The Guide Star

Newsletter of the Amateur Astronomers Association of Pittsburgh Inc
Founded June 9, 1929 by Chester B. Roe and Leo J. Scanlon
Website: 3ap.org

August 2012 ***Volume 46, No. 8***

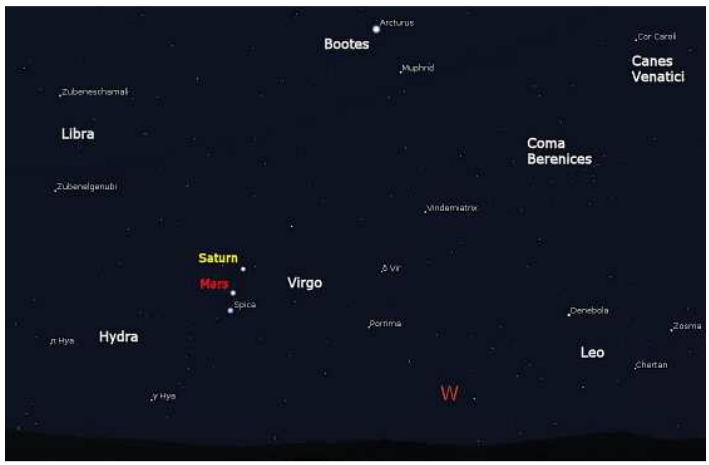
AAAP Events for August

Mingo Observatory Star Parties, August 10 & 11

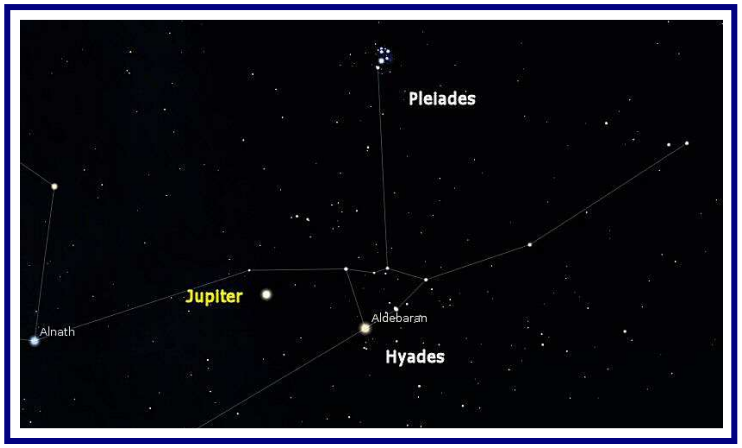
Near the height of the Perseid Meteor Shower. Mars, Saturn and Spica form a tight group low in the west just after sunset around 20:30. Neptune and Uranus are in the east. The Moon rises well after midnight on both dates.

Wagman Observatory Star Parties, August 24 & 25

A waxing Moon just past first quarter highlights southern Ophiuchus both evenings. Mars, Saturn and Spica, as mentioned above, will still be viewable just after sunset. Jupiter, in the Hyades, will rise about an hour past midnight on both evenings.



Saturn, Mars and Spica will dominate the western evening sky during the second and third weeks of August. This is how they'll appear on August 14th at 21:45 local time.



Jupiter's grand return, rising in the company of the Hyades after midnight.

The Perseids of August

Celestial events no longer punctuate our year. We tinker with clocks to mask the ebb and flow of daylight, flood every nook with glare, banishing the night.

For many people, solstices and equinoxes hint at some obscure connection between sky and season and a heliacal rising is a profoundly unfamiliar term that applies to heaven knows what.

But meteor showers continue to remind us of the regularity of the heavens that induced the ancients to record what they saw and transform mere sky watching into a science. They occupy fixed positions in our calendar and prominent showers are readily associated with particular months. August is the time of the Perseids.

Each year, Perseid activity begins on the 17th of July and runs until the 24th of August.

This year, the International Meteor organization announced two times for Perseid maximum, both on 12 August. A traditional prediction of 08:00 through 10:30 and a prediction which takes account of recent observations. This gives 03:00 through 15:30 local time.

Regardless of date however, the best viewing time is normally during the last hour before the start of morning twilight, when Perseus is highest above the horizon. This equates to around 04:00 to 05:00 on the morning of the 12th.

ZHR or zenith hourly rates sometimes list a value of 100 for the Perseids, but a more realistic maximum is in the 40 to 60 range.

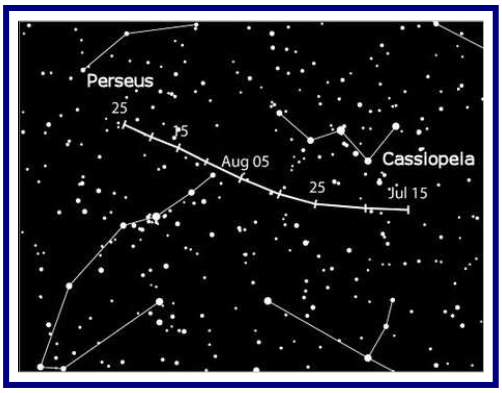
> ***Zenith hourly rate or ZHR is a somewhat idealized value. It's defined as the "number of meteors per hour which would be expected by an experienced visual observer under a perfectly clear sky with a limiting magnitude of +6.5 with the radiant directly overhead."***
>
> ***This is seldom, if ever the case. Also remember that sporadic meteors - those random meteors not attributable to any known shower - can vary in number from 3 to 4 in the spring and 8 to 10 in the fall.***

Two factors will lower this year's number. The waning crescent of the 24 day old Moon will rise in Taurus around 01:40. It will be about 35 to 40 degrees away from the Perseid radiant in northern Perseus. Not a show-stopper but not ideal either.

