

# STAR GAZER NEWS

NEWSLETTER OF THE DELMARVA STARGAZERS

June 2004

WWW.DelmarvaStarGazers.Org

Volume 11 Number 12

## At the May Meeting.....

Don Surles brought the meeting to order at 7:15 with 21 members and guests attending.

## New Members

Jeannie Adams, Harbeson, DE

Monthly Meeting, Tuesday, June 1

## PROGRAM TO BE ANNOUNCED

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

## STAR GAZE X RECAP

Most members present had preferred the Equestrian Center to our normal site for star parties. Reasons cited were more visible skies and lower horizons and way more room, should we decide to expand. The cooking facilities and food preparation areas were better and there was gas heat available to escape the cold night weather. There was an area for slide, overhead and computer projection presentations, superior to the pavilion. On the down side was a lack of nearby bathing facilities and the need for Porta Potties. There was also some sky glow from the west and occasional lights from parallel traveling cars.

**Current Sky Objects** were briefly discussed such as the visibility of the naked eye planets, total Moon Eclipse May 4-5, the 2 comets NEAT and LINEAR, and the June 8 Transit of Venus.

## Outreach Events

**Somerset Lake** Jerry Truitt announced a May 8th Star Party at Somerset Lake community, involving about 30 people with about half of them being children. The Star Party will start at 8:00 p.m. at the tennis courts of the Somerset Lake clubhouse in

## Election of Club Officers for 2004-2005

At the June 1st Meeting

Landenburg PA, near Hockessen, DE. Driving directions are posted on the Stargazer Yahoo pages.

**Ridgely Facility** Lyle Jones received a request that an observing session be set up for 13 handicapped individuals at the Ridgely facility near Tuckahoe State

Park. Two persons will be in wheel chairs and one person has vision problems. The Ridgely contact person is Dolly at 410 634-843.

## Candidates for Club Officers 2004-2005

The following candidates were nominated for the 2004-2005 time period:

**President** Don Surles

**Vice President** Jerry Truitt

**Secretary** Keith Lohmeyer, Paul Riley

**Treasurer** Kathy Sheldon

**Aid de Camp** Leonard White

The Aid de Camp is a less formal volunteer position similar to a committee member

Election will be held at the June 1st club meeting.

## UPDATE ON MARS ROVERS

Jerry Truitt presented a portion of the NASA slide show on the 2 Mars Exploration Rovers, Spirit and Opportunity for the time periods of April 3 -9 and April 10-16

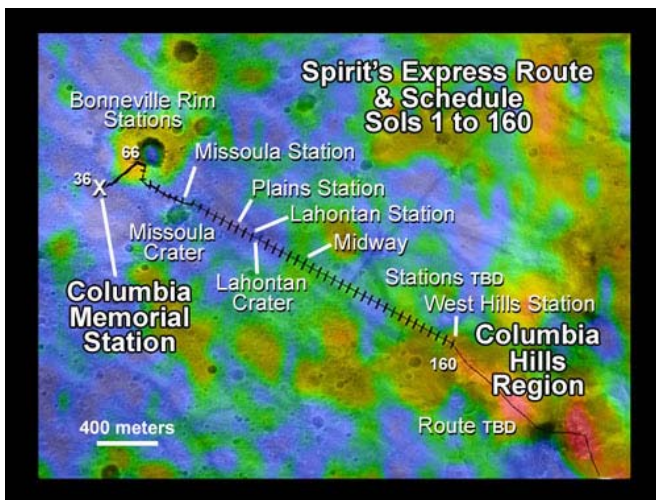
Below are further updates to the middle of May. You will see the word sol and sols used frequently. While the term "sol" represents a solar martian day, solar time keeping on Mars is complicated by the planet's orbital eccentricity, five times larger than Earth's, causing a 40% seasonal variation in its incoming sunlight and a fifty minute variation in the timing of local noon (as measured on a 24 "hour" Mars clock). Therefore I recommend using earth time; along with the sols.

