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President's Message



We all share the goal of becoming better observers. One way to do this is to work from a list of objects of a particular type and try to observe them all.

[The Astronomical League](#) (AL) is an organization of over 240 amateur astronomy clubs across the country. Our club is a member of the AL, which also offers individual memberships. At the moment we do not automatically submit an AL membership application for each NHAS member due to the extra cost involved.

The AL has many "Observing Programs Programs" that can provide a frame-work to help you become a better observer. Each program provides a set of objects to observe of a particular type and a way to document that you have observed them.

Once you complete a program and submit your document-tation, a pin and certificate is sent to our AL coordinator, **Ken Charles**, and we can present it to you at an NHAS meeting. Among the AL's many observing programs are Lunar features, constellations, Messier objects, double stars, carbon stars, open clusters, globular clusters, occultations, planetary nebulas and dozens more. You can see them all at the AL's [Observing Programs](#) web-page.

NHAS is currently running a pilot program where we will pay your AL individual membership for a year if you express interest in undertaking any AL observing program. Just contact Ken Charles through our website to get started. Happy observing!

Clear skies,

Ted Blank
NHAS President

Great Brook School, Antrim NH, April 1

Steve Rand gave the presentation and NHAS members **Elaine Grantham-Buckley** and **Gardner Gerry** showed a crescent moon and Jupiter through a high overcast. About 40 students and parents attended.

- *Gardner Gerry*

The Beech Hill School, Hopkinton NH, April 3

Sometimes you win, and sometimes you lose...

I feared cloudy conditions did not warrant a GO call last week (March 27), so I postponed the NHAS skywatch. The school went ahead with their student presentations; somehow the skies cleared and with the few scopes on hand, they got some observing in. We rescheduled for the backup date of April 3 but our contact cancelled the event, having had a hard time getting interest up for another night. We hope to reschedule at a later date.

- *Gardner Gerry*

Henry Wilson Memorial School, Farmington NH, April 9

Ted Blank gave the presentation to about 30 students and afterwards members **Elaine Grantham-Buckley**, **Gardner Gerry** and **Ted** showed the Moon, Jupiter, Mars, the Orion Nebula and the Pleiades. It was a nice location behind the school, but it was a windy and cold evening.

- *Gardner Gerry*

Daniel Webster College, Nashua NH, April 10

Steve Rand gave the presentation and NHAS members **Larry LaForge**, **Joe Dechene** and **April South** showed Jupiter, Mars, M42, the Moon, and the double stars Mizar and Alcor. The high clouds and bright moon washed almost everything else out. About 10-12 college students and a 9-10 year old and a parent attended.

- *April South*

This was our third and most successful visit to DWC. We had 16 attendees at the presentation, but none from Prof. Ludlow's astronomy class. They had all had seen the flyers that had been put up. All the scopes were set up in the same area at the end of the soccer field (DWC had witnessed a split skywatch the last time around, in October 2013), where a Gibbous Moon, Jupiter, M42, double stars, and Mars were easy targets. We got to see Ganymede disappear into Jupiter's shadow, leaving the three Galileans that were predicted in my Stellarium slide during the presentation.

- *Steve Rand*

Salem High School, Salem NH, April 16

Members **Ted Blank**, **Herb Bubert**, **John Pappas**, **Elaine Grantham-Buckley** and **Gardner Gerry** showed the students what we could from the sometimes well-lit courtyard. The worst case was the person in a car sitting in front of the Library with the headlights of the car on. We all brought reflectors from 7 to 11 inch of aperture, except for **Ted** who brought a C8 SCT.

Everyone was showing Jupiter and Mars, so I found M3 and then M35.

I got a request for M81 and M82, along with M97 (the Owl Nebula) though it was difficult to see with the rising moon. I finished by showing Polaris, Cor Caroli and Castor. We briefly discussed trying to find a carbon star, but no one knew one that was actually in the sky at the moment. There were a couple of students that were extremely interested and asked to see more different objects, which was refreshing.

- *Gardner Gerry*

Goffstown High School, Goffstown NH, April 24

NHAS members present were **Curtis Rude**, **Steve Pearsall**, **Ted Blank**, **Gardner Gerry** and **Paul Winalski**. Many of the students were from the Honors class and were very interested and asked good questions. Saturn finally rose just at the end of the night so the last few students got to see it. Before that, Jupiter, Mizar and M38 were my main targets for the night. The ISS pass came out of the sunset so I could not see it until it was almost at Zenith, then it was as bright as Jupiter until it reached the horizon. The Iridium flare was so bright it shone right through clouds, the brightest one I'd ever seen!

