The ECLIPSE

July 2018

The Newsletter of the Barnard-Seyfert Astronomical Society

Next Membership Meeting:
July 18, 2018, 7:30 pm

Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

Topic TBD

In this Issue:

Barnard-Seyfert Astronomical Society
bsasnashville.com

From the President

Greetings,

If you only attend one BSAS star party this year, choosing to go to Bells Bend Outdoor Center on July 20th would be a great decision. The reason is simple. Come out for absolutely great views of Mars, weather permitting. Hopefully you attended our December, 2017 meeting when Lonnie Puterbaugh gave us a great overview of this event. As a reminder, the red planet takes about two years to orbit the sun. So, with Earth's orbit taking just one year, opposition for Mars, when Earth passes between Mars and the sun occurs about every two years. The last opposition was in May, 2016. Opposition this year occurs on July 27, and closest approach on July 31. But this is not an ordinary opposition. This will be a perihelic opposition. As most of you now, perhelic refers to the point in the planet's orbit when it is closest to the sun. That means Earth and Mars will be closest as well. How close? On average, Mars is about 140 million miles away. It's greatest distance from Earth is around 250,000 million miles. On June 26 it will be just 44 million miles away and on July 31, a mere 35.8 million miles. Looking back nearly 60,000 years, Mars was only closer than that one time, in 2003 when it was 34.6 million miles from Earth. According to NASA, you will need to wait until the year 2287 when that record will be broken.

Here is a link to a fairly good article by Jeffrey Beish you may find informative:

alpo-astronomy.org/jbeish/2018_MARS.htm

I'm hoping to see the bright white south polar region and dust storms which are likely observable according to Beish.

We are expecting a large crowd that night, so please come and support BSAS. We could use lots of telescopes. But it does not matter if you have a telescope or not, please come and enjoy

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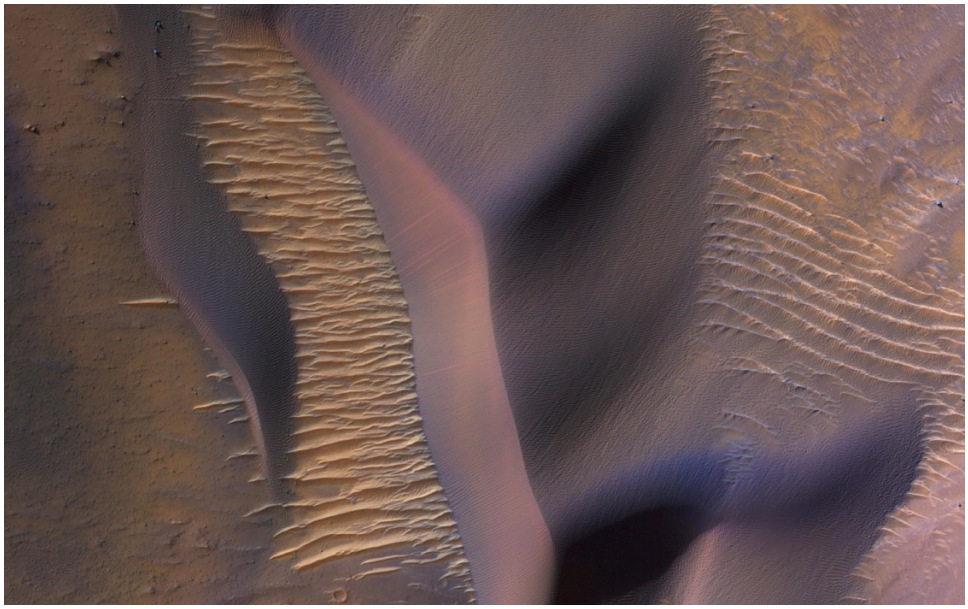


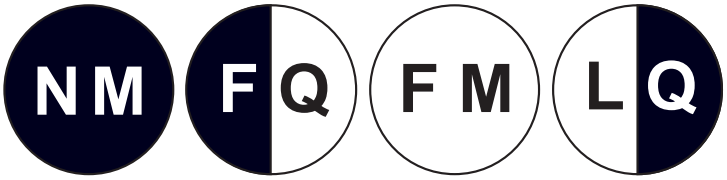
This image from NASA's Mars Reconnaissance Orbiter (MRO) shows sand dunes on the slopes of Nectaris Montes within Coprates Chasma. Sand dunes in Valles Marineris can be impressive in size, with steep slopes that seem to climb and descend.

The brighter bedforms are inactive while the bigger dunes move over the landscape, burying and exhuming the surface.

NASA/JPL-Caltech/Univ. of Arizona

Upcoming Star Parties

Saturday 7/14	Private Star Party Natchez Trace Parkway mile marker 435.3
Friday 7/20 9:00 pm to midnight	Public Star Party Bells Bend Outdoor Center
Saturday 8/11	Private Star Party Natchez Trace Parkway mile marker 412 (Water Valley Overlook)
Friday 8/17 8:30 pm to 10:30 pm	Public Star Party Bowie Nature Park (Fairview)



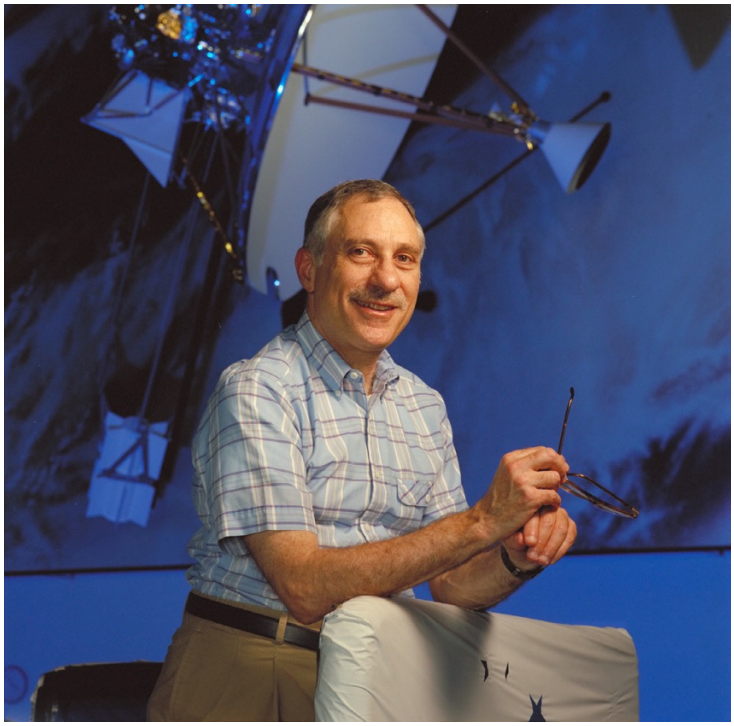
Jul 12
Aug 11

Jul 19
Aug 18

Jul 27
Aug 26

Jul 6
Aug 4

Happy Birthday James B. Pollack
by Robin Byrne



This month, we celebrate the life of a man whose name may not be well known, but whose contributions to astronomy are.