**SPIRIT UPDATE:** Spirit Speeds to 'Lead Foot' - sol 124-126, May 12, 2004.

Spirit drove 80 meters (262.5 feet) on sol 124, bringing its total odometry to 1,909.52 meters (1.2 miles). Spirit has less than 1.2 kilometers (.75 mile) to go before reaching the base of the "Columbia Hills," and will reach them by sol 160. Later in the martian day, after completing the sol 124 drive, Spirit took a 360-degree afternoon panorama of its surroundings with the navigation camera.

On sol 125, Spirit continued driving and set a new one-sol driving record of 123.7 meters (405.8 feet). Science on Sol 125 included morning atmospheric sky and ground remote sensing, mini thermal emission spectrometer observation of the sol 126 instrument deployment device work volume, imaging with the panoramic camera, and cloud observations. After the long sol 125 drive, Spirit was in perfect

position to work with the instrument deployment device on sol 126. This included alpha particle X-ray spectrometer, Mössbauer and microscopic imager work on a target called "Lead Foot" (in honor of the big drive on sol 125). The Mössbauer was used as the feeler for all these activities but touched down on rocks rather than soil at the "Lead Foot" location, compromising the Mössbauer and microscopic imager data (images out of focus). Spirit also did some driving on this sol, and added 55.6 meters (182.4 feet) to the odometer, bringing Spirit's new drive total to 2,089 meters (1.3 miles). At the end of the sol, Spirit successfully executed a sequence that used the panoramic camera to find the Sun and correct for accumulated rover attitude errors. Below is the final Spirit mission map:



**OPPORTUNITY UPDATE**

**sol 103-106, May 13, 2004: Crater Cruise**  
 On Sol 103, Opportunity traversed approximately 13 meters (about 43 feet) farther south along the eastern rim of "Endurance Crater," reaching the beginning of the "Karatepe" area. On sol 104, the rover approached "Lion Stone," a rock at the crater's edge that stands about 10 centimeters tall (about 4 inches) and is about 30 centimeters long (12 inches). This brought Opportunity's total mission odometry to 1,054 meters (3,458 feet)! On Sol 105, Opportunity acquired a series of microscopic images of Lion Stone and the surrounding soil. The rover then went on to collect a short Mössbauer integration on the rock during the day, performed a tool change to the alpha particle X-ray spectrometer in late afternoon, and acquired that integration in the early morning of Sol 106. That sol also included additional microscopic

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images and a successful "bump" maneuver to reposition the rover so the top of Lion Stone was in position for the rock abrasion tool on Sol 107. Remote sensing was also acquired during the two sols, including panoramic camera images of the heatshield that protected Opportunity during its toasty trip through the martian atmosphere. The heat shield impacted approximately 250 meters (about 820 feet) south of Endurance Crater. Plans for Sol 107 are to perform a rock abrasion tool grind on Lion Stone with subsequent microscopic images and alpha particle X-ray spectrometer overnight integration. The tentative plan for Sol 108 is to leave Lion Stone and begin traverse to observation position 2 on the southeastern rim of Endurance Crater.

**From the Presidents Desk....**

The 2004 Transit of Venus...we have all probably seen a few articles on this phenomenon resulting from "cosmic geometry". Honestly, I always planned to put the event on my calendar and make every effort to view the spectacle. But, I have not done a lot of research on the crossing and half expect to have clouds or fog or rain...we have all been skunked by Mother Nature and understand all too well the sinking feeling when we are denied the necessary conditions to observe special events. This week I read an article on the Transit of Venus in the Science and Health section of May 14's Financial Times. I will attempt to paraphrase the information so that we all have a better understanding of this event. The last time a transit occurred was in 1882; no one alive today witnessed the event. Transits of Venus normally occur on a 122 year cycle and normally come in pairs separated by 8 years. So, we will have the second one of this cycle in 2012. The first sighting of a Venus transit was in 1639. The 1874-1882 cycle was a culturally stimulating event. John Phillip Sousa wrote the march "The Transit of Venus" and Harper's Magazine cover showed Appalachian school children watching the sun through a pane of smoked glass. Astronomers were psyched too. The US

