



## Scanning Aquila for Planetary Nebulae

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If you enjoy observing planetary nebulae there's no better constellation than Aquila for scoping them out. I've chosen only four, all of them NGC objects, simply because these should be visible in 8" - 10" telescopes, even in bright city lights.

**NGC 6741** is a perfect blinking planetary. Although listed at 10.5 magnitude I find it to look a little fainter. When a filter is blinked, almost all the myriad of background stars sprinkled across the field of view seem to disappear, except for that bluish "star", which is actually NGC 6741.

**NGC 6781** – This one isn't as easy as NGC 6741, only because it's larger, and has lower surface brightness. This Pac-Man shape planetary nebula is one that's fun to look at, even in bright city lights. Use a nebula filter, preferably a Lumicon UHC, Orion UltraBlock or a Lumicon OIII. If you don't know what a "Pac-Man" is you're too darn young.

**NGC 6790** – I spotted this even through thin clouds on a less-than-ideal evening. It's quite bright, small, and appears very blue. A star next to it nearly disappears when blinking a filter.

Does everyone know about "blinking" a nebula filter? It's a neat trick for identifying planetaries. Use a nebula filter, but don't screw it into the bottom of the eyepiece the way you normally do. Instead, place it between you eyeball and the eyepiece. Now quickly remove it, and then slide it back again. Do this back and forth. The stars will nearly vanish, but presto, the planetary will appear to brighten.

**NGC 6803** – At 6 arc seconds in size this one is stellar, but it blinks very well with an 11.9 magnitude star in the same field when using a nebula filter as described above.

I hope you've enjoyed my few Aquila "challenge" planetary nebulae for city viewing. Let me know if you have any luck. Although they're idea for city viewing with 8" – 10" telescopes you may be able to see them with apertures as small as 6" in a dark sky.

## SMALL SCOPE FAVORITES FOR JULY SKIES

Jim Tomney

The summer celestial bonanza of our home galaxy kicks in to high gear this month. It makes selecting a "top three" showpieces for small scopes/binoculars a bit challenging, but what a great dilemma to have!

**Jupiter** – If you had to sentence me to one object to view I guess it'd be Jupiter (and hopefully with a scope of at least 6" of aperture!). Our solar system's giant provides not much cloud details in a 60mm scope, usually only the equatorial stripes, but that is still more than you will find on Venus, Mars, or Saturn in terms of global features. The real attraction lies in the four Galilean moons that are readily apparent in even binoculars as they weave in and out around the planet. In a scope you can also catch some of their shadow play. While picking up the transiting shadow of a moon upon Jupiter's cloud tops is challenging (Ganymede is likely your best bet having the largest shadow of the four), catching any of the moons materializing into view as they leave the giant's shadow is very doable, especially around quadrature when emergence happens farthest away from the planet's limb. And the best part is you only need to care about clear skies to catch the show instead of obsessing about transparency and lunar phase!

**M 57** – Probably the best known planetary nebula, this little gem is a bit hard for binoculars (unless you have at least 10 x 50 and darkish skies) but is like a bike with training wheels for folks just learning to find celestial wonders with their first scope. A little bigger than Jupiter at 1.5 by 1 arc-minutes, this 8<sup>th</sup> magnitude nebula is an easy star hop at the base of Lyra and framed in a wonderfully starry field. For more details check out the Shallow Skies article elsewhere in this issue!

**Albireo** – Color in the eyepiece (especially for a small scope) is a bit of a rarity. Easy to locate as the second brightest star in Cygnus this is, if you'll pardon the pun, the gold standard for striking doubles. With a separation of 34 arc-seconds it resolves readily in even small scopes to reveal its gold & sapphire suns. It's no wonder that when people catch something like Albireo with its bold University of Delaware colors they can get hooked, always looking for another contrasty double that can match it. While there was some debate in the past whether the pair was a physical or optical double, Hipparcos data seems to indicate that it is a true double some 400 light years distant, taking a leisurely 75,000 years to complete an orbit.

So there's my top three targets for small scope observing on a midsummer's evening. Hope you get the opportunity to catch them all in a scope big or small!

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

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Do you need the newsletter snail mailed to you (Y/N)? \_\_\_\_\_

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 Tim Milligan at 410-841-9853 for more information.

## **Plutoid chosen as name for Solar System objects like Pluto**

**11 June 2008, Paris: The International Astronomical Union has decided on the term *plutoid* as a name for dwarf planets like Pluto at a meeting of its Executive Committee in Oslo.**

Almost two years after the International Astronomical Union (IAU) General Assembly introduced the category of dwarf planets, the IAU, as promised, has decided on a name for transneptunian dwarf planets similar to Pluto. The name *plutoid* was proposed by the members of the IAU Committee on Small Body Nomenclature (CSBN), accepted by the Board of Division III, by the IAU Working Group for Planetary System Nomenclature (WGPSN) and approved by the IAU Executive Committee at its recent meeting in Oslo, Norway.

