

The View From Arunah

Arunah Hill Natural Science Center

Vol. 10

Summer 1995

Welcome to the Winter edition of "The View From Arunah" the Arunah Hill informational newsletter.

Thank you for supporting your Dark Sky Observatory, Arunah Hill. Clearing Parties/Observing Sessions are still the first Saturday of every month, in addition there are other observing events. *Please see schedule for more info.* If you would like to take part in any of the projects or activities, call Steve Pielock at (413)772-6715 or Joe Zuraw at (413) 665-7402

Arunah Hill Days 1995

Our fourth year

This is our big event of the year. It's a chance for members and interested parties to enjoy dark skies high in the Berkshires. Bring a tent and spend a couple evenings. Food is catered including a fantastic and unique roast beef feast on Saturday. Enjoy lectures, games, exhibits, workshops, nature walks, and dark sky observing. August 18-20, no admission or activity fees. Show your support and have fun. help make this our best star party ever!

Welcome new members

We would like to say hello and welcome to the newest members of Arunah Hill.

William & Julie Carragan	Troy, NY
Craig Cortis	Oxford, MA
John Neidzielski	Huntington, MA
Rick Versace	Poughkeepsie, NY
Rich Volant	New Fairfield, CT
Ron Fiedler	Salem, CT
Gary J. Cislak	Ludlow, MA
Howard Lazarus	New York City
Joseph G. Gavin Jr.	Amherst, MA

Thank you for supporting Arunah Hill.

The Torch Is Passed At Annual Elections

In a display of our vitality two new faces will appear at Executive Board meetings this year. We welcome the election of Patty Eli and Bob Osgood to the board. The Board also recognizes the contributions of former Board members Rose Naff and Ed Fairs who helped formulate Arunah Hill policy. Arunah Hill is indebted to them for their wisdom and guidance. *The executive board collectively guides Arunah Hill development and direction.*

The 1995 Board is as follows...

Ray Burk
Patty Eli
Bob Osgood
Steve Pielock
Joe Zuraw
John Davis

***** ANNUAL REPORT*****

How did fund raising go last year? How did the money get spent? All good questions, here are the answers.

Income:

1994 Started With		\$ 1254.86
Collected Dues	\$ 662.00	
Contributions And Donations from Other Clubs And Individuals	\$ 974.00	
Money Collected For The Friends Of Arunah Land Organization	\$ 3315.00	
Total Revenue Collected And Carried Over From Last Year		\$ 6205.86

Expenses:

Newsletter Printing	\$ 90.20	
Chain Saw Expenses	\$ 102.39	
Buildings	\$ 8314.68	
Insurance	\$ 8229.00	
Culvert	\$ 195.00	
Gravel	\$ 850.00	
Payments To New Land Loan	\$ 3351.57	
Total Expenses For Last Year		\$ 5132.84

Year End Balance \$ 1073.02

Star Watch Class Receives First Aid Training

On Saturday June 17th members of the Star Watch received First Aid and CPR training at Camp Chesterfield. The class was organized by Arunah Hill and the Boy Scouts of America. Participants also received CPR certification in the state of Massachusetts. In attendance were John Davis, Dave Bowman, Patti Eli, Chuck Musante, Bruce Blanchard, Bob Osgood, Joe Zuraw and Bob Douglas.

If you are interested in getting involved in the Fall 1996 class please contact Joe Zuraw 665-7402 days

1995 Starwatch Training Program

Do you or members of your organization work with the public, schools, or youth groups? Or would you personally like to have a well rounded knowledge of:

- A. Sky lore
- B. Cosmology
- C. Planetary Science
- D. Observing Skills
- E. Telescopes
- F. Organizing and running public programs and star parties
- G. Handling unusual or emergency situations.

Starwatch sets the standard

- Meet active astronomers and naturalists from all over the region.
- Gain access to resources available to your organization.
- Become a Arunah Hill Member.
- Get the keys to Arunah Hill's club house and telescopes.
- Become CPR and First Aid certified by trained, licensed instructors.
- Help shape the future of active amateur astronomy and education in the region.

Starwatch Enriches

Your support has created and directed Arunah Hill's development. Now we can start fulfilling our vision and give something back. Starwatch raises public outreach to higher standards and enriches and revitalizes local astronomy and sciences through networking and informative training.