Congress funded 8 expeditions in 1874 for \$177,000 – Russia fielded 26 teams! There is a picture of some astronomers who transported a portable observatory from Greenwich to Egypt in the Financial Times article (the scope appears to be 4 or 5 inch refractor). The camera was relatively new and mating it with a telescope seemed the right thing to do (glass plates!...definitely not a 35mm or digital). The goal was to time the exact second when the disk of Venus slipped inside the disk of the Sun from several points on Earth. The data from these observations would be used to calculate the distance from Earth to Venus and via Johannes Kepler's orbital laws one could also calculate the distance from the Earth to the Sun or the value for one Astronomical Unit (AU). The answer derived from the observations was very close to today's accepted value of 150 million kilometers. But the teams were hindered by the "black drop effect" which is a distortion of the silhouette of Venus just as it enters and exits the Sun's disk. The usually round shape appears to distort and look like a water drop. Some believed the clouds of Venus caused the black drop effect; others discounted the atmosphere of Venus and blamed Earth's atmosphere. Still others blamed the bending of light within the telescope. Fast forward to 1999 – a satellite (NASA's Transition Region and Coronal Explorer- TRACE) high above Earth's atmosphere observed a transit of Mercury which has no appreciable atmosphere and experienced the same black drop effect. Astronomers again blamed the scattering of light within the satellite's scope/camera system. And they added the possibility that the "limb darkening" of the Sun could be the culprit. The same satellite will again attempt to record June's Venus transit and any distortion of the image. Stay tuned...we may finally learn what causes the black drop effect. So now I have more appreciation for the transit and the efforts of previous generations to learn from it. Have you seen Comet NEAT? I have seen it and have enjoyed watching it climb higher each night. The 25 X 100 Chinese binocular is a wonderful instrument for this type of comet. The comet is a big fuzz ball with a dense core. And by shifting the

binocular just a tad the short stubby tail pops out from the background. The communications about this comet between members of our organization has been plentiful and inspiring. We are fortunate to live in a time when communications are so inexpensive, fast and easy.

We will hold our election for 2004-2005 officers at the June 1 meeting. The candidates were nominated at the May meeting and you have to be present at the June 1 meeting to vote.

Planning meeting(s) for the coming year will be sometime in late June/early July. Typically, those interested in planning for the coming year meet at Frank and Kathy's house for a Saturday afternoon of food, drink, fun, and of course planning for the coming year. All members are invited to attend, to share their ideas and volunteer to insure their favorite activities are properly and successfully executed. Take a few minutes to jot down your thoughts and any pertinent information so that you can convince the group and gain their support. I am always amazed at the variety of opportunities our group can assemble in an afternoon.

Enough for now – see you at Tuckahoe or the Church. Don...

#### Observer Notes

The following are observer notes excerpted mostly from the Yahoo pages with minimal editing.

#### May 12 13 Kent Blackwell

Galaxy Quest? No, not the movie but rather a report on my continuing quest for spring edge-on galaxies, all observed through a moderate 10" Dobsonian. I located 27 additional edge-ones Wednesday, May 12 bringing the two-night total to a whopping 60 edge-on galaxies. Do I need to get a life or what? One you should surely put on your list is **NGC 5746** in Virgo. My notes read, "!!! Wow! Beautiful edge-on galaxy just slightly west of the 3.7 magnitude star 109 Virginis. The galaxy is dusty, and I suspect a dust lane. Wonderful object."

How about a real test for those with 8-10" scopes? I have never seen **NGC 5971** in any telescope, so I tacked it with my 10" f/4.7. Here's my notes: "eef, pl, elongated. Lies just to the NE of the wonderful pencil-thin edge-on N5965. This galaxy,

**How to Join the Delmarva Star Gazers:** Anyone with an interest in any aspect of astronomy is welcome to Join.

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 Fleetown Rd, Lincoln, DE 19960. Call club President Don Surles at 302-653-9445 for more info

at 15th magnitude, is the faintest I have yet seen with the 10".

**NGC 5746** Mag 11.4 Virgo RA14h 44 d +01 57'  
**NGC 5971** Mag 15 Draco RA15h 35m d+56 27'

### **Bob Bunge May 15**

Actually, I did TSP Saturday night! All of the forecasters had been guessing the cold front was finally going to come east all week, and Saturday night started out looking a lot like Friday had, so I made the run.