Further, the Perseids shower produced decent meteor activity in the 1990's due to the close approach of the parent body, Comet 109P/ Swift-Tuttle, which was recovered for observation in September 1992. This comet is thought to be the largest object to make repeated passes near our planet and one of the oldest known periodic comets, the Chinese having sighted it as long ago as 68 B.C.

But now, it is receding and the good numbers of the 90's may be history. 109P Swift Tuttle is predicted to pass quite close to us in 2126.

Members of the Perseids are bright white or yellow and usually last less than a half second. Brighter Perseids often leave a train or trail that can last one or two seconds after the meteor has disappeared. The trail consists of ionized gas generated by the meteor passing through the atmosphere at high speed.



This chart shows the drift of the Perseus radiant over the duration of the period of activity

Next Year's Star Party Schedules Announced

Following are the star party schedules for 2013:

Mingo Creek Park Observatory

Apr	19 -	20
May	17 -	18
Jun	14 -	15
Jul	12 -	13
Aug	9 -	10
Sep	7	
Sep	27	
Oct	12	
Oct	26	

Wagman Observatory

All but the Moonrise and Dark Sky events will be within days of First Quarter.

Feb	16	(Winterfest)
Apr	19 -	20
May	17 -	18
Jun	14 -	15
Jul	12 -	13
Aug	9 -	10
Sep	14	
Sep	21	(Moonrise Star Party)
Oct	12	
Oct	26	(Dark Sky Star Party)

Wagman may add dates if a spectacular celestial event or object appears. This includes comets, Near Earth Asteroids, a Milky Way Supernova, etc

July Lightning Strike at Mingo

In the week prior to July 22, Mingo Creek Observatory incurred damaged from a probable lightning strike. As of this writing, the problems are still being addressed. What follows is an assessments of the damage as posted by Mingo Director, Bill Roemer:

The damage to equipment at Mingo Creek Park Observatory as evaluated to this point is:

- 10 inch controller fried
- Computer in 10 inch room fried (We think this is how the surge reached the telescope)
- Dimmer switch in the 10 inch room fried
- 24 inch controller fried
- Dimmer switch in the 24 inch room fried
- Member's room networking switch (computers) fried
- Reception room dimmer switch fried and the PA system damaged.
- Planetarium power strip damaged (Planetarium seems okay)

The problem of having a computer connected to the 10 inch telescope will be resolved as we replace the ruined computer with a laptop (we already have it). The laptops are locked up in the members room and will not be a source of damage in the future.

We suspect the surge reached the 24 inch telescope through the ground wire. The whole-building surge protection seems okay and shows no sign of arcing or burning. The circuit-breaker panel also seems fine and no evidence of arcing.

The source of all this is a mystery. There are no visible signs of a lightning strike on the building or immediate grounds. The roof seems fine and the lightning arrestors show nothing.

The power to the building is buried for about 200 yards from the building where it rises by a pole. It is possible that a branch fell upon two lines somewhere, bringing the lines into contact, and sending a surge through the lines into the building. However, I think we should have seen some sign of that in the whole-building surge protection. We did not.

Both controllers are being send back to the manufacturers for repair/replacement.

It is possible that the control motors are also damaged, but we cannot assess that until the controllers can run the drives properly. It is possible that we can get a loaner controller for the 10 inch from Astro-Physics. We might have that telescope back in operation first. We don't need the computer anyway, as we usually just use the hand-paddle.

We are also looking into what we might add as additional layers of protection. Perhaps nothing could have stopped this surge, whether through a lightning strike or a surge through the power line. Still, we will do what we can.

NASA's Mars Science Laboratory Mission and Curiosity, the Next Generation Rover

Launched from Cape Canaveral in November of 2011, NASA's Mars Science Laboratory Mission is due place the next generation of roving vehicles on Mars at 01:31 local time on the morning of August 6th. The rover, called Curiosity, builds on the success of 2004's Mars Exploration Rovers, Spirit and Opportunity. But it differs from them in three prominent ways.