*Plutoids* are celestial bodies in orbit around the Sun at a distance greater than that of Neptune that have sufficient mass for their self-gravity to overcome rigid body forces so that they assume a hydrostatic equilibrium (near-spherical) shape, and that have not cleared the neighbourhood around their orbit. Satellites of plutoids are not plutoids themselves, even if they are massive enough that their shape is dictated by self-gravity. The two known and named *plutoids* are Pluto and Eris. It is expected that more *plutoids* will be named as science progresses and new discoveries are made.

The dwarf planet Ceres is not a *plutoid* as it is located in the asteroid belt between Mars and Jupiter. Current scientific knowledge lends credence to the belief that Ceres is the only object of its kind. Therefore, a separate category of Ceres-like dwarf planets will not be proposed at this time.

The IAU has been responsible for naming planetary bodies and their satellites since the early 1900s. The IAU CSBN, who originally proposed the term *plutoid*, is responsible for naming small bodies (except satellites of the major planets) in the Solar System. The CSBN will be working with the IAU WGPSN to determine the names of new *plutoids* to ensure that no dwarf planet shares the name of another small Solar System body. The WGPSN oversees the assignment of names to surface features on bodies in the Solar System. These two committees have previously worked together to accept the names of dwarf planet Eris and its satellite Dysnomia.

In Oslo, members of the IAU also discussed the timing involved with the naming of new *plutoids*. Again, following the advice of the Division III Board and the two Working Groups, it was decided that, for naming purposes, any Solar System body having (a) a semimajor axis greater than that of Neptune, and (b) an absolute magnitude brighter than  $H = +1$  (see Notes) magnitude will, for the purpose of naming, be considered to be a *plutoid*, and be named by the WGPSN and the CSBN. Name(s) proposed by the discovery team(s) will be given deference. If further investigations show that the object is not massive enough and does not qualify as a *plutoid*, it will keep its name but change category.

### **Links**

IAU website: <http://www.iau.org/>

Information about Pluto and the other dwarf planets: [http://www.iau.org/public\\_press/themes/pluto/](http://www.iau.org/public_press/themes/pluto/)

### **The Delmarva Stargazers Announces a Writing Contest.**

The DMSG will raffle away astronomy gifts to members who submit articles to the Star Gazer News.

How to enter:

- 1 Open to DMSG members.
- 2 Members may submit original articles at least 500 words (1/2 page) for publication in the Star Gazer News.
- 3 Articles **must** be authored by the member.
- 4 Pictures can be included, but they do not count towards word count (1 picture <sup>1</sup> 1000 words).
- 5 Must be astronomy related. Each article = one chance in the raffle. The drawing will be made at the star parties based on the previous 6 issues – need not attend to win (but it would be nice to see you there). *The editor of the Star Gazer News qualifies articles submitted.*

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# Shallow Sky Observations for July 2008

Jim Tomney

Summer time has scores of objects vying for your attention. Among them are the finest specimens of planetary nebulae riding high overhead on July evenings. A planetary nebula is formed at the end of a star's life as it enters its Helium burning stage. Such stars pulse (like Mira) and throw off material, which in turn is excited by the hot stellar core so that it appears as a glowing cloud to us.

The premiere planetary nebula for small scopes is M 57, the Ring nebula<sup>1</sup> in Lyra. Lyra is easily located by brilliant Vega. Once your eyes acquire their dark adaptation you should be able to make out a parallelogram of stars to the south of Vega (or at least a pair of stars some 5 degrees south of Vega that represent the base of the harp). Our quarry lies about midway between these two stars, Beta and Gamma Lyrae.

Sweeping the area at 40x with the 2.4" refractor it only takes a few moments to locate M 57. At this magnification and aperture the nebula is pretty stellar looking. In fact, a novice observer might easily glide by it, not noticing the bloated star. Doubling the magnification makes it far more obvious that this is a non-stellar object that is about twice the size of Jupiter. At 9<sup>th</sup> magnitude it holds direct vision pretty well. Although it is an oval it looks more circular in the eyepiece. The annulus nature of the nebula can not be seen, but it would not require much additional aperture to begin to discern it.