The skies started clear. There were toads everywhere on the ballfield. About 8:30 I heard a Barred owl make it's normal call. About 8:45, I heard a Great Horned Owl call. Since the Great Horneds like to eat the Barreds, that quited the Owls for the night. This is the first Great Horned I've ever heard at TSP. About 8:45, a Buck, apparently, in the field on the other side of the trees to the east, decided to stand ground against me and made repeated aggressive noises. I decided not to charge.

On a whim, I glanced at Jupiter in the 20-inch and was surprised to see one of the best views I've ever had of it. I ranked the seeing at 9.5 at 800x and holding. At 9:15, I hunted up the Beehive and quickly found Comet NEAT in the 4.25-inch f/4 finder. It was a fine view of both the cluster, the comet and the comet's tail. The 20-inch showed nice detail in the outer parts of the coma and the close in tail. As I started to draw the view in the 4-inch, noticed the first of the flashes to the west. By time I finished the drawings, the skies were almost completely overcast.

I Hung around for a few minutes and was packed up by 10:30. While on Rt 304, my wife called from Bowie to comment they were in heavy downpours. I ran into the first wind gusts just before Kent Island and the first rain drops as I approached the Bay bridge.

A short, but a pretty fun trip. FYI, being the only warm blooded target on the field was not pleasant; the blood sucking insects were about the only draw back of the night. **Bob Bunge**

### **The Solar system in June** by Paul Riley

Good News - For only the sixth time since the invention of the telescope Venus will transit the Sun. It will be on the morning of June 8th. Bad News - We will get to see the egress only. For us, Venus will start to egress at 7:05 AM and complete egress by 7:25 AM. Sunrise on June 8th is 5:36 AM so if you get up early, you will be able to see Venus transit the Sun for almost 2 hours. Remember, use only approved solar viewing devices !

Comet NEAT will be in URSA MAJOR in the middle of June, While Comet ILinear will be near Hydra. June 21st brings us the summer solstice, the shortest night of the year. Astronomical twilight occurs at 10:44 PM and at 3:38 AM the following morning. As you remember, Civil twilight starts when the sun is 6 deg. below the horizon. Nautical twilight starts when the sun is 12 deg below, and astronomical twilight starts when the sun is 18 deg. below the horizon. All that means that the sky will be at it's darkest for less than 5 hours. The moon will set at 11:41 PM that night. How many Messiers can you find during the shortest night ?

### **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 Tuckahoe, 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, March 19, **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 2003-2004**

**President.....Don Surles 302 653 9445**  
**Vice President.....Lyle Jones 302 736 9842**  
**Secretary.....Keith Lohmeyer 410 482 6077**  
**Treasurer.....Kathy Sheldon 302 422 4695**



## Observing Chair Comparison

*By Keith Lohmeyer*

Observing chairs allow observers to have more quality eyepiece time. Longer views at the eyepiece will bring out more object detail. You will also have a better chance of catching those moments of 'perfect' seeing. Refractor users really benefit by keeping them off their knees. There are also chairs that can be used by Dob users too. Stargazers were invited to bring their favorite observing chair but only two showed up. One was made by James Morgan and the other by Keith Lohmeyer. Both were variations on the Denver Chair shown in photo at left.

This is probably the best and most foolproof of the home made type with the most critical element being the 3 M adhesive backed stair tread which keeps your seat (and you) from crashing down.

**Below is are various types available:**

Brand	Price	Height	Const.	Features	Available From
TeleVue Air-Chair	\$175	21" to 28"	metal	padded seat, lever seat adjustment	High Point Scientific and other Televue dealers
Drum Throne	\$30 - \$115	17" to 28"	metal	similar to airchair, screw or manual seat adjustment	DrumNetwork.Com and other music stores
Denver Observer seat	about \$35	10" to 28"	wood	ATM project, plans online	<a href="http://members.tripod.com/denverastro/seat.html">http://members.tripod.com/denverastro/seat.html</a>
Kendrick Observing Chair	\$139	9" to 30"	wood	similar to Denver chair	Anacortes Telescope
Starbuckets Observing chair	\$135	13" to 29"	wood	available in Red Oak or Hickory	Starbuckets Telescopes
StarStep Observing Chair	\$139	8" to 29"	wood	triangle shape, can use standing	Starmaster Telescopes
Starbound viewing chair	\$159	9" to 32"	metal	padded seat, black or white	High Point Scientific and others
Astro Chair	\$95	18" to 32"	metal	padded seat, lightweight - 10lb	<a href="http://www.buyastrostuff.com/">http://www.buyastrostuff.com/</a>
Beerchair observing chair	\$199	9" to 35"	wood	lightweight - 8lb, padded seat, carrying case	<a href="http://www.thebeerchair.com/">http://www.thebeerchair.com/</a>
Catsperch observing chair	plans\$44 kit \$188	8" to 46"	wood	includes footpegs, usable with dobs	<a href="http://www.catseyecollimation.com/">http://www.catseyecollimation.com/</a>