James Pollack was born July 9, 1938 in New York City. He grew up in Woodmere, Long Island with his parents, Michael and Jeanne. His father ran a family-owned clothing business called Pollack's, which had been in operation since the the early 1900's. As a child, James had trouble speaking, which caused his parents and teachers to wonder if he had a mental disability. After being examined by a psychologist, it was determined that because he thought so quickly, he had trouble keeping up when trying to speak. He had to teach himself to speak slowly in order to say exactly what he was thinking. During his childhood, James made model rockets in his basement, enjoying the experimentation. While attending Lawrence High School, in Lawrence Long Island, James ran track, but was also a strong student, ultimately graduating valedictorian.

James went to Princeton College for his undergraduate work. There, when he wasn't studying, James worked on the college humor magazine; he would be known for his sense of humor all of his life. At Princeton, James was a member of the Phi Beta Kappa honor society and graduated magna cum laude with a degree in physics in 1960. James then went to Berkeley, where he obtained his Masters degree in nuclear physics in 1962. Finally, James went to Harvard to work on his PhD in astronomy. It was at Harvard that James began his work with Carl Sagan, who was his adviser. Sagan recognized Pollack's potential, describing him as "bright and thoroughly imaginative, with keen physical insight and a significant ability to choose the most felicitous approaches to complex problems in mathematical physics." James was never secretive about the fact that he was gay. While at Harvard, his lover encountered trouble obtaining care at the school's health services emergency room. Sagan was the one who came forward to help clear things up as an advocate for the couple. James received his PhD in 1965.

At first, Pollack remained at Harvard working with Sagan, but in 1970, NASA's Ames Research Center located at Moffett Field, California lured him away. Pollack would remain at Ames for the remainder of his life, eventually rising to the title of Senior Research Scientist in the Space Science Division. Here he had the opportunity to work with large computers to perform numerical modeling of various characteristics of planets. He also would be involved with almost every NASA planetary mission, including: Mariner 9, Viking, Voyager, Pioneer Venus, Mars Observer, Galileo, and Cassini. Additionally, Pollack worked with the Kuiper Airborne Observatory data related to a variety of planetary characteristics, including: the composition of Venus' clouds, the composition of the soil and dust on Mars, and the size of particles in Saturn's rings.

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James B. Pollack, continued

Ray Reynolds, who was the person responsible for luring Pollack to Ames, was studying the formation of gas giant planets. Pollack quickly joined the team, and he created the first models in any detail to describe the steps in the formation process. The idea was to assume that forming gas giants are much like forming stars and that this will influence the heat generated during the formation process. They then used that heat to help explain the various compositions of the larger moons of Jupiter. The moons closer to Jupiter, having formed where it was hotter, would be composed of little to no ice compared to the more distant moons. The final version of this model was published in 1996 in the paper titled "On the Formation of Giant Planets" by Pollack, et al. This is considered the standard model for gas planet formation.

In addition to Jupiter, Pollack also explored Saturn, but focusing on the ring system. One enigma had to do with the fact that the rings are strong reflectors of radar signals, but they don't emit any radio waves. Most people approached this in terms of strange materials that could explain the behavior, but Pollack had a different idea. He speculated that the rings were primarily water ice, and instead looked at the behavior based on how big the ice particles would need to be. Pollack and Jeff Cuzzi proposed that the ice particles would behave this way if they were in the size range of centimeters up to meters. When Voyagers 1 and 2 flew past Saturn, their hypothesis was confirmed.

James also studied the atmosphere of Mars. Starting with data from Mariner 9, and later from Viking, Pollack was able to model how the atmosphere circulates. From his models, we now have a more complete understanding of the winds and pressure patterns on Mars, as well as of the global dust storms. These models have since been used by every mission to Mars, especially those that involved a lander. Pollack was also investigated the possibility of terraforming Mars, that is, introducing plant life to slowly alter the atmosphere of Mars into one more like Earth's.

Pollack's work with planetary atmospheres went beyond Mars, though. He studied the various processes that are involved in the formation of an atmosphere around a terrestrial planet. What's happening on the planet's surface plays a role, with such things as outgassing from the cooling crust, volcanic eruptions, and asteroid impacts all having an effect on the resulting atmosphere. His models are still the basis of much of the work that continues to be pursued in this area.

Inevitably, studying the atmospheres of other planets led to studying Earth's own atmosphere. When studying Venus, Pollack was among the first to consider the greenhouse effect as the source for Venus' extremely high temperatures. Applying this to Earth, Pollack showed that with increasing greenhouse gasses, Earth could become more like Venus, with unlivable temperatures and sulfuric acid rain.

Next he looked at the effect on Earth's atmosphere that would have occurred from the asteroid impact that killed the dinosaurs. Modeling the amount of debris that would have been thrown into the upper atmosphere, it would have blocked sunlight, throwing Earth into a perpetual winter for many years. Working along with Carl Sagan and others, Pollack then applied this to the possibility of what would happen to Earth in the event of a nuclear war. With similar amounts of debris being blasted into the atmosphere, they proposed that the result would be a "nuclear winter." Their paper, titled "Nuclear Winter: Global Consequences of Multiple Nuclear Explosions," was published in the journal Science in 1983 and was one of the catalysts for the anti-nukes movement. However, by 1990, the team reassessed their model and conceded that the severity of the nuclear winter scenario would not be as extreme as they had originally concluded.

