



Vol. 2015, No. 8

Newsletter of the New Hampshire Astronomical Society

August 2015

In This Issue...

2 [*President's Message*](#)

2 [*Sky Watch Review*](#)

Community Roots
Madison Old Home Week
Goffstown Public Library
Castle in the Clouds
Nesmith Library
Harrisville Public Library

4 [*Stellafane 2015*](#)

7 [*Object of the Month*](#)

September: S Cephei

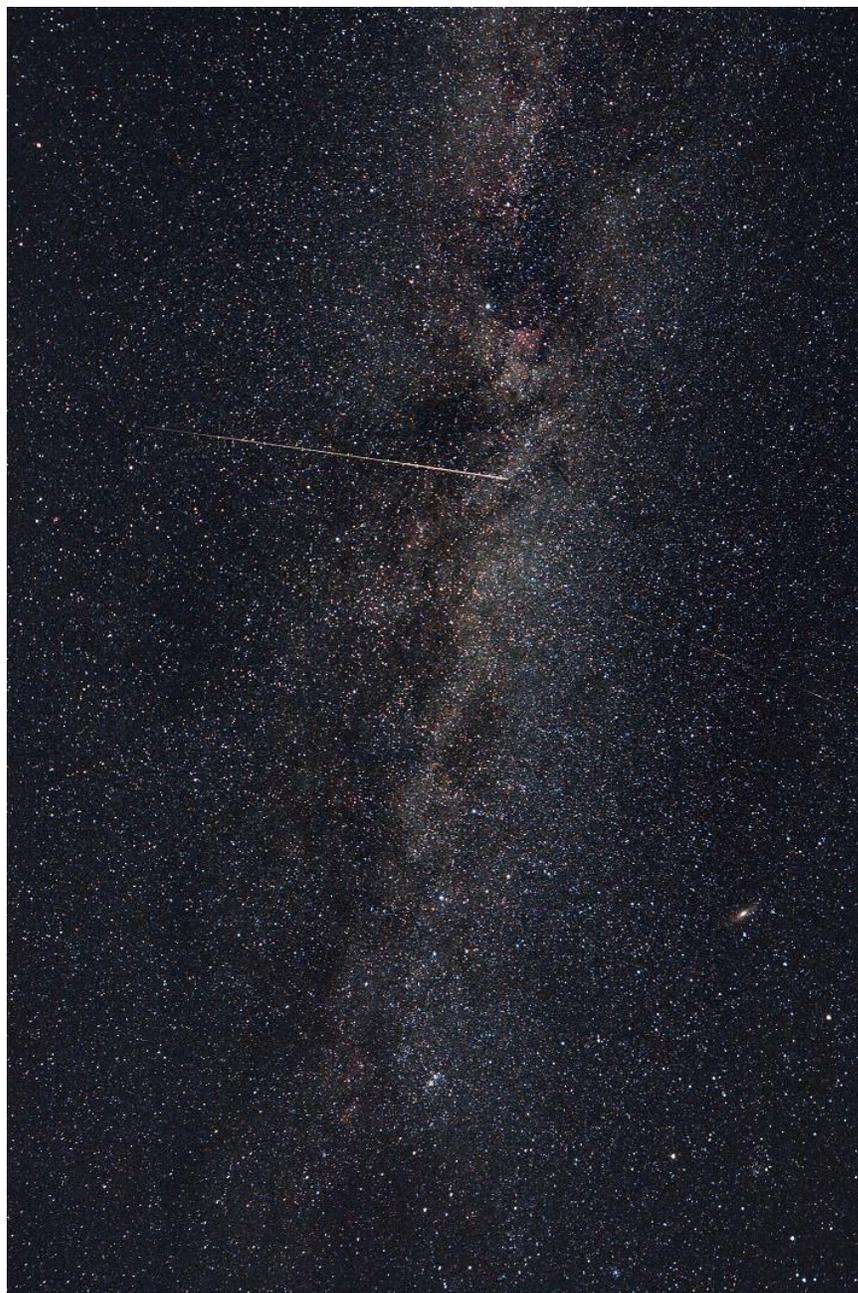
8 [*Images of the Month*](#)

Moosehead Lake Trails

9 [*The Regular Items*](#)

Business Meeting Report
Treasurer's Report
Contact Information
Club Loaner Scopes
Astronomy Resource Guide
Upcoming Events
Credits

August Showers



A Perseid streaks across the Milky Way above YFOS.

(Image: John Buonomo)



Dark Sky at Night

You probably already know about “Olbers’ Paradox”, which tells us that the fact that the night sky is mostly dark with just some stars means that the Universe is finite in either time or space ([if not, look it up!](#)). The discovery of the microwave background got the Nobel Prize because it meant that of those two choices, we now knew that the Universe was finite in time, with the current estimate being 13.7 billion years old.

But there’s another deduction we can make from what we see when we look at the night sky. During the Big Bang, there were times when the entire Universe was at temperatures and pressures similar to those in the cores of stars today. If the Universe had stayed in those conditions for decades or centuries, all the hydrogen would have fused to helium and then all the helium to carbon and so on. The fact that the night sky has any stars at all means that the Big Bang was a fast event, so fast that it didn’t burn up all the fuel.