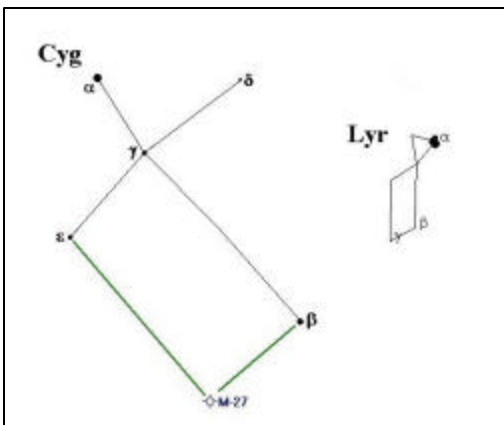
The central star that is responsible for energizing the gases is no where to be seen, which is expected considering that it is a challenge for scopes ten times this size. One of the best aspects of this nebula is the wonderful field of stars that frame it. Even in this diminutive refractor there are over half a dozen stars scattered around M 57.

Next we slide eastward to Cygnus in search of M 27. Well, technically we're heading for the constellation Vulpecula the Fox whose brightest star is mid-4<sup>th</sup> magnitude and hopelessly overpowered by my suburban skyglow. It's sort of the M 51 syndrome – it may be part of another constellation (Canes Venatici) but you associate it with Ursa Major (the Big Dipper). So the first issue is how to hop to this great planetary. Years ago at a Baltimore Astronomical Society gathering a friend of mine, Bill Burbridge, gave me a tip that I've used ever since in tracking down the Dumbell nebula. If you take Gamma, Epsilon, and Beta Cygni and then imagine completing a rectangle – M 27 becomes the fourth corner.

Even with this star hop strategy it takes some careful panning to finally pick up the Dumbell. It is roughly four times larger than M 57 at 8' x 6' but is only a magnitude brighter. The nebula is best described as ghostly in the 20mm eyepiece and it vanished completely at 10mm. It provides a clear example of how surface brightness (the light spread out over an area) rather than magnitude is the real yardstick of a deep sky object's visibility. The glow appears approximately circular and is again set amid a nice Milky Way background of stars. In larger scopes the filaments of the nebula begin to emerge along with the "apple core" outline, making M 27 one of the finest examples of a planetary nebula.

Although you've bagged the top two planetaries in the area there is still one more amid the Summer Triangle's environs that you can tackle. NGC 6826 is a planetary located in Cygnus' western wing, a few degrees northeast of Theta Cygni. Our target is more on par with M 57 in terms of size, but it is significantly fainter and approaching my scope's limit at 10<sup>th</sup> magnitude.

With a bit of effort I pick up Theta in the telescope. From here I move WNW about a degree to 16 Cygni, a double star of about 6<sup>th</sup> magnitude components and 30" separation. From this point our nebula is almost due east about half a degree and will eventually be carried into view by the Earth's rotation. The presentation is that of a fainter double star compared to 16 Cygni – but when you look closely at the preceding star it refuses to take a sharp focus. Unlike the prior two planetary nebulae this one has its central star quite visible. When we look directly at it the star does not wilt like its shell, but when we glance away our averted vision causes the nebulosity to bloom back into view. This play between direct and averted views is responsible for the nebula's nickname of the "Blinking Nebula".



Before we conclude the planetary nebula expedition swing back to 16 Cygni and ponder the slightly fainter comes, 16 B. This yellow dwarf, similar to our Sun at 1.3 times its luminosity, has been discovered to sport a Jupiter sized planet in an 800 day orbit. It looks so unassuming, as our own solar system would at 70 light years. How many wonders are out there waiting for us to learn of their existence? We may never know, but we can be certain that even with a modest telescope you can find some truly amazing celestial venues!

(1) It's interesting that maybe 40-50 years ago the moniker for M 57 was the "Smoke Ring" nebula, an eponymous reference to a torus puff of cigarette smoke that some folks could create. And it was probably the most apt description of a celestial object. However, it appears that we have to shorten it to just "Ring" nebula lest we somehow imply a positive association with the act of smoking.

Locating M 27 by the "Rectangle" Method

## The Zodiac constellation Leo

*Jerry Truitt*

**Bright Stars:** Regulus ( $\alpha$  Leonis), the lion's heart; Denebola ( $\beta$  Leonis); and  $\gamma$  Leonis (Algieba).