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James B. Pollack, continued

When not revolutionizing planetary science, James was a lover of playing tennis and basketball, and a reader of science fiction. His long-time partner Bruce Hassell shared his love of opera, especially Wagner. In the early 1990's, Jim was diagnosed with Chordoma, a rare form of cancer that attacks the spine. With the support of Bruce and his colleagues, James continued to work up until the end. He died June 13, 1994 at the age of 55. The following year, the International Astronomical Union honored him by naming a crater on Mars after him: the Pollack Crater. With the opposition of Mars this summer, what better way to remember this month's honoree than to observe Mars in all its glory and think about the man who helped us understand not only Mars, but most of the planets in our solar system.

References:

James B. Pollack Obituary AAS by Jeffrey N. Cuzzi

James B. Pollack NASA Ames Hall of Fame

James Pollack, a Top Researcher in Space Science, Is Dead at 55 by Eric Pace New York Times

James B. Pollack Wikipedia

This image shows the galaxy NGC 6744, about 30 million light-years away. It is one of 50 galaxies observed as part of the Hubble Space Telescope's Legacy ExtraGalactic UV Survey (LEGUS), the sharpest, most comprehensive ultraviolet-light survey of star-forming galaxies in the nearby Universe, offering an extensive resource for understanding the complexities of star formation and galaxy evolution.
The image is a composite using both ultraviolet light and visible light, gathered with Hubble's Wide Field Camera 3 and Advanced Camera for Surveys.

Credit:
NASA, ESA, and the LEGUS team

DEEP SKY DAZE
by Mike Benson

July's early evening sky has lots of planets. In the first half of the month, Mercury is low on the western horizon as the sun's glow fades. Venus is bright, near Regulus in Leo. Jupiter is high in the south and the shrinking, Great Red Spot has really turned red for the first time in years. Mars is at opposition and will be high enough for observing from 9-10 on.

This month's star hop includes three named diffuse nebulae, twelve open clusters (one possibly a "star cloud"), twenty globular clusters, and one planetary nebula. They are located in Ophiuchus, Scorpius, and Saggitarius. We're at the heart of the Milky Way and there is a LOT to see. This ramble may require more than one night's viewing. Twenty-three are Messier objects and thirteen are NGC objects and most of these are on the AL's Herschel 400 list. The best times for deep sky work will beafter Independence Day and before the middle if the month.

Start by finding Ophiuchus, south of Hercules. Along the base of the Serpent Bearer is a broad, curving line of stars like a smile on a Happy Face. The brightest of these is 2nd magnitude, Epsilon (ε) Ophiuchi, also called Sabik, "the preceding one." If you have really stable viewing and good clean optics you may want to try to split the two almost equally bright components, which are separated by about 1" of arc. Almost due east about 6° is 3.6 magnitude, Xi (ξ) Serpentis, in the tail of the snake held by Ophiuchus. Somewhat fainter is Omicron (o) Serpentis, about 2.5° NNE. Split the difference between these two stars and swing due east about 9° and you are on top of **M-16 (NGC 6611)**. It's a 6th magnitude open cluster surrounded by a 7th magnitude haze of nebulosity. The cluster is about a quarter the diameter of a full moon and the nebulosity may stretch about 45" in some scopes under dark, transparent skies. Called the "**Eagle Cluster**" by most, Burnham's Celestial Handbook referrs to it as "Star Queen." Both seem appropriate in different settings. This is, of course, the site of the incredible Hubble Space Telescope image of the light year-long columns of dust and gas sprouting little fingers with newly exposed stars in the birth process. In any case, a clear night and a nebula filter, coupled with high magnification, will reveal a lot of detail. Patience will be well rewarded here.


M-16 and M-17

Two degrees south and a half degree east brings you to Sagittarius, and the "Omega", or "Swan" nebula. This is **M-17 (NGC 6618)**, another stellar nursery. At 6.0 visual magnitude, it's bright, and also reveals

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DEEP SKY DAZE, continued

a lot of detail with a nebula filter. 8" scopes frequently suggest a sort of celestial check mark, rather than a bird or a Greek letter. In a 10" under superbly transparent skies at the Grand Canyon, the Swan was clear and there were hints of the arc to complete the "Ω"

Now center on the 5th magnitude star to the NW and drop due south just over a degree to **M-18 (NGC 6613)**. This one doesn't move me a lot. It's an open cluster about 7' in diameter with about a dozen visible members and a total magnitude of about 8. The big concern here is not to overrun it on the trip south to the next object, the Little Star Cloud, which covers an area about 2 1/4 degrees long and 1 1/3 degrees wide. This haze of stars forms a backdrop to **NGC 6603** a galactic cluster located a bit east of the center of the cloud. There is some controversy over whether the Messier number (**M-24**) belongs to the cluster or the cloud, but when confronted by beauty like this, WHO CARES? Feast your eyes, folks!

About 4° due west of the southern part of the star cloud (which is aligned NE-SW on its long axis), is **M-23 (NGC 6494)**. It's big–about the diameter of the moon–and bright (5.5 magnitude). The sky is crowded with stars and it may be difficult to pick this open cluster out of the background. I saw several streams of nearly parallel stars. The stars were pretty evenly scattered across the field. As big as it is, use low power.

At this point you are at -19°. Maintaining that declination, return to the star cloud and continue east about 4° where you will find **M-25 (IC 4725)** which is another large open cluster with some very pretty strings of stars. Like M-23 it is large and sparse. It does not stand up to magnification, but it makes up for its lack of density, in the variation of the color of the stars.

Back to the Star Cloud again–the SW corner–and south about 2° to Mu (μ) Sagittarii. About 1/2° SSW is **NGC 6568**, a large open cluster with 50-60 stars visible in my 8" down to 13th magnitude, in an area about a quarter degree in diameter. This and the next cluster are Herschel 400 Club objects.

NGC 6583 lies about a degree SE of 6568, with about half the number of stars all packed into a 2' diameter package. It could easily be taken for a poor man's globular cluster.

Just less than 3° west and a tad south is **M-21 (NGC 6531)**. It's about 10' in diameter and very neat and tidy with over 50 stars 12th magnitude and brighter. Take your time with it; it's full of little surprises!

Next is **M-20 (NGC 6514)**, the "Trifid" nebula. It's 3/4° SW of M-21. If you've done any deep sky work before, this is probably already an old friend. It's one of my favorite objects in the sky, with lots of dark lanes and texture. If you spend less than an hour on it, you haven't really seen it.