The books I’ve read say that relativity implies that mass-energy in a space causes the space to expand. That isn’t things inside expanding into nearby space; it’s the expansion of space itself. I am not a physicist and I’ll have to believe them without understanding how it really works. But I can look at the stars in the sky and know that theory, or something like it, must be true, because the Big Bang had to have happened so fast that the Universe didn’t reach equilibrium. That’s why there’s still hydrogen, and stars fusing hydrogen and thus life on Earth.

That’s the wonder of science – knowledge from noticing -- and it all starts with looking up!

John Bishop
NHAS President

*[Heinrich Wilhelm Matthias Olbers (1758-1840) devised the first reliable method of calculating the orbits of comets while still studying medicine at the University of Göttingen. Upon graduation in 1780, he began practice as a physician in Bremen while continuing astronomical observations, converting the upper story of his house into an observatory. He discovered the asteroid **2 Pallas** in 1802 and **4 Vesta** in 1807, while the paradox mentioned above was conceived by him in 1823. His other major claim to fame has to be as mentor to **Friedrich Wilhelm Bessel**, beginning in 1804, as the young man was trying to recalculate the orbit of Halley’s comet based on 2 centuries old observations by Thomas Harriot. Read about them in chapter 12 of “**Parallax: The Race to Measure the Cosmos**” by **Alan Hirshfeld**, this month’s guest speaker at the monthly business meeting. –Ed.]*

Sky Watch Review

Community Roots, Lee NH, August 1

The event had been postponed from July 18. **Ted Blank, Steve Forbes** and I were there from NHAS. The observing site at Coppel House Farm is very dark and has excellent horizon views. Skies were a bit hazy and clouds eventually rolled in.

About 10 people were in attendance and I showed: Saturn (and a few moons), Albireo, Mizar, 61 Cygni, Cor Caroli, M57, M13, NGC 457, M11, and finally the gibbous (one day past full) Moon.

- **Paul Winalski**

Madison Old Home Week, Silver Lake NH, August 4

It was, as advertised, a small but enthusiastic group. The sky cleared to a lovely, dark, steady wonder. Madison is one good astronomer event.

- **Marc Stowbridge**

***Goffstown Public Library,
Goffstown NH, August 5***

It was raining as I drove out to Goffstown, but the skies started to clear in the west, and when I arrived at the observing field I found Ted Blank and Steve Forbes admiring a rainbow in the east. By twilight we had very clear, very transparent, and very dark (modulo the Manchester light dome in the east) skies. M8 was naked-eye visible. We had a good crowd of 50 or so people, and also had a good turnout by NHAS members: **Ted Blank, Herb Bubert, Steve Forbes, Gardner Gerry, Ed Ting, Bob Veilleux and Paul Winalski**. Seven scopes meant short lines. A 14" truss-tube dob can point quite low to the ground, which meant the man in a wheelchair was able to enjoy Saturn, NGC 457 and some other low objects.

With the good conditions and short lines, I was able to show off a lot more objects than usual: Saturn, Albireo, 61 Cygni, V Aquilae, NGC 457, M57, M13, M17, M8, M31/32/110, M81, M82, the Veil Nebula and Perseus double cluster.

- ***Paul Winalski***

We all had a great time at the skywatch! A bit of rain moved through around 6pm but by 7pm the sky was clear and seeing was quite good. M8 was visible naked eye in Sagittarius. There were lots and lots of visitors, including several high school students who stayed quite late. The gentleman in the wheelchair was able to get excellent views of Saturn in Mr. T (he slid right under the scope with the eyepiece in perfect position) and I believe he also talked to several members about astrophotography.

- ***Ted Blank***

***Castle in the Clouds,
Moultonborough NH,
August 12***

From the moment that I found the right place to go to (it was poorly signed) I never had a moment to stop and see all the scopes. We had five telescopes with **Stan Herman, Dave MacDonald, Marc Stowbridge, Gardner Gerry and Elaine Grantham-Buckley** representing NHAS. Over 70 people show up for a wonderful evening of viewing. The observing was done from the front deck of the Castle with a magnificent view of Lake Winnepesaukee. During the course of approx. 2 and 1/2 hours we had several enthusiastic yells for seeing brilliant Perseids, a few complete with smoke trail that certainly made the trip worthwhile. We also observed Saturn, M13, M15, M31, M57, M92 and more, along with Alberio, part of the Veil nebula and more. If invited to do the same again next year I most certainly will go back. There was even mention of doing a daytime solar as well as an evening observing next year.

- ***Bob Veilleux***

We had a very successful night. At least 75 folks showed up. We had five scopes ranging from a superb TAK 90 to my humble 10" dob and we were able to show quite a few objects, including Saturn (the biggest hit), M13, M57, M31, Lagoon Nebula, Double Cluster, Alberio and several interesting stars. And then there were the Perseid meteors - every time one passed, the crowd roared. The Castle hosts were extremely accommodating, and couldn't thank the club enough for putting on the event. Viewing conditions were just about perfect, and we closed up around 11 PM.

- ***Stan Herman***

***Nesmith Library, Windham,
NH, August 17***

The skies cooperated for the event that began with my presentation to a mix of about 40 adults and kids and I was able to wow them with the 8.6 lbs. club meteorite. When we got outside, **Gardner Gerry and Mike Deneen** had scopes set up with the three day old crescent moon as their first target. Saturn was a main feature of the night with Albireo, M13, and M57 in supporting roles. GLPs drew out the constellations while the library staff expressed interest in our Library Telescope Program and another possible skywatch in the winter.

