way above the floor when looking at objects close to the horizon. Thus, the floor goes up and down so you can keep up with the eyepiece as the telescope moves. Also, the telescope is not computer controlled, so you have to manually push the 25,000 pound telescope around (it is pretty well balanced, but if you get stuck—which sometimes happens—you have to go to the top of the telescope pier and move it using the old "shipwrights" wheels). In addition, the telescope dome is James Lick's tomb. He really is buried at the base of the 36" telescope pier, which is somewhat creepy at midnight and you hear noises you never noticed before in the dome. James' ghost didn't pay me a visit while I was observing, but the observatory staff felt obligated to tell me all the ghost stories before I was in the dome alone!
After opening the dome just before sunset I waited for it to get dark and pointed the leviathan telescope at M13 to make sure the Right Ascension and Declination dials were calibrated and that everything was working correctly. It turned out the RA dial was off by 3 minutes, but I was too lazy to recalibrate and just offset by 3 minutes for the rest of the night. M13 was a gorgeous field of stars and the seeing was incredibly steady for so early in the evening. My eyepiece of choice was a 55mm Plossl, the widest field, lowest power eyepiece Lick Observatory has (about 320 times magnification). The low power finder scope (a 6" refractor) gives fantastic views of the sky in its own right.

I next pulled out the TAAS 200 list and started looking for objects that would be visible and not too far south (the telescope is so long that objects too far south in declination are impossible to look at because the eyepiece will be far above floor, even when the floor is all the way up). NGC 6210 looked good as a first object to look for. NGC 6210 is a planetary nebula with a prominent central star and green oval nebula in the constellation Hercules.

Next I moved to NGC 6356, one of many globular clusters in Ophiucus. Even with the 36" telescope, only a few stars were resolved and the cluster appeared more fuzzy and diffuse (especially compared with M13 earlier).

Moving to another planetary nebula, NGC 6445 in Sagittarius, I found it to be much different from NGC 6210. NGC 6445 was oval to almost rectangular with no visible central star.

Swinging the telescope far north of where I had been observing, I moved to NGC 6503. This move involved taking the observatory floor most of the way down and then back up as I pushed the telescope around. It is quite disorienting to move the telescope, floor, and dome all at the same time! NGC 6503, an edge-on spiral galaxy, was a fun object to observe. An off center, indistinct dust lane can be seen. I'll have to remember this object for public nights—it will definitely be a crowd pleaser.

NGC 6543 (the Cat's Eye Planetary) looked outstanding through the 36". The blue-green color is distinct, though nebula looks less like a Cat's Eye than through smaller telescopes.

NGC 6572 was a beautiful object. It is a very small planetary nebula, brilliant green planetary with no visible central star. It is no wonder that it is called the Emerald!

I moved on to yet another planetary nebula, NGC 6781. This is a very large and diffuse nebula that is brighter at the edges than in the center, with no discernable color and no central star. I was wishing I had an O III filter available to improve the view of this one! It is very aptly named the Ghost of the Moon Nebula.

At this point I decided to look at something other than a planetary nebula and looked at NGC 6802. This is an open cluster in Vulpecula. The group is fairly compact and small enough to be
looked at with the 36" (most are too spread out and lose their impact in small fields of view). It wasn't as impressive an object as I would have hoped, but that may be because the 36" is too powerful even for this open cluster.

The planetary nebulae, however, were impressive to look at, so I took a look at two more: NGC 6818 and NGC 6826. NGC 6818 was slightly green without much structure and had no visible central star. NGC 6826 was a much different sight. It has a bright blue-green disk and a prominent central star (no need for averted vision here). NGC 6826 is also known as the Blinking Planetary, but with a 36" scope, it is way too bright to show its blinking behavior!

At this point it was about 11pm and I was gearing up to do some more galaxy hunting, but clouds, the bane of all astronomers, rolled in and cut my evening short. After only observing 10 new objects on the TAAS 200 list, I had to call it a night. Oh well, I'll just have to wait for the next time I can get my hands on the Great Refractor!

