

The View From Arunah

Arunah Hill Natural Science Center

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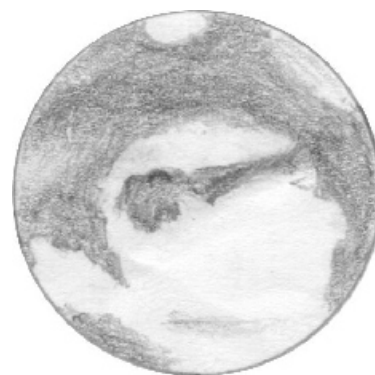
The temporary tent village at the summit of Arunah Hill at this year's annual Arunah Hill Days event.

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. (10/2003 means that your membership expires at the end of October 2003). 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,

Mars at Opposition...



As Viewed at 11:30 PM, Thursday August 28th with Arunah Hill's 6 inch Gaertner refractor, using an Orange #21 filter with 7mm Nagler eyepiece at 340X. Inverted image

is reversed in diagonal mounted eyepiece.

South polar cap is at the top. The prominent dark pipe-shaped feature at center is Sinus Meridiani with Sabaeus Sinus forming the elongated stem. On the left is Margaritifer Sinus and at the extreme right is Syrtis Major. Light colored zone at upper right is the Hellas Basin.

Sketch by John Davis

DEEP SKY TREASURES “Unlocking Andromeda’s

by John Davis

In the fall of the year nightfall creeps in upon us much earlier each evening, as dusk arrives at an accelerated rate, especially around the time of the Equinox. Meanwhile, as a consequence of this earlier darkness we can still enjoy deep sky viewing among the lingering summer constellations like Ophiuchus and Sagittarius.

As our skies darken during this 2003 autumn observing period most of us will still be fixing our gaze on Mars to pick up details and surface features on the “Red Planet”, center stage and at 34.6 million miles, closer to Earth at this opposition than at any time in recorded history and for over two centuries to come. Also, as is the case each year, many eyes will be drawn high in the east and overhead to observe the great Andromeda Galaxy (M-31), always a show stopper and certainly an object to which we could easily devote an entire column, in fact one that we have often mentioned in previous columns. This time however, we’ll focus on some neighbors of that great galaxy.

Andromeda, the chained lady of legend as many of us know was sacrificed to atone for her mother, Queen Cassiopeia’s vain and arrogant boasting of her beauty, and was chained to a cliff as prey for a sea monster, only to be rescued by Perseus. Within her wide expanse of sky she harbors a number of interesting deep sky objects, a few of which we’ll look at here. In fact, we’ll start off with a galaxy just outside Andromeda’s boundaries in nearby Pisces.

Our target is **M-74 (NGC-628)**, a low surface brightness face on type Sc I spiral galaxy which has proven to be one of the more difficult (perhaps the MOST difficult) of the Messier objects to observe, especially if you’re attempting the observation at the time of a Messier Marathon in the month of March, when the galaxy is immersed in layers of atmosphere, low near the western horizon at dusk, at which time your likelihood of success is extremely small. M-74 lies at a distance of around 36 million light years, a “safe” estimate, as various professional studies gleaned from several sources show results of anywhere from a distance of 26 to 42 million LY. You can easily locate M-74 by first spotting the bright triangle of stars of Aries. From the brightest of these, Hamal (alpha Arietis) on the E end, extend a line SW thru beta Ari (second brightest) just under twice again the distance between those two stars (an additional 8 degrees). This should put you almost on top of mag. 3.6 eta Piscium, our key reference star. Just under 2 degrees NE of eta lies a pair of 6th mag. Stars, 103 and 105 Psc, a mere 15 arc min. apart. Exactly 1 degree, 20 arc min. ENE of eta, glowing dimly at mag. 9.4 lies our quarry, M-74, a little over half way from eta to those stars 103 and 105, and slightly below (S of) a line joining the star eta with the pair.

You may have difficulty in seeing this elusive galaxy despite its listed magnitude unless you use a low power with clean optics on a very dark transparent night. The reason is with a low surface brightness of mag. 14.4 the galaxy is spread out over more than 10 arc min of sky. Surprisingly, the galaxy can sometimes be seen with a very small telescope or even binoculars when not visible in larger scopes with their higher powers and narrow fields of view. Indeed, when he discovered M-74 in late September of 1780 Pierre Mechain declared that it is “fairly large, very obscure and extremely difficult to observe..one can make it out with more certainty in fine frosty conditions”, a reference, no doubt to the clear frosty nights of autumn after a frontal passage, when the atmosphere is clear, transparent and free from aerosols, allowing dim, low surface brightness objects to be seen much more easily. Some years later, possibly seeing faint foreground stars scattered around its circular glow, John Herschel mistakenly classified M-74 as a globular cluster in his General Catalog of 1864. This misclassification in fact, was carried over into the New General Catalog, or “NGC” published by J.L.E. Dreyer in 1888. Spiral structure in M-74 was detected by Lord Rosse in Ireland as early as 1848 with his giant 72” “Leviathan” reflector.