- ***Steve Rand***

***Harrisville Public Library,
Harrisville NH, August 28***

Steve Forbes and I got thrown a curveball by Google Maps, which doesn't know how to find the street address of the observing site and sent us to the Public Library instead. But we all eventually got there. Next time I will use latitude/longitude coordinates for the map link.

The site is near to ideal - a big, open field at the top of a hill, with excellent horizon views and no nearby artificial lighting. But there was a near-full Moon to light everything up. I still managed to pull in several deep-sky objects for the 40 or so library patrons who showed up. Representing NHAS were **Steve Forbes, Gardner Gerry, Steve Rand, K. K. Varghese and Paul Winalski**. The Library Telescope was also on the field. We are working on scheduling another date at this excellent site, this time when the Moon is absent.

- ***Paul Winalski***

Rob Mack opens the account

Fairly nice weather graced the Stellafane 2015 weekend. The NHAS attendees included: **Joe Dechene, Gary Duranko, Joel Harris, Rick Lilly, Larry and Linda Lopez, Rob and Brian Mack, John Rose, Dan Smith, Mike Townsend, Bob Veilleux and Pete Wolczko.** The NHAS encampment was at the traditional location below the McGregor Observing Field. The club tarp covered a food/snack table and provided shelter from the sun during the day. Despite partly cloudy conditions both nights, there were enough sucker holes to get in some deep sky observing. Quite a few scopes were entered in the telescope making competition, many of which are documented in a YouTube video by **Francis O'Reilly** of ATMoB entitled: [Telescope Maker's Workshop – Stellafane 2015](#). Interestingly, the video tour winds through the vicinity of the NHAS Tent at about the 30-minute mark and my Telescope World 12.5" Newtonian mount is also featured.



The Fun times – Chef Harris with his clientele on Saturday. (All photos: Rob Mack)



Linda explaining a loop prominence seen in the Lunt. (below): The early scopes from the 1930s that ushered in the era of affordable units for the masses, now on display in Hartness House, Springfield VT.



The Saturday evening Twilight Talk was exceptional. The crowd was packed in like sardines into the Flanders Pavilion due to incoming storms, and if one didn't have a seat by 6:45pm, one arrived soaked by a deluge. The big raffle drawing was the early highlight of the evening and two NHAS members came home with some nifty prizes. Brian Mack won the big stack of observing books from Willmann-Bell in the raffle drawing and Joel Harris won a rare bumper sticker from Alan Stern that says "My other vehicle is on its way to Pluto."

John Bortle delivered the Shadowgram talk entitled: "*How Stellafane Created Amateur Astronomy in America.*" This featured the early history of people and events leading up to and after the formation of the Stellafane gatherings (late 1920's-early 1930's) and how the art of home telescope making evolved, making astronomy accessible to the general public for the first time; the hobby was born!

The keynote talk was given by **Alan Stern**, Principal Investigator of the *New Horizons* mission to Pluto and beyond. His fascinating presentation of behind-the-scenes events of the mission, from initial planning and funding through the Pluto flyby last month, captivated the audience well beyond the end of twilight.

On Sunday morning, a few of us stopped by the Hartness House in Springfield to check out the old underground observatory and their collection of historical astronomical memorabilia. While I've visited the museum many times over the decades, this visit was especially interesting as John Bortle's talk the previous night really pulled it all together for me in terms of content and context.

Larry Lopez waxes without waning

We had some rain on Saturday evening. And we had fun in the pavilion watching the rain in the afternoon. The Keynote talk on the New Horizons Pluto mission was the best talk ever. It was not because the images are so wonderful (they are, even though they are the low-res quickies). It is that they were able to do things which were impossible to do, in a period of time which was much too short, at a cost which was much too small ...

It was wonderful.

And there was one more speaker...

Striking a note of a different kind was **Glenn Chaple**, who talked about Carbon Stars, the coolest things out there in the dark skies. In a paradox all their own, they are at their reddest when also dimmest. Glenn is a regular contributor to *Astronomy* magazine with his *Observing Basics* column; he also talks about an *Object of the Month* every month in this newsletter (and others) – the current topic is S Cephei, a very circumpolar carbon star (next, on page 7). Glenn Chaple will also be our guest speaker at the November NHAS business meeting, when the topic is likely to be Double Stars. His many articles on double stars can be found at [Skyscrapers](#), the web-site of the Amateur Astronomical Society of Rhode Island. ***But first, mark your calendars for November 13!***



Glenn Chaple assumed the correct hues to talk about Carbon Stars.
(Photo: Jim Hendrickson)



This 'Police Box' 10-inch Dob was one of the novel entries in the scope making competition, winning two awards.
(Photo: Rob Mack)

Mike Townsend is succinct as usual

We had 2 nights of clouds and rain, but Stellafane this year seemed better attended than the past few years. We had Solar observing on Saturday, but Sunday was a bust. This year's flea market was the best in some 5 years, with lots of people set up and lots of activity. The club picnic went very well and we all had a very good time, enough though the turnout was lower than last year.

John Rose is in his element in the elements

Unfortunately Stellafane coincided with the August business meeting this year, causing me to miss the latter. I am not sure if this was my twenty-third or twenty-fourth convention. Saturday morning I got down to the swap tables at about 7:00am, the best I have seen in several years. Dan Smith and Mike Townsend were already set up and Mike had taken some of my extra stuff and put it on his table. I did spell Dan and Mike at their table giving them a chance to look around. The swap meet started winding down around 10:30am. I loaded my Trailblazer with what had not sold and what I had bought, and by 11:00am I was off to the club tent.

