

The View From Arunah

Arunah Hill Natural Science Center

Fall 2007

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Edited by Dan Carnevale

Mark Your Calendars Now for

Arunah Hill Days 2008!

Our big star party of the year occurs on the weekend of Sept. 5-7, 2008. We are pleased to have scheduled as our Keynote Speaker for this event John Briggs, widely known as an expert on antique telescopes, their history and evolution. Plan now to attend this great Star Party, Arunah Hill Days, 2008!

A reminder: Watch for the date in the autumn of 2008 of "Star Watch". This important weekend had to pass over in 2007, but for 2008 will be announced in the "View From Arunah" and on the Arunah Hill web site.

Front Cover



Autumn arrives at Arunah Hill

A Note from the Treasurer

I don't know if you noticed it, but there is something on the mailing label you should check out. We added the date that your membership expires. So please check it. (10/2007 means that your membership expires at the end of October 2007). 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

The Editor's Desk

by Steve Pielock

Fall 2007

Here we are again, the Fall colors are in the trees and on the ground. The days are getting shorter and the nights are getting longer, and this means of course that we will have more time for observing. We have a great observing events coming up starting at dusk on Friday evening, November 2nd, the first night of the Astronomy Association Fall Star Party. The next morning, Sat., Nov. 3rd we'll be holding our regular First Saturday work party session; and on the Saturday evening, Nov. 3rd we'll hold part 2 of our Fall Star Party.

We'll also host the Springfield Boy Scout Group on the following weekend: Saturday evening, November 10th. We'll keep our fingers crossed for a continuation of all the beautiful and clear Fall weather we've already been having!

Our work sessions continue on an ongoing schedule the first Saturday of each month throughout the winter, weather and conditions on the Hill permitting of course, as there is always maintenance that needs to be kept up on the several buildings we have on our property. Whether you are a new member of Arunah Hill or an "old timer," helping out on these first Saturday is always a rewarding experience.

Steve

The View From Arunah

How to Submit Material

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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DEEP SKY TREASURES

Leavitt, Shapley & Globular Clusters Part II

by John Davis

Fall is the season for noticeable transition in our weather, with its cooler and sometimes frosty nights taking over. This year, of course, has been exceptional as unseasonable summer-like temperatures have lingered well into October. In the sky, however, the seasonal cycle remains constant as the “Summer Triangle” slides slowly westward drifting toward the horizon. Even with increasing earlier darkness, Sagittarius eventually disappears and a tableau of autumn constellations, many of them dimmer, especially toward the south, creep steadily higher in the sky. Among some of the dimmer “showpieces” in the fall sky (for example, the Helix planetary, NGC-7293 and the face-on galaxy, M-74), there is one class of deep sky treasures, however, that you don’t need to “strain your eyeballs” to enjoy, and that makes observing them a pleasure for nearly everyone, especially if you are an observer “just getting started” in this fascinating hobby. We’re talking about the glorious globular clusters, those ancient and vast aggregations of stars surrounding our Milky Way galaxy that played such a role in the work of the pioneering American astronomer, Harlow Shapley. Early in the 20th century, following up on the important period-luminosity relationship in Cepheid variable stars discovered by Henrietta Swan Leavitt at Harvard College Observatory, Shapley laid out his model for the shape and size of our Milky Way galaxy, as we discussed in Part I of this article (VFA summer issue, Vol. 58).

Of the approximately 150 globular clusters belonging to our Milky Way galaxy, we’ve chosen our “Top Ten” an arbitrary and admittedly, a personal choice. We’ve omitted the two most spectacular globular clusters as those two, NGC-5139, “Omega Centauri” and NGC-104, “47 Tucanae,” lie in the southern hemisphere’s sky and are not visible from these latitudes. Also in order to provide you with an enjoyable observing experience we’ll plan to visit all of these interesting “Top Ten” globulars. Not surprisingly, all of these happen to bear Messier “M” designations and we haven’t ranked them on any scale or in any order, as each has its own distinctive appeal.

Very low now, sliding below the western horizon, is

M-5, in the constellation Serpens Caput, perhaps better seen when it reappears in the springtime evening sky next May. M-5 is certainly one of the best globulars in the northern sky, a breathtaking array of glittering suns rivaling in splendor the great Hercules cluster, **M-13**. Glowing at a bright magnitude 5.7 from a distance of 25,000 L.Y., M-5 is easily resolved with a nicely condensed core and exhibits more detail at higher powers including several chains of stars radiating outward. Be sure you catch M-5 just 8° SW of 2.6 magnitude Alpha Ser. It hovers next to 5th mag. 5 Ser. just 22□ to the SSE.



As with most deep sky objects, globulars reveal more detail in larger apertures and at higher powers, especially in the resolution of stars across the core and in the outer peripheries. They are also measured by the degree of concentration of their stars on the Shapley-Sawyer (S-S) scale, where Class I is the most condensed and Class XII the least. M-5 is a Class V.

M-4, only about a degree and a half W of Antares in Scorpius, glowing at mag. 5.8, carries the distinction of being the closest globular to us at only about 6500 L.Y.s distance. A neighbor, NGC-6397, in Ara in the southern sky below Scorpius, is another candidate. Because of this proximity and a loose concentration (Class IX) of stars, M-4 is very easy to resolve and is a fascinating object. Look for a bright vertical line of stars running N-S through it and splitting the cluster right down the middle!