If you visit Lick Observatory on a public night, you too can have a chance to look through this fantastic telescope! Contact me if you are going to be in the area and want to know more about visiting the observatory and viewing nights.

**Internet Info**

*By Michael Pendley*

Fellow gadget freaks have probably heard of a little device called the Palm Pilot or the Palm III. For those of you that have not—it is a pocket size computer (3.25 inches by 4.75 inches) with a backlit LCD screen. There is no keyboard. Data is input via a stylus on a touch sensitive screen. The device is normally used as an electronic calendar, address book, note pad, etc.

So what does this have to do with astronomy? Plenty. Since the device is a fully functional computer I figured someone had to have developed astronomical related software for it. I went to Altavista and found The Astronomy Pilot Page—Astronomy Applications for your Palm Pilot at [http://www3.gamewood.net/mew3/pilot/astro](http://www3.gamewood.net/mew3/pilot/astro).

Applications at the site include J-Moons—a graphical application showing the positions of Jupiter's 4 large moons; Moon and Sun—applications to calculate solar and lunar rise / set times; Moon Phase Calendar—a graphical "month-at-a-time moon phase calendar; Planetarium—a graphical compass like display indication the position of the planets and other objects; Astro Info—a handy little program for calculating the rise and set of the planets; and several more applications covering astronomy databases, star maps, etc.

Many of the applications are written in CASL—a very simple object oriented (well almost) language that is available from [http://www.caslsoft.com/](http://www.caslsoft.com/) for $65.00. The compiler produces P-
code that is interpreted by a Palm Pilot runtime system. Runtime systems for Windows CE systems will be available next year.

I have been playing with CASL and just finished an Astronomical Coordinate Converter. I am looking for beta testers before I put it up on the web. Please give me a call or send e-mail if you are interested.

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**Book Review**

*(and commentary)*

*By Kevin McKeown*

**The Stars: A New Way To See Them,**

by H. A. Rey

I recently purchased a copy of "The Stars: a New Way To See Them" from a local thrift shop. I figured, "for 95 cents, how can I go wrong?". After all, new copies of Rey's venerable work, which has been available for 46 years now, are commonly seen in the hands of many TAAS members who endeavor to learn the night sky.

Essentially, "The Stars" is a book that presents another way to make sense out of that wonderfully random mess we know as the starry night sky. In Part I, page 10, of "The Stars", Rey presents his analysis of the problem of how to learn the constellations outdoors. He writes: "The constellations have such intriguing names-somehow we expect the books to show us groups of stars in the shape of a Lion, a Whale, a Virgin, and so forth. But they show us nothing of the sort." He further states: "Some books show, arbitrarily drawn around stars, elaborate allegorical figures which we cannot trace in the sky. Others . . . show the constellations as involved geometric shapes which don't look like anything and have no relation to the names. Both ways are of little help if we want to find the constellations in the sky-yet this is precisely what we are after."

Then Rey states his remedy. His book: " . . . shows the constellations in a new, graphic way, as shapes which suggest what the names imply: it shows the group of stars known as the Great Bear, in the shape of a Bear; the Whale in the shape of a Whale, . . .", and so on. Rey next describes what he defines as the two methods that older star maps have used to present the constellations. The first is by the use of "pictures" drawn around the stars of a constellation. Rey calls this the "allegorical" method. The second method is the use of lines drawn between the stars of a constellation, to denote geometries the observer should hope to recognize outdoors. Rey calls this the "geometrical" method.

Then, on page 13, Rey tells us about his "new" method: the "graphical" way. On analysis, Rey's new method consists of the use of lines drawn between the stars of a constellation, to produce a stick figure (was this approach really new?). To some extent, he combines what he defines as the two "historical" methods described above. So far, so good.
But the first hint of major trouble with this book was borne out to me quickly. On pages 11, 12, and 13, Rey uses the stars of Gemini, the Twins to illustrate the allegorical, the geometrical, and then, his "new" graphical method. But first, to begin, on page 11, Rey presents only the stars of Gemini. These are in the form of starry dots, with no connections, or picture overlays. "That's funny", I thought, "but that's not the way I know the stars of Gemini!" And I oughta know! As a meteor shower observer, I've spent countless hours staring at the stars of Gemini, watching Geminids each December. Especially since four of my meteor magnitude comparison stars are in Gemini. The fact is, Rey's illustration of the star pattern of Gemini- a simple reproduction task it would seem- is wrong! It's distorted! Furthermore, Rey uses starry "dots" of differing sizes, and styles to indicate a star's magnitude. However, Rey's star sizes relate poorly to the visual magnitudes of the stars one actually sees in the sky. But then, the problem of how to represent magnitudes of stars with discs (or starry dots) of differing sizes on paper (called "binning") is a complex one, I'll admit.