Joel Harris did his usual nice barbecue. Club member turnout was lower this year. There was some thunder and some of us spotted a lightning bolt which was likely a ground strike to the Northeast. After lunch I went down to catch the bus to the Clubhouse. The display field was almost empty and the telescopes I saw there were all covered, so I walked back to the main convention field.

The Pavilion was crowded and the talk did not interest me, so I went back to the club tent and chatted with the members who were there.

Later on towards 6:00pm we got some heavy rain and got a bit wet. After that cleared out I headed down to the Pavilion. I have never seen it so crowded. No luck with the prize drawings, but when the drawings ended we went up to the food tent. It was a different service this year and they closed at 7:00pm! I did manage to find some Hot Chocolate on the honor system and chatted with some other people in the food tent.

I went back down to the Pavilion later but it was still overflowing. Due to weather considerations I was planning to leave after the Keynote speech, but being tired and not wanting to sit outside with the potential of getting wetter than I already was, and worrying about what the ride home might turn into if I stayed late (past experience talking!), I headed home early. The drive down the hill was fine, but I started seeing fog in Springfield. While crossing the Connecticut river, it began to rain. Fortunately it did not rain too hard, but enough to keep me under the speed limit about a third the way home.

Sunday morning I unloaded my Trailblazer and put the stuff I bought at the swap meet on the garage floor while I sorted out where I would put it. It had been a really nice swap meet!



Clouds and shrouds did not dampen the good times.

(Photo: John Rose)

Andromeda and a Perseid



The Andromeda Galaxy (M31) seen just above the left end of a Perseid trail.

(Image: Dave Weaver)

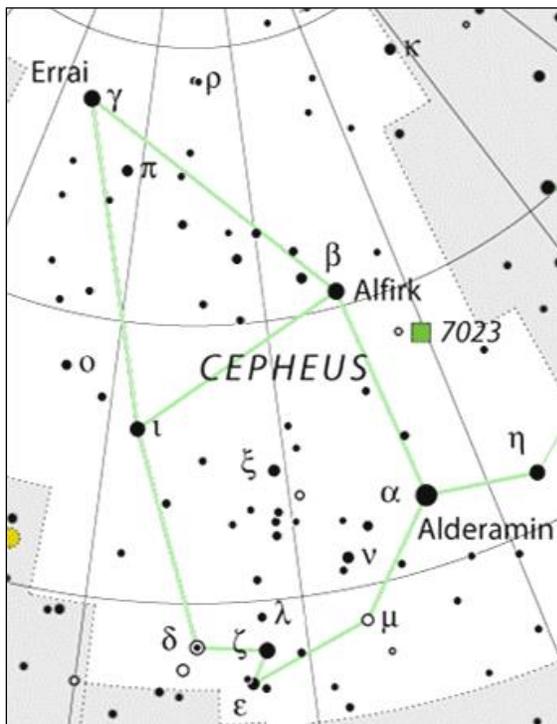
S Cephei – Carbon Star in Cepheus

by Glenn Chaple

On August 15, I presented a talk on carbon stars at the **Stellafane Convention**. The library at the McGregor Observatory, which served as the setting, hosts a typical audience of 12 to 20. This time more than 30 showed up. The topic was obviously one of intense interest! The reason is obvious to anyone who has ever looked at a carbon star like R Leporis (Hind's Crimson Star), T Lyrae or V Aquilae. At times, they can appear red – drop-of-blood red!

Popular fare for backyard astronomers over a century ago, carbon stars have enjoyed a resurgence in popularity, particularly with individuals seeking a change from the usual deep-sky fare of nebulae, clusters and galaxies. They have become so popular that the **Astronomical League** recently initiated a carbon star observing program that lists 100 of these cosmic rubies. Lest I be accused of false advertisement, I should point out that not all carbon stars are ruby red. The color you see will depend on your vision, the nature of binoculars or telescope used, sky conditions, and the star's magnitude (carbon stars tend to be reddest when near minimum brightness). At the very least, a carbon star will shine with a rich golden yellow hue.

Like its kindred carbon stars, of which nearly 7000 have been catalogued, S Cephei is a red supergiant with a 'sooty' carbon-laced outer atmosphere that enhances its ruddy appearance. Typical of its stellar class, it varies in brightness, ranging from 7th to 11th magnitude in a period averaging 485 days.



Finder Chart A.

(Courtesy: www.constellation-guide.com)

The finder charts above point the way to S Cephei.

A line from gamma (γ) to the wide pair of rho (ρ)

and 28 Cephei and extended an equal distance beyond brings you to a triangle of 7th magnitude stars perched atop

HIP 104105, a 6th magnitude star labeled 59 (its magnitude without decimals) on Chart B. Chart C will help you

