# STAR GAZER NEWS

NEWSLETTER OF THE DELMARVA STARGAZERS

October 2004 **WWW.DelmarvaStarGazers.Org** Volume 12 Number 4

**At the September Meeting.....**
Don Surles brought the meeting to order at 7:15 with 23 members and guests attending.
**UFO?! August 31** While searching for comet C/ 2003 K4 (LINEAR) in the neighborhood of Arcturus, member Rick Barnes stumbled on a white nova-like cloud about the size of the moon...had the comet exploded? Rick photographed the object and posted images on the yahoo pages where a number of folks were able to identify his "UFO". Mike Borgia and others identified the event as the launch of an Atlas Centaur Rocket from the Kennedy Space Center. The actual white cloud was formed by a dump of liquid hydrogen fuel from the spent upper stage of the rocket that launched the payload.

**Outreach Opportunities**
Volunteers are needed to help out with the following events:
**Dover Library** Wednesday afternoon astronomy sessions starting October 6 till ?
Near **Augustine Beach** 40 to 50 cub scouts Inside and outside programs October 15.
**Bombay Hook** November 19 with Nov 29 rain date. Many birding people.
**Prime Hook Wildlife Refuge** Probably November.

**What's up September 2004** *Keith Lohmeyer*
**Conjunctions 9/10/04**
Venus, Saturn and the Moon will form a triangle near the constellation Gemini, best viewed just before dawn.
Mercury will rise ¼ degree away from Regulus in Leo, just as the sky brightens.
**New Comets**
**2004/Q2 (Machholz**) is a 10th magnitude comet in Eridanus with a 3'coma that should be visible in a 6-inch telescope from all but the far-northern latitudes. Unfortunately, moonlight will interfere until Sept 9th or so. Comet Machholz, discovered visually in a 10 inch reflector on August 27at 3:00A.M., is the 10th comet discovered by Don Machholz of California. According to the preliminary orbit, this comet will brighten dramatically and may be visible to the naked eye after Christmas!

**2004 Q1 (Tucker)** is a 12th magnitude object in Cetus with a 21" coma that should be visible in an 8 –inch telescope. Moonlight will interfere until the 5th or so. Comet Tucker was discovered on CCD images by Roy A. Tucker of Tuscon, Arizona on August 23 at 3:00 A.M. This comet should brighten until around November 1, when it should be brighter than 11 magnitude and in Andromeda. Throughout September, it will be well placed for evening observation from both the northern and southern hemispheres.

Monthly Meeting, Tuesday, October 5

**ASTROMART**

**Pluses & Minuses**

*7:00 p.m. First Presbyterian Church, Smyrna*

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**From the President's Desk...**
September 17 What is recreation and how much are you willing to commit to your chosen forms of recreation? If you include amateur astronomy and star parties in your chosen forms of recreation then this weekend and our No Frills Star Party provided an acid test. The skies, the hurricane gods, the fog gods, the god of clouds, the muggies, and various other celestial and meteorological forces successfully conspired to produce the worst week of star party weather our organization has experienced in all of our nineteen star parties. Days of weatherfunk and fickle would-be star party attendees may alter this organization's willingness to commit to future star parties. The volunteered efforts of our many Star Gazers were ignored by all those who did not show for the Ninth No Frills Party. Although I can understand the decision of each person who did not attend it is still quite disappointing to prepare for 4 or 5 days of amateur astronomy for a very limited number of people. We will review our inputs and the outputs of No Frills #9 and report to you next month of any changes in our plans for star parties in the coming year.
Sunday morning, September 19th update: the 9th No Frills is history. The remains of Hurricane Ivan successfully and thoroughly dumped on the observing field from late Friday thru all day Saturday and convinced even the most hardy of us

that we should pack up and vamoose. So, we strategically retreated from the Equestrian Center at 1:00 PM Saturday afternoon; now only the storing of Star Party equipment and supplies and analysis of NF #9 remain. Quoting one of our party attendees, "Sometimes you are the windshield and sometimes you are the bug!". Now, to rub salt into the wounds of rained out starparty planners and attendees the skies cleared by 2:00 AM Sunday morning and the forecast for the next several days is for clear skies – this morning it is 54F with a north wind and CLEAR! The overall attitude of our attendees this year is disturbing to me. Talking to the few attendees has confirmed my belief that our scopes and equipment are taking root in storage. They are being used less each year due to the lack of access to suitable observing sites. Our backyard has become too bright for most of us to use. Our hobby has never had access to more or better equipment than at present. We have a desire to continue with amateur astronomy; some of us have more time to devote to star gazing than before. Money, time, equipment, and desire are very plentiful. But we do not have the skies and in recent years we have been plagued with weatherfunk of one type or the other. I believe each of us spends more hours traveling to and from observing sites and loading(home), unloading(site), reloading(site) and unloading(home) equipment than we do observing. As we travel farther and farther to observing sites we also must travel farther and longer late at night when we are less alert (ie, we are asleep!). This is unsafe and is a recipe for disaster for us and for our hobby. Recognizing we have a problem is just the beginning. Finding workable solutions and implementing them is absolutely necessary and the time to begin is now.