On page 12, Rey's allegorical illustration of the Twins isn't what I see (or imagine) either. In fact, it is a halfhearted attempt to fit a drawing- even if it still is allegorical- to a group of stars. It's silly. And then Rey's illustration of the geometrical solution (page 12) is just absurd. When you look at the stars of Gemini, do you naturally trace this angular star river? Absolutely not! Not only do we not see this snaking angular line hidden in the stars of Gemini, Rey offers no explanation as to why he chose to connect the stars he did.

Sadly, it's all downhill from here. Pages 14 & 15 offer some of Rey's "new way" illustrations, compared to what he presents as the "old way" illustrations. In fact, pages 14 and 15 were jaw droppers for me. The first problem is that Rey's "old way" illustrations are only presented using the "geometric method". But these "geometric" stick figures are apparently arbitrary on Rey's part. This is highly presumptuous: I don't know where he got them from. Rey's geometrical Bootes, Hercules, and especially Pegasus are ludicrous! They make no sense at all! In fact, the "old way" geometric forms Rey presents for Hercules, and Pegasus are so confusing one has to come up with another method- anyway- just to unravel the tangle! Rey has already stacked the deck in favor of a new method! Secondly, Rey's "old way" of presenting Ursa Major lacks the Bear's head, and his old Bootes & Cetus are completely backwards from what the ancient astronomers tell us they should be!

But the real crime is Rey's graphical method of presenting the constellations- his "new way of seeing the stars", of which samples appear on pages 14 and 15. You see, Rey not only redraws using his "new" graphical method, he completely redesigns many of the patterns that the ancient astronomers drew up! Rey completely reforms Ursa Major, Bootes, Hercules, Pegasus, and Cetus as seen on pages 14 and 15. For example, the star at the end of the handle of the Big Dipper becomes the tip of the nose of the Bear! Rey depicts Bootes as a short legged fellow, seen sitting, in profile, smoking a pipe that is fully one-third his length! Enif, the star that marks the tip of the nose of Pegasus, becomes a rear hoof in Rey's new Winged Horse. And the stars that form the chest of the old Hercules (the Keystone) become the head of Rey's new Hercules.

Upon inspection of Rey's constellation charts of Part 2, I found (in addition to those above) the constellations of Cepheus, Perseus, Leo, Coma Berenices, Libra, Lyra, Aquarius, Taurus, Aries, Auriga, Corvus, Ara, and Phoenix were redesigned, to usually a greater degree, by Rey. As an
enthusiast of the constellations and the associated mythology, I found many of Rey's revisions to
be sadly disheartening. For instance, Rey replaces the really beautiful, ancient, image of Aries,
the Ram- seen as a ram's face- with an insipid, Kindergarten like stick figure. This new Ram is
no more easier to recognize in the night sky than the old Ram. Rey's Phoenix is redrawn such to
eliminate the feeling of this avian monster rising out of the autumn southern horizon. Taurus is
maliciously redrawn. Does the stargazer ever have trouble visualizing the old Bull from the
given stars? Of course not! For Perseus, Rey apparently willfully disposes of the associated
mythology that applies to this most important figure. We know that Perseus is to be seen flying
through the heavens on his Nike sandals, trailing behind him the freshly taken Gorgon's head.
The stars of Perseus are bright, distinct, and easy to locate, considering they lie near Cassiopeia.
Therefore, the way the observer should see Perseus in the sky is for him to be looking away from
the Gorgon. Rey eliminates the Gorgon completely!