Even today with modern telescopes most amateur astronomers do well to see a misty round glow about 6 arc min. across, often more easily visible with averted vision. You may also detect a small, much brighter 2.5’ core. M-74 as revealed in photographs is a magnificent face-on giant spiral galaxy some 97,000 light years across, resembling M-101 and quite similar in size to our own Milky Way galaxy. Its spiral structure however, can only be detected in larger aperture instruments of at least 14” and up. Even then the low surface brightness makes their detection extremely difficult. The core can be seen as somewhat mottled with a sprinkling of field stars across the galaxy as well as to the west and east. On exceptional nights these larger apertures will reveal two spiral arms, the one curving to the east and south more prominent and further from the galaxy’s core, the western arm closer in and extending toward the west and north. Despite its dimness, M-74 should provide you with an interesting challenge for your fall observing, regardless of the size of your equipment.

Two of the three prominent stars of Andromeda, beta and gamma both present a rather unique viewing experience for the observer. Second magnitude gamma (Almach) on the E end of the line is a gorgeous double with gold and blue components, while Mirach (beta), the “middle” star in the bright line of stars has a companion of its own, only 6.5 arc min. to its NW. Actually this “companion” is hardly a neighbor, being some 8 million light years distant! It is **NGC-404**, a small lenticular S0 type galaxy far in the background from the 2nd magnitude type M0 red giant luminary, Mirach (beta) just 200 LY away. Glowing dimly at mag. 10.4 within the glare of the star, its round 4.4’x 4.2’ form with a somewhat brighter core area can be more easily glimpsed by sliding the bright star just outside the edge of your eyepiece’s field of view. On a clear, transparent night, especially with larger apertures you might be able to discern its tiny bright nucleus surrounded by a mottled area 2’ across. Try also to see if you can spot a faint 14th mag. star at the N. edge.

Now, for a little diversion before we visit an attractive open cluster we'll make a stop en route to discover an interesting asterism conspicuously placed in the same neighborhood. To do this we'll first find Triangulum, a small constellation shaped like a very narrow isosceles triangle, pointing SW and located midway between 2nd mag. Almach (gamma And.) and the bright triangle of Aries. From the short end of the Triangulum triangle at the NE we'll draw a line 2 degrees NW from gamma Tri. to beta Tri. and extend it still NW twice again the distance between gamma and beta. Here you will see the "**Golf Putter**", a remarkable asterism I came across some years ago while scanning the area with binoculars. It was subsequently featured in Phil Harrington's binocular column in Sky & Telescope magazine that he did at the time, also appearing later in his book "The Deep Sky". The end of the blade of this celestial golf club is marked by 56 And., actually two orange-yellow G8 and K2 6th mag. stars less than 4 arc min. (190") apart, forming a nice binocular double. The shaft of the putter runs from the blade toward the NW and is formed by a 1½ degree long straight line of five 6th to 7th mag. stars. Try finding the "Golf Putter" with your binoculars...you could sink the putt and "birdie" the hole!

Actually, the oversize golf ball is really close by! Just half a degree NE from the double, 56 And. at the end of the blade is the center of the loose open cluster **NGC-752**, glowing at mag. 5.7, a splendid scattering of some 60 stars and a beautiful sight in large binoculars and in a low power wide field telescope eyepiece. NGC-752 was another bright northern cluster that, for some reason Messier missed completely. According to author and deep sky aficionado, Phil Harrington in a recent e-mail, the cluster's discovery back in the mid 1600s can be attributed to Giovanni Batista Hodierna, (1597-1660) a Sicilian astronomer, contemporary and follower of Galileo. Many of his discoveries were made with a 20 x Galilean refractor! NGC 752 appears in Hodierna's catalog of 1654. Telescopically you will see that the 60 + stars of mags. 9 down thru 12 are arranged in a variety of clumps and curving chains, punctuated by oval shaped voids throughout the wide 50 arc minute expanse of the cluster. NGC 752 is about 1300 light years away and most of the stars are F type sub-giants, with a smattering of K type giants. Studies reveal the age of the cluster to be well over a billion years, much older than most open clusters and similar to Cassiopeia's NGC-7789 (see our last fall's column) and NGC 2158 in Gemini. While you're in this area near gamma And. don't forget to hunt down NGC-891, a beautiful low surface brightness edge-on galaxy just over 3 degrees due east of gamma, a deep sky gem that we've previously featured in our column.