Odds are that when you turned your telescope on that area of the sky, the first thing that you noticed wasn't M-20, but the Lagoon Nebula (**M-8**), which is over three times the size of M-20. At 5th magnitude, it's four magnitudes brighter, as well. The entire complex is called **NGC 6523**; within the nebula is the galactic cluster (**NGC 6530**) which provides the energy illuminating the immense cloud

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DEEP SKY DAZE, continued

of gasses. These gasses, in turn, are busily spawning stars. On a good night you can find M-8 with the naked eye without difficulty from a dark site. Like the Orion Nebula, the Lagoon is full of detail and is one of those objects one can't help returning to over and over. Every time you look, something new catches the eye. Take your time! There is nebulosity on top of nebulosity; dark nebulae; Bok globules; star clusters; filaments resembling cirrus clouds–all are there for the careful searcher.

A little over a half degree SE of the Lagoon is **NGC 6544**, a small (1' diameter), distant, globular cluster. It's about 9th magnitude. Continuing in the same direction another degree brings you to **NGC 6553**. It's about twice the diameter of 6544, but a magnitude fainter. Spreading the light over the larger area and noting that you are peering at it in one of the brighter portions of the sky, it's hard to find. Both are members of the AL's Herschel 400 list.

M-28

Now slide back up to NGC 6544 and set it in the southern portion of an ocular that gives you about 1/2-1/4° field of view. Shift the telescope due East almost 4° and you have 8.5 Mag, **M-28 (NGC 6626)**. This pretty globular cluster is about 15' in diameter. Another way to zero in on this one is to find the top star in the lid of the Teapot, Lambda (λ) Sagittarii. M-28 is about a degree NW of λ. Like most globulars, this one takes power well. At 200X I began to get some resolution in this dense, fuzzy little ball. When you're ready, shift back to λ. East and just a tad south is another small Herschel 400 globular, **NGC 6638**. It's about 9.5 Mag and on a good night shows some resolution at the edges of the cluster at about 170X. And if you're a real deep sky nut, you may want to try for **NGC 6644**, a planetary nebula a half degree NE of 6638. It was a real treasure hunt on a clear night. I finally got enough contrast at 200X with a nebula filter. No points for Messier's or Herschel's; just the knowledge that you've succeeded in a difficult hunt.

M-22 is next. There will be no problem finding it. If you have succeeded in finding NGC 6644, just shift about a degree and a quarter NE or look through your finder scope; it should be easy to spot in the same finder field. If you are still at M-28, shift north a degree and east about 3°. Also known as NGC 6656, this globular cluster is just a bit larger, than M-28, but at 6.6 magnitude, it's two magnitudes brighter and a lot less dense. Achieving resolution of the brighter stars is not at all difficult. A mist of unresolved cluster stars makes a beautiful backdrop for this, one of the closest of the globulars. Its total brightness exceeds M-13 in Hercules, which it resembles.

Next we head toward M-69, but before we get there, a brief stopover at NGC 6624 is in order. This 8.5 magnitude, Herschel 400, faint fuzzy is actually another globular cluster with a diameter of about 3'. It's easy to find. Look for Delta (δ) Sagittarii which marks the western edge of the Teapot's lid–the one nearest the spout. The globular is a bit over a half degree SE of δ. The best you will probably get

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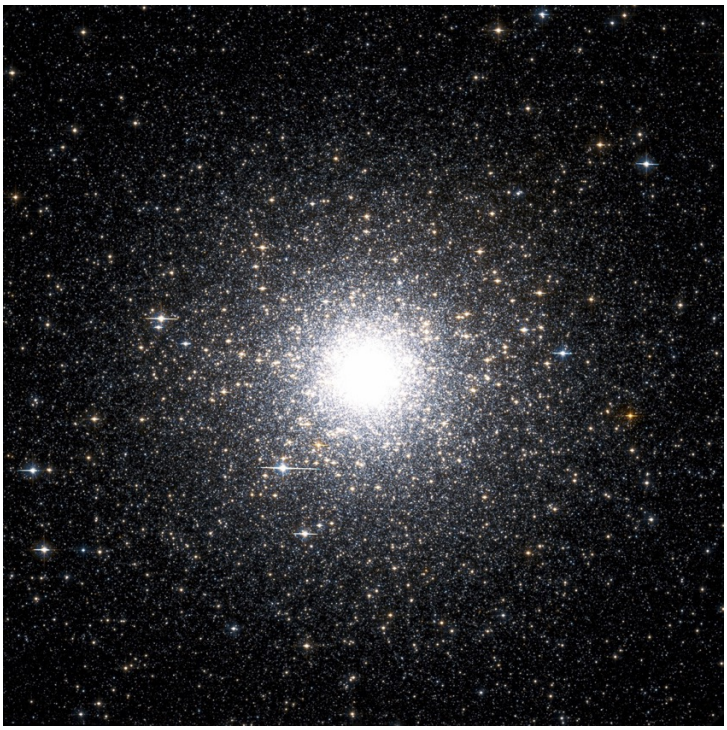
DEEP SKY DAZE, continued

is a diffuse glow with a somewhat brighter core. **M-69 (NGC 6637)** is a magnitude brighter and a bit larger, and it's located 2.5° further SE from δ. The three objects are almost in a straight line. Clint Bach, a Knoxville friend, got a bit of resolution at 85X in a 12.5" Dob. My 8" SCT showed no resolution at 200X under similar seeing conditions. There is much condensation toward the center of the cluster.

M-70 (NGC 6681) is 3° due east of M-69, very similar in size and density. There is a neat little row of stars just to the SE of this fuzz ball.



M-54

Next is **M-54 (NGC 6715)**, located about two-thirds of the distance between M-70 and Zeta (ζ) Sagittarii–the base of the Teapot nearest the handle. About 6' in diameter, this globular has a very dense core surrounded by a faint haze. Just to show what different instruments can do under varying sky conditions, Clint had no resolution in his 12.5 at 85X in average transparency, while my 8", under very transparent skies was able to resolve a few stars at 200X.

This group makes a very nice contrast to **M-55 (NGC 6809)**, our next object. To find it drop in a low power ocular and put M-54 in the north part of the field. Then swing due east 10 degrees. It's 2 1/2 diameters larger and quite faint. M-55 is not as dense and the result is that you can achieve considerable resolution, even at moderate power.

