

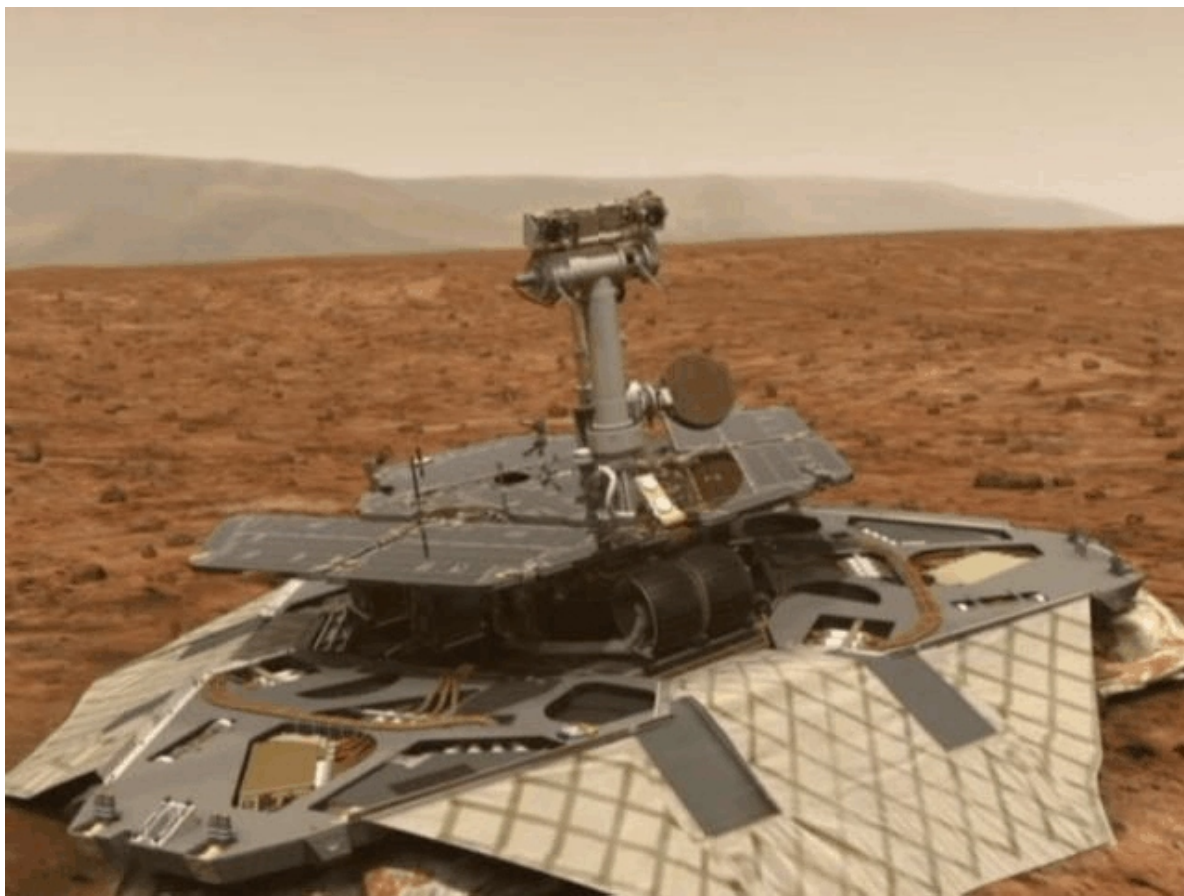
The View From Arunah

Arunah Hill Natural Science Center

Winter 2004

The Journal of the Arunah Hill Natural Science Center, Inc.

Volume 44



Mars Exploration Continues...