### Online Resources:

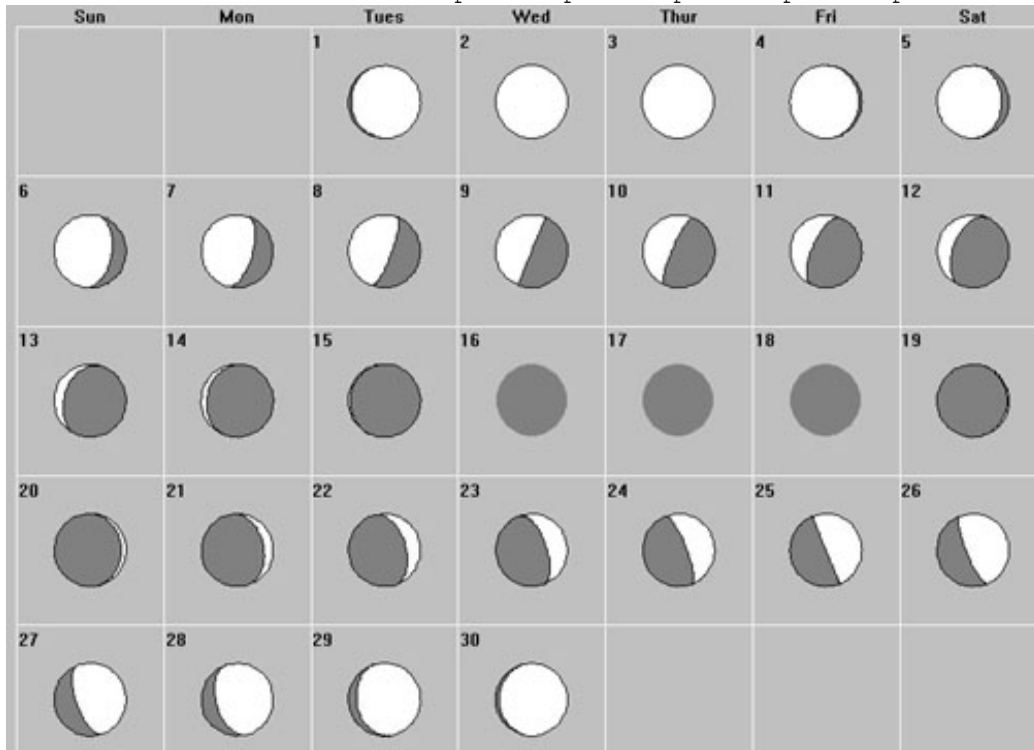
Yahoo e-mail group- [http://groups.yahoo.com/group/telescope\\_observing\\_chair/](http://groups.yahoo.com/group/telescope_observing_chair/)

Observing chair Review by Joel Frazier- <http://www.catseyecollimation.com/jfrazier.html>