You will probably need a star chart for this next one. A star hop would take more words than I have available. In essence, starting at M-55 go east 6° and north 9°. There, on the Capricornus border, is **M-75 (NGC 6864)**. This is another small, dense cluster with little resolution. It's 8 magnitudes are spread over 3' of arc, so it is quite bright.

At twilight a glance to the south will show Scorpius, already beginning to drop toward the west, with Ophiuchus just to the north. Our next part of this month's perambulation through the starry firmament won't stray from the bounds of these constellations. Specifically, we'll be in the eastern reaches of Scorpius and the more southerly parts of the "Serpent Bearer".

We'll start in the deep south by following the curve of the Scorpion's tail all the way to the end where the two nearby stars, Gamma (γ) and Upsilon (υ), mark the location of the stinger. The proper names for them are Shaula and Lesath, respectively; both mean "sting." Due east about three degrees is a 3rd magnitude, star with the letter designation "G". (It's interesting that all of the Greek letters denoting the brighter stars have been used in Scorpius and, having moved into the upper-case Roman letters, we've

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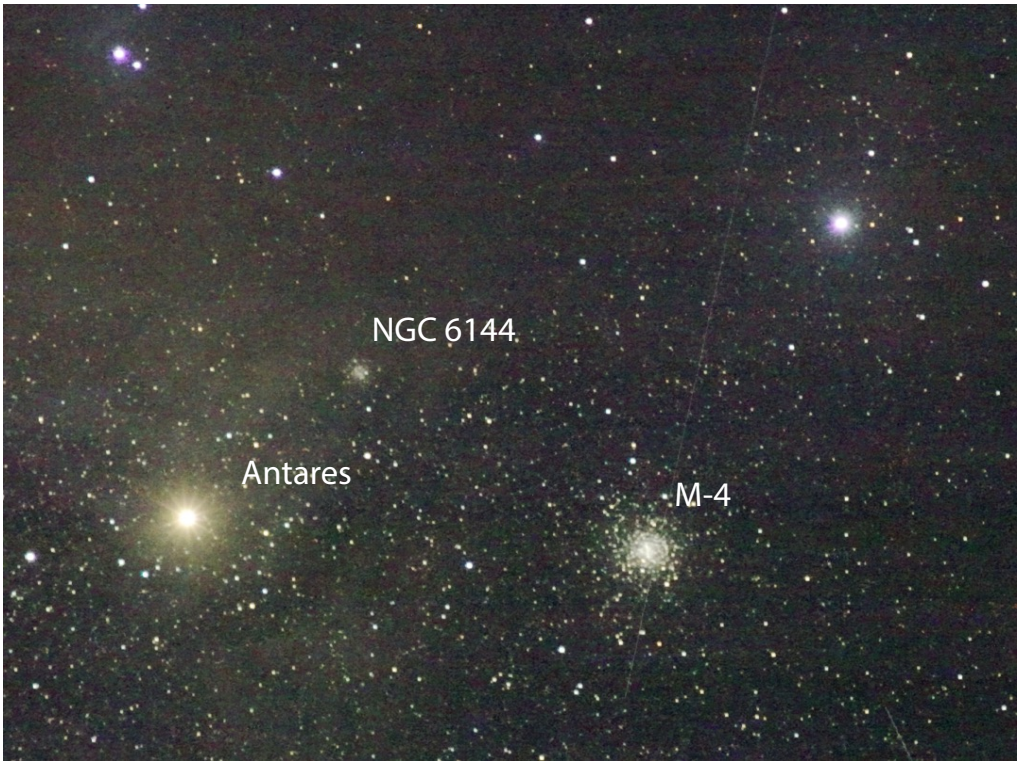
DEEP SKY DAZE, continued

only reached stars at 3rd magnitude. This is a BUSY part of the sky, folks!). A few arc minutes east of this star take a look at **NGC 6441**, an 8th magnitude globular cluster with a diameter of about 3'. I've tried up to 250X on this one without even a hint of resolution. NNE about 2° puts you in the middle of **M-7 (NGC 6475)**. This galactic cluster is a degree in diameter and is, in fact, visible to the naked eye in a moderately good sky. I actually preferred the view through the finder, which helped in picking the cluster out of the background. There are several arcs and strings of stars in this cluster which includes over 50 stars brighter than 11th magnitude. There's another small globular about 30' WNW of the cluster's center, **NGC 6444**, which is about 1' in diameter.

A move 3.5° NW brings you to **M-6 (NGC 6405)**, sometimes called the "Butterfly Cluster." Less than half the size of M-7, this open cluster is listed as half a magnitude brighter. 80-100X reveals long strings of stars which seem to converge toward the center of the cluster, but I can only see the butterfly asterism in photographs.



Antares, M-4, and NGC 6144

The next move takes us about halfway between M-6 and Antares, the heart of the scorpion, and a bit south of a line drawn between them. This line cuts off a tiny segment of southwestern Ophiuchus, and in that small area is **M-62 (NGC 6266)**. At 6.5 magnitude and about a third the diameter of the full moon, this globular cluster has a bright core which is somewhat off-center, and many stars are resolved, particularly around the rather irregular edge of the cluster. Now move to red Antares; west about 1.5° is mighty **M-4**, rivaling M-13. This globular is large and bright. It has a bright belt of stars running N-S across much of it's central core. NW of Antares about a half degree is smaller **NGC 6144**. Exhibiting low surface brightness and little in the way of central condensation this globular–one of the Herschel 400–can be easy to miss in less than favorable skies.

Continue in the same northwesterly direction another 4° for **M-80 (NGC 6093)**. Compared to M-4, this globular cluster is dainty. Small and bright, it exhibits considerable central condensation while, at the same time, at 160X and higher many individuals stars are resolved. To me this is a really pretty globular cluster.