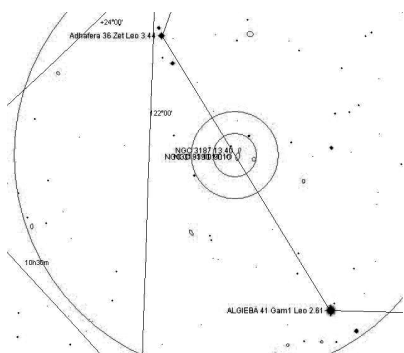
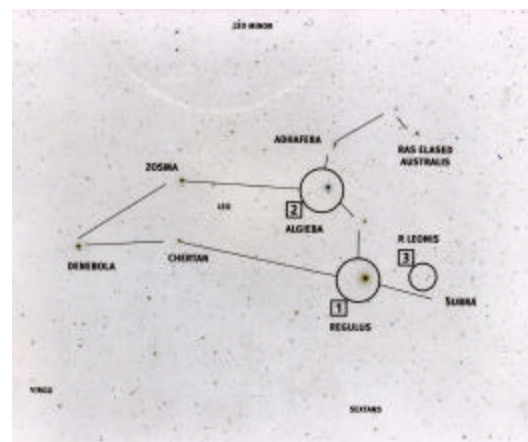
**Galaxies:** Messier 65, Messier 66, Messier 95, and Messier 96 are the most famous, the first two being part of the Leo Triplet. Plus there is another trio we'll look at too.

**An asterism** known as the Sickle

**Wolf 359** a star located approximately 2.4 parsecs or 7.7 light years from Earth. It is one of the nearest stars; only the Alpha Centauri system and Barnard's star are known to be closer. If you're really a geek you also know this is where Captain Picard faced down the Borg.

**Gliese 436**, a faint star in Leo about 33 light years away from the Sun, is orbited by one of the smallest extrasolar planets ever found.

**CW Leo**, a carbon star (atmosphere contains more carbon than oxygen) CW Leo (IRC +10216) is the brightest star in the night sky at the infrared N-band (10  $\mu$ m wavelength).



### The Trio in Leo

This is actually a quartet, but the trio will fit nicely in an eye piece. This group is commonly referred to as the Hickson 44. A Canadian Astronomer, Paul Hickson, in 1982 used the red prints from the Palomar Observatory Sky Survey to determine compact groups of galaxies. He published a catalog of 462 galaxies suspected to exist within a compact grouping. These groupings are now referred to as "Hickson Compact Groups" (HCG). The four dominant members of HCG 44 are three spirals and an elliptical galaxy, NGC 3190, 3193, 3185, 3187. Signs of tidal encounters between members of HCG 44 are present. NGC 3190, the dominant edge-on spiral shows considerable warping of its dustlane on the side nearer to NGC 3187. NGC 3187, also known as ARP 316a (Catalogue of Peculiar Galaxies) shows numerous tidal tails well above and below its disk plane. Signs of tidal interactions are significant in proving that the group is actually a compact system.

### Leo's Regulus

Now move back to bright Regulus. Regulus is the alpha star which designates it as the brightest star in Leo and it is in fact one of the brightest stars in the night sky. At 140 times brighter than our Sun, Regulus has a surface temperature of over 12,000 degrees C and core temperature of 100 million degrees C. Regulus is also the brightest star near to the ecliptic and is regularly occulted by the Moon. Though rare, Regulus may also be occulted by the planets Mercury and Venus. The last occultation of Regulus by a planet was on July 9, 1959, by Venus. The next will occur on October 1, 2044, also by Venus.

Regulus has about 3.5 times the Sun's mass and is a young star of only a few hundred million years. The star has an oblate shape due to its extremely rapid spin rate rotating every 15.9 hours. The extremely rapid spin also results in the poles of Regulus being considerably hotter, and five times brighter per unit surface area, than its equatorial region. This is called gravity darkening of the photosphere. If the star was rotating only 16% faster, centripetal force (a force that pulls a rotating or spinning object toward a center or axis) would overcome gravity and the star would tear itself apart.

Regulus is a multiple star system composed of a hot, bright, bluish-white star with a pair of small, faint companions

### Leo I

Just below and a little west of Regulus is a dwarf spheroidal galaxy Leo I. At 800,000 light years Leo I may be the most distant of the several known small satellite galaxies orbiting our Milky Way Galaxy.

### Saturn

Moving east from Regulus that next bright object currently in Leo is the outer planet Saturn. Even in light polluted skies Saturn is a wonderful object to observe with its majestic rings. In 2003 the ring tilt reached yjr maximum tilt of 27 degrees. The tilt of the rings has been decreasing since 2003. The ring tilt decreases (closes slightly) each year until 2009, when we'll again see an edge-on, or nearly invisible view of the rings. In 2008 the ring tilt angle varies from 10 degrees down to 1 degree. Saturn reached opposition on Feb. 24, 2008 (an object is at opposition when the sun is on one side of Earth and the object is directly on the opposite side). At opposition the object is fully illuminated by the

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sun and appears disk-like. Saturn halted its retrograde motion in May, pulling away to the east of Regulus. Retrograde - Earth completes its orbit in a shorter period of time than the planets outside its orbit, we periodically overtake them, like a faster car on a multi-lane highway. When this occurs, the planet we are passing will first appear to stop its eastward drift, and then drift back toward the west. Then, as Earth swings past the planet in its orbit, it appears to resume its normal motion west to east. Through telescopes, notice the shadow cast on the rings by the globe of Saturn, as Saturn is at eastern quadrature, 90 degrees east of the sun. This is when the planets shadow on the rings is most prominent. Earth moves away from Saturn and the rings are beginning to close, making the magnitude of the planet dim.