I believe we should lobby our government reps for assistance in reducing excessive light pollution, for night-time access to government owned properties, and for establishment of permanent facilities on those properties for the purpose of amateur astronomy activities.
Government owned property can be used for astronomy just as surely as it is used for hunting, hiking, biking, fishing, logging, and low-rent leases to private agriculture. I invite anyone who is interested in pursuing more access to more government-owned observing sites to contact me so that we can form a task force to make this a reality. Now we must put the No-Astronomy Summer of 2004 behind us. Fall 2004 begins tomorrow! No more summer weatherfunk to foul our plans. Coming events include: a total lunar eclipse October 28th, Saturn reaches 60 degrees in elevation and will provide us with excellent viewing - and it grows in size and brightness,
Daylight Savings Time ends Sunday Oct 31st,
Jupiter and Venus are in conjunction Nov 4th,
there will be occultations of the Moon with Jupiter (1 deg), Venus (0.2 deg), & Mars (0.5 deg) on Nov 9, 10, & 11, the Leonid meteor shower peaks Nov 17th (very little moon interference!),
Jupiter grows in diameter, brightness and elevation, and the Geminid meteor shower peaks Dec 13th (again very little moon interference).

Fall is also a time for increased Auroral activity. If you are interested in auroras please log on to www.spaceweather.com for current information on sunspots, coronal mass ejections, and their effects on our atmosphere. All of these events will happen during the driest months of the year. Keep your astronomical fingers crossed and hex the weatherman/woman as often as possible.
We have plenty of opportunities to improve our astronomy activities in the coming months. I am sure each of you will do your best as each opportunity makes it's appearance. Please don't forget to enlist the assistance and input of your fellow amateur astronomer friends. Progress is faster and better when we all pitch in and pull together for the common good.
Keep your Naglers dry and do the Clear Sky Dance often. See you at the Church or Tuckahoe.
Don…

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**October Deep Sky Challenges** Kent Blackwell
In the words of poet T. S. Eliot, *"If April is the cruelest month*", then surely October is the kindest. The air becomes cooler and cleaner in this month of bracing air. There is just something magical about the golden colors of dying cornfields and myriads of orange-colored pumpkins lining outdoor markets, ready to be carved for spooky Halloween decorations. October is also a very good month to dry off one's telescope after a very wet summer season. For this month's challenging objects I've picked two globular clusters and a Barnard dark nebula. That Barnard object is the best nothing I have ever seen.

( continued on page 3)

**NGC 6717 Sagittarius**
Globular Cluster
Apparent Position: RA. 18h55m15.3s Dec. -22°41'57"
Magnitude: 8.4
A pretty little globular cluster only 1.7' south of the 5.8 magnitude star Nu2 (35 Sgr). Though it's small and contains only a very few bright stars, it's quite interesting to see a globular so close to such a bright star. The only time I have observed N6717 was on August 24, 1995 through a 12.5" f/6 Newtonian. Have you ever seen it?

**Barnard 146 Cygnus**
Dark Nebula
Apparent Position: RA. 20h04m59.9s Dec. +36°04'24"
Barnard 146 is a small, inky black spot lying next to a 6.6 and 9.5 magnitude double star. The inky spot stands out from the glow of the Milky Way. I saw this in a 4.5" Orion StarBlast, so it's not too terribly difficult. Report to me if you see it.

**Palomar 2 Auriga**
Globular Cluster
Apparent Position: RA. 04h46m21.7s Dec. +31°23'26" (Aur)Magnitude: 13.0

I was expecting this to be much more difficult. Easy at 200x in a 12.5", but don't expect to resolve it. Quite large and faint, but one of the easiest of the Palomar globulars. Lies just west of a 13.3 magnitude star, but that star does not affect viewing Pal 2. Obscure globulars aren't always easy but are always rewarding.
*Kent Blackwell*

**-MULTIPLE STARS - Contributed by Dave Wells**

**ETA CASSIOPEIAE**
RA 0h49.1m DEC +57° 49'
PA 293 Sep 12.2"
Mag 3.4, 7.5
A nice binary with good color contrast.

**EPSILON LYRAE**
RA 18h44.3m DEC +39° 5840'

| | PA | Sep | Mag | |
|---|---|---|---|---|
| AB+CD | 173 | 207.7" | 4.7, 5.1 | (e1 + e2) |
| AB | 357 | 2.6" | 5.0, 6.1 | (e1) |
| CD | 094 | 2.3" | 5.2, 5.5 | (e2) |

The famous "double double". Easy to split the main double (e1 + e2) with binoculars. Splitting e1 and e2, individually, is a good test of your telescope optics.