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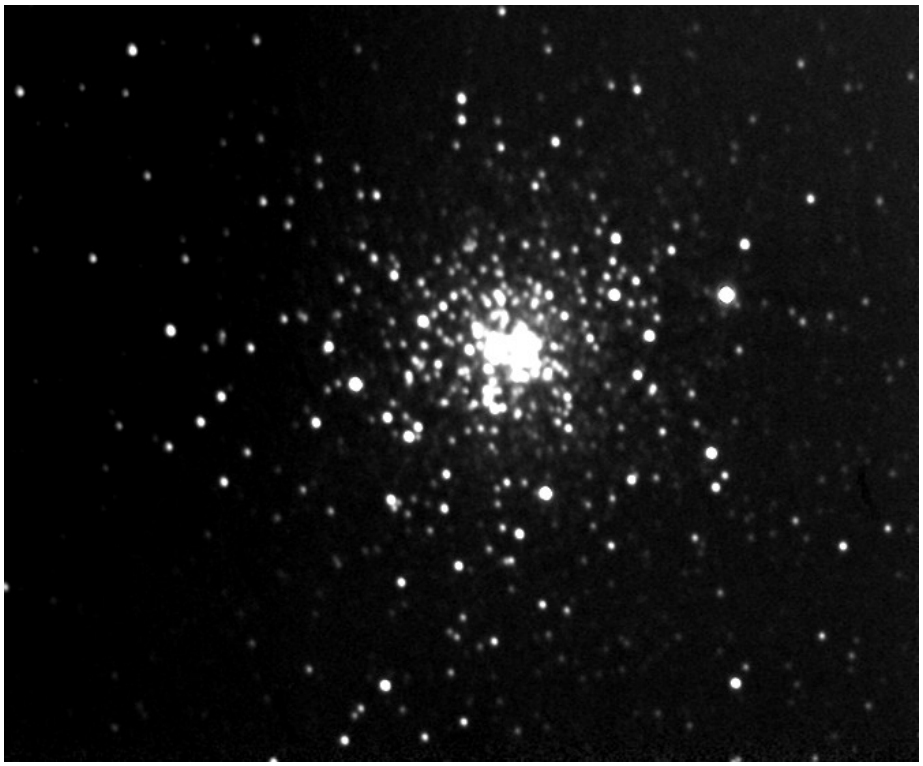
DEEP SKY DAZE, continued

Again using Antares as a starting point, slide due east 7°. You're back in Ophiuchus, just west of the stem of the dark nebula called "The Pipe." Here we find another globular cluster (this constellation is full of them), **M-19**. Fairly large and bright, the core is brighter than the edges and is, perhaps, a bit elongated in the N-S dimension. This chart in Uranometria (337) shows a total of 10 globular clusters, the faintest of which is 10.6 magnitude. I haven't seen them all, but intend to try one clear night.

One more from that chart needs mention here: **M-9**. Easily found by heading east about 4° and north a degree to 3.3 magnitude Theta (θ) Ophiuchi, than due north and a bit west, a total of about 6.5° (You'll pass 4.5 magnitude Xi (ξ) along the way). This is a very dense globular cluster with resolution of stars at the edges but little at the much brighter core. The overall shape seemed somewhat triangular to me.

Probably the simplest way to reach the final globular cluster of the evening is to return to Antares and head due north past Omega (ω) to Psi (ψ) Ophiuchi, a total of 10 degrees. Looking about 6° NNE of ψ we find 2.6 magnitude Zeta (ζ). A bit over halfway between the two, heading north, is **M-107 (NGC 6171)** somewhat west of a line between the two stars. In most instruments it's a hazy patch with little or no resolution (No individual star in the cluster appears brighter than 14th magnitude.), about 8-9' in diameter. There is considerable central condensation. This final object is also one of the Herschel 400 list, one of the few Messier objects to be included.



M-107

I hope you enjoyed this month's excursion. Again, I welcome any feedback you may have about the column or its contents. My e-mail is: ocentaurus@aol.com. May the rain fall all day and the skies clear for the night for all of us, for surely, we need both! Remember: ASTRONOMY, because it's (out) there! Enjoy.

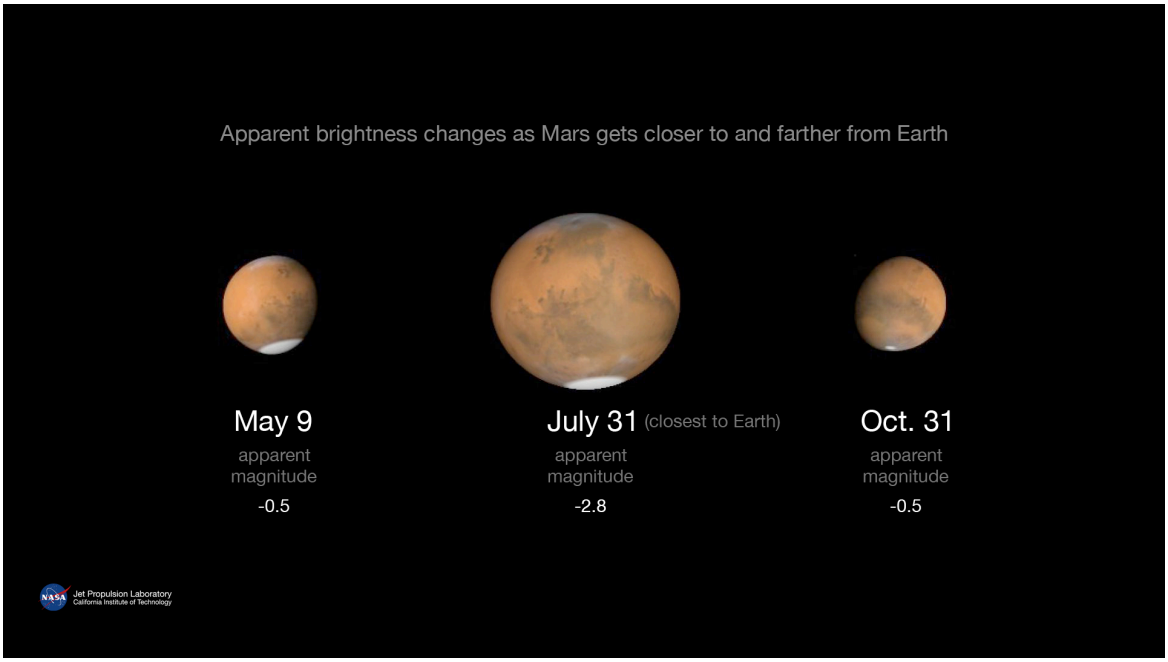
Image Credits:
M-16 and M-17: Liam O'Brien
M-28: Atlas Image courtesy of 2MASS/UMass/IPAC-Caltech/NASA/NSF.
M-54: Space Telescope Science Institute
Antares, M4 and NGC 6144: AsperaAT
M-107: Martin Baessgen

A Close-Up View of Mars
By Jane Houston Jones and Jessica Stoller-Conrad

In July 2018, skywatchers can get an up close view of Mars—even without a telescope! In fact, on July 31, Mars will be closer to Earth than it has been in 15 years.