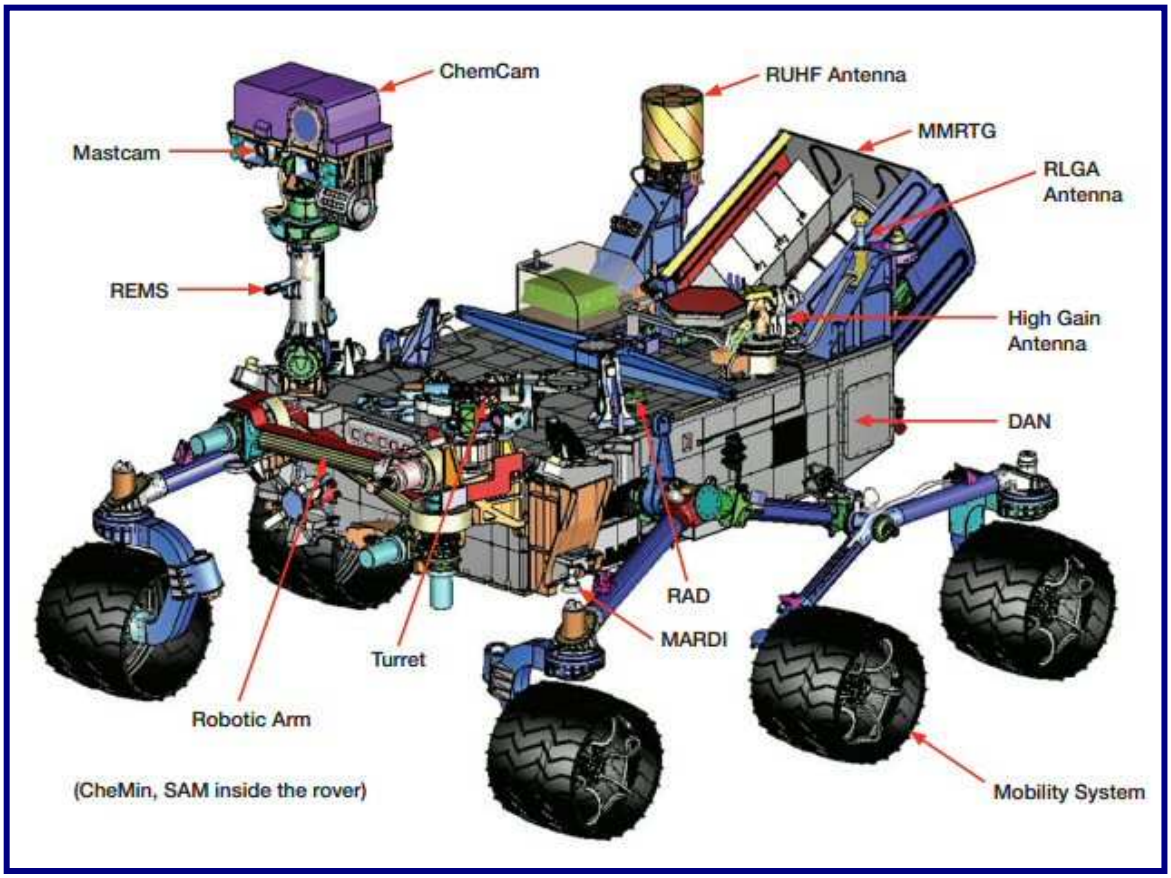
First, while the Curiosity rover has the familiar six wheels and mast-mounted camera of the earlier vehicles, it's twice as long and five times as heavy as the Exploration Rovers. This allows it to carry a number of sophisticated analytical tools.

It will collect soil and rock samples and place them in on-board test chambers for chemical analysis. A laser will vaporize a thin layer rock surfaces and analyze the elemental composition of the material. Its instruments will be able to spot organic materials like proteins and amino acids and identify other bases and acids that are associated with the carbon underpinnings of life as we understand it. Curiosity will also have the ability to recognize atmospheric gases indicative of biological activity.

How Martian Rovers have Grown. In the foreground is 1997's 2 ft long Sojourner. On the left is 2004's 5 ft long Exploration Rover and on the right, 2012's 10 foot long Mars Scientific Laboratory Rover

Locations of several science instruments and major sub-systems on the NASA Mars rover (clockwise from left):

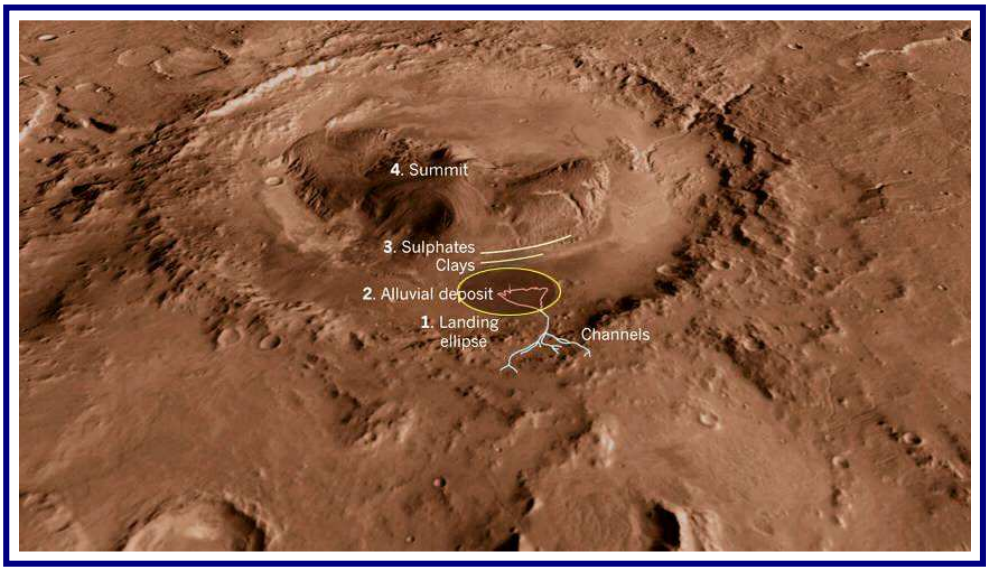
Rover Environmental Monitoring Station (REMS); Mast Camera (Mastcam); Chemistry and Camera (ChemCam); Rover ultra high-frequency (RUHF) antenna; Multi-mission radioisotope thermoelectric generator (MMRTG); Rover low-gain (RLGA) antenna; high-gain antenna; Dynamic Albedo of Neutrons (DAN); mobility system (wheels and suspension); Radiation Assessment Detector (RAD); Mars Descent Imager (MARDI); turret (see larger image for tools on the turret at the end of the robotic arm); and robotic arm. Two science instruments — Chemistry and Mineralogy (CheMin) and Sample Analysis at Mars (SAM) — are inside the body of the rover.