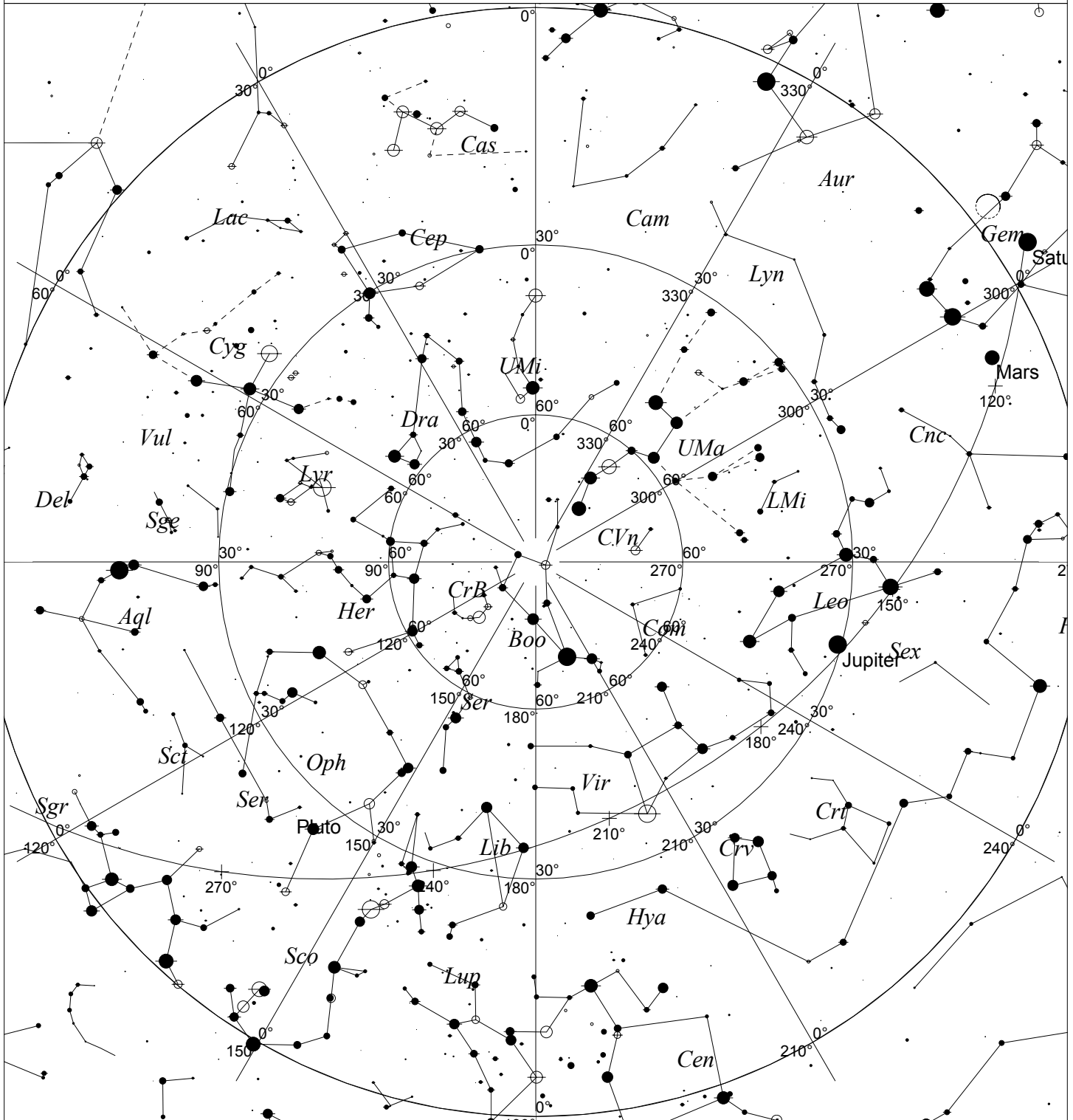
### Sun and Moon Data for June 2004 Tuckahoe MD