## Also in this Issue



**32 PEGASI**
RA 22h21.5m DEC 28° 21'

| | PA | Sep | Mag |
|---|---|---|---|
| AB | 127 | 72.6" | 4.8, 9.2 |
| BC | 018 | 2.4" | 9.2, 10.9 |
| AD | 307 | 42.3" | 4.8, 11.9 |
| AE | 116 | 60.3" | 4.8, 11.9 |
| AF | 294 | 00.4" | 4.8, 8.9 |

A six star multiple.**--MESSIER OBJECTS** - Contributed by Dave Wells(With apologies to Stephen James O'Meara)

**M31 – Andromeda Galaxy**
RA 0h42m7 DEC +42° 16'
Mag 3.4 Size 3°x 1°
A large spiral galaxy 2.3 million light years distance from Earth, one of the most distant objects visible to the naked eye. A magnificent binocular study, with much detail available to even small aperture telescopes.

**M52 – Open Cluster – The Scorpion**
RA 23h24m.8 DEC +61° 36'
Mag 6.0 Size 16'

This open cluster appears as a large uniform glow to binoculars, but is a rich telescopic cluster. Dominated by an 8th magnitude topaz star (not an actual part of the cluster) which is the tip of the scorpion's tail

**M56 – Globular Cluster**
RA 19h16m.6 DEC +30° 11'
Mag 8.4 Size 7'
Constellation: Lyra

At low power this globular cluster appears as a "dirty snowball" amid the Milky Way. Moderate power starts to resolve the cluster.

**How to Join the Delmarva Stargazers:** Anyone with an interest in any aspect of astronomy is welcome
NAME_____
ADDRESS _____
CITY, STATE & ZIP_____
E-MAIL ADDRESS (If any)_____
Please attach a check for $15 made payable to Delmarva Stargazers and mail to Kathy Sheldon, 20985 Fleatown Rd, Lincoln, DE 19960. Call club President Don Surles at 302-653-9445 for more information

**The Edmund Halley Program** presented by Bob Mentzer appears below in an abridged version to fit this newsletter. It is presented in the first person.

Tonight's speaker will be, Edmond Halley, the second Astronomer Royal. In this rare appearance, or apparition, Dr. Halley will talk to us about his "Life as a Scientific Adventurer". Dr. Halley has told me that most astronomy books only mention one or two things that he did and thus give no sense of the variety of pioneering scientific work that he engaged in over his entire life span.

### MY LIFE AS A SCIENTIFIC ADVENTURER

It is indeed a pleasure to appear before such a distinguished group of amateur astronomers. Whenever I read a current account of my life, they always talk about my prediction of the return of Halley's comet and my work on getting Newton to publish, and actually paying for the publication of his Principia. Now those two things are correct, and I am justly proud of them. Yet my interests were much wider ranging then just those two things. So tonight I would like to tell you my life story and see if you agree that I did indeed have a multi-textured scientific life.

( Continued on Page 5 )

**Member Magazine Subscriptions**
Just a reminder -- As an added bonus to your **PAID** membership in the Delmarva Stargazers, you can get the club discount on your favorite astronomy magazines, **Sky and Telescope** -or- **Astronomy**. You can save $10 -or- more ! For more info on a subscription (or renewal) please contact PJ Riley at pjr127@Yahoo.com

**The Solar system in October** *Paul Riley* The Solar system in October Good News - Bad News. Bad News first - The partial solar eclipse on Oct 14th is not visible from here. If you are traveling to NE Asia or parts of Alaska, you might see this event!
Good News - are you in luck!! On the night of Oct 27-28th the Hunter's Moon will be eclipsed. The whole event is visible for us on the eastern half of the US. The eclipse will start (enter penumbra) a little after 8PM EDT. Total eclipse begins 10:23 PM EDT and ends 11:45 PM EDT. The Moon leaves penumbra 2 AM EDT. Start praying now for clear skies on the 27th. Almost 6 hours of just pure entertainment! You won't find this on cable! Zodiacal Light should be visible during October. See your March newsletter for more info on this phenomenon.**Planets- Uranus** and **Neptune** are near Capricornus this month with **Saturn** hanging around Cancer. Set your alarms early this month, for you can find **Venus, Jupiter** and **Mars** (in that order) rising in the early morning just before the Sun.

**Club Activities**

**Club Meetings-** We meet in the First Presbyterian Church in Smyrna, DE (653-8000) on the first Tuesday of each month from 7-9 PM. From US 13, turn west at Wendy's and go one stoplight on Commerce Street; the church is on the right directly across from the Fire Hall.

**Future Meetings..**The annual meeting dates for 2004 are: January 6, February 3, March 2, April 6, May 4, July 3 Picnic at Don's house, August 3 No inside meeting;event to be scheduled, September 7, October 5, November 2 and December 7.
The regular meeting format includes discussion of club activities, observing highlights and an advertised presentation.We solicit suggestions for topics and presenters.