The second way in which the Mars Science Laboratory differs from previous craft is that it uses a guided entry technology which allows it to land more precisely than previous Mars missions. Being able to land in a chosen area, coupled with the rover's mobility means that, for the first time, the area of scientific interest can be removed from the area needed for a safe landing. NASA figures that the Mars Scientific Laboratory mission has about a 99% chance of landing within its designated 12 by 15 mile landing ellipse. This is a distinct improvement over the ellipses designated for the 2004 rover missions which were 50 miles long.

The third way in which the Mars Science Laboratory mission differs is that its target is already known to meet a condition that is conducive to supporting life - it contained water. The Martian crater Gale, 155km (or 96 miles) in diameter and located less than five degrees below the Martian equator is one of four sites nominated by a team of 150 scientists working over a period of five years. The crater floor is low lying, indicating that pooled water may once have stood in its interior.

Further Gale contains a structure of exceeding scientific interest, Aeolis Mons, a mound 18,000 feet high. The features that make it of scientific interest are visible in the following image:



Curiosity will set down in the Martian crater Gale. The crater was named in 1991 for the Australian astronomer Walter F. Gale (1865-1945). The crater itself is located close to the Martian equator and was one of four sites of scientific interest identified by a team of planetary scientists over a five year period.

Curiosity will land in the ellipse (1) which is itself of interest. Material seems to have been carried into the ellipse via channels from the crater wall, possibly by water.

The ellipse also contains a hard, light-toned rock which consists of unidentified material but it's thought that this might be sedimentary rock formed in interaction with water, perhaps salts left by the drying of a lake bed (2)

The large mound to the south of Curiosity, Aeolis Mons, is thought to contain strata of sulfates and clays that contain information about the changes in the environment that took place over long periods of time. The obvious question is was Mars more conducive to microbial life in its past. (3)

Easily visible on the northern face of the mound are fissures and canyons caused by liquid run off. Over the duration of the mission, Curiosity will investigate these formations which may have exposed layers that represent hundreds of millions of years of change. Curiosity may, with luck, scale the summit of Aeolis Mons (4) .

The majority of the project team is American, but it includes personnel and test packages from Canada, Spain and Russia.

NASA cautions: Mars Science Laboratory " ...is not a life detection mission and is not designed to detect extant vital processes that would betray present-day microbial metabolism. Nor does it have the ability to image microorganisms or their fossil equivalents. MSL does have, however, the capability to detect complex organic molecules in rocks and soils. If present, these might be of biological origin, but could also reflect the influx of carbonaceous meteorites. More indirectly, MSL will have the analytical capability to probe other less unique bio-signatures, specifically, the isotopic composition of inorganic and organic carbon in rocks and soils, particular elemental and mineralogical concentrations and abundances..."

The Mars Science Laboratory has four primary science objectives to meet the overall habitability assessment goal:

I. To assess the biological potential of at least one target environment by determining the nature and inventory of organic carbon compounds, searching for the chemical building blocks of life, and identifying features that may record the actions of biologically relevant processes

II. To characterize the geology of the landing region at all appropriate spatial scales by investigating the chemical, isotopic, and mineralogical composition of surface and near-surface materials, and interpreting the processes that have formed rocks and soils.

III. To investigate planetary processes of relevance to past habitability (including the role of water) by assessing the long timescale atmospheric evolution and determining the present state, distribution, and cycling of water and carbon dioxide.

IV. To characterize the broad spectrum of surface radiation, including galactic cosmic radiation, solar proton events, and secondary neutrons.

The Mars Science Laboratory has an estimated life expectancy of one Martian year or 687 of our days during which it will process about 70 surface samples. Extensive information is available at : http://mars.jpl.nasa.gov/files/msl/MSL_Press_Kit.pdf

- Guide Star Editor

Curious about Curiosity

Interested in Curiosity and video games?

NASA has released a suite of video games and virtual experiences for members of the general public who wish to follow the massive rover across the sands of the Red Planet. They may be accessed at

http://mars.jpl.nasa.gov/msl/participate/

The Mars rover is expected to land on Monday, Aug. 6 at 1:30 am. Watch the landing from anywhere online in real time on NASA TV

http://www.nasa.gov/multimedia/nasatv/index.html

Here in Pittsburgh join Carnegie Science Center for their observance of the landing of Curiosity.

http://www.carnegiesciencecenter.org/

See stunning computer animations and ask questions of their experts.

Pre-landing programs at the Science Center are slated on Saturday, Aug. 4 at 12:30 pm and Sunday, Aug. 5 at 1 pm.

Buhl Planetarium staff will hold its post-landing program Monday August 6 at 1 pm. Visitors will be able to experience the landing again or for the first time through videos of NASA's Mission Control Center.

- Kathy DeSantis

Mingo Observatory Shop and Swap.

As mentioned in last month's Guide Star, an astronomy equipment Shop and Swap will be held at Mingo Observatory on September 22, 2012, from noon to 18:00 (6pm), prior to the scheduled star party.

Any member interested in selling any used equipment will be able to bring their equipment to the observatory on that date. There will also be a silent auction of some of the telescopes that have accumulated at the observatories and are sitting unused and needing good homes.

Included in this newsletter is a form for listing any equipment you intend to bring to the event for sale. Please follow the directions printed on the form and return it as soon as possible.

Keep in mind, we'd like to make sure that the list of items that members will offering at the event can be published in the September Guide Star and listed online.