Join the Starwatch. Classes start Sept. 2.

Arunah Hill Aids In Multiple Events

Hundreds of Boy Scouts learned about astronomy and got to observe the sun, moon, planets and deep sky objects thanks to the efforts of our dedicated membership.

Ray Burk and Bob Osgood helped out on the merit badge midway at the Wilbraham Spring Camporee. Nearly 600 scouts were in attendance.

At Wendell State Forest over 400 scouts got together to compete in orienteering and pioneering skills as well as spend considerable time observing through telescopes. Thanks to Steve Pielock, Chuck Musante, Patty Eli, John Davis, Joe Piorkowski, Bruce Blanchard, Ron Zissell, Rose and Bill Naff and Scott Massey an impressive array of telescopes pointed skyward and delighted the scouts. To be sure, a few future astronomers got their start that night and the rave reviews from adult scouters ensures that we will be included in the planning of future events.

Return to Albany

Steve Pielock and Joe Zuraw were welcomed once again by the good people of the Albany Area Amateur Astronomers Club. We gave an update of Arunah Hill activities and programs and recruited new members.

Arunah Hill Becomes Chartering Organization of Hadley Scout Troop 550

In a unanimous vote at the annual meeting Arunah Hill members adopted Troop 550 of Hadley. As the chartering organization we will provide a meeting place for the troop and help to publish their activities and lend non-monetary support. We are pleased to be formalizing our current relationship with the Boy Scouts.

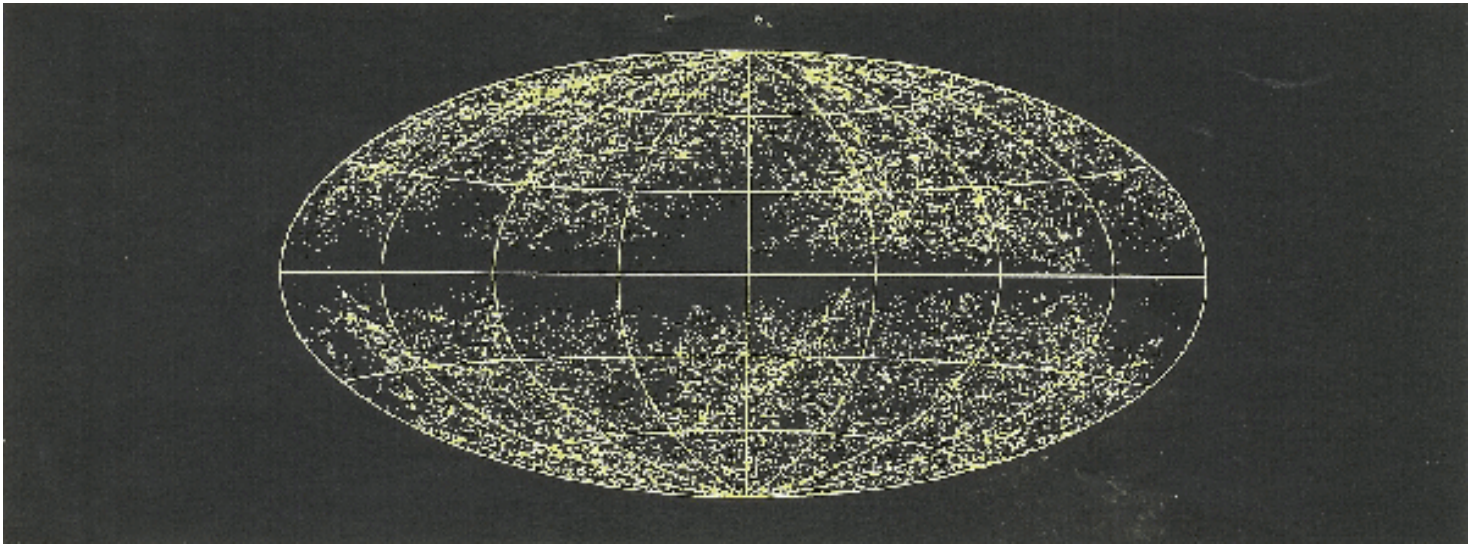
TALES FROM A TALL HILL

By Chuck Musante

Meteor! How many times have people heard that word spoken (or shouted out) at star parties? That single utterance has the power to turn heads, to move eyes away from telescope eyepieces and lift them to the sky almost instantaneously. No matter how enthralled we are while studying an object through a telescope, we never want to miss seeing a meteor streak through the sky. The seemingly infinite variety of meteor shapes, sizes, colors, and durations of incandescent flight always seem to delight observers everywhere.