I found other troubling statements by Rey. On page 62, he describes Crux, the famous Southern
Cross, and concludes: "Northern visitors, though, are often disappointed at the sight: it is not as
grand as they expected and looks more like a kite than a cross. Still, it's a graceful group". Oh,
really? I'll never forget the excitement Carl Frisch and I shared at the sight of seeing Crux from
Big Bend last January! But how can you describe Crux as "graceful"? C'mon Rey!

I've tried to find reasons to justify Rey's work, but I can't. Recall Rey's thesis for "The Stars":
that the existing sky guides present the constellations on paper in ways that make their
identification in the sky difficult. Was this true for many of the guides of the 1940's? Perhaps.
The same problem exists today, more or less. But do the constellations have to be redesigned? I
can honestly say no! I believe that Rey failed to distinguish between the need to write a better
guidebook on the starry patterns AND the need to actually redesign the patterns themselves. Had
Rey combined quality allegorical drawings with well designed, robust stick figure graphics
within the allegory, he would have been successful! However, Rey's constellation revisions have
the sinister implication that maybe one can form anything out of any group of stars. But you
can't! Like it or not, our northern night sky reflects the efforts of countless stargazers, for
millennia, to make sense out of the random stars. Their interpretation, as difficult as it is to learn,
represents for the most part the path of least resistance. I'll even admit that I agree with the way
Rey sees the constellation Cetus, the Whale- which I think may have somehow been reversed
around the time of Ptolemy, but I can only suggest this. Still, I accept Ptolemy's clumsy Whale:
that's the way it is. Sadly, for me personally, the problems of parts I, II, and III cancel out the
mostly excellent work Rey does in part IV: "Some Whys and Hows".

While no excellent book on the constellations seems to have existed 46 years ago, Rey did have
access to the really fine old star atlases of Hevelius, Bayer, Argelander, and others which nicely
depict the way the shapes are supposed to fit the stars, as the ancients related them to us. He also
had access to books such as "Star Names: their lore and meaning", by R. H. Allen. Allen's book
tells us what the various star names mean. It's an excellent watershed. For example, Enif is
Arabic for "the Nose (of the horse)". With that in mind, let's orient Pegasus around Enif. Next,
let's get out under a black sky, and reconcile this information with the feelings that we get from
the stars, and then form our imaginary star picture. But none-the-less, you still have the problem
of finding Enif! The effort still has to be there!
Possibly "The Stars" filled a niche 46 years ago, before the information age. But the stargazer who learns the night sky exclusively from "The Stars" seriously compromises his understanding of the constellations! Besides, there's too much good literature currently in print to rely on the Rey's work. This includes the two common monthlies "Sky and Telescope" and "Astronomy" magazine, and even H. Zim's "A Golden Guide to the Stars". As for myself, I'm not going to burn "The Stars", rather, it now resides alongside my copy of Velikovsky's "Worlds in Collision", von Daniken's "Chariots of the Gods", and books of similar ilk.

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**Space Art Show in Los Alamos**  
*By Michael Pendley*

Michael P. Robinson, president of the astronomy club in Los Alamos tells me he is hosting a space art show next month. "Planetary Landscapes: Astronomical Visions Of Our Universe" will be held at the Mesa Public Library in Los Alamos from October 1st through October 30th, 1998. An opening reception will be held on Thursday, October 1st, 1998 from 5:00 to 7:00 pm at the upstairs gallery. Mesa Public Library is located at 2400 Central Avenue, Los Alamos, New Mexico 87544. For more information call Mesa Public Library—Sally Hoffman at 662-8262 or Michael Peter Robinson at 820-6237 or send Michael e-mail at Meow@rt66.com.

For those of you not familiar with Michael Robinson, his art appears in the collections of Smithsonian magazine, Sky and Telescope magazine and Astronomy magazine. Striking for its accurate detail painted in vivid colors, his work shows the symbiotic relationship between humans and the natural cycles of the universe from the birth of galaxies to the death of stars. Viewers are reminded of the awe-inspiring grandeur of the Creation and are reminded to not to forget their responsibility as custodians of our planet, and the divine purpose of life in recreating itself in never-ending diversity.