Why is that?

Like all the planets in our solar system, Earth and Mars orbit the Sun. Earth is closer to the Sun, and therefore it races along its orbit more quickly. Earth makes two trips around the Sun in about the same amount of time that Mars takes to make one trip.



In 2018, Mars will appear brightest from July 27 to July 30. Its closest approach to Earth is July 31. That is the point in Mars' orbit when it comes closest to Earth. Mars will be at a distance of 35.8 million miles (57.6 million kilometers).
Credit: NASA/JPL-Caltech

Sometimes the two planets are on opposite sides of the Sun and are very far apart. Other times, Earth catches up with its neighbor and passes relatively close to it. This is called Mars's closest approach to Earth, and it's happening this year on July 31. The Moon will be near Mars on that night, too!

Keep in mind that even during its closest approach, Mars is still more than 35 million miles away from Earth. That's really far. So, Mars won't appear as big as the Moon in the sky, but it will appear bigger than it usually does.

July and August will be a great time to check out Mars. Through a telescope, you should normally be able to make out some of the light and dark features of the Red Planet—and sometimes even polar ice. However, a huge Martian dust storm is obscuring these features right now, so less planetary detail is visible.

continued on next page

A Close-Up View of Mars, continued

There is another important Mars date in July: Mars opposition. Mars opposition is when Mars, Earth and the Sun all line up, with Earth directly in the middle. This event is happening on July 27 this year.

Although you may see news focusing on one of these two dates, Mars will be visible for many months. For about three weeks before and three weeks after opposition and closest approach, the planet will appear the same size to a skywatcher.

From July 7 through September 7 Mars will be the third brightest object in the sky (after the Moon and Venus), shining even brighter than Jupiter. The best time to view Mars during this time is several hours after sunset, when Mars will appear higher in the sky.

Mars will still be visible after July and August, but each month it will shrink in size as it travels farther from Earth in its orbit around the Sun.

In other sky news, there will be a partial solar eclipse on July 13, but it will only be visible from Northern Antarctica and southern Australia. On July 27 (beginning at 20:21 UTC), a total lunar eclipse will be visible in Australia, Asia, Africa, Europe and South America. For those viewers, Mars will be right next to the eclipsing Moon!

If you're wanting to look ahead to next month, prepare for August's summer Perseid meteor shower. It's not too early to plan a dark sky getaway for the most popular meteor shower of the year!

You can catch up on NASA's missions to Mars and all of NASA's missions at www.nasa.gov

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From the President, continued

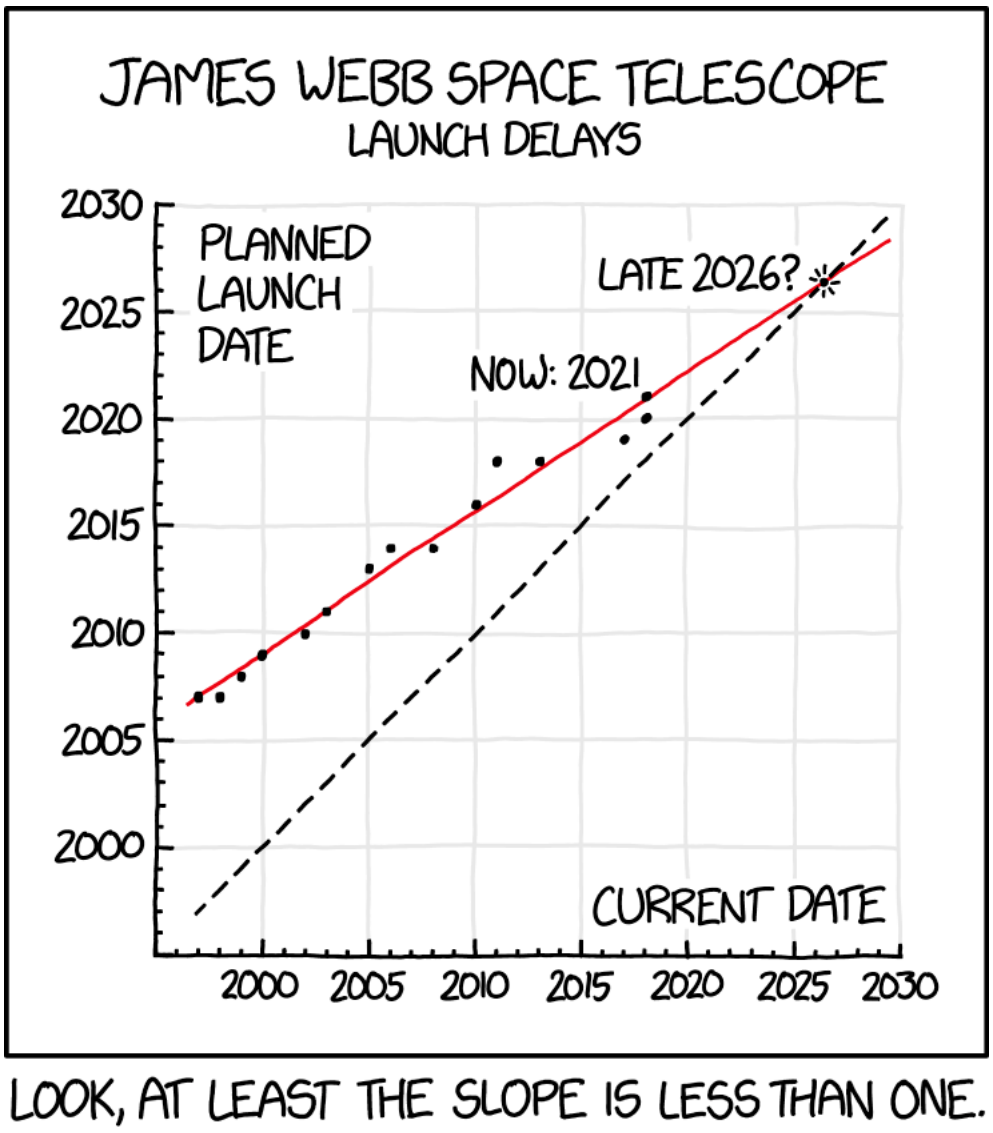
what could be one of the more memorable star parties we have had in recent memory.