**Club Observing...** Observing is (usually) scheduled for the Friday nearest the New Moon to maximize the hours of deepnight without the moon in the sky. Unless otherwise stated, the monthly observing site will be at the baseball field in the camping area at Tuckahoe State Park.
The observing days for 2004 are:
January 16, January 23, February 20, March19,. **April 14-18 ( Stargaze X)**, April 23, May 14, June 18, July 16, August 13, August 20, **September 15-19 (No Frills IX)**, October 15, November 12, and December 10.

The cloud or rain date for the monthly Friday observing will be the following Saturday, but don't trust the weather man! Go outside and look for yourself or check the CNN weather link on our web page. If you still can't decide, call Don Surles (302) 653-9445 or Lyle Jones (302) 736-9842.

**Delmarva Star Gazer Officers 2004-2005**
**President.....Don Surles 302 653 9445**
**Vice President.....Jerry Truitt 410 885-3327**
**Secretary.....Paul Riley 302 738-5366**
**Treasurer.....Kathy Sheldon 302 422 4695**

*(continued from page 4)*

I was born in London October 29th 1656, making me 14 years younger than Newton. My father had a soap making factory and other business interests and property in and around London. Our neighbors, friends, and my school friends frequently had business connections with the East India Company or other similar business interests. The 1650's were turbulent times in England. To quote Dickens "they were the best of times, they were the worst of times." They were the best because they were my childhood years. But civil war stalked the land. Cromwell and the Commonwealth were in power at my birth. Charles had been beheaded 7 years earlier. The monarchy was restored when I was 4 years old in 1660. Samuel Pepys, who would become a friend of mine, was 27 that year when he went out to see Major-General Harrison hanged, drawn and quartered. The new King's revenge had started. In 1665, when I was 9, the Great Plague hit London. People died by the thousands. We had enough money that we could flee to our country property so no one close to me died. Then the next year the Great Fire hit London. The people who fled the plague were mainly the wealthy and they did so over several weeks. But this time everyone was fleeing London over the span of a few days. The roads teemed with refugees. At every rise you could look back and see the towering flames of London on fire. I was only 10 so those awful scenes would appear in my dreams for the rest of my life. When we returned we found that the house we had been living in had narrowly escaped the fire. The turbulence continued. For more than 25 years of my life we were at war with France, and if not them then the Dutch. I was 32 when William of Orange invaded and captured the crown. In 1673, when I was 17, I went to Oxford University. I was always interested in astronomy I often observed with my friend Charles Bouche who put me in touch with the first Astronomer Royal, John Flamsteed At this time the Greenwich buildings were still on the drawing boards.I published 3 papers while at Oxford. One dealt with a mathematical way to determine the elliptical orbits of planets. The second was on sunspots and the third on an occultation of Mars by the Moon that allowed me to calculate the longitude difference between Oxford and other locations that had made similar observations.

After 3 years at Oxford, I left to begin my first scientific adventure: sailing to St Helena's to spend a year measuring the stars in the southern hemisphere.

Thus one October day in 1676 I stepped aboard the ship "Unity" for my 3 months voyage to St Helena. I brought with me state-of-the-art instruments including a 5 ½ foot sextant with telescopic sight. Remember this was 67 years after Galileo's reinvention of the telescope. I also had a 2 foot quadrant, a pendulum clock, several telescopes, one 24 feet long. Telescopes had to be long to minimize aberrations until Dolland patented achromatic lenses in the 1750's. I also noticed that a pendulum clock ran slower near the equator. I had no explanation at the time but later Newton would have one using his new theory of gravitational attraction. In St.Helena I did publish data on some 300 stars. I also observed a transit of Mercury while there. After a full year of observing I left for England. In the 3 months voyage home I was able to complete the work and I published it soon after I arrived back home. Although it was not all I had hoped for, it still was a major accomplishment, the first accurate star map of the southern skies. Fifty years later it was still the most comprehensive map of the southern skies. As a consequence, I was granted a degree from Oxford and elected to the Royal Society.

The premier observational astronomer at this time was Johann Hevelius of Danzig. In May of 1679 I went by boat to meet him and brought my 2 foot quadrant with telescopic sights. In January of 1681, I journeyed to Paris to meet with Cassini who was doing impressive work on the rotations of Venus, Mars and Jupiter. He used the times of the Jupiter Moon eclipses as a celestial clock for determining longitude. In 1695 I did the first comet calculations. I gave a report to the Royal Society in 1696 where I concluded that some comets could return periodically and that the comets of 1607 and 1682 were the same comet.

In 1720, upon the death of Flamsted, I was appointed the second Astronomer Royal. I was 64 years old.

I studied the saltiness of seas and lakes with no outlet. By estimating the rate that rivers carry salt into them, I could estimate there age and approximate the age of the earth. My estimates were greater than the current biblical-based predictions of a few thousand years.