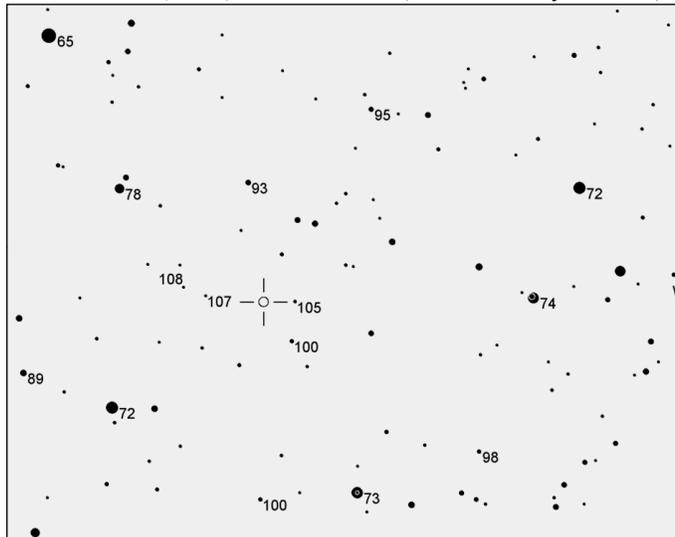
star-hop from the triangle to S Cephei. Magnitudes of surrounding stars are added (decimals are omitted). You'll

find more information on S Cephei at www.aavso.org/lcotw/s-cephei. Information about the Astronomical League's

Carbon Star Program can be found at www.astroleague.org/content/carbon-star-observing-program.



Finder Chart B (above) with γ Cep left and ρ-28 pair in the middle.
Finder Chart C (below). (Charts courtesy: AAVSO)



Moosehead Lake Trails



The calm night of August 10 yields reflections of star trails in the Lake, with aurora to the north. [stacking of 75 exposures of 135 seconds each beginning at 11:30pm, total exposure: 2 hours 48 minutes; taken in RAW mode, processed in Lightroom, and then compiled and exported as JPEG from StarStax.]

(Images: Carter Van Eitreim)



Dead snags at the edge of a swamp, with one 'shooting' right through the NCP. [stacking of 85 exposures of 120 seconds (2 hours 50 mins) on August 14 from 12:40am]

The Eitreim family spent the week of August 10 at Moosehead Lake, Maine, and the 20-year old son of **Jeff Eitreim** practiced his craft nightly, snapping star trails.

Carter Van Eitreim used his Canon 5D MKII camera for these shots, with a 16mm lens at f/2.8. As he recalls:

The image above was created by light painting the dock with a flashlight. I was lucky to get a very calm night as this was taken over Moosehead Lake, so any waves would have ruined the reflection of the star trails. The Aurora Borealis display occurred from midnight to 1:30am.

The image to the left was taken at the edge of a swamp near the lake by aiming the camera so Polaris was in upper right. The dead snags throughout the swamp draw your vision up into the sky, while the density of the stars serves to highlight the shape of the snags.

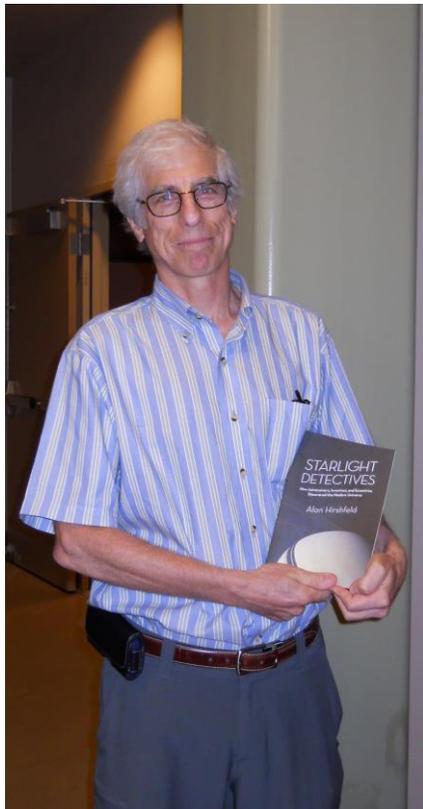
The monthly business meeting was held at MSDC, Concord NH on August 14th, with our President **John Bishop** presiding. The Treasurer's report by "**Rags**" follows on the next page.

President's Report

At the quarterly Officers' meeting, ways of generating publicity for the upcoming talk by **Ed Ting** were discussed. We also have to get moving on the Astro 101/201 courses for the (new) membership.

The Summer BBQ held at **Melinde** and **Don Byrne's** residence on August 1 was quite an affair. A very good time was had by all and there was way too much food! And who knew our hosts kept bees?

Ed Ting will present his talk "*What Telescope to Buy*" in October at MSDC. Intended to target the general public, it has to be widely publicized. It will be held in the side hall (outside the paywall), so that everyone can attend free of charge.



Astronomy Shorts

Rags: Nori spent the past two nights looking at Perseids.

Megan Gialluca: Spent the past 3 nights looking at Perseids and persuaded about half a dozen non-astronomy friends to look as well.