And by the way, plan to stay late. Our star party starts at 9:00 PM, but Mars will just barely be above the horizon at that time. At 10:00 PM it will only have risen to 11 degrees. By 11:00 PM it will at about 19 degrees and about 25 degrees above the horizon at midnight, which is when we are scheduled to end the night's event. So, the later you stay the better the viewing.

Whether or not you can make the Bells Bend star party, you should have great views of Mars over the next couple of months. Enjoy them every chance you get.

Gary Eaton

xkcd



Barnard-Seyfert Astronomical Society
Minutes of a Regular Meeting of the Board of Directors
Held On Wednesday, June 6, 2018.

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held June 6, 2018, at the Girl Scout Center, 4522 Granny White Pike, Nashville, TN 37204. Present were Mike Benson, Spencer Buckner, Gary Eaton, Bud Hamblen, K C Katalbas, Johanna Keohane, Keith Rainey and Theo Wellington, and guest Meghan Keohane. Gary asked for a motion to approve the minutes of the May 2, 2018, board meeting as published in the June issue of the Eclipse. Spencer so moved, Theo seconded, and the minutes were adopted without discussion, by unanimous voice vote. Bud reported that there was $4,996.03 in the checking account and $4,151.02 in the savings account. Keith reported that the membership was 141.

Meeting programs for 2018 were discussed. Dr Allyn Smith, APSU, will present at the July general meeting.

Joanna will run a price comparison between Cafe Press and Vistaprint for club-branded material, and has contacted Hatch Show Print about a 90th Anniversary/Mars Opposition themed commerative poster.

Gary said he has received club owned equipment from Lonnie Puterbaugh. Loaner telescopes are still available.

Johanna reported that about 2000 people attended the Coopertown Barrel Festival with many of theme visiting the club booth.

There being no further business, Gary asked for a motion to adjourn. Mike so moved, Spencer seconded, and without objection the meeting was adjourned at 8:45 PM.

Respectfully submitted,

Bud Hamblen

Secretary

Next BSAS meeting
July 18, 2018, 7:30 pm

Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

Topic To Be Determined

Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held On Wednesday, June 20, 2018.

The Barnard-Seyfert Astronomical Society held its monthly meeting at the Girl Scout Center, Nashville, Tennessee, on Wednesday, June 20, 2018. Twenty-three members and guests signed in. Gary Eaton called the meeting to order at 7:30 PM. Gary then asked for a motion to approve the minutes of the May 16, 2018, meeting as published in the June Eclipse, and the minutes were approved without further discussion. Bud Hamblen reported that the checking account held $4,291.03 and the savings account, $8,4402.04. Keith Rainey reported that there were 141 members. Gary recognized new members Gabby and Dan, and visitors Jason, Bill and Ryan.

The private star party at the Water Valley Overlook on June 16 was successful with the sky conditions improving as the night wore on. Members brought about twelve telescopes. Keith Rainey provided images of M81 and M63, and David Reagan provided images of M63, Saturn and Jupiter.

Lonnie Puterbaugh and Chuck Schlemm provided a star party at Camp Horizon for children being treated for cancer.

Gary announce that the next public star party is schedule for June 22 from 8:30 to 10:30 PM at Bowie Nature Park, Fairview, Tennessee. The next private star party is scheduled for July 14 at Natchez Trace Mile Marker 435.3. The (week before) Mars Opposition star party is scheduled for July 20 at Bells Bend Outdoor Center, from 9 PM to midnight.

Keith Rainey presented “What’s Up” for the summer.

Gary brought before the members for thought the subject of participating in a telescope loan program with the Nashville Public Library.

There being no further business, the meeting was adjourned at about 9:00 PM.
Respectfully submitted,

Bud Hamblen
Secretary

Barnard-Seyfert Astronomical Society

Become a Member of BSAS! Visit bsasnashville.com to join online.

All memberships have a vote in BSAS elections and other membership votes. Also included are subscriptions to the BSAS and Astronomical League newsletters.

Annual dues:

Regular: $25
Family: $35
Senior/Senior family: $20
Student:* $15

* To qualify as a student, you must be enrolled full time in an accredited institution or home schooled.

About BSAS

Organized in 1928, the Barnard-Seyfert Astronomical Society is an association of amateur and professional astronomers who have joined to share our knowledge and our love of the sky.

The BSAS meets on the third Wednesday of each month at the Cumberland Valley Girl Scout Building at the intersection of Granny White Pike and Harding Place in Nashville. Experienced members or guest speakers talk about some aspect of astronomy or observing. Subjects range from how the universe first formed to how to build your own telescope. The meetings are informal and time is allotted for fellowship. You do not have to be a member to attend the meetings.

Membership entitles you to subscriptions to Astronomy and Sky & Telescope at reduced rates; the club's newsletter, the Eclipse, is sent to members monthly. BSAS members also receive membership in the Astronomical League, receiving their quarterly newsletter, the Reflector, discounts on all astronomical books, and many other benefits.

In addition to the meetings, BSAS also sponsors many public events, such as star parties and Astronomy Day; we go into the schools on occasion to hold star parties for the children and their parents. Often the public star parties are centered on a special astronomical event, such as a lunar eclipse or a planetary opposition.

Most information about BSAS and our activities may be found at bsasnashville.com. If you need more information, write to us at info@bsasnashville.com.

Free Telescope Offer!

Did someone say free telescope? Yes, you did read that correctly. The BSAS Equipment & Facilities Committee has free telescopes ranging in size from 2.6" to 8" that current members can actually have to use for up to 60 days at a time. We also have some other items in the loaner program such as a photometer, H-alpha solar telescope, educational CDs, tapes, DVDs, and books. Some restrictions apply. A waiting list is applicable in some cases. The BSAS Equipment Committee will not be held responsible for lost sleep or other problems arising from use of this excellent astronomy gear. For information on what equipment is currently available, contact info@bsasnashville.com.