**The Leo Triplet**



From Regulus we continue moving down the body of the lion to 3.34 mag Theta Leo. Next move down about one quarter of the distance past Theta Leo toward Denebola. Here you'll find the wonderful eye piece full of three galaxies. This small group of galaxies consists of the Messier objects M65 and M66 as well as the edge-on spiral NGC 3628. These three galaxies, the heart of the M66 group, form a beautiful and photogenic group which is frequently referred to as the Leo Triplet; Halton Arp has included this group as number 317 in his Catalogue of Peculiar Galaxies (M66 is also Arp 16). The triplet is lying at a distance of some 35 million light years

**Leonids Meteor Shower**

The Leonid meteor shower has produced some of the most spectacular meteor displays in history, but it unfortunately runs in a 33 year cycle. The Leonids start around November 13 and end November 21 with the peak being 17/18. The last enhanced peak was in 1998 - 2002, we are in a winding down phase that is normally 10 or so meteors an hour.

**Summary**

Stop by Leo and spend some time checking it out. Leo is full of easy to find objects and some real challenges too.

**For Sale:**

**Sky Design – 20” F/4 Open Truss Tube Telescope  
With JMI NGC Max computer**

This is a complete operating telescope and is ready for use. It comes with a **NGC Max computer** and **encoders** installed, **Starlight Instruments Feather Touch focuser**, **Telrad finder**, and a **TeleVue ParaCor Coma corrector** with **Tunable Top** and **2” – 1 1/4” reducing adapter**. I've installed **brass inserts** for attaching a set of Obsession 20” wheel-barrel handles (not included) so you can move it around easily. In case you want to move the telescope without wheelbarrow handles, I've installed handles on the rocker box.

*Original owner* – The telescope is in **excellent condition**, and **looks brand new**. I took good care of it and it was always kept in a cool dry room.

*Optics* – Galaxy Mirror # 16 - 1.5 inches thick. In 2003 John Hudek, owner of Galaxy Optics, refigured the mirror to remove under-correction and astigmatism. Mirror center was etched onto the glass and then the mirror was re-coated with 3 dielectric layers over aluminum. The top layer is pure quartz and yields 96% reflectivity. The mirror is superb and the scope is a real performer.

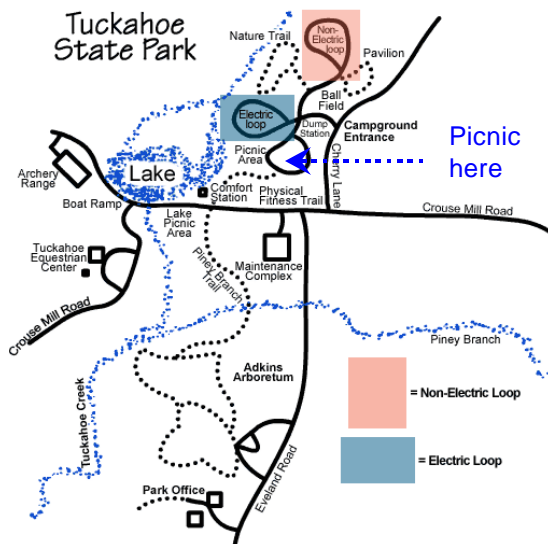
This is a complete telescope system and is ready for immediate use.