At a recent observing session several of us were treated to not one, but two unusual meteor events. First, John Davis spotted a meteor as it passed behind a cloud, illuminating the cloud from behind! Then later on, Rose Naff and myself, to our delight, both spotted a bright meteor streaking across the sky from southeast to northwest. When the meteor had died out, Rose and I looked at each other, both of us with amazed looks on our faces. Could it be true? What we had just witnessed was a double headed meteor! At the head of the break were two distinct nuclei, one behind the other, both glowing with the same apparent brightness, separated by perhaps 8 arc minutes. What a sight!

Tales from a Tall Hill is a regular column dedicated to strange but true observing stories. If you have a tale you would like to share please send it to: Arunah Hill (Strange But True Dept.) P.O. Box 16, Cummington MA. 01026



IT'S ALL VERY ELECTROMAGNETIC, MY DEAR WATSON

a compilation by P. L. Eli

Levels of movement exist in the night sky. In three hundred sixty-five nights of periodic viewing, a number of objects can be seen to move faster than the backdrop of distant starglow. These objects periodically appear to slow down, stop movement, reverse direction, then stop again before resuming movement. These objects are our planetary neighbors – Mercury, Venus . . . Mars, Jupiter, Saturn, Neptune, Uranus, and Pluto proceeding in proper motion with periodic retrograde. Beyond the planets of our solar system, the sweep of stars and interstellar dust lanes known as the Milky Way rise each springtime . . . to set and disappear from view before winter. Beyond all of this, we look across the expanse of galactic space where movement seems to have ceased completely. Nevertheless, it moves.

Extend your arm and closed hand out in front of you, so that you can see your fingers. The width of one finger measures very roughly one degree of arc. Ten degrees of arc would be the approximate measurement of the entire hand (thumb to outer edge of palm). This visual measurement might make more sense to say that one second of arc is about equal to the fraction a thirty-six thousandth (.0036 – emphasis on the placement of the decimal point, and the number of zeroes which follow) of one degree of arc.

One parsec (approximately 3.26 light-years) is the distance from Earth at which an object or star would appear to measure one second of arc. The Sun's distance from the Earth is approximately ninety-three million miles. One revolution of the Sun around its galactic center (Sagittarius A) takes about two hundred forty million Earth-years. Travel-time from the Sun to Sagittarius A is approximately twenty-six thousand to thirty-two thousand years – at the speed of light. Between the Sun and Sagittarius A is a boundary of neutral hydrogen (discovered in 1964, and which is not visible except by use of radio astronomy), which occurred as part of a stellar explosion about thirty million Earth years ago. While it takes about eight minutes for the Sun's light to reach the Earth, it would take about twenty-one Earth-years to travel to the Sun using our current fastest means of travel by spacecraft.

Travel to Centauri A, which is approximately 4.5 light-years away from Earth (two hundred seventyfive thousand times further from Earth than the Sun), or Barnard's Star (about 6.0 light-years away from Earth) – would take about seven million Earth-years to travel to either of these nearby stars . . . emphasis. on the word "million." There are at least twenty-seven stars which are known to be within 12.0 light-years distance of Earth, but most require an optical telescope or other technology in order to be visible . . . they are so dim.

Galaxies (like the Milky Way) are grouped in larger structures, as above which shows only portions the Virgo, Hydra, Centaurus, and Antlia clusters in the mid-right upper and lower quadrants – and have been mapped by various researchers, within such technical forums as peculiar velocity, N-body analysis, or gravitational influence.