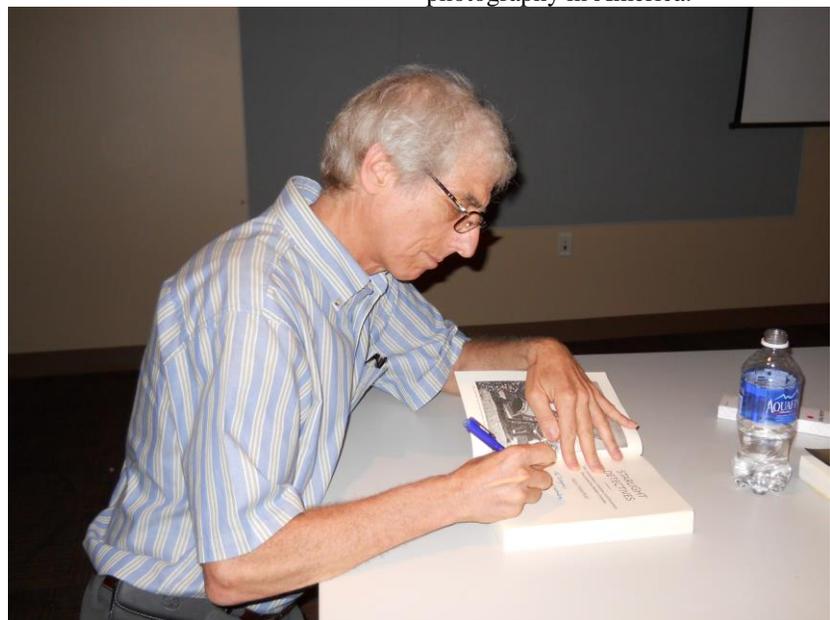
Wayne Mitchell: University of Arizona at Tucson had astronomy presentations on campus when he visited, with big SCGs. Later went to observatory on the mountain for a personal tour from the Director.

Steve Rand: doing a skywatch every Saturday night at Greenfield State Park after the park's night walk. Last Wednesday was able to see lots of stuff on a very clear sky.

Scope of the Month

John Bishop showed Vixen Optics 2.1x42 binoculars with Galilean optics that are just right for looking

Prof. Hirshfeld with his latest book.
(Photos: Michelle Thomas)



at constellations. It feels like you're seeing 1 or 2 magnitudes deeper. Although adjustable for bad eyes, it is still a bit pricey at \$289.

The Evening Presentation

Alan Hirshfeld's book "*Starlight Detectives*" presents biographical vignettes of those in modern history to have shaped Astronomy as it is today. His talk focused on William Cranch Bond, a clockmaker in Dorchester MA, who was instrumental in establishing Harvard Observatory as the preeminent site for scholarly Astronomy in the New World in the 19th century.

Bond was also a pioneer in the field of Astrophotography, generating the very first stellar image (of Vega) on daguerreotype in collaboration with John Adams Whipple (July 1850). Linking a series of personal stories, Dr. Hirshfeld (Professor of Physics at the University of Massachusetts, Dartmouth) brought the audience back in time to the birth of celestial photography in America.

NHAS Treasurer's Report

(as of August 9, 2015)

Starting Checking Balance:	\$12,447.79	Membership:	137
Deposits:		Single + Family	
Membership	260.64	Cash Renewals:	1x30.00+0x10.00 30.00
Donations	760.00	Cash New Members	0x30.00+0x10.00 0.00
Interest	0.31	PayPal Renewals:	0x28.83+0x 9.61 0.00
Total:	\$1,020.95	PayPal New Members:	8x28.83+0x 9.61 230.64
		Total:	9 \$260.64
Expenses Paid:		Current Members:	146
Rackspace Cloud (Web site)	58.00	<i>[18 Family memberships; 80 members paid by PayPal]</i>	
Astronomical League	218.88	Donations:	
Steve Forbes (new mower)	80.00	Dad's Campout Fund,	GEN 400.00
PayPal (shortfall)	7.36	Wellesley MA	
Total:	\$364.24	Gary Duranko, Salem NH	GEN 60.00
Current Checking Balance:	\$13,104.50	Lake Morey Resort, Fairlee VT	GEN 250.00
Petty Cash:	\$100.00	Community Roots, Lee NH	GEN 50.00
Current Cash Balance:	\$13,204.50	Total:	\$760.00

New Members:

Tim McNeill	Amherst NH	Glenn Tonnensen	Gilmanton NH
Rebecca "Becca" Rooney	Bedford NH	Mauro Scali	Londonderry NH
Varchese Kochunny	Somersworth NH	Charles Rose	Nashua NH
Don Holshuh	Surry NH	Paul Collins	Nashua NH

Contact Information

How to join NHAS

Write to us: **NHAS**
P. O. Box 5823
Manchester, NH 03108-5823

Send Email to: info@nhastro.com

Visit our web site: <http://www.nhastro.com>

How to contribute to the Observer

Email articles and snapshots to the Editor:

ramax.astro@yahoo.com

NHAS Officers:

President: [John Bishop](#)
Vice-President: [Tom Cocchiaro](#)
Secretary: [Paul Winalski](#)
Treasurer: [David "Rags" Gilmore](#)

Board of Directors:

[Ken Charles](#)
[Pete Smith](#)
[Steve Rand](#)

How to Borrow a Loaner Scope in 3 Simple Steps

- Contact the custodian of scope you're interested in
- Arrange to meet for the transfer (usually at a monthly Business Meeting)
- Sign the requisite papers and leave with the scope

It is a benefit of your membership in NHAS. The loan will be for 2 months; an extension might be granted if no one else is waiting for the unit. The objective is to help new members get to know what will suit them personally, to experiment with options and to understand **what will work** in the time available to them to pursue their new hobby, and equally, **what may not**. A suitable (beginner's) telescope is invariably one that is easy to transport to the observing site and easy to setup, and not necessarily the one with the most aperture or sophistication.



Orion Starblast 4.5 – LTP-style Telescope

Custodian: Pete Smith
Contact: psastro60@gmail.com

Equipped with:

Commercial red-dot finder with a special Joel Harris mount.