In 1691, a frigate floundered off the coast of Sussex. This ship's cargo includied much gold. I designed a diving bell and divers helmet to try and salvage the cargo. We worked in about 50 feet of water. The bell sat on the bottom and the divers could go inside to breath. I sent air down in wooden casks full of air. They were opened in the bell and the pressure forced the air to the top. The diving helmet had an air line from the air in the bell to the helmet and a return line to a container above the bell at lower pressure. The pressure difference forced air from the bell to the helmet. We had much trouble with currents moving along the bottom but finally had fair success with the salvage.

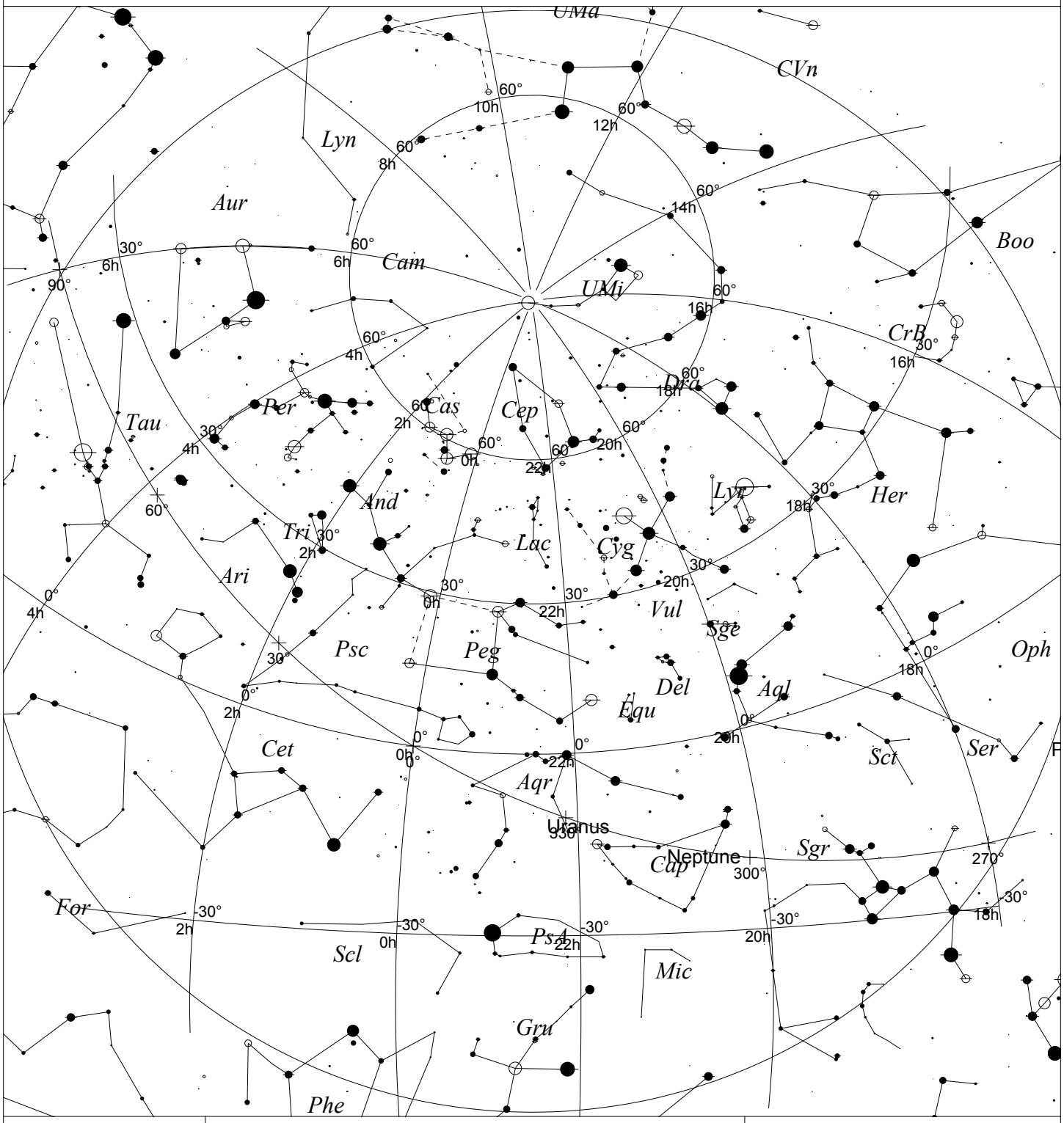
Harrison came to me around 1730 with his first clock. I could see the genius in the man and sent him to Graham the leading clockmaker of the day. Graham encouraged him to continue his work. In 1735 Graham and I and others signed a certificate saying that Harrison deserved public support for his work.

I explained how the transit of Venus was the best tool available to determine the size of the solar system.