If you have any questions about this event, contact Michael Meteney, Assoc. Director, Mingo Observatory:

mmeteney@comcast.net

June's AAAP Star Parties

June was a busy month on the club's observatory calendars. Both facilities hosted observers who turned out for the Venus transit, while Wagman hosted the club picnic and a series of events to celebrate the observatory's anniversary.

But apart from these, the month was a successful one for the club's public outreach efforts. Normally scheduled star parties held on June 22nd and 23rd at Mingo and Wagman observatories were attended over 580 visitors, which were hosted by dozens of AAAP member volunteers.

A reminder to members. Please sign in when you assist at a club star party. Your effort is appreciated and remember, a youngster's first look through a telescope can stay with them for a lifetime

Thanks to all who gave their time and shared their enthusiasm at AAAP star party events in June:

Mingo Creek Park Observatory

June 22

Bill Roemer
Jean Roemer
Jon Johnson
John Diller
Ken Kobus
Dick Haddad
George Guzik
Nick Martch
Colleen Martch
Gene Leis
Greg Shephard
Timothy Kelly
Flo Rusch
Kathy DeSantis
Gene Kulakowski

June 23

Bill Roemer
Mike Meteney
Sam Terry
John Diller
Ken Kobus
Jon Johnson
Dick Haddad
Nick Martch
Colleen Martch
Dan Peden
Joseph Borella
Flo Rusch
Kathy DeSantis
Melody Bishop
Gene Leis
Gene Kulakowski

Wagman Observatory

June 22

Bill, Diane and Devon Yorkshire
Mike Nizinski
Tom Reiland
Bill Moutz
Maureen Moutz
Bill Hayeslip
Pete Zapadka
Eric Fischer
Lori Seitz
Frank Pastin
Rowen Poole
Mary DeVaughn
Matt Maskas
Tim Colbert
John Holtz
Don Hoecker
Jon Grimme
Matt Jones

June 23

Bill, Diane
Devon and Julie Yorkshire
Bill Hayeslip
Frank Pastin
Eric and Joyce Osborne-Fischer
Pete Zapadka
Lori Seitz
Flac Stifel
Phil Breidenbach
Terry and Joanne Trees
Bill and Maureen Moutz
Kelly Fletcher
Becky Valentine
Don Hoecker
Tim Manka
Mary DeVaughn
Jon Grimme
Matt Maskas
Matt Jones
Tom Turiak
Viola Christy
The Patrick Rieger Family
Tom Reiland

Sun	Mon	Tue	Wed	Thu	Fri	Sat
Astronomy..... is the most magnificent of the sciences. ***... Astronomy has its clear side and its luminous side; on its clear side it is tinctured with algebra, on its luminous side with poetry.*** ***Victor Hugo***			**1** 23:27 Perseid Activity July 17 to August 24 SR:06:18 SS:20:34 MR:20:03 MS:05:45 PI:98%	**2** SR:06:18 SS:20:33 MR:20:37 MS:06:54 PI:100%	**3** SR:06:19 SS:20:32 MR:21:08 MS:08:02 PI:99%	**4** SR:06:20 SS:20:31 MR:21:38 MS:09:07 PI:96%
5 SR:06:21 SS:20:29 MR:22:06 MS:10:10 PI:90%	**6** Perseid Activity July 17 to August 24 SR:06:22 SS:20:28 MR:22:34 MS:11:11 PI:84%	**7** SR:06:23 SS:20:27 MR:23:05 MS:12:11 PI:76%	**8** SR:06:24 SS:20:26 MR:23:37 MS:13:10 PI:67%	**9** 14:55 SR:06:25 SS:20:24 MR:***** MS:14:07 PI:58%	**10** Star Parties Mingo Observatory August 10 - August 11 Mars between Saturn and Spica. August 10 thru August 16. SR:06:26 SS:20:23 MR:00:13 MS:15:03 PI:48%	**11** SR:06:27 SS:20:22 MR:00:54 MS:15:55 PI:39%
12 Perseid Maximum Mars passes between Saturn and Spica. August 10 thru August 16. All are 1st magnitude and within 5^{o} . SR:06:28 SS:20:21 MR:01:40 MS:16:45 PI:30%	**13** Perseid Activity July 17 to August 24 SR:06:29 SS:20:19 MR:02:31 MS:17:30 PI:21%	**14** SR:06:30 SS:20:18 MR:03:27 MS:18:12 PI:14%	**15** SR:06:31 SS:20:16 MR:04:27 MS:18:49 PI:8%	**16** SR:06:32 SS:20:15 MR:05:30 MS:19:24 PI:3%	**17** 11:54 SR:06:33 SS:20:14 MR:06:35 MS:19:56 PI:1%	**18** SR:06:34 SS:20:12 MR:07:41 MS:20:27 PI:0%
19 SR:06:35 SS:20:11 MR:08:48 MS:20:58 PI:2%	**20** Perseid Activity July 17 to August 24 SR:06:36 SS:20:09 MR:09:57 MS:21:30 PI:7%	**21** SR:06:37 SS:20:08 MR:11:06 MS:22:05 PI:14%	**22** SR:06:38 SS:20:06 MR:12:16 MS:22:45 PI:22%	**23** SR:06:39 SS:20:05 MR:13:26 MS:23:30 PI:32%	**24** 09:53 Star Parties Wagman Observatory August 24 -August 25 SR:06:40 SS:20:03 MR:14:32 MS:***** PI:43%	**25** SR:06:41 SS:20:02 MR:15:34 MS:00:22 PI:55%
26 SR:06:42 SS:20:00 MR:16:30 MS:01:20 PI:66%	**27** SR:06:43 SS:19:59 MR:17:18 MS:02:24 PI:76%	**28** SR:06:44 SS:19:57 MR:17:59 MS:03:31 PI:85%	**29** SR:06:45 SS:19:56 MR:18:35 MS:04:39 PI:92%	**30** SR:06:46 SS:19:54 MR:19:08 MS:05:46 PI:97%	**31** 09:58 SR:06:47 SS:19:52 MR:19:38 MS:06:51 PI:99%	Times are local. SR = Sunrise, SS = Sunset, MR = Moonrise, MS = Moonset, PI = Approx. Percentage Visible Lunar Surface Illuminated Local Midnight