Celestron 8mm-24mm zoom EP, plus 17mm and 6mm EPs.
 A red/white Headlamp and a Lens Cleaning Pen in the pouch.
 A simple Collimation Cap to learn to collimate the old way.
 A Planisphere, a Moon Map and Richard Berry's "Discover the Stars" Instruction booklet and an Audubon constellations guide.



Lunt LS60TH α /B600PT H-alpha Solar Telescope

Custodian: Pete Smith
Contact: psastro60@gmail.com

Equipped with:

Tele Vue Sol Searcher
 Celestron 8mm-24mm Zoom EP

Feathertouch focuser for smooth and precise focusing.
 Celestron CG-4 EQ Mount with RA/Dec. motor drives and controller.
 Sun screen to shade the observer, a Marc Stowbridge special.
 Booklet with quick start instructions.
 Foam-lined custom hard case for the OTA.

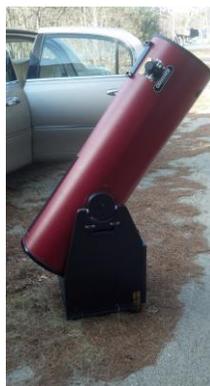


Orion XT6 – 6" Newtonian on a Dobsonian mount

Custodian: Tom Cocchiaro
Contact: tomcocchiaro@comcast.net

Equipped with:

Telrad finder with a dew shield
 32mm, 25mm and 10mm Plössl EPs in a case
 A Planisphere, Moon map, red light
 Orion XT6 user manual
 Richard Berry's "Discover the Stars"



Coulter Odyssey 10" Newtonian on a Dobsonian mount

Custodian: "Rags" Gilmore
Contact: nhas@ragnorok.net

Equipped with:

Telrad finder with a dew shield
 26mm TeleVue Plössl and
 15mm Celestron Plössl in a case
 A Planisphere and a Moon map
 Richard Berry's "Discover the Stars"
Also available in a separate slip-case:
 Sky Atlas 2000.0 by Wil Tirion and Sinnott

Sky Atlas 2000.0 Companion by Robert Strong and Roger Sinnott



Meade 8" Newtonian on a Dobsonian mount

Custodian: Scott McCartney
Contact: Scott_McCartney@nhb.uscourts.gov

Equipped with:

Telrad finder with a dew shield
 25mm and 10mm EPs
 A custom-built base (made by Joe Derek and Chase McNiss)



Orion XT10 Newtonian on a Dobsonian mount

Custodian: Pete Smith
Contact: psastro60@gmail.com

Equipped with:

Telrad finder
 Assorted EPs: 35mm, 25mm wide-angle, 17mm and a mystery one (25mm?).
 An EP case
 Richard Berry's "Discover the Stars"

Regional Astronomy Clubs

New Hampshire Astronomical Society
[NHAS] *Skywatches around the State*
Sidewalk Astronomy in Portsmouth
www.nhaastro.com

Amateur Astronomical Society of Rhode Island (North Scituate, RI)
www.theskyscrapers.org

Amateur Telescope Makers of Boston
(Westford, Mass.)
www.atmob.org

Astronomy Society of Northern New England (Kennebunk, Maine)
www.asne.org

Gloucester Area Astronomy Club
(Gloucester, Mass.)
www.gaac.us

McAuliffe-Shepard Discovery Center
[MSDC] (Concord, NH)
First Friday Observing Event
www.starhop.com

Northeast Kingdom Astronomy Foundation (Peacham, VT)
www.nkaf.org

North Shore Astronomy Club
(Groveland, Mass.)
www.nsaac.org

Penobscot Valley Star Gazers
(Bangor, Maine)
www.gazers.org

Online Live Observatories

Astronomy Live (broadcasts)
www.astronomylive.com

SLOOH (Tenerife, Canary Is.)
www.slooh.com/about.php

Worldwide Telescope
www.worldwidetelescope.org

Magazines

Astronomy
www.astronomy.com

Sky & Telescope
www.skyandtelescope.com

Astronomy Gear

Adorama
www.adorama.com

Agena AstroProducts
www.agenaaastro.com

Astromart
(Used equipment and advice)
www.astromart.com

Astronomy-Shoppe
(in Plaistow, NH 03865)
www.astronomy-shoppe.com

Celestron
www.celestron.com

Cloudynights
(Used equipment, Articles, Forums and Reviews)
www.cloudynights.com

Explore Scientific
www.explorescientific.com

High Point Scientific
www.highpointscientific.com

Kendrick Astro Instruments
www.kendrickastro.com

Lunt Solar Systems
www.luntsolarsystems.com

Meade Instruments
www.meade.com

Oceanside Photo & Telescope
www.optcorp.com

Orion Telescopes
www.telescope.com

ScopeStuff
www.scopestuff.com

Stellarvue
www.stellarvue.com

TeleVue
www.televue.com

Vixen Optics
www.vixenoptics.com

William Optics
www.williamoptics.com

Astronomy Web Sites

CalSky
(Sky Calendar to plan Observing)
www.calsky.com

Free Star Charts
(Star Charts for MM, Planets etc.)
www.freestarcharts.com

Heavens Above
(on Satellites, Spacecraft, Planets)
www.heavens-above.com

NASA
www.nasa.gov

Dark skies Observing Sites
(Horizons and Clear Sky information)
www.observingsites.com