The force of gravity depends on the distance between two objects. and on the size / brightness of the objects, identifying intrinsic differences between objects found in different regions of space. An extremely modest attempt to provide a visual aid to this discussion might be the bar-magnet experiment, using two bar magnets and a bit of iron filament - positioned far apart, then closer and closer by increments -- to show the properties of magnets, and movement of objects in space (regardless of their size). These articles are dedicated to extragalactic researchers. such as Nigel A. Sharp, publishing firms who represent various science-oriented authors, the comraderie of AHNCS members as well as visiting speakers - who have spent their time discussing a common interest.

DEEP SKY TREASURES THE OBSERVER'S NOTEBOOK

By John Davis

A Bonanza of Springtime Galaxies

The Great Bear with the Big Dipper arcs almost overhead and the Celestial Lion leaps high into the South. Arcturus and Spica lead lesser beacons marching their way up the East and into the South. Evening temperatures moderate. Springtime has come again, and with it a bountiful bonanza of galaxies. Scanning a vast swath of sky from Draco and Ursa Major through Leo to Virgo, up through Coma Berenices and Canes Venatici we find galaxies everywhere, especially in the Realm of the Galaxies in Virgo and Coma. Many of us as amateurs often seek out the bright Messier galaxies in this region, but with the exception of NGC 4565, the prominent edge-on spiral in Coma, we all too often overlook those NGC galaxies (of which there are hundreds), some of which turn out to be well worth viewing, and several of which we noted in our column last issue (Winter). Of course clear dark skies are essential for successful galaxy hunting, and we spent several observing sessions with Chuck Musante this late Winter and Spring under the dark skies of Arunah Hill tracking down a number of these objects, clearly revealed through the diffraction-limited optics of Chuck's superbly crafted 12 ½ inch reflector. A very handy guide we used as a reference to narrow down priorities is "The Finest NGC Objects" (Spring Sky) section of the Observers Handbook of the Royal Astronomical Society of Canada (p 219 of the 1995 edition). Here you find a nice selection of the better and brighter NGC Galaxies.

Although we cannot possibly do justice to them all here, we'll highlight a few of them and briefly mention others, but on our observing agenda there are in this region at least 30 additional bright galaxies (mags.9-11) that space didn't permit our listing which are within easy reach of your 8 inch or larger scope.

We'll start in the South just to the right of the Corvus quadrangle where, less than one degree N of the 5th Mag. star 31 Crt we encounter two interacting galaxies NGC 4038-39, known as "the Antennae" or "Rat-Tail" galaxies. Moving over to Sextans, looking 20 degrees due S of bright Regulus in Leo we find the bright lenticular (or SO) "Spindle Galaxy", NGC 3115 at mag 9.2. On the celestial equator in southern Leo look for the nice bright Spiral NGC 3521 at mag. 8.7.

Moving up to "The Sickle" of Leo and aiming our finder scope almost exactly midway between gamma and zeta, we find a fascinating quartet of galaxies arranged in flattened triangle, the NGC 3190 (mag 11.2) group, consisting also of NGC's 3193 (mag. 10.9), 3185 (mag. 12.2) at the far S end, and 3187 (a real challenge at mag. 13.1 with low surface brightness) completing the triangle. (Hint: look only 5' WNW of 3190 with averted vision) All four of these fainter galaxies fit into a medium to low power field. Swinging up from "the sickle" to the "front paw" of the Great Bear, at mag 9.3 don't overlook the beautiful elongated spiral NGC 2841.

Now, if we look some 25 degrees below the Dipper handle, or 13 degrees NNE of bright Denebola in the tail of Leo, we'll glimpse the beautiful spray of stars in the naked eye cluster of Coma Berenices (Mel. 111) in the Wend of that constellation. Scanning 2 degrees E of star 17 in that "wishbone" group, we come upon the magnificent galaxy NGC 4565, which at mag 9.6 is the most famous showpiece of all edge-on galaxies, a thin streak of light of a length 10 times its width. This is a giant spiral very similar to our own Milky Way sporting a prominent dust lane not quite bisecting its bright nuclear bulge. Its spiral arms span 90,000 light years of space at a distance of 20 million light years. (See Chuck Musante's sketch of 4565).