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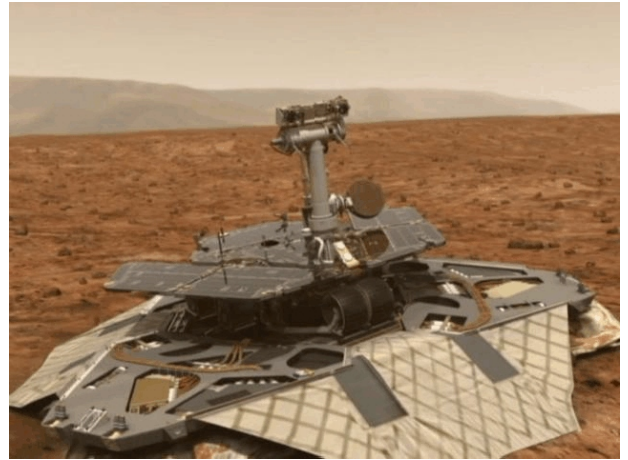
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Winter 2004 Arunah Hill Regional Calendar:

Edited by Dan Carnevale

Jan-Feb-March
Activities at Arunah Hill and the Northeast
region clubs. Stick it up on your
refrigerator.



This December and January Mars will be visited by several spacecraft, two of which will be from the United States. The picture on the front cover is a computer-generated image of the Mars Exploration Rover (MER) due to land later this month on the surface of Mars.

A Note from the Treasurer

I don't know if you noticed it, but there is something new on the mailing label. We added the date that your membership expires. So please check it. (1/2004 means that your membership expires at the end of January 2004). If the date on your mailing label indicates that your membership has expired, this will be the last issue of "The View from Arunah" that you will receive unless we hear from you. We value you as a member but if you don't value us we can't continue to bring you the benefits of membership in the Arunah Hill Natural Science Center. So, if this applies to you, act now before you forget, and renew your membership!

Thank you, Peter Scherff,

DEEP SKY TREASURES

Winter Star Party Objects

by John Davis

As winter tightens its grip on the northeast a number of diehard winter observers among us are making plans, albeit under frigid conditions to enjoy the star parties we hope to hold under crystalline clear skies this winter season on the Hill. All too frequently however, a series of winter storms and generally horrible New England weather conditions have forced us to cancel these events, as was the case with every scheduled star party last winter. And as is often said about the Boston Red Sox, "wait till next year!" We are now entering that next year, and hopefully the winter storms, snowfall depths and general weather conditions this winter will be such as to allow us to get things under control and keep the hill plowed and accessible to both observers and vehicles. In anticipation of adverse weather we have listed two Winter Star Party dates in January & February, and two Messier Marathon dates in March on consecutive evenings in the schedule of these events that you will find on page 6 of this "View From Arunah".

Assuming we get clear weather on these dates, or for observing on any clear moonless winter night we'll obviously want some objects to observe. This time we'll examine a few of what are generally considered rarities for winter observing: galaxies. Having already covered the beautiful winter spiral galaxy, NGC-2403 in Camelopardalis in a previous column, we'll look at five other more southerly winter galaxies, two of which could easily pose an observing challenge. Why challenging? Well, were we living at a much more southerly latitude, these galaxies would be easy targets, as their apparent magnitudes and surface brightnesses are well within the "comfort" range of a moderate size (8"-10") reflector. However, because of their southerly declinations they float near our southern horizon at this time of year immersed in layers of atmosphere. Add to this the fact that unlike stars, which are point sources, galaxies by their very nature are tenuous wisps of light often spread out over several arc minutes, sometimes rendering them almost invisible if enough atmosphere intervenes. So we can take some satisfaction in merely sighting and identifying them with moderate size or larger scopes, particularly in a transparent and very dark sky directly to our south,