ScopeReviews
(Reviews by Ed Ting, NHAS)
www.scopereviews.com

Sloan Digital Sky Survey DR10
<http://skyserver.sdss3.org/>

SpaceWeather
(Solar activity, Asteroid passes)
www.spaceweather.com

Computer Software

Cartes du Ciel (*aka Skychart*) (Free)
www.ap-i.net/skychart/

Celestia
www.shatters.net/celestia

Computer Aided Astronomy (Free)
www.astrosurf.com/c2a/english/

Earth Sky Tonight
www.earthsky.org/tonight

SkyMap Online
www.skymaponline.net

Starry Night
(many versions, Novice to Expert)
www.starrynight.com

Stellarium (Free)
www.stellarium.org

WinStars (Free)
www.winstars.net/english/

Upcoming Events

13

Event	Date	Time	Location
First Friday Skywatch for MSDC	Friday, September 4	7:00pm	MSDC, Concord NH
Mt. Washington Resort Skywatch	Saturday, September 5	8:00pm	310 Mount Washington Hotel Road, Bretton Woods, NH
NHAS Business Meeting	Friday, September 11	7:30pm	St. Anselm College, Manchester NH
Coffee House Night at YFOS	Saturday, September 12	5:00pm	YFOS
Rey Center Skywatch	Saturday, September 12	8:00pm	Waterville Valley NH
Kilton Public Library Skywatch	Tuesday, September 14	7:30pm	80 Main Street, West Lebanon NH
Kilton Public Library Skywatch (backup date)	Thursday, September 17	7:30pm	80 Main Street, West Lebanon NH
Josiah Carpenter Library Skywatch	Wednesday, September 16	6:30pm	41 Main Street, Pittsfield NH 256 True Road, Pittsfield NH
Rochester Paranormal/UFO Festival Skywatch	Friday, September 18	7:30pm	Rochester Common, Rochester NH
Sidewalk Astronomy Skywatch	Saturday, September 19	6:00pm	Market Square, Portsmouth NH
North Hampton Public Library Presentation	Saturday, September 26	1:00pm	237a Atlantic Avenue, North Hampton NH
North Hampton Public Library Skywatch	Sunday, September 27	9:00pm	237a Atlantic Avenue, North Hampton NH
First Friday Skywatch for MSDC	Friday, October 2	7:00pm	MSDC, Concord NH
Plaistow Public Library Skywatch	Saturday, October 3	7:00pm	85 Main Street, Plaistow NH
Hooksett Library Skywatch	Wednesday, October 7	7:00pm	31 Mount Saint Mary's Way, Hooksett NH
Hooksett Public Library Skywatch (backup date)	Thursday, October 8	7:00pm	31 Mount Saint Mary's Way, Hooksett NH
NHAS Business Meeting	Friday, October 9	7:30pm	MSDC, Concord NH
Coffee House Night at YFOS	Saturday, October 10	5:00pm	YFOS
NH Boy Scout Jamboree Skywatch	Saturday, October 10	6:00pm	NH Motor Speedway, Loudon NH
Rey Center Skywatch	Saturday, October 10	7:00pm	Waterville Valley NH
Kimball Library Skywatch	Tuesday, October 13	6:30pm	5 Academy Avenue, Atkinson NH
Merrimack Parks and Recreation Skywatch	Wednesday, October 14	6:30pm	Wasserman Park, Merrimack NH
Merrimack Parks and Recreation Skywatch (first backup date)	Thursday, October 15	6:30pm	Wasserman Park, Merrimack NH
Merrimack Parks and Recreation Skywatch (second backup date)	Friday, October 16	6:30pm	Wasserman Park, Merrimack NH
Ghost Hunt/Fall MM at the Wicketts'	Saturday, October 17	6:00pm	[Members only]
Sidewalk Astronomy Skywatch	Saturday, October 17	6:00pm	Market Square, Portsmouth NH
Auburn Public School Skywatch	Tuesday, October 20	6:30pm	Preston Field, Auburn NH
Greenleaf Recreation Center Skywatch	Wednesday, October 21	6:30pm	195 Greenleaf Ave, Portsmouth NH
Auburn Public School Skywatch (backup date)	Thursday, October 22	6:30pm	Preston Field, Auburn NH
Greenleaf Recreation Center Skywatch (backup date)	Wednesday, October 28	6:30pm	195 Greenleaf Ave, Portsmouth NH
Milton Free Public Library Skywatch	Saturday, October 31	6:30pm	Milton Town Beach, Milton NH

Note: Please check [\[Calendar\]](#) at www.nhastro.com for up-to-date information on upcoming events.

Date	Time	Lunar Phase
Saturday, September 5	5:54am EDT	 Last quarter
Sunday, September 13	2:41am	 New moon
Monday, September 21	4:59am	 First quarter
Sunday, September 27	10:50pm	 Full moon
[Total Lunar Eclipse:	Totality from 10:11pm to 11:23pm]	
Sunday, October 4	5:06pm	 Last quarter
Monday, October 12	8:06pm	 New moon
Tuesday, October 20	4:31pm	 First quarter
Tuesday, October 27	8:05am	 Full moon

Credits

Contributors to this month's **Observer:**

John Bishop, Ted Blank, John Buonomo, *Glenn Chaple*,
Carter Van Eitheim, Jeff Eitheim, Gardner Gerry,
 "Rags" Gilmore, *Jim Hendrickson*, Stan Herman,
 Larry Lopez, Rob Mack, John Rose, Marc Stowbridge,
 Mike Townsend, Bob Veilleux, Dave Weaver and
 Paul Winalski.