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

Date	Sun				Moon				% illumination
	Twil.	Rise	Transit	Set	Twil.	Rise	Transit	Set	
6/1/2004	3:44a	5:40a	1:02p	8:24p	10:20p	6:57p	11:59p	4:17a	97
6/2/2004	3:44a	5:39a	1:02p	8:24p	10:21p	8:18p	*****	4:54a	100
6/3/2004	3:43a	5:39a	1:02p	8:25p	10:22p	9:35p	1:02a	5:41a	100
6/4/2004	3:42a	5:39a	1:02p	8:26p	10:22p	10:44p	2:08a	6:40a	96
6/5/2004	3:42a	5:39a	1:02p	8:26p	10:23p	11:41p	3:16a	7:49a	91
6/6/2004	3:41a	5:38a	1:02p	8:27p	10:24p	*****	4:20a	9:04a	83
6/7/2004	3:41a	5:38a	1:03p	8:27p	10:25p	12:25a	5:19a	10:20a	73
6/8/2004	3:40a	5:38a	1:03p	8:28p	10:26p	1:00a	6:12a	11:33a	63
6/9/2004	3:40a	5:38a	1:03p	8:29p	10:27p	1:28a	7:00a	12:41p	52
6/10/2004	3:40a	5:38a	1:03p	8:29p	10:27p	1:53a	7:45a	1:46p	41
6/11/2004	3:39a	5:38a	1:03p	8:30p	10:28p	2:16a	8:27a	2:49p	32
6/12/2004	3:39a	5:38a	1:04p	8:30p	10:29p	2:38a	9:09a	3:50p	23
6/13/2004	3:39a	5:37a	1:04p	8:30p	10:29p	3:01a	9:51a	4:51p	15
6/14/2004	3:39a	5:37a	1:04p	8:31p	10:30p	3:26a	10:34a	5:53p	9
6/15/2004	3:38a	5:38a	1:04p	8:31p	10:30p	3:54a	11:20a	6:54p	4
6/16/2004	3:38a	5:38a	1:05p	8:32p	10:31p	4:27a	12:07p	7:55p	1
6/17/2004	3:38a	5:38a	1:05p	8:32p	10:31p	5:07a	12:57p	8:52p	0
6/18/2004	3:39a	5:38a	1:05p	8:32p	10:32p	5:53a	1:48p	9:43p	1
6/19/2004	3:39a	5:38a	1:05p	8:32p	10:32p	6:46a	2:39p	10:28p	3
6/20/2004	3:39a	5:38a	1:05p	8:33p	10:32p	7:44a	3:29p	11:07p	7
6/21/2004	3:39a	5:38a	1:06p	8:33p	10:32p	8:46a	4:17p	11:40p	13
6/22/2004	3:39a	5:39a	1:06p	8:33p	10:32p	9:49a	5:03p	*****	20
6/23/2004	3:40a	5:39a	1:06p	8:33p	10:32p	10:52a	5:48p	12:08a	29
6/24/2004	3:40a	5:39a	1:06p	8:33p	10:32p	11:56a	6:32p	12:33a	38
6/25/2004	3:40a	5:40a	1:06p	8:33p	10:32p	1:00p	7:15p	12:57a	49
6/26/2004	3:41a	5:40a	1:07p	8:33p	10:32p	2:07p	8:01p	1:20a	59
6/27/2004	3:41a	5:40a	1:07p	8:33p	10:32p	3:17p	8:49p	1:45a	70
6/28/2004	3:42a	5:41a	1:07p	8:33p	10:32p	4:31p	9:42p	2:13a	80
6/29/2004	3:42a	5:41a	1:07p	8:33p	10:32p	5:49p	10:41p	2:46a	88
6/30/2004	3:43a	5:42a	1:07p	8:33p	10:32p	7:07p	11:45p	3:27a	95



# SKYMAP FOR JUNE 2004



<p><b>STARS</b></p> <ul style="list-style-type: none"> <li>● &lt;1    ● 3.5</li> <li>● 1.5   ● 4</li> <li>● 2     ● 4.5</li> <li>● 2.5   ● &gt;5</li> <li>● 3</li> </ul>	<p><b>SYMBOLS</b></p> <ul style="list-style-type: none"> <li>● Multiple star</li> <li>○ Variable star</li> <li>☄ Comet</li> <li>☉ Galaxy</li> <li>□ Bright nebula</li> <li>◻ Dark nebula</li> <li>⊕ Globular cluster</li> <li>⊙ Open cluster</li> <li>⊖ Planetary nebula</li> <li>⊞ Quasar</li> </ul>	<p><b>SYMBOLS</b></p> <ul style="list-style-type: none"> <li>△ Radio source</li> <li>× X-ray source</li> <li>○ Other object</li> </ul>	<p>TUCKAHOE STATE PARK, MD JUNE 18, 2200 HOURS EDST</p>
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Local Time: 22:00:00 18-Jun-2004