Many of us, after viewing M64, M53, and NGC 4565 in Coma B. tend to move on, but in so doing, we miss two more magnificent bright spirals in Coma. Looking just 2 degrees due N of 4565 we find NGC 4559 at mag 9.8, showing mottling and hints of spiral structure and several bright field stars. Then, just 3 ½ degrees E of 4565, the large spiral NGC 4725 with its concentrated nucleus, mottling, within its haze and evidence of outer spiral arms, glows brightly at mag 9.2.


Turning North into Canes Venatici, home of several bright Messier objects, we find a constellation strewn with a number of impressive NGC galaxies. Just 6 ½ degrees SSW of alpha CVn (Cor Caroli) we come upon a true celestial leviathan, NGC 4631, at mag. 9.3, a large bright, very elongated and irregular edge-on spiral system of 15' x 3.3' dimensions, resembling quite strikingly a blue whale. As shown in the sketch you can see its distinctive shape and note its mottled texture. Averted vision will reveal this 'whale's "calf" in the form of NGC 4627, a small companion galaxy just N of its mid-section. And within the same low power field, slide just over ½ degree SE and pick up two more galaxies merged into one, the interacting pair NGC's 4656, 57 at mag 10.4 which appears as a twisted galaxy and has been described as both a cross-section airplane wing and more recently as a "hockey stick".

Moving up to Beta CVn and from there just 3 degrees NNW we arrive at a "must see". This is NGC 4449, a very bright (mag 9.4) irregular galaxy with a marked rectangular shape which on some photographs (see Burnham's C.B. Vol. I p. 380) noticeably resembles a "stubby" state or Massachusetts! With averted vision and concentration (see sketch) we could just get B suggestion of S E Mass. and Cape Cod, Bnd another "hook" over "Boston Harbor", and a definite blotchy appearance throughout, brighter toward the center. We've previously mentioned the several excellent Messier galaxies in this region, and now we'll briefly focus on one of them. M101 is a face on "Pinwheel Galaxy" just above the end of the Dipper's handle. At mag. 7.7 its evident glow is often noted in Messier Marathons and then passed over for other Messier objects. We decided to study it closely this time with the 12 ½ inch, and found that on a good night and in a dark sky M101 readily reveals its spiral arms splaying out in "classic" spiral symmetry from its glowing nucleus. What's more, with averted vision, knots of HII regions, (especially one SW of nucleus) stand out along the spiral arms. Truly, M101 under good conditions is worth more than a glance, as Chuck's sketch illustrates.

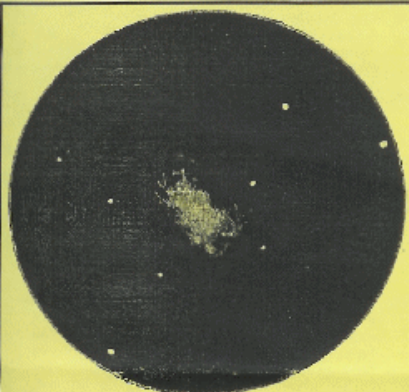
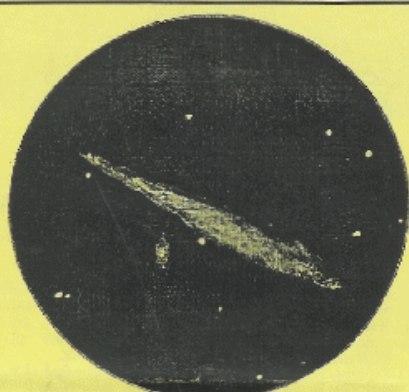
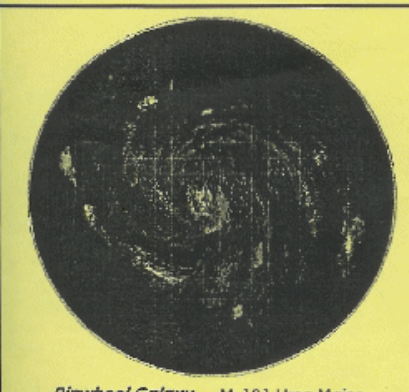
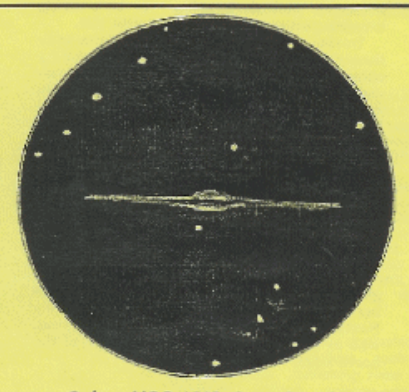
To cap off our galaxy tour, lets star-hop 4 degrees NE from Beta UMa (Merak) into the bowl of the Dipper where we observed NGC 3690 mag 11.5, a.k.a. Arp 299, a disrupted galaxy interacting with IC694. This is an object with two very complex nuclei just .3 arc minute apart, an "active" starburst galaxy with supernova activity, currently being actively studied by Arunah Hill Member Deborah Maraziti, a professional astronomer at nearby Williams College. Chuck Musante has contributed some fine sketches from these observing sessions for this article; and we remind you that you are invited to send in photos or sketches of your observations of the deep sky from wherever you may have made them. Remember as an Arunah Hill member this is your newsletter and we welcome your contributions to our column Deep Sky Treasures".