This show is dedicated to the vanishing dark skies of New Mexico and the rich astronomical heritage that we all share in this state.

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**Sharing Astronomy at Carlsbad Caverns**  
*By Bruce Levin*

On the weekend of August 22nd, several of us TAAS members went down to Carlsbad Caverns to observe and share astronomy with the park visitors and staff. James Brockway, David Blair, and Bruce Levin headed down on Friday. This first group got in early enough to get settled in Research Hut #6 and then took in the bat flight along with a good crowd of park visitors at the cave entrance amphitheater around sunset. A good show was put on by several waves of bats spiraling up out of the entrance like a series of black tornado clouds.

There were a lot of high vapor clouds after sunset, so the viewing was not great for star gazing. The view got a little clearer as the evening progressed, so Dave set up his telescope next to the
research hut. Dave was on the prowl for the elusive asteroid Ganymed as well as others. Later in the evening, Katherine Blankenburg arrived in her trusty pick-up truck.

The next morning, the group had a good breakfast. David, James, and Katherine went to tour the big main cave while Bruce stayed behind to clean up the hut. Later in the afternoon, Robert Williams arrived in time for all of us to throw steaks on the barbecue grille. Park service ranger Steve Oakes met us at the hut in preparation for the evening astronomy presentation and observing session.

After checking out the bat flight, the group went to the Visitor's center to set up telescopes. David Blair gave an informative presentation about asteroids to a full house in the visitor center lecture room (Dave reports about 80 people but gives some credit to the large crowd to the bats! ed). No asteroid hit the earth, so everyone left the presentation with much anticipation to see the evening sky through our telescopes. Unfortunately, the clouds covered much of the evening sky with little to see. We had a chance to talk with several park visitors and staff before putting our equipment away and retiring to the research hut.

On Sunday morning, Bruce and Robert prepared breakfast burritos for the group. The group then headed to Slaughter Canyon Cave for an afternoon expedition. This cave is 28 miles from the main cave. The group had to hike a good half-mile with a climb of 500 feet to get to the cave entrance. Everyone had to bring flashlights for this adventure. It was well worth the effort for this specially guided tour. The formations in this cave were very impressive—just like the postcards, but better in person.

Ranger Elizabeth was one of the guides on this tour. Her residence was just above the research hut where we stayed. After the tour, we invited her to have dinner with us. Robert drove into town to pick up some groceries for a spaghetti dinner. Bruce and Robert then prepared an incredible spaghetti feast with garlic bread and the works. When Elizabeth came over, we found out that it was her birthday. If only we knew sooner, Robert would have pickup up a birthday cake. After stuffing ourselves and good conversation, we went to the amphitheater to check out the bat flight again—just can't get enough of those bats!

At nightfall, the skies were very clear and steady! This was by far, one of the better evenings an observer could wish for! When we got back to the research hut, Dave set up his scope and James set up the Robinian he borrowed from the Society telescope curators. The Milky Way stood out like a sore thumb stretching out from Sagittarius and across to Cassiopeia with incredible bright and dark nebulae. David was able to bag many of the asteroids he set out to observe over the weekend on this excellent night. Monday came too soon and we had to head back to Albuquerque. As it turns out, the worst day in Carlsbad is better than the best day staying at home—and it just gets better from there!

More on Carlsbad
by David Blair
Research notes: On the trip I recorded a total of 14 positions for 5 asteroids, none of which I had recovered before: 1036 Ganymed, 5 positions; 49 Pales, 3; 59 Elpis, 2; 165 Loreley, 2; 690 Wratislavia, 2.

How low can you go? Carlsbad Caverns National Park has a north latitude of about 32 degrees, 10 minutes, just a few miles north of the Texas border. From there I observed Alpha Pavonis (mag 1.9) at south latitude 56 degrees, 44 minutes. Have any club members topped (bottomed?) that with their feet still in New Mexico?