We'll jump now to the WNW nearly 30 degrees, crossing over M-31, the Great Andromeda Galaxy at the half way point in our long leap to a fuzzy little bluish orb nicknamed **The Blue Snowball (aka NGC-7662)** or PK 106-17.1. "Guideposts" to finding this somewhat out-of-the-way, but remarkable planetary nebula are three 4th mag. stars: lambda, kappa, and iota And., lined up N-S in a 3 degree long bent row some 16 degrees NNW of alpha And. (Alpheratz), the star marking the NE corner of the square of Pegasus. From Iota at the S end of that row slide 2 degrees W to the 5.8 mag. star, 13 And. The

"Blue Snowball", NGC-7662 lies just 26 arc min. SSW of 13, and greets our gaze from a distance of some 3900 LY. Glowing brightly at mag. 8.3 its 20 arc second disk will stand up to considerable magnification, often enhancing its bluish or blue-green tint in so doing. While appearing as a small fuzzy disk in low powers and small apertures, it will blossom out with more detail at higher powers or in larger aperture instruments. In fact, the late legendary amateur astronomer, Leland Copeland once described its photographic appearance as resembling a lily. One caveat: planetary nebulae are extremely sensitive to seeing conditions and often you will not see detail in them to any appreciable degree unless seeing conditions are very good in steady atmosphere. What you can see in moderate to large apertures with greater magnification (200x-350x) is a darkening in the center, which will result in creating an annular, or ring appearance in the planetary. The outer rims on the NE and SW edges appear brighter and will stand out from the other fuzzy edges and the darker interior. Larger apertures (18" and up) under ideal transparency and seeing conditions could afford you a glimpse of the 13.2 mag. central star embedded in the nebulous haze at the center. As is the case with almost any object, using averted vision will help you to discern structure and detail here. You might spot two or three 13th mag. stars near the NE edge with sufficient aperture and magnification. Regardless of your scope's size, its pleasing blue color makes the "Blue Snowball" well worth the effort of hunting it down.

Our last stop will be just under 2 degrees (1 degree, 50') SSW of the Blue Snowball where we'll find a nice Sb type edge-on spiral galaxy, mag. 11.3 **NGC-7640**. More precisely, by sliding on a line from star 13 just under 1½ degrees SSW to a 6.5 mag. star and continuing SSW an additional 50 arc min. you should be right on top of the galaxy, neatly positioned N-S snugly inside a triangle of 11th mag. stars. Like the aforementioned NGC-891, this one also has a low surface brightness: a dimmer mag.14.5. It occupies 10.0'x 2.2' of sky, of which a length of just 8' will be seen in most amateur scopes. Larger apertures will show faint 13th mag. stars on both sides of the faint elliptical core, as well as some mottling in the surrounding halo. It is estimated that NGC-7640 lies some 28 to 30 million LY away. Although it is faint, this edge-on galaxy should provide a challenging exercise for you as you continue to ply the sparkling skies of frosty autumn nights!

The Editor's Desk

by Steve Pielock

Fall is here.

Hello Everyone

I hope all of you enjoyed this year's Arunah Hill Days as much as I did! It was a fantastic event! I want to especially thank our three guest lecturers: John Sillasen, Edwin Aguirre, and Mike Ostrander. I attended all three lectures and found them all to be fascinating! Once again New England weather confounded the local weather forecasters and gave us a good weekend after all. This was the best attended Arunah Hill Days ever. During the course of the weekend we saw in excess of 250 people on the Hill. I have never seen so many tents and telescopes at the top of the hill. It was a moment of joy for all of us who work so hard to put this event on to see so many people having such a great time!

The Boy Scouts of Hadley also had the best year ever with the food service tent. For those of you that don't already know, serving food at Arunah Hill Days is a means of funding their activities and camping events throughout the next coming year. Troop 550 appreciates your help and looks forward to seeing all of you at next year's event.

Lastly, with a Saturday afternoon of Horseshoe Tournament eliminations between many different astronomy clubs throughout the Northeast, the final contest was between the Arunah Hill team and Springfield Telescope Makers of Vermont. After a spirited battle for the coveted horseshoe trophy... I am here to announce the victory went to Arunah Hill!

Important events this fall:

October 17-19 - Star Watch

Please see the pull-out flyer for more details, or go to www.arunah.org

Enjoy this newest edition of the VFA.

Steve

How to Submit Material to *The View from Arunah*

The View from Arunah welcomes material submitted by guest contributors. The strength of this publication is its writers and photographers, so we are always on the lookout for new contributors. If you have an idea that you think might make a good article, or if you are an astrophotographer who would like others to enjoy your work, then please consider contacting us. Our staff will be happy to provide any assistance that you might need to get your work published in *The View From Arunah*.

To submit articles, photographs, or drawings, please send to them to: Steve Pielock, 132 Sand Gully Rd, So. Deerfield MA 01373. Materials submitted via electronic mail should be sent to "pielock@pielock.com". Comments and criticisms are always welcome. Letters to the Editor or any of the section editors are also welcome.

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