conditions we often experience observing at Arunah Hill

Specifically, these challenging galaxies are in the constellation, Columba, the Dove located well below Orion south of Lepus, the Hare, centered on about -35 south declination, definitely an area you'll want to observe when it's on the meridian. To locate these two galaxies we'll first look for the distinctive pattern of Columba, a horizontal zigzag line of 3rd and 4th mag. stars, with outliers to the E and S, giving it the shape of a reclining letter Y. You'll find it situated roughly 15 WSW of the hindquarters of the Great Dog, Canis Major, and the same distance slightly E of S from Lepus. The two brightest luminaries of this group are 2.6 mag. alpha (Phact) and 3.1 mag. beta (Wasn), lying 3 to alpha's SE. Forming a triangle with those two is 3.8 mag. epsilon, just over 2 SW of alpha. Now we'll hop from epsilon some 5½ due E where we'll find mag. 4.5 gamma Caeli and its companion, mag. 6.5 X Caeli, just 13 arc min. due S, both almost on the constellation border of neighboring Caelum. From this duo, slide S an additional 2° 17' at which point you should have **NGC-1792** in your finder's field of view sitting on the -38° line of south declination. Reaching our eyes from a distance of 43 million light years, its 10.2 magnitude glow spanning 4.0' x 2.1' of sky results in a relatively generous surface brightness of mag. 12.6, a feature in our favor for visibility. This is a Hubble class Sb spiral, and is ordinarily bright enough for most scopes, yet even in 12" or 13" apertures it shows no trace of spiral structure nor any core brightening you might expect. However its NE-SW oriented uniform oval glow at high magnification does show a hint of mottling, with bright spots near the extremities of the halo.

Now, lets nudge the telescope in an NE direction from NGC 1792 to a point just a mere 40 arc minutes away where you should pick up the 9.9 mag. spindle of **NGC-1808**, a beautiful 3.9'x7.0' class S(B)a edge-on spiral galaxy some 33 million LY distant. The Hubble class letters S(B)a signify that the presence of a bar in the spiral is uncertain. Many observers however have noted that a brighter streak running through the center of the 7' long mottled length of the spiral indicates the presence of a bar and for this reason several sources classify the galaxy as an Sba. Unlike NGC 1792, this galaxy shows a small but very bright central core area around a pinpoint nucleus. The distinctive spindle

shape of NGC 1808 with a 10th magnitude star to the north and several much fainter ones in the field lends additional attractiveness to this edge-on spiral, provided you're able to adequately penetrate the layers of atmosphere you'll encounter from these northern latitudes. Before we leave this area for other, perhaps more accessible winter galaxies, you might want to swing just under 3° SSE from NGC 1808 to take in a real challenge: actually the most prominent deep sky object in this constellation, the bright and dense Mag.7.2 globular cluster, **NGC 1851**, glowing dimly from a low, low declination, -40° south!

Now we journey northward to a region along a more favorable 20° south declination line, and to the banks of the celestial river, Eridanus. Here we'll zero in on hopefully easier targets in our winter galaxy hunting tour. They are all located along the south end of the first huge bend in the river, where it swings around 180 degrees, heading first south, then back toward the east. This section is marked by a line of "numbered" 4th mag. stars, all designated "tau". We'll be concerned only with those stars labeled tau 3, tau 4, and tau 5, 3+ to 4+ degrees apart and lined up along the "horizontal" south segment of the river bend. (Here you might want to check a good star atlas.) Our target this time is a beautiful face-on Sc-I giant spiral galaxy, **NGC-1232**, glowing at a relatively bright mag. 9.9 from a surprisingly remote distance of 72 million light years. You'll be able to find this gem by first locating and identifying the stars tau 3 and tau 4 Eri. NGC-1232 forms the right angle at the northern corner of a triangle with these two stars. It lies 2 ½ ° NW of tau 4 and 3 ½ ° NNE from tau 3. Look for a 7th and 8th mag. pair of stars aligned NNE-SSW exactly 2° NW from tau 4. The galaxy will be in the same low power field half a degree to the W of the pair, covering 7.8 x 6.9 arc minutes of sky. As with many galaxies, especially spirals, larger apertures will show you more detail and therefore give you a fuller appreciation of their beauty. It takes a 16" to 20" scope to bring out the structure well in this galaxy's spiral arms. With an overall surface brightness of mag.13.8, the core area of NGC-1232 is substantially brighter than the halo, making the spiral arms barely discernible in a 13" scope. What is evident in these larger apertures are H-II regions forming knots in the considerably mottled spiral arms, especially noticeable at higher powers (150X-175X). Some of the brighter knots in the halo even show up in 8"-10" scopes, and the view, with the surrounding field stars makes finding and observing NGC-1232 well worth the effort of hunting it down!