UTC: 02:00:00 19-Jun-2004

Sidereal Time: 14:42:49

Location: 38° 58' 0" N 76° 56' 0" W RA: 14h42m49s Dec: +38° 57' Field: 182.0°

Julian Day: 2453175.5833

## Moondark for June: The Notorious Black Drop

I'll wager it's the rarest sight in astronomy: the "[notorious](#)" [black drop of Venus](#). It appears at just two moments during a transit of Venus—as the planet appears to completely enter, and again as it begins to exit, the solar disk. Observers differ in their description of this phenomenon: it is a varying dark region, a band, thread or ligament, connecting Venus to the edge of the Sun's disk as seen under high telescopic magnification.

Transits of Venus, when that planet passes in front of the Sun as viewed from Earth, are themselves infrequent: they occur only 13-14 times in a thousand years. There have been only five transits of Venus ever observed: in [1639, 1761, 1769, 1874, and 1882](#)—the last was nearly 122 years ago. Not only is this event so rare that no one alive has seen one, but possibly less than a thousand people have ever observed Venus' transit and the black drop.

The black drop has considerable historical significance. Edmund Halley first proposed measuring Venus' path across the solar disk by timing Venus' entrances and exits, known technically as the 2nd and 3rd contacts. [Observations made across the globe could determine the solar parallax](#) by triangulation. This quantity is simply related to the Sun-Earth distance, and thus provides a benchmark for the solar system. Although this was attempted at the next two opportunities, 17th century astronomers' results were far less precise than hoped. Uncertainty in contact timings introduced by the black drop, an error of up to one minute in some cases, was enough to introduce considerable inaccuracy in the Sun-Earth distance.

Astronomers tried again during the 18th century transits, this time as part of the first international scientific expeditions sponsored by their governments. Indeed, this is why [Lieutenant James Cook](#) was in Tahiti and soon to discover *terra australis*, what today we know as New Zealand and Australia. Even for Cook and his astronomer Charles Green, the black drop rendered the measurements imprecise. 19th century astronomers had better equipment, although their timings were scarcely better. Photographs documented the black drop as a real effect, proving that it was not just an optical illusion. But by the late 1800's, there were superior methods for determining the solar parallax, and it was realized that transit timings were no longer scientifically critical. In the 20th century, interplanetary distances were measured by radar, and the solar parallax was determined to great accuracy. Transit timings no longer have any role in determining this cosmic yardstick.

Unlike past transits, nowadays the spectacle is made for amateurs and history buffs. No doubt [millions will watch webcasts](#) of the first of two transits of Venus this century. On 8 June 2004, Venus will cross the face of the Sun, taking about 6 hours. While observers in the eastern hemisphere will be able to see the whole event, we on Delmarva will not miss out entirely. As the sun rises over the Atlantic Ocean, the transit will be well underway: we will be able to view the last quarter of the transit. [3rd contact and the black drop will occur around 7:06 EDT](#) with the Sun about 15° above the horizon. A mere 20 minutes later, Venus will have left the Sun, and this much anticipated conjunction will be finished. The next, and our last, opportunity will be eight years hence, 5-6 June 2012.

To help prepare for this June's extraordinary sight, I'd recommend: William Sheehan and John Westfall's *The Transits of Venus*, Eli Maor's *June 8, 2004: Venus in Transit*, and Guy Ottewell's *Astronomical Calendar 2004*. [Sky & Telescope](#) magazine has published numerous feature articles this year: see June pp. 73, 108 and 112, May pp. 32 and 137, and February p. 46. Plenty of historical and astronomical information is available on the web: visit Fred Espanak's authoritative [2004 Transit of Venus](#) page or [www.transitofvenus.org](#) for graphics and other resources. Be sure to use safe observing techniques to view the transit and the black drop. Never look at the Sun directly or through a telescope without an aperture filter. See astronomy books, magazines and web sites for how to observe the Sun safely. Low clouds and fog are common in summer near the coast, so check a local forecast and choose alternate viewing locations to maximize your chances. I'll be on the beach with the surf fishermen hoping for an unobstructed view of a most memorable sunrise.

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