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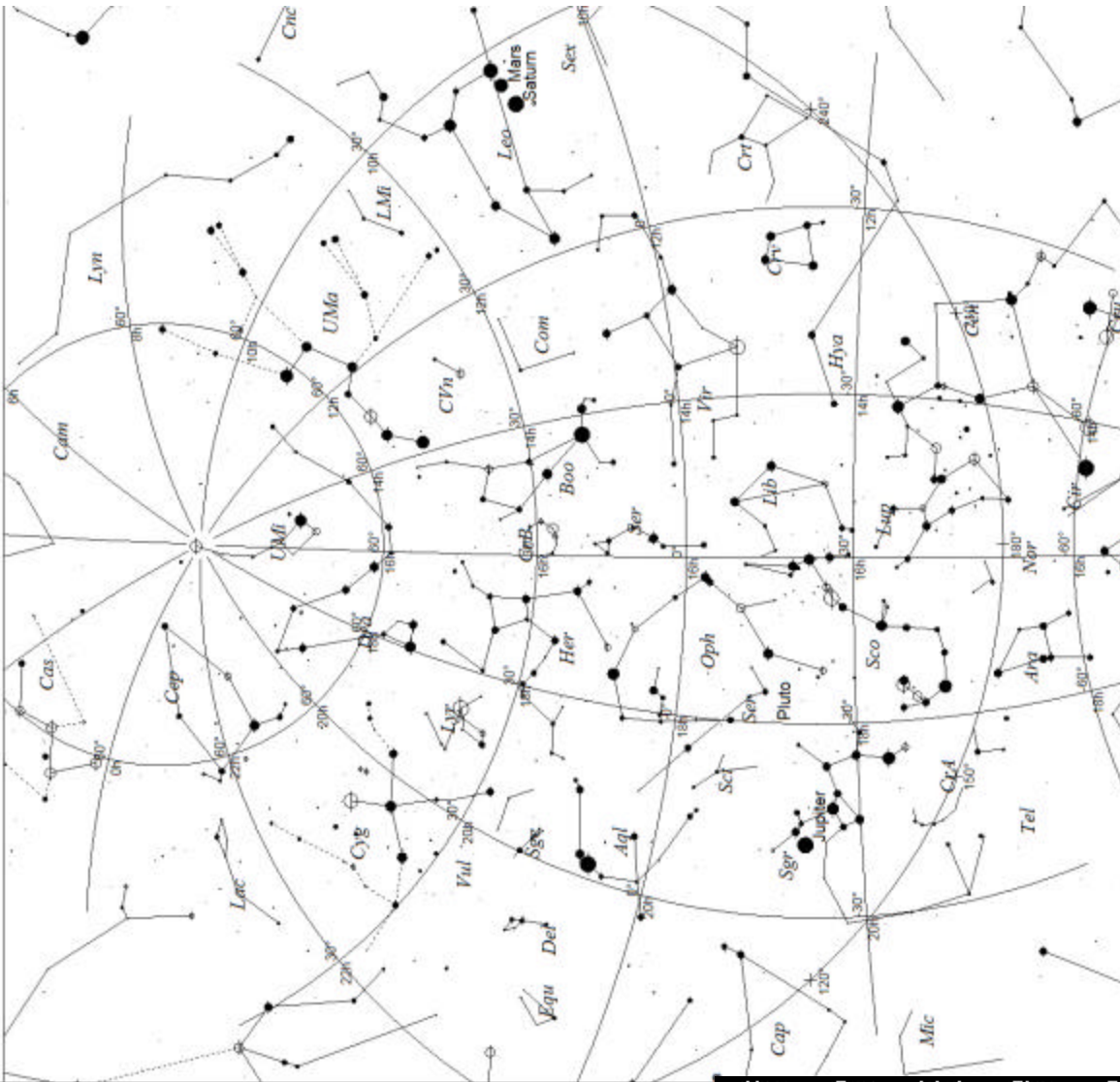
**The Stargazers Annual Picnic  
July 12th 1PM  
Tuckahoe Picnic Pavillion**

You may bring a dish or dessert, but that is not necessary. All we ask is that you bring yourself and your family. See map at right for location within Tuckahoe State Park. On the map it is the area labeled 'picnic area'.

**The Solar System in January-** Mercury is at greatest elongation West (22°) on the 1st. Venus emerges from behind the Sun and becomes our 'evening star' for the rest of the year. Mars is within 1° of Saturn on the evening of the 10<sup>th</sup>. Jupiter is at opposition on the 9<sup>th</sup>. You can watch it all night. Saturn is in Leo. Uranus is still in Aquarius. Neptune is in Capricornus and sets just after Sol. You can find the minor planet Pluto to the right of Scutum, look for it before dawn. If you're looking for Terra, check under your feet.