Finally on January 14, 1742. I was sitting in a chair after drinking a glass of wine, not brandy, when the spirit, that was Edmond Halley, departed this earth. My obituaries talked of my achievements but none mentioned my prediction of a comet's return in 1759, 17 years after my death. The comet is on about a 76 year cycle, it had to be in the sky above me sometime between age 10 and 76. And indeed it was known as the comet of 1682. So I saw it at age 26. It wasn't very impressive that year.

*-finis-*

# `SKYMAP FOR OCTOBER 2004




| STARS | SYMBOLS | | |
|---|---|---|---|
| <1 • 3.5 | Multiple star | Dark nebula | Radio source |
| 1.5 • 4 | Variable star | Globular cluster | X-ray source |
| 2 • 4.5 | Comet | Open cluster | Other object |
| 2.5 • >5 | Galaxy | Planetary nebula | |
| 3 | Bright nebula | Quasar | |

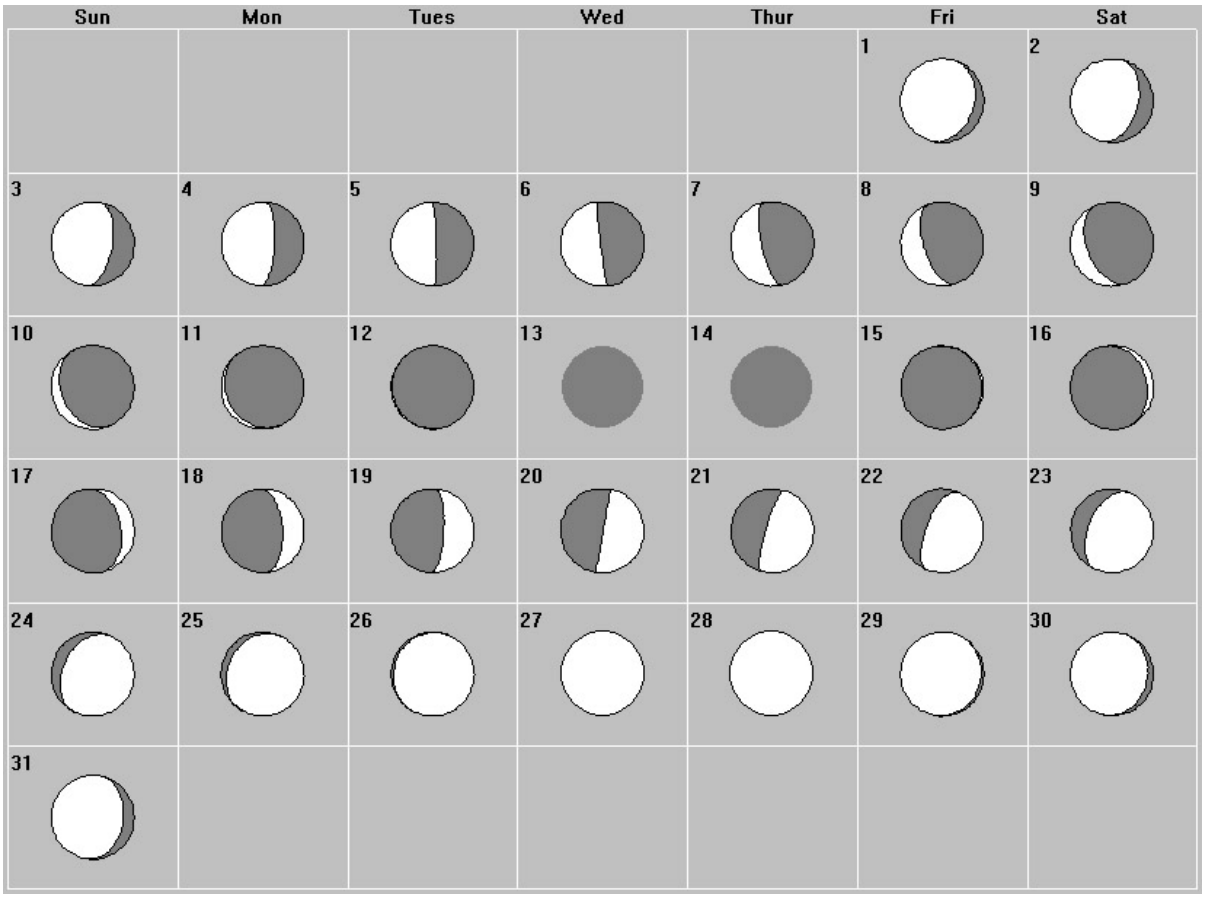
*TUCKAHOE STATE PARK, MD*
*OCTOBER 15, 2004*
*2200 HOURS EDT*

Local Time: 22:00:00 15-Oct-2004 UTC: 02:00:00 16-Oct-2004 Sidereal Time: 22:31:59
Location: 38° 58' 0" N 76° 56' 0" W RA: 22h31m59s Dec: +38° 57' Field: 182.0° Julian Day: 2453294.5833