GALAXY VIEWING

At ARUNAH HILL



From the clear dark sky at **Arunah Hill** in Cummington, MA on Saturday night, May 27th, *Amherst Astronomy Association & Arunah Hill* members, **John Davis** and **Chuck Musante**, made the drawings below, using Chuck's home made 12.5" f/6.5 Dobsonian-Newtonian Telescope.
Negative Imaging by *Amherst Astronomy Association & Arunah Hill* member, **Tom Whitney**.

 <p style="font-size: x-small; margin-top: 5px;">Massachusetts Galaxy NGC-4449 Canes Venatici 12.5" f/6.5 Newtonian 123x, May 27, 1995, Arunah Hill John Davis</p>	 <p style="font-size: x-small; margin-top: 5px;">Whale Galaxy NGC-4631 Canes Venatici 12.5" f/6.5 Newtonian 123x, May 27, 1995 Arunah Hill John Davis</p>
 <p style="font-size: x-small; margin-top: 5px;">Pinwheel Galaxy M-101 Ursa Major 12.5" f/6.5 Newtonian 123x, May 28, 1995, Arunah Hill Chuck Musante</p>	 <p style="font-size: x-small; margin-top: 5px;">Galaxy NGC-4565 Coma Berenices 12.5" f/6.5 Newtonian 123x, May 28, 1995, Arunah Hill Chuck Musante</p>

Take a Hike!

I think we've all heard that phrase at least few times in our lives, but this time it's meant literally.

Think about it! Are you missing out?

We live in a hectic world. As people we are always trying to find some way to kill two birds with one stone. Here at Arunah, we can!

Arunah is not just for Astronomers! It is a place for naturalists, hikers, birders, botanists, photographers or someone who may just desire to take a relaxing walk through quiet woodlands.

Granted, a hike on Arunah is not exactly like the climb up Tuckerman's Ravine on Mt. Washington or a hike along the Knife Edge on Katahdin.

Arunah is indeed a minor mountain in comparison (611 meters, 2004 feet). It is basically a gentle ridge line running in a general North-South direction. It is a mountain for people even of limited abilities. What Arunah lacks in height it gains in character.

Over many years of hiking I have come to appreciate that big is not always best. There is much more to a mountain than the view from its summit.

Arunah has much to offer, yet most who visit here rarely find the time to take a hike.

I've personally spoken to some members who come here often. Each time they have parked their cars below and walked up the woods road to the telescopes. When they have finished observing they simply retrace their steps and go home. If that is what one desires from Arunah then so be it. It is indeed a great observing site.

However, Arunah is much more than just telescopes and dark skies. It is a living breathing observatory teeming with life.

During a single day of hiking one can walk through clearings, along a woods road and by stone walls long since forgotten. One can walk through woodlands of Oak, Beech, Striped Maple, Hemlock, Pine, Spruce and Fir--to name just a few; and that doesn't include the even greater variety of understory plants including several species of wild flowers.

Arunah is mainly made up of what is known as a Northern Hardwood Forest. This type of forest is the most dominant here in southern New England, but it is not the only forest type found here.

On Arunah's south ridge we see hardwoods give way to a beautiful stand of Red Spruce (a boreal species). Boreal literally means – of the North. Boreal is taken from the word Boreas, who in Greek Mythology, was the god of the north wind.