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**Placitas Star Party**

by Barry Gordon

After two "Cloud Parties" in a row, TAAS' third try at a Placitas Star Party took place on September 12—this time in a still undeveloped area at the edge of the BLM land that adjoins the Placitas Open Space. As usual, our host for this event was Las Placitas Association (LPA), a non-profit volunteer group dedicated to the preservation of open space in the Placitas area—and to public education on the value and varied uses of this space.

Judie Hendry, LPA President, made a few brief welcoming comments and graciously provided an open snack bar, offering very fine lemonade and a nice assortment of cookies.

TAAS, in customary splendid fashion, provided a great turnout, including Carl Frisch, Barry Gordon, Jay Harden, Linda Hixon, Jim Lawrence, Bruce Levin, Kevin McKeown, Robert Ortega, Katie Noble, Gordon Pegue, Mike Pendley, Ruth Pendley, Alejandra Valderrama, Robert Williams, and Rick Zamarron (who must get awfully tired of being last on just about every list that includes him). No less than thirteen telescopes were set up for the event, including three refractors (of 3", 3.1", and 4" aperture) and an 8" SCT; the Dobs were two 6", an 8", three 10", a 13", and two 16".

Public attendance was estimated at well over 100.

Though the evening started out partly cloudy—and then proceeded to deteriorate—quite a few people did manage to get in a bit of observing nonetheless; for a great many, their very first telescopic views of the heavens. The star of the evening (in the theatrical, not astronomical, sense of the word) was undoubtedly Jupiter; as darkness fell, it was the target of every telescope there, and it continued to attract observers, on and off, throughout the evening. Among the (few) other objects seen were Albireo, the Alcor/Mizar grouping, and the Ring Nebula. And those who hung in till the end were rewarded with views of Saturn— not the best views, but still a great showstopper.

All in all, despite the fact that the skies left a lot to be desired, as Placitas Star Parties go, #3 has to be considered a major triumph.
Letters to the Editor

I suppose that many of us have been searching for answers to the great egg mystery. (At least those of us who have nothing better to do.) Can an egg only be balanced on the equinox or will it balance on any date throughout the year? Is it magic, science, or some other mysterious explanation that results in an egg balancing on its end?

So I decided to try the great egg experiment myself. On August 1, the first arbitrary day I could come up with, that mysteriously enough turned out not to be on any equinox, I was able to balance an arbitrary egg not only once, but twice. (I had to balance it twice because I bumped the table the first time after I had balanced it, but before I could get the picture taken.) I did not use any special "techniques", look for an especially flat-sided egg, or shake the egg, thus breaking the yolk and altering the center of gravity. I did not scrutinize for a scientific reason why the egg was able to balance. Yet, I think I found the true explanation to why an egg balances at any time during the year.

All of you, being amateur astronomers, should be very familiar with this secret. As with anything that deals with astronomy, all it takes is patience. Let's hope that this puts an end to the great egg debate!

Waiting for clear skies!
Beth Fernandez

Classified Ads

For Sale or trade + cash for Celestron C5+: Meade 8" Starfinder Equatorial, Telrad, Meade #140 2x Barlow, Meade 25MM, Endcaps. Used only 15-20 Times, $700, Paul Grunwald, rubicon@nmia.com, 505-275-7313,
Non-commercial ads for astronomy related products listed at no charge for members. To place an ad, send a message to the editor at the society PO box or send a message to mycall@rt66.com.

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**TAAS Telescope Loaner Program**

*by Dee Friesend and Jason Vargas*

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*Free Telescope Offer*

What's that? Did you say free? That's right FREE!

Any TAAS member can use this coupon to borrow a TAAS telescope. Call Dee Friesen at 856-1593 or Jason Vargas at 452-9096 and receive a loaner telescope absolutely free. You can choose from scopes with apertures ranging from 6” to 12”. Call soon because they’ll be going fast!

Some restrictions apply. Offer is first come first served. Latecomers will be put on a list. Neither TAAS nor the telescope curators will be held liable for any loss, theft, or other problems arising from the use of TAAS scopes. Offer only valid for current TAAS members. Borrowers are required to enjoy these scopes.