AAAP Events can also be found at: https://nightsky.jpl.nasa.gov/event-list.cfm?Club_ID=675&EventEra=Future

Some Solar System Highlights

Selenographic Colongitude is 71.75° at 0h UT on the first day of the month. Add 12.2° each day.

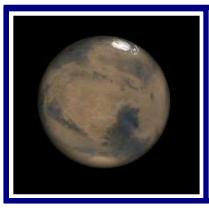
The following planetary entries include Local Rise and Set Times (for Pittsburgh) , Magnitudes and Disk diameters in Arc Seconds on the 1st, 11th, 21st and 31st days of the month.

Date	Rise	Set	Mag	Arc
1st	06:02:27	19:49:37	4.1	10.95
11th	05:08:30	19:17:34	1.1	8.70
21st	05:08:11	19:20:57	-0.6	6.54
31st	05:55:05	19:36:17	-1.4	5.34

Mercury reappears in the dawn sky by the second week of the month. It reaches greatest western elongation of 19º on the 16th with the Moon nearby. Brightening thru the month, it disappears into dawn daylight by month end.

Date	Rise	Set	Mag	Arc
1st	03:03:24	17:27:58	-4.4	27.96
11th	02:58:28	17:28:30	-4.3	24.72
21st	02:59:32	17:30:39	-4.3	22.16
31st	03:06:03	17:32:21	-4.2	20.10

Venus is in the eastern morning sky and reaches greatest western elongation of 46º on the 15th. The waning crescent Moon lies near Venus on the 13th.



Date	Rise	Set	Mag	Arc
1st	11:56:50	23:16:39	1.1	5.75
11th	11:48:20	22:51:18	1.1	5.54
21st	11:40:55	22:26:57	1.2	5.36
31st	11:34:34	22:03:44	1.2	5.20

Mars is low in the western evening sky, moving eastward in Virgo. It sets in mid-evening. In mid-month, it passes between Saturn and Spica, which are separated by 4.5º. Each of these objects will be close to first magnitude.

Date	Rise	Set	Mag	Arc
1st	01:53:17	16:32:43	-2.1	36.02
11th	01:19:53	16:01:05	-2.2	36.94
21st	00:45:49	15:28:24	-2.3	37.96
31st	00:10:57	14:54:35	-2.3	39.08

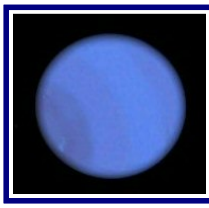
Jupiter is in the morning sky in Taurus near the Hyades star cluster.

Date	Rise	Set	Mag	Arc
1st	12:30:04	23:46:08	0.8	16.59
11th	11:54:05	23:08:16	0.8	16.34
21st	11:18:43	22:30:45	0.8	16.10
31st	10:43:54	21:53:31	0.8	15.90

Saturn low in the western evening sky. It sets in late evening.

Date	Rise	Set	Mag	Arc
1st	22:55:12	11:21:10	5.8	3.59
11th	22:15:28	10:40:55	5.8	3.61
21st	21:35:34	10:00:19	5.7	3.63
31st	20:55:32	09:19:26	5.7	3.65

Uranus rises in late evening, retrograding in Cetus.



Date	Rise	Set	Mag	Arc
1st	21:29:27	08:20:04	7.8	2.31
11th	20:49:30	07:39:26	7.8	2.31
21st	20:09:31	06:58:45	7.8	2.31
31st	19:29:31	06:18:03	7.8	2.31

Neptune is visible all night. It comes to opposition in the 24th in Aquarius.

Jupiter Activity: Satellites & the Great Red Spot

Following are times for Jovian satellite transits and occultations and Great Red Spot meridian crossings for the current month that are visible in our area.

They are organized by observing sessions beginning with the first event of interest on a given evening and continuing to Jupiter's setting or the Sun rising. Using August 29 as an example, at 04:14, Io' s shadow will begin to transit the Jovian disk (**S**). At 05:35, Io itself will transit, so both a satellite transit and a shadow transit will be in progress (**ST**). At 05:56, Europa's shadow will begin to transit the Jovian disk, giving two shadows and a satellite in transit (**SST**). At 06:24, Io's shadow will exit the disk leaving only Io itself and Europa's shadow itself in transit (**ST**). Sunrise ends the session. All times are local.