- *Ted Blank*

Conditions were mostly clear at dusk but clouds were a persistent problem throughout the evening. I got excellent views of Jupiter and its moons through the FSQ-106. We had an ISS pass and an impressive Iridium flare early in the evening. Two teachers and a handful of students attended.

- *Paul Winalski*

The Iridium Flare

Even as some NHAS members, teachers and students at the Goffstown High School skywatch were taking in the brilliance of an Iridium flare on April 24, **Rob Mack** was thanking his lucky stars from the driveway of his home in Bow NH, some 8 miles to the north, as heavy clouds parted at appointed time of 8:55pm (and in the right area). His imaging plans had to change, but he wasn't about to get "skunked!"



The Iridium 66 Flare (Image: Rob Mack)
Canon 6D, 35mm at f/4.5, 43 second exposure at ISO 200.

The flare to -8.4 magnitude occurred as it passed through Canes Venatici. Coma Berenices is to the upper right of where the satellite ended up in the image.

Rob picks up the narration:

With the camera centered on Canes Venatici (where the flare was predicted to occur), I had planned a 2-3 minute exposure at a 24mm wide angle for an extensive satellite trail, with the lens stopped down to f/4.5 and ISO set to 200.

But as a brief opening occurred in the clouds, the time for the exposure was limited and so I zoomed to 35mm to capture a smaller area of the sky. I opened the shutter to as long as I dared, as some clouds streaked toward the area (the clouds are apparent on the left, with a pinkish hue from Concord's sky glow to the east). I picked up the satellite (moving from left to right) near the end of the Big Dipper's handle (Alkaid).

How Far Away Is It?

A wonderful [video book by David Butler](#) outlines a lot of what is known about the cosmos. **David Butler** is a retired software developer with a background in mathematics and physics. He has used images from the Hubble and other space- and ground-based telescopes, as well as other data and images to present the latest information about objects in the universe (from planets to galaxies), how far away those objects are, and how we know what we know about them. There is even a section with 2013 Updates to the content!

The video book is divided into three main chapters: **The Solar System, The Milky Way and Galaxies.**



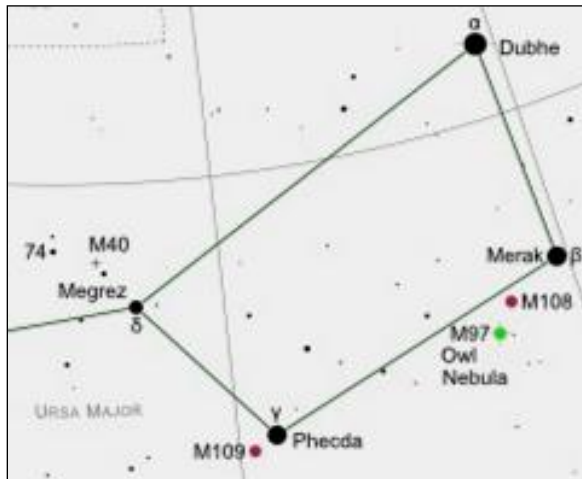
These are sub-divided into a total of fifteen sessions, each of about 20 minutes duration, starting with "The Earth" and ending with "The Cosmos". The series is intended for use in a classroom with video projection. Each segment comes with a document containing the text, notes, and additional information about the topics covered, and a lesson plan. The video book is available via special request on Blue Ray DVD. All the document files are in PDF format, and the lesson plans are available in both MS Word and PDF formats.

There is also a [Concept Index](#) that covers all the scientific concepts touched on in the video book. It is composed of 127 *YouTube* URLs that take the viewer to specific time-offsets into the set of videos – in effect a set of bookmarks into specific 'sections' of the individual videos.

- **Steve Rand**

M108 – The Barred Spiral Galaxy in Ursa Major

by Glenn Chaple



(Chart by freestarcharts.com)



M108 in Ursa Major

(Image: Mario Motta, MD)

Not far from the Big Dipper “bowl” star Merak (β Ursae Majoris) are two Messier objects - the edge-on spiral galaxy M108 and the planetary nebula M97. M108, discovered by Pierre Méchain in 1781, is nearer Merak, lying just 1.5 degrees to its southeast.

A 10th magnitude object with 8 by 2 arc-minute dimensions, M108 has a low surface brightness. Nevertheless, the small-scope owner can capture it, provided he or she sets up in a dark-sky location on a clear, moonless night. I once captured M108 from the camping area at Stellafane in Springfield, VT, using a 4-inch f/4 rich-field reflector and magnification of 74X. It stood out as a surprisingly easy elongated glow.