SkyMap 4 July 2008 10PM



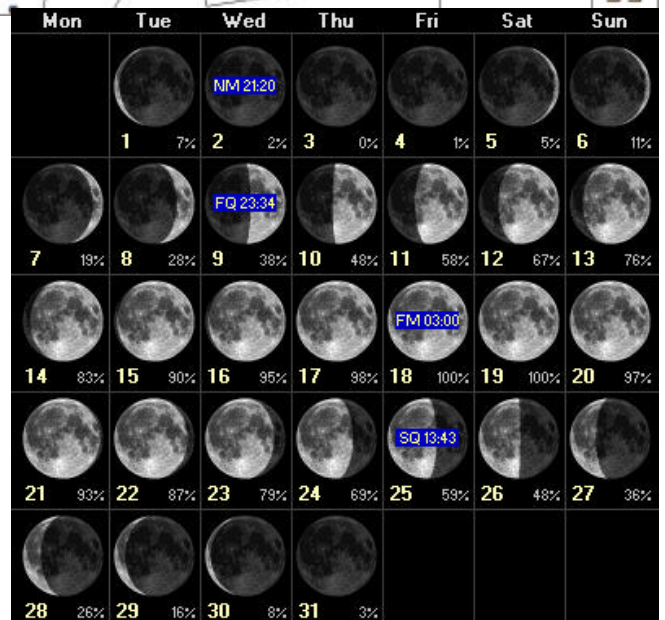
Tuckahoe State Park, MD

- STARS**
- <1
  - 1.5
  - 2
  - 2.5
  - >5
- SYMBOLS**
- Multiple star
  - Variable star
  - Comet
  - Galaxy
  - Bright nebula
  - Quasar
  - Dark nebula
  - Globular cluster
  - Open cluster
  - Planetary nebula
  - △ Radio source
  - × X-ray source
  - Other object

Local Time: 22:00:00 4-Jul-2008  
 Sidereal Time: 15:50:02  
 Location: 38° 58' 0" N 75° 56' 0" W  
 RA: 15h50m03s Dec: +23° 57' Field: 180.0°  
 UTC: 02:00:00 5-Jul-2008  
 Julian Day: 2454652.5833

Sun and Moon Data for July 2008  
 Tuckahoe MD  
 38.97°N 75.93°W 5hrW  
 Daylight Time Civil Twilight

Date	Twilight	Rise	Sun Transit	Set	Twilight	Rise	Moon Transit	Set	%
7/1/2008	5:10a	5:42a	1:08p	8:33p	9:05p	3:39a	11:37a	7:37p	3
7/2/2008	5:11a	5:43a	1:08p	8:33p	9:05p	4:45a	12:44p	8:38p	0
7/3/2008	5:11a	5:43a	1:08p	8:33p	9:05p	6:00a	1:48p	9:26p	1
7/4/2008	5:12a	5:44a	1:08p	8:33p	9:04p	7:18a	2:47p	10:04p	4
7/5/2008	5:12a	5:44a	1:08p	8:32p	9:04p	8:33a	3:41p	10:36p	9
7/6/2008	5:13a	5:45a	1:09p	8:32p	9:04p	9:45a	4:29p	11:02p	16
7/7/2008	5:14a	5:45a	1:09p	8:32p	9:03p	10:53a	5:15p	11:26p	25
7/8/2008	5:14a	5:46a	1:09p	8:32p	9:03p	11:57a	5:58p	11:49p	35
7/9/2008	5:15a	5:47a	1:09p	8:31p	9:03p	1:00p	6:40p	12:12a	45
7/10/2008	5:16a	5:47a	1:09p	8:31p	9:02p	2:01p	7:23p	12:12a	55
7/11/2008	5:17a	5:48a	1:09p	8:30p	9:02p	3:03p	8:07p	12:37a	64
7/12/2008	5:17a	5:49a	1:09p	8:30p	9:01p	4:05p	8:54p	1:05a	73
7/13/2008	5:18a	5:49a	1:10p	8:29p	9:01p	5:05p	9:42p	1:38a	81
7/14/2008	5:19a	5:50a	1:10p	8:29p	9:00p	6:02p	10:33p	2:16a	88
7/15/2008	5:20a	5:51a	1:10p	8:28p	8:59p	6:55p	11:24p	3:02a	93
7/16/2008	5:20a	5:52a	1:10p	8:28p	8:59p	7:41p	*****	3:55a	97
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7/18/2008	5:22a	5:53a	1:10p	8:26p	8:57p	8:55p	1:06a	5:56a	100
7/19/2008	5:23a	5:54a	1:10p	8:26p	8:57p	9:24p	1:54a	7:00a	98
7/20/2008	5:24a	5:55a	1:10p	8:25p	8:56p	9:50p	2:40a	8:05a	95
7/21/2008	5:25a	5:55a	1:10p	8:24p	8:55p	10:14p	3:25a	9:10a	89
7/22/2008	5:26a	5:56a	1:10p	8:24p	8:54p	10:37p	4:09a	10:15a	82
7/23/2008	5:27a	5:57a	1:10p	8:23p	8:53p	11:01p	4:53a	11:21a	73
7/24/2008	5:28a	5:58a	1:10p	8:22p	8:52p	11:28p	5:39a	12:29p	62
7/25/2008	5:28a	5:59a	1:10p	8:21p	8:51p	11:59p	6:28a	1:40p	51
7/26/2008	5:29a	6:00a	1:10p	8:20p	8:50p	*****	7:21a	2:53p	40
7/27/2008	5:30a	6:01a	1:10p	8:19p	8:49p	12:38a	8:19a	4:08p	29
7/28/2008	5:31a	6:01a	1:10p	8:19p	8:48p	1:26a	9:21a	5:20p	19
7/29/2008	5:32a	6:02a	1:10p	8:18p	8:47p	2:26a	10:25a	6:23p	11
7/30/2008	5:33a	6:03a	1:10p	8:17p	8:46p	3:36a	11:30a	7:16p	4
7/31/2008	5:34a	6:04a	1:10p	8:16p	8:45p	4:51a	12:31p	7:58p	1