**Sun and Moon Data for October 2004 Tuckahoe MD**

38.98°N 75.93°W 5hrW Daylight Time Astronomical Twilight

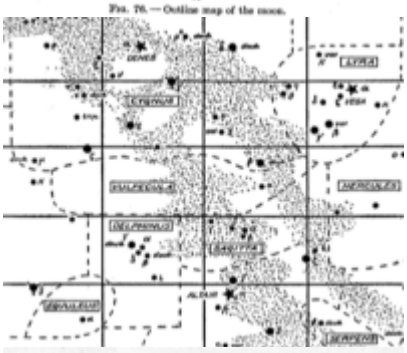
| | Sun | | | | Moon | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Date | Twi. | Rise | Transit | Set | Twi. | Rise | Transit | Set | % |
| 10/1/2004 | 5:31a | 7:00a | 12:53p | 6:46p | 8:14p | 8:24p | 2:57a | 10:09a | 90 |
| 10/2/2004 | 5:32a | 7:01a | 12:53p | 6:44p | 8:13p | 8:56p | 3:44a | 11:14a | 83 |
| 10/3/2004 | 5:33a | 7:02a | 12:53p | 6:43p | 8:11p | 9:33p | 4:32a | 12:17p | 75 |
| 10/4/2004 | 5:34a | 7:03a | 12:52p | 6:41p | 8:10p | 10:17p | 5:22a | 1:17p | 66 |
| 10/5/2004 | 5:35a | 7:04a | 12:52p | 6:40p | 8:08p | 11:07p | 6:13a | 2:11p | 57 |
| 10/6/2004 | 5:36a | 7:05a | 12:52p | 6:38p | 8:06p | ***** | 7:05a | 2:59p | 48 |
| 10/7/2004 | 5:37a | 7:06a | 12:51p | 6:36p | 8:05p | 12:04a | 7:55a | 3:40p | 38 |
| 10/8/2004 | 5:38a | 7:07a | 12:51p | 6:35p | 8:03p | 1:05a | 8:44a | 4:15p | 29 |
| 10/9/2004 | 5:39a | 7:08a | 12:51p | 6:33p | 8:02p | 2:08a | 9:32a | 4:44p | 21 |
| 10/10/2004 | 5:40a | 7:09a | 12:51p | 6:32p | 8:00p | 3:13a | 10:17a | 5:11p | 13 |
| 10/11/2004 | 5:41a | 7:10a | 12:50p | 6:30p | 7:59p | 4:18a | 11:02a | 5:35p | 7 |
| 10/12/2004 | 5:42a | 7:11a | 12:50p | 6:29p | 7:57p | 5:24a | 11:46a | 5:58p | 3 |
| 10/13/2004 | 5:43a | 7:12a | 12:50p | 6:27p | 7:56p | 6:31a | 12:32p | 6:22p | 0 |
| 10/14/2004 | 5:44a | 7:13a | 12:50p | 6:26p | 7:55p | 7:41a | 1:20p | 6:48p | 0 |
| 10/15/2004 | 5:45a | 7:14a | 12:49p | 6:25p | 7:53p | 8:53a | 2:10p | 7:19p | 3 |
| 10/16/2004 | 5:46a | 7:15a | 12:49p | 6:23p | 7:52p | 10:09a | 3:06p | 7:55p | 8 |
| 10/17/2004 | 5:47a | 7:16a | 12:49p | 6:22p | 7:51p | 11:25a | 4:05p | 8:40p | 16 |
| 10/18/2004 | 5:48a | 7:17a | 12:49p | 6:20p | 7:49p | 12:37p | 5:08p | 9:36p | 25 |
| 10/19/2004 | 5:49a | 7:18a | 12:49p | 6:19p | 7:48p | 1:42p | 6:11p | 10:42p | 36 |
| 10/20/2004 | 5:50a | 7:19a | 12:48p | 6:18p | 7:47p | 2:36p | 7:12p | 11:54p | 47 |
| 10/21/2004 | 5:51a | 7:20a | 12:48p | 6:16p | 7:45p | 3:19p | 8:10p | ***** | 58 |
| 10/22/2004 | 5:52a | 7:21a | 12:48p | 6:15p | 7:44p | 3:53p | 9:03p | 1:08a | 69 |
| 10/23/2004 | 5:53a | 7:22a | 12:48p | 6:14p | 7:43p | 4:22p | 9:51p | 2:20a | 79 |
| 10/24/2004 | 5:53a | 7:23a | 12:48p | 6:12p | 7:42p | 4:48p | 10:38p | 3:30a | 87 |
| 10/25/2004 | 5:54a | 7:24a | 12:48p | 6:11p | 7:40p | 5:11p | 11:22p | 4:38a | 93 |
| 10/26/2004 | 5:55a | 7:25a | 12:48p | 6:10p | 7:39p | 5:34p | ***** | 5:44a | 98 |
| 10/27/2004 | 5:56a | 7:26a | 12:48p | 6:08p | 7:38p | 5:58p | 12:06a | 6:49a | 100 |
| 10/28/2004 | 5:57a | 7:27a | 12:47p | 6:07p | 7:37p | 6:24p | 12:50a | 7:54a | 100 |
| 10/29/2004 | 5:58a | 7:28a | 12:47p | 6:06p | 7:36p | 6:54p | 1:36a | 8:59a | 98 |
| 10/30/2004 | 5:59a | 7:29a | 12:47p | 6:05p | 7:35p | 7:29p | 2:24a | 10:03a | 94 |
| 10/31/2004 | 6:00a | 7:30a | 12:47p | 6:04p | 7:34p | 8:10p | 3:14a | 11:05a | 88 |