No “Top Ten” list would be complete without a couple of extra “honorable mentions.” Those would belong to **M-10** and **M-12** in Ophiuchus. About midway down and inboard of the western side of the long coffin-shaped outline of the constellation, both are beautifully resolved and present an attractive view in the eyepiece.

M-22, just 2° NE of 3rd mag. Kaus Borealis at the top of the Sagittarius “Teapot,” is a glorious aggregation of over a half a million glittering gems spanning over 20 arc minutes, a mere 10,000 L.Y. away. This spectacular (Class VII) cluster with its beautiful chains of stars would perhaps steal the top spot from M-13, were it not so far south. Don’t miss it!

Our next stop is, in fact, the “Great Hercules Cluster” M-13, at mag.5.7 still visible but sinking in the western sky. It could very well be the most observed object at star parties, and deservedly so, as this magnificent (Class V) array of 500,000-plus stars, 21,000 L.Y. away, presents a vista laced with chains of stars and dark lanes, notably a Y-shaped gap near the NE. Find it 2/3rds of the way from Zeta to Eta Her. on the W end of the “Keystone” of Hercules.

“Upstaged” by its neighbor, M-13, is the other globular cluster in Hercules, **M-92**, tucked away in a spot 6.5° N of the star Pi at the NE corner of the Keystone. It shines at a fairly bright mag. 6.4 and is some 25,000 L.Y. away. More condensed (Class IV) than M-13, M-92 is a truly beautiful cluster, presenting a bright core and an attractive halo speckled with myriads of stars extending well out across its full 11□span. Again, like M-5, M-92 should command much more attention.

Our next stop, in the small constellation of Sagitta, the arrow, you’ll find a truly non-spectacular oddball entry, **M-71**. We’ve included this rather small (7.2 □) and faint (mag. 8.0) globular because of its unique character. Long thought to be a rich and compact open cluster whose stars have more heavy elements than those in globulars, recent research has found the cluster’s H-R diagram has a “horizontal branch” putting M-71 in the globular category. You can find this very well resolved and pretty little cluster with a somewhat triangular shape halfway between and a tad south of a line joining the stars Beta and Gamma in the shaft of “the arrow.”

Looking now to the SW in the constellation Capricornus in the autumn sky we’ll find Delta Cap. marking the E corner of the triangular constellation. Just 7° S and slightly W from there near the star 41 Cap. just to its E, lies **M-30**. Glowing at mag. 7.3, it’s another less dazzling but somewhat unique globular, and at its distance of 27,000 L.Y., the cluster is somewhat difficult to resolve. In fact, in moderate apertures you’ll likely see stars twinkling only in the halo. The core part is flattened to an E-W oval shape, and three prominent straight rows of stars extend out at

right angles perpendicularly from the core’s N and NW edge. This gives the overall impression of a ‘Webber Kettle’ barbeque grill standing on its legs... Check it out!

Looking to **M-2** in Aquarius just 5° N of 3rd mag. Beta Aquarii will put us back into the “spectacular” category. It’s “way out there” at a distance of 37,000 L.Y. and yet shines fairly brightly at mag. 6.4. The cluster looks best in larger apertures (14□ and up) that more readily resolve stars across the central glow which is highly concentrated at S.S. Class II. These larger apertures reveal a huge number of stars in the outer halo; a beautiful scene.

Due N from M-2 only 13° and adjacent to a 7th mag. star lies **M-15** in Pegasus, more easily located by moving 7°WNW from Theta Peg., marking the head of the flying horse, through Enif (Epsilon Pegasi) at the horse’s nose and extending that line NW another 4° to put you right on top of what is by far the most popular globular cluster in the fall sky. A highly concentrated Class IV cluster, M-15 at mag. 6.0 is very impressive in the eyepiece, despite its remote location almost 31,000 L.Y. away. It displays dozens of stars resolved across the entire cluster and a number of impressive strings and chains of stars seen extending outward from its brilliant core. Hidden among the legions of faint stars is a tiny planetary nebula that provides a challenging target for very ambitious observers.

Finally, advancing the season we move on to the showpiece globular cluster of early springtime, **M-3** in Canes Venatici. The best star-hop to find this one is with binoculars or your finder scope to locate the spot on a line not quite halfway from Arcturus to Cor Caroli, Alpha CVn. There you should see a small narrow isosceles triangle about a degree in length pointing back to Arcturus with a 6th mag. fuzzy patch marking the N base angle. If your finder is aligned you should see M-3 in your scope’s eyepiece. This one is also a glorious sight, even from its distance of 27,000 L.Y., with a very bright center and in scopes 8 – 10 inches and up with stars resolved across much of its wide, well condensed (Class VI) core. Spanning almost 16 arc min., this magnificent array of stars, extending out in glittering chains, also rivals M-13. Be sure you include M-3 in your observing agenda when you haul out your scope next spring.

These “Top Ten”-plus globular clusters of course comprise only a small fraction of the great swarm of ancient clusters studied by Harlow Shapley that surround our Milky Way galaxy.