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## Moondark for July: Summertime Planetary Postings

Doug Miller

[Jupiter](#) reaches opposition on the 9<sup>th</sup>, just above the [Teapot](#) of [Sagittarius](#). At a brilliant magnitude of -2.7, this giant planet will no doubt attract the gaze of many telescopic observers. Distant, point-like [Pluto](#), at only [magnitude](#) 13.8, is less than four millionths of Jupiter's brightness and over seven times as far away. Despite having reached [opposition](#) on June 20<sup>th</sup>, it represents [a far greater challenge](#) even for observers with large telescopes and dark skies.

Although the other bright planets will be in [conjunction](#) with the [Sun](#), and difficult or impossible to observe in the coming months, they will definitely not be forgotten. [Robotic exploration](#) of our [solar system](#) is in high gear, and it seems that each day that one or more of the planets [makes headlines](#).

Take for example the [Phoenix Mars Lander](#). After a [successful landing](#) on [Mars](#), mission operations have begun, marred only by [occasional communication glitches](#). I'm amazed at the timely way in which even mundane details and inevitable speed bumps are communicated to the public. In fact, the Phoenix Mars Lander [actually blogs daily](#) using [its own Twitter site](#), albeit with the assistance of a human proxy. When I read its reports, I hear the [monotone voice](#) of 2001's [Hal 9000 computer](#), don't you?

A [mysterious white material](#) has been found in trenches dug in the Martian red soil. Quite a bit excitement concerns its [apparent disappearance](#), interpreted as a [clear indication of water ice](#). Although textbooks have for some time suggested that [ice from both water and carbon dioxide](#) form Mars' polar caps, [hard evidence of water ice is significant](#). [Water is the holy grail of planetary exploration](#): its presence is an apparent [necessity for life](#), microbial as well as for [future manned colonization and exploration](#). In addition, it is a cheap and universal [rocket fuel](#).

[Cassini](#) continues its exploration of [Saturn](#) and [its moons](#). The images of the rings, subtle shades and sharp shadows on the planet, wispy ringlets and each of the [remarkable moons](#) are nothing short of spectacular. Expect more stunning images from the [next Titan flyby](#) is at the end of this month.

[Messenger](#) has already flown past [Venus](#) and [Mercury](#), with the second of three planned Mercury flybys this coming October. In 2011, the spacecraft will begin a [year-long orbit of scientific study](#). In the opposite direction relative to the Sun, [New Horizons](#) has entered its interplanetary cruise, having [just passed the orbit of Saturn](#) last month. Rendezvous with Pluto and its [three known moons](#) occurs in 2015. But is Pluto a planet or a "plutoid"? This [controversy has resurfaced](#) and [the battle lines are drawn as before](#), pitting the IAU's definition versus [Alan Stern](#) (a NASA scientist in charge of the New Horizon's mission) who leads a vocal opposition of professionals and amateur [Pluto-aficionados](#). Kidding aside, in addition to [Stern's pointed criticisms](#), I'd like to hear his new and improved definition of what makes a planet.

Other scientists stay busy studying [our home planet](#) and its [moon](#) with [robots](#) as well. [Jason 2](#), a satellite designed to monitor global sea level with unrivaled precision (an increase is a symptom of global warming) [launched this week from California](#). And also from the west coast, [Google announced a competition](#) to return to the Moon with a privately funded robot in just four years, well ahead of NASA's advertised [return of humans to the Moon](#) in 2020, at an estimated cost of [over \\$100 billion](#).

So you can see it will be a busy and exciting time for the whole solar system this [summer and fall](#). Observe Jupiter all night on any clear night, with the more distant members of the solar system for large telescopes or [early risers](#) with [Uranus](#) and [Neptune](#) in the [Watery Constellations](#). For cloudy-night astronomy, Mercury, Mars, Saturn and Pluto will surely record many hits on the Internet. To complement virtual observing with a real and much closer to home event, I look forward to the [Perseid meteors](#) in August, which peaks on the 12<sup>th</sup> with a waxing gibbous Moon setting just before optimal viewing times. If only we could be just as certain of [mosquito-](#) and [cloud-free skies!](#)

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*Ice on Mars: Now you see it, now you don't (above). (goto moondark website for active pic -ed.)*

*A myriad of rings and an icy moon Enceladus orbit Saturn (below).*



*Credits: LPL at UA and NASA*