Things got interesting when I revisited M108 this past spring with a 10-inch f/5 reflecting telescope and magnifying power of 139X. The increase in telescope aperture and magnification brought out detail not seen with the RFT. M108 had a noticeably blotchy appearance – a ghostly version of M82. Near its center was a 12th magnitude star - a foreground Milky Way star that could easily be mistaken for a supernova erupting inside M108.

Just 48 arc-minutes southeast of M108 is M97.

We’ll pay a visit to this interesting planetary nebula next month.

The Road Trip

I drove down to Suffern, NY with **Mike Townsend**, **John Rose** and **Larry LaForge** on the Saturday morning (April 12), just for the day. Other NHAS members I ran into were **Tom Cocchiaro**, **Gardner Gerry**, **Larry Lopez** and **April South**. Both **Ted Blank** and **Marc Stowbridge** were wearing different hats on the floor – **IOTA** and **SSP** respectively, although the latter was promoting LTPs with gusto. More on this later.

The consensus was that about the same number of vendors as last year were present, with perhaps fewer people attending. Buying EPs at 20% discount is somehow routine now, so this time I looked around for binoculars and parallelgram mounts, and Larry had the same idea. Each found a mount to his liking.



NEAF 2014 on Day 1

The talks in the Celestron Theater were well attended; indeed the video-link interview with Neil deGrasse Tyson was a 'sellout,' with some 150 people turned away at the door! Larry and I took in the final lecture of the day – by **Alan Stern**, the principal investigator of NASA's *New Horizons* mission to Pluto. Earlier in the afternoon, Larry Lopez and I sat in on **Ted Blank's** presentation on "*Getting Started in Occultation Recording*" that explained why Pro-Am collaboration was important. Ted showed examples of hardware and went through the software used to deploy observers and to analyze results (he repeated his presentation on Day 2, the Sunday). He had a dozen in the audience the first day, and 5 the next day.

Solar observing in the courtyard was very interesting, especially an AP175 fitted out for 0.2Å bandwidth filtering in H-alpha. Whereas I was able to compare the view through a PST and both single- and double-stacked setups, the mottled detail on the surface of the Sun seen through this scope was, frankly, bizarre. And what showed up as a mushroom-shaped prominence elsewhere displayed a kind of filigree detail that was awesome.

Mike Townsend found a lot more astrophotography gear around than in the past, but most of it was high-end. Once again Astronomics was missing in action, but 2 other vendors stood out in his view: the Skywatcher display was impressive – in addition to a new mount, they showed off their 150mm Esprit refractor (f/7.0). There was also talk of their reviving the old Orion 190mm Mak-Newt Astrograph (f/5.3). The other vendor was Lunt Engineering (an off-shoot of Lunt Solar) that showcased a 6" APO refractor for night-time pleasure (designed and manufactured by APM in Germany) for \$3990. Very affordably priced!

John Rose was particularly impressed by the display of Classic Telescopes, including a few he had wanted as a kid.

And then there's the story of booths #245 and #146, located back to back on either side of an array of booths. 245 was the **IOTA** booth, manned almost continuously by **Ted Blank**. 146 was the **Solar Star Party** presence, where **Marc Stowbridge** had set up shop to promote the LTP. But it might just as well have been the other side of the Moon as far as Ted was concerned, quite unaware of what lay beyond the separator! Marc was sponsored by **Barlow Bob** of the SSP, and spent most of his time walking about the aisles with an LTP tucked under his arm and handing out information cards – he went through his stash of 300 4x6 cards, talking to many more people. He must have talked fast for a change!

- **Ramaswamy**



A walkabout with the huggable portable LTP. (Photo: Ted Blank)



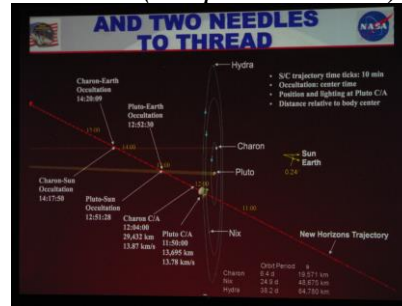
Larry Lopez focusing under the Shroud and April South busy counting Spots



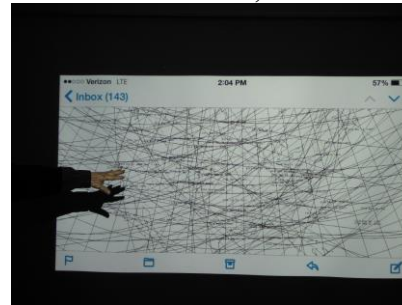
Classic scopes and the LTP

(Both photos: John Rose)