On the north ridge of Arunah, around Land's End, we see a purer boreal stand with few hardwoods, and Fir and Spruce become the dominant growth. This is a very delicate area. It is a tiny island of a forest type found much farther north. In the Northeast this forest type is found in some areas along the U.S.A./Canada border. It can also be found on the upper slopes of many New England mountains. This forest type extends as far north as the Tundra of the Canadian Arctic.

This area on Arunah is a leftover, a remnant of the original forest which settled here not long after the end of the last glaciation. It exists here in part due to Arunah's elevation and climate.

This forest type is also noted for it's understory plants as well. These plants must also live in the shadow of the evergreens above them. Some of these plants have taken decades or longer to fully colonize this area. Arunah is their home, and we are simply visitors with a purpose. Our negligence can erase the efforts of these plants in no time at all. So let's all please stick to the trails. This will insure that this area will also be enjoyed by those who may venture here after us.

In hiking on Arunah I've come to realize that in order to explain all that we have here, it will take several articles of this type. So there is more to come! Remember, Arunah is not just for Astronomers! So the next time you visit please allow yourself some extra time and explore some of our woodlands as well. It can be very relaxing, and it can also set the mood for a great evening under the stars.

So please, no matter what your interest, enjoy your time here. And please don't ever get offended if someone ,walks up to you and tells you in a very direct manner to go TAKE A HIKE!

NOTE: Our trails are maintained by a local Boyscout Troop. They've done some excellent work here. So thank a Boyscout the next time you see one.

******1995 Memberships******

It's the time of the year to collect the 1995 dues. As always the membership is \$15.00, the revenue collected from the dues goes directly into the driveway gravel fund. It also helps pay for the publication of this newsletter. By paying your dues you are contributing to active science education in the Northeast region. Without you, and the hundred or so other people like you, Arunah Hill will not continue to grow and develop. Thank you for your continued support of Arunah Hill, your dark sky observatory.

If you have a red stripe on the outside of your maller you need to pay your 1995 dues! Thank you.

Please make check payable to: Arunah Hill. Send it to: Arunah Hill Natural Science Center, Box 16, Cummington, Ma. 01026

August 18th, 19th and 20th.

Arunah Hill Days

Our fourth year

This is our big event of the year. It's a chance for members and interested parties to enjoy dark skies high in the Berkshires. Bring a tent and spend a couple of evenings. Food is catered and reasonably priced. Enjoy a fantastic and unique roast beef banquet on Saturday.

Enjoy lectures, games, exhibits, workshops, nature walks, and dark sky observing. August 18-20, no admission or activity fees. Show your support and have fun, help make this our best star party ever!

Events will include:

Astronomy, Nature, and Woodworking Demonstrations

Dave Bowman, Shawn Whitney, Joe Zuraw and the Boy Scouts will be presenting a variety of exhibits and demonstrations such as wood carving, Post and Beam construction, trail hiking and identification of diverse flora and fauna.

Astronomy Art Show

Local astronomy artist Beth Kurtz will again present an exhibit of her realistic and richly colored paintings of deep sky objects such as galaxies, clusters and nebulae.

Planetarium Shows

Come and experience Arunah Hill's Nova Planetarium equipment.

Swap Table

We will have space for astronomical items you wish to swap or sell.

Horseshoe Tournament

Arunah Hill challenges any and all clubs to another lively competition at the clearing on the hill.

Talks will include:

Development of the Apollo Lunar Module

Former Vice President at Grumman Aerospace and Lunar Module Program Director, Joseph G. Gavin Jr. , will discuss the engineering problems in the development of the lunar module systems for project Apollo! Joe will also bring a scale model of the Lunar Module for display all day Saturday.

Colliding Galaxies

Deborah Maraziti of Williams College will discuss about her research on interacting galaxies. Her talk will include computer simulations showing first-hand "Colliding Galaxies" .

Asterisms and Star-Hopping

Deep sky observer John Davis will present a short discussion on asterisms and techniques of locating your targets with your telescope.

Having Fun With Globular Clusters

Shawn Whitney of the R.I. Skyscrapers will show us what we can learn about Globular clusters through observing them.