1 01:55 Jupiter Rises
05:09 GRS: Crosses Central Meridian

4 01:45 Jupiter Rises
02:39 GRS: Crosses Central Meridian

6 01:38 Jupiter Rises
02:46 Ganymede: Shadow Transit Begins **S**
03:28 Europa: Eclipsed **S**
04:06 Io : Shadow Transit Begins **SS**
04:18 GRS: Crosses Central Meridian
04:38 Ganymede: Shadow Transit Ends **S**
05:19 Io : Transit Begins **ST**
05:50 Europa: Reappears from Eclipse **ST**
05:53 Europa: Occulted **ST**
06:15 Io : Shadow Transit Ends **T**

7 01:35 Jupiter Rises
04:44 Io : Occultation Ends

8 01:31 Jupiter Rises
01:58 Io : Transit Ends **T**
03:00 Europa: Transit Ends
05:57 GRS: Crosses Central Meridian

9 01:28 Jupiter Rises
01:48 GRS: Crosses Central Meridian

11 01:21 Jupiter Rises
03:27 GRS: Crosses Central Meridian

13 01:15 Jupiter Rises
05:06 GRS: Crosses Central Meridian
05:59 Io : Shadow Transit Begins **S**
06:02 Europa: Eclipsed **S**

14 01:11 Jupiter Rises
03:13 Io : Eclipsed

15 01:08 Jupiter Rises
01:44 Io : Transit Begins **SST**
02:37 Io : Shadow Transit Ends **ST**
03:05 Europa: Shadow Transit Ends **T**
03:21 Europa: Transit Begins **TT**
03:54 Io : Transit Ends **T**
05:44 Europa: Transit Ends

16 01:04 Jupiter Rises
01:11 Io : Occultation Ends
02:36 GRS: Crosses Central Meridian

17 01:01 Jupiter Rises
01:53 Ganymede: Occulted
03:46 Ganymede: Occultation Ends

18 00:58 Jupiter Rises
04:14 GRS: Crosses Central Meridian

20 00:51 Jupiter Rises
05:53 GRS: Crosses Central Meridian

21 00:47 Jupiter Rises
01:44 GRS: Crosses Central Meridian
05:07 Io : Disappears into Eclipse

22 00:44 Jupiter Rises
02:21 Io : Shadow Transit Begins **S**
03:19 Europa: Shadow Transit Begins **SS**
03:40 Io : Transit Begins **SST**
04:31 Io : Shadow Transit Ends **ST**
05:42 Europa: Shadow Transit Ends **T**
05:50 Io : Transit Ends
06:03 Europa: Transit Begins **T**

23 00:40 Jupiter Rises
03:07 Io : Occultation Ends
03:23 GRS: Crosses Central Meridian

24 00:37 Jupiter Rises
02:28 Ganymede: Eclipse Ends
02:53 Europa: Occultation Ends
06:02 Ganymede: Occulted

25 00:33 Jupiter Rises
05:01 GRS: Crosses Central Meridian

26 00:30 Jupiter Rises
00:53 GRS: Crosses Central Meridian

27 00:26 Jupiter Rises
06:40 GRS: Crosses Central Meridian

28 00:23 Jupiter Rises
02:31 GRS: Crosses Central Meridian

29 00:19 Jupiter Rises
04:14 Io : Shadow Transit Begins **S**
05:35 Io : Transit Begins **ST**
05:56 Europa: Shadow Transit Begins **SST**
06:24 Io : Shadow Transit Ends **ST**

30 00:16 Jupiter Rises
01:30 Io : Eclipsed
04:10 GRS: Crosses Central Meridian
05:03 Io : Occultation Ends

31 00:12 Jupiter Rises
00:27 Europa: Eclipsed **ST**
00:53 Io : Shadow Transit Ends **T**
02:14 Io : Transit Ends
02:49 Europa: Eclipse End
03:08 Europa: Occulted
04:35 Ganymede: Eclipsed
05:29 Europa: Occultation Ends
06:29 Ganymede: Eclipse Ends

Suggested Deep Sky Objects for August

This table is part of a series of monthly Deep Sky targets compiled by Bob Kepple, co-author of *Night Sky Observer's Guide*. The complete set of tables, one per month, may be found at the AAAP web site : http://www.3ap.org/ under the S.I.G. link (Special Interest Group) for Deep Sky Observing.

Bob mentions that, "…objects in the … lists may be observed for about two months before and after the month they are listed… If you have a small telescope see how many objects you can find in the lists for larger scopes and, of course, individuals with larger instruments will have no trouble observing objects listed for smaller instruments…." [PA = Position Angle of second component in relation to primary, with 0^o representing North, 90^o representing East, etc.]