Now, let's swing east-northeast just over 2 ½ °, where we'll land right on top of **NGC-1300**. You can also look exactly 2°

20' directly N of the star tau 4 to find it. A 7th mag. star lies just over half a degree N of the galaxy. NGC-1300 is an excellent example of an SBb-I barred spiral galaxy. Measuring 6.5'x 4.3' on the sky, this giant galaxy glows at mag.10.4 across a vast 62 million light years of space. With smaller 6" to 10" apertures we'll be able to see a bright-ish core inside the much fainter halo of the bar. Even 12" to 13" instruments reveal only suggestions of spiral structure. Only apertures of 18" to 20" or more will show the faint spiral arms which curve at right angles from the ends of the bar counterclockwise and extend away parallel to the bar, much like what you might see in more vivid and striking textbook photo images or on calendars. So, what we have already mentioned concerning NGC 1232 also applies to NGC 1300, as well as almost any spiral galaxy, namely: detail, especially spiral structure comes with "aperture" and sometimes with reasonably higher magnifications.

For the final step in our winter galaxy hunt we'll sight our finder scope on a point midway between the stars tau 4 and tau 5. There, just 23' above a line joining those two tau stars we should be able to spot mag 10.3 **NGC-1332** a nice E-7 elliptical or lenticular galaxy, sometimes classified as an S0. It lies at the E end of a group of fainter galaxies and has a very faint star-like companion galaxy, NGC 1331, just 3' to the ESE. With a surface brightness of mag. 12.2 the 4.6' x 1.4' oval of NGC 1332 is fairly easy to pick up. As another very sizeable galaxy, this lenticular star city sends us its light from a distance of 64 million light years, or in the same general range as the previous two galaxies. You'll discover while observing NGC-1332 its noticeably bright central core area, enclosing a star-like point nucleus. This bright core is surrounded by a substantially elongated but much fainter halo aligned in an ESE-WNW orientation.

Although they're not dazzlers, these galaxies in Eridanus are among dozens of other galaxies to be found in this area of the sky, especially in neighboring Fornax, where you'll find an excellent galaxy cluster. We've only scratched the surface here so far! If weather conditions permit, we should be able to get a good start with these denizens of the deep sky at our winter star parties this season at Arunah Hill. Why not plan to join the rest of us?

Barlow Bob's Corner

The Window Shade

by Barlow Bob Godfrey

As the Sun sinks lower in the western sky at sunset, a dark blue line of sky appears in the east, stretching across and above the entire eastern horizon. This appears to be a giant window shade in the sky, raised at sunset and lowered at sunrise. As the Sun sets lower, this dark line of sky rises higher and disappears when the color of the evening sky becomes darker than the cloud.

As the Sun rises higher in the eastern sky at sunrise, a dark blue cloud-like line of sky appears again stretching across the entire western sky. As the Sun rises higher, this dark line of sky sets lower and disappears when the color of the morning sky becomes brighter than the blue line cloud.

What is It? This is the shadow of the Earth on the atmosphere. Think of the Sun as the ultimate flashlight, shining on the Earth. The Earth casts a permanent shadow into space in the opposite direction from the Sun, every day of the year. As the Earth rotates on its axis, sunlight shines on the Earth's atmosphere at sunrise and sunset. As the Sun / flashlight moves higher or lower in the morning and evening sky, the shadow of the Earth is cast on the atmosphere, creating a straight dark blue line in the sky.

Barlow Bob