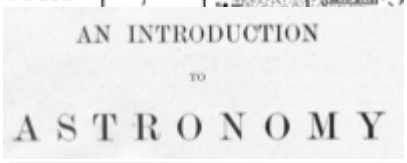
## Moondark for October: Buried Treasure

Buried among all the other titles at the used book sale was an old astronomy text. “An Introduction to Astronomy” by Forest Ray Moulton was a “new and revised edition” when published in 1920. The cover was a faded maroon red, and the pages, musty and barely attached. But it didn’t take much thumbing-through before I added this volume to my stack to take home.

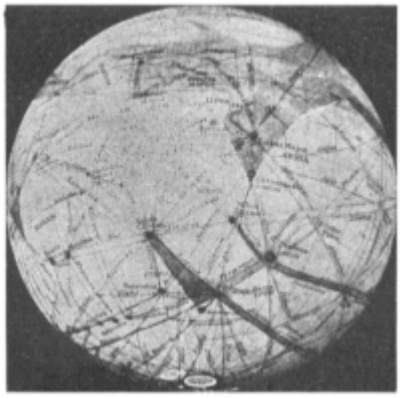
At first, the contents appeared little different from any such volume. More of a reference text than observing guide, this book begins with the planet Earth and moves outward. In turn, the moon, the planets and other solar system objects are presented. The front plate features the Lick Observatory, and most photographs are credited to the Yerkes Observatory. Portraits of famous astronomers are scattered throughout the text.



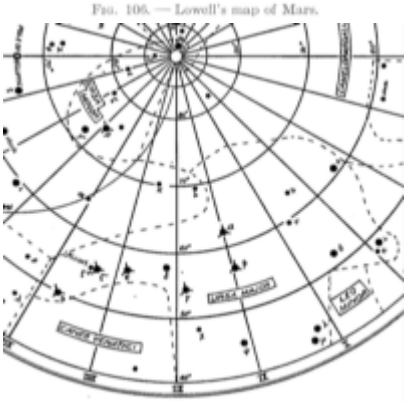
Digging deeper uncovered some curiosities. Several explanations for the craters on the moon—volcanic, gaseous eruption and impact theories—are all discussed, but this issue is left essentially unresolved. And apparently there was as much speculation about life on Mars then as there is today. Evidence for vegetation on Mars' surface is presented along with Lowell’s arguments for intelligent civilizations, though that possibility is largely discarded. A full page is given to what adaptations Martian life must have to survive there and to the real likelihood that life exists on other planets around other suns.




The most anachronistic section is certainly that devoted to the power source for the Sun. A “contraction theory,” the release of gravitational energy as the Sun shrinks, is presented as the most convincing. Chemical combustion and meteoric (kinetic energy adding to gravitational) hypotheses are considered untenable. Today, we know that fusion of hydrogen into helium drives stars, including our own: there is no mention of nuclear theories here.



Nearly detached from the cracked binding are small star charts depicting the north polar region and four equatorial sections—far southern stars are not shown. While these charts are probably too limited to be useful at night, the startlingly difference comes in constellation boundaries that flow around the sky in free form. These charts predate today’s official constellations bordered along lines of right ascension and declination.



Space was evidently much smaller in the 1920’s. Ending with a chapter on various nebulae, the “spiral nebulae” are explained as solar systems disrupted gravitationally by passing clusters of stars. Though admitting that the Milky Way may have a similarly spiral structure, the idea that spiral nebulae represent distant, galactic island universes is largely dismissed. The clustered distribution of galaxies around the sky, their central condensation, and dark streaks seen edgewise all count against what would eventually be revealed as an immensely larger universe.

I wonder: this copy of “Introduction to Astronomy” was previously owned by one Virgil B. Wiley of Washington, D.C. For us, the past year has been a celebration of astro-history: with 10th anniversaries, browsing of old magazines, the transit of Venus, and even a visit by Edmund Halley himself. While we have the benefit of looking back over these decades, has Mr. Wiley has also enjoyed how much our knowledge of the universe has grown in the past century?