Objects for Binoculars							
RA	Dec	Number	Mag(s)	Size/Sep.	PA	Const.	Type of Object
$20^h\ 18.1^m$	-12° 33'	Alpha-1 & 2	3.6, 4.2	378"	291°	Cap	Double Star
$20^h\ 21.0^m$	-14° 47'	Beta Cap	3.4, 6.2	205.3"	267°	Cap	Double Star
$20^h\ 23.9^m$	+38° 32'	M29	6.6v	6'		Cyg	Open Cluster 50*
$21^h\ 30.0^m$	+12° 10'	M15	6.0v	12.3'		Peg	Globular Cluster
$21^h\ 32.2^m$	+48° 26'	M39	4.6v	31'		Cyg	Open Cluster 30*
$21^h\ 33.5^m$	-00° 49'	M2	6.4v	12.9'		Aqr	Globular Cluster
Objects for Small Telescopes (2-6 inch)							
RA	Dec	Number	Mag(s)	Size/Sep.	PA	Const.	Type of Object
$19^h\ 30.7^m$	+27° 58'	Beta Cyg	3.1, 5.1	34"	54°	Cyg	Double Star, "Albireo"
$19^h\ 44.8^m$	+50° 31'	NGC 6826	8.8v	>25"		Cyg	"Blinking Planetary" Nebula
$20^h\ 46.7^m$	+16° 07'	Gamma Cyg	4.3, 5.1	9.6"	268°	Del	Double Star
$21^h\ 43.5^m$	+53° 47'	Mu Cep	3.4, 5.1	730 days	Var.°	Cep	"Herschel's Garnet Star"
$22^h\ 15.3^m$	+49° 53'	NGC 7243	6.4v	21'		Lac	Open Cluster 40*
$23^h\ 11.5^m$	+60° 34'	NGC 7510	7.9v	4'		Cep	Open Cluster 60*
Objects for Medium Telescopes (8-14 inch)							
RA	Dec	Number	Mag(s)	Size/Sep.	PA	Const.	Type of Object
$19^h\ 41.3^m$	+40° 11'	NGC 6819	73.v	9.5'		Cyg	Open Cluster
$20^h\ 22.4^m$	+20° 05'	NGC 6905	11.1v	39'		Del	"Blue Flash" Plan. Neb.
$20^h\ 23.1^m$	+40° 52'	NGC 6910	7.4v	7'		Cyg	Open Cluster 50
$20^h\ 45.7^m$	+30° 43'	NGC 6960	-	70' x 6'		Cyg	"Veil Nebula", W. Segment"
$20^h\ 56.4^m$	+31° 43'	NGC 6992-95	-	60' x 8'		Cyg	"Veil Nebula", E. Segment
$22^h\ 10.5^m$	+52° 50'	IC 1434	9.0p	7'		Lac	Open Cluster 40*
Objects for Larger Telescopes (16-inch & larger) Challenge Objects							
RA	Dec	Number	Mag(s)	Size/Sep.	PA	Const.	Type of Object
$20^h\ 12.0^m$	+38° 21'	NGC 6888	-	18' x 13'		Cyg	"Crescent Nebula"
$20^h\ 16.4^m$	+30° 34'	NGC 6894	12.3v	>42"		Cyg	Planetary Nebula
$21^h\ 00.6^m$	+54° 33'	NGC 7008	10.7v	83"		Cyg	Planetary Nebula
$21^h\ 04.2^m$	-11° 22'	NGC 7009	8.3p	>25'		Aqr	"Saturn Nebula"
$22^h\ 54.3^m$	+60° 50'	NGC 7419	13.0p	2'		Cep	Open Cluster 40*
$00^h\ 44.4^m$	+85° 20'	NGC 188	8.1v	13'		Cep	Open Cluster 120*

2012 Star Party Dates

Mingo Observatory

August	10 – 11
September	8 – 22
October	6 – 20

Wagman Observatory

August	24 – 25
September	8 * – 22
October	6 * – 20

* Moonrise

Guide Star Submissions:

All AAAP members are encouraged to submit items to the club newsletter. Articles, images, observations, notices, ads, book, software and equipment reviews, all are welcome.

The Guide Star is posted online at month's end to both the club web site and the file section of the Yahoo Group AAAPgh.

Please submit items as early as possible for inclusion in the coming issue. Forward submissions or questions to: gseditor@3ap.org

Membership Information

AAAP Member Dues:	$ 24.00
Student Membership (K-12 & full time college student):	$ 16.00
Family Membership	$ 40.00

Basic Procedure for Paying Dues:

1. Make check payable to "AAAP Inc."
2. Send check to: Nate Brandt, Treasurer
   2520 Campmeeting Rd.
   Sewickley, PA 15143-9104

Membership Renewal Form can be found at:

http://www.3ap.org/AAAP_Mem_RenForm_2012.pdf

New Membership Form can be found at:

http://www.3ap.org/AAAP_New_MemForm_2012.pdf

AAAP Welcomes Our New Members

Erik Edwards
Denise C. Galuppo
Caroline L. Hopper
Thomas M. McClure
Annette McLeod
Nicholas Nowlin
Daniel J. Thomas

Amateur Astronomers Association of Pittsburgh, Inc.

Executive Committee

2012-2013 Elected Officers

President:	John Holtz president@3ap.org
Vice-President:	Terry Trees vicepresident@3ap.org
Treasurer:	Nate Brandt treasurer@3ap.org
Corresponding Sec:	Kelly Fletcher correspondingsecretary@3ap.org
Recording Sec:	Diane Yorkshire recordingsecretary@3ap.org
Membership Sec:	Don Hoecker membershipsecretary@3ap.org
Guide Star Editor:	John Cheng gseditor@3ap.org

Facility Directors

Mingo Creek Park Observatory

Director: Bill Roemer
Assistant Director: Gene Kulakowski
Assistant Director: Mike Meteney

Wagman Observatory

Director: Tom Reiland
Assistant Director: Rowen Poole
Assistant Director: Bill Yorkshire

Executive Committee Appointees

Eric Fischer
Joyce Osborne-Fischer
Bill Moutz
Chris Mullin

Mingo Observatory Swap and Shop

September 22nd

Noon to 6:00pm

Star party to follow

If you are planning on bringing your own equipment to sell, please fill out the following form so that we can accommodate you and we can advertise in the September Guide Star the kind of equipment people will be bringing. Send the completed form to Mike Meteney at the address below by August 20th to make the September Guide Star publishing.

Name _____ Phone Number_____

List of equipment that you plan on selling at the Swap and Shop:

Send this information to: Michael Meteney
1070 Sugar Run Road
Venetia, PA 15367

Or email to: mmeteney@comcast.net