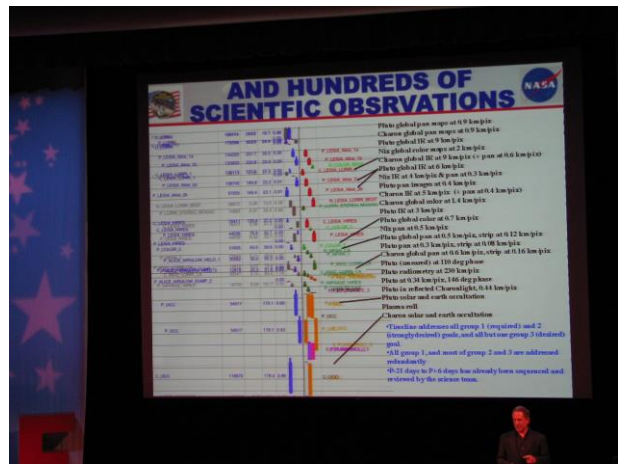
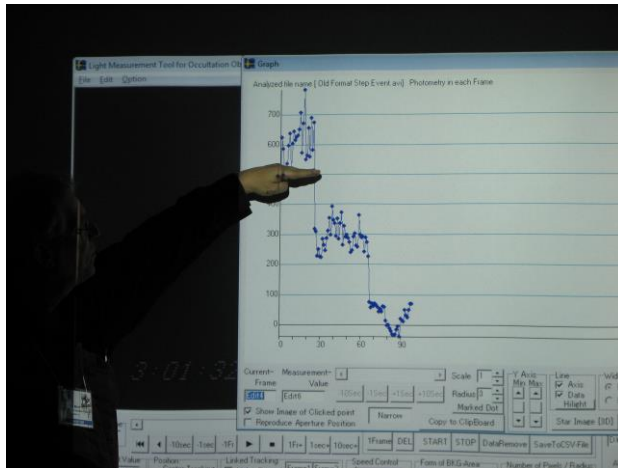
Sextant lessons from Gary



Alan Stern holding forth on the big stage about the mission to Pluto, with rendezvous in July 2015.



Ted Blank demonstrating the relatively simple hardware used to record occultations, explaining a tangled (up-to-the-minute) web of 'occultation tracks' across the continental US for the next 2 weeks alone, and pointing out the effort across California that went into observing the occultation of a magnitude 6.7 star by the "double" asteroid (90) Antiope on July 19, 2011.







Two talks at NEAF, two different contributions to science: a nearby occultation in 2011 and a faraway fly-by to come in 2015.

LTP Instructional Videos

A new chapter is about to be added to the saga of the Library Telescope Program. For the past few weeks, **Steve Rand** has been busy narrating and starring in a proposed 6-part ‘video book’ of his own.

From 3 to 6 minutes long, these segments will explain to the patrons and staff of NH Libraries (and elsewhere) the working, use and care of the telescope they are dealing with. The need has been voiced informally by librarians for a while now, and Steve answered the call. 4 of 6 ‘units’ of are now publicly available on *YouTube*; the complete set should be online by the summer of 2014.

No.	The Video (click to view)	Duration	The Topic
1.		6:15	<u>Program Introduction:</u> The Library Telescope Program of the NHAS places astronomical telescopes (for beginners) in local Libraries that can be checked out by patrons much as books, CDs and DVDs are. Come have a look!
2.		2:41	<u>Transporting the Telescope:</u> Of course, greater care has to be exercised in the process of actually checking out the telescope to take it home, and on its return. Here are a few simple guidelines to help you do it safely and without hassle.
3.		5:35	<u>How the Telescope Works:</u> This clip explains the basic operation of the telescope you will be borrowing, in simple straight-forward terms. It will help you get started with its use by removing any misconceptions above the unit.
4.		4:11	<u>Aligning the Finder:</u> For the telescope to function properly by showing you a star or planet that you are aiming it at, its Finder has to be in proper alignment with the optical tube. If per chance it is not, this is what you'll have to do!
5.		--	Setting Up to Use
6.		--	Telescope Maintenance

NHAS April 2014 Business Meeting Report

The monthly business meeting was held at MSDC, Concord NH on April 11th, with our Treasurer **David "Rags" Gilmore** presiding in the absence of Ted Blank and Tom Cocchiaro (who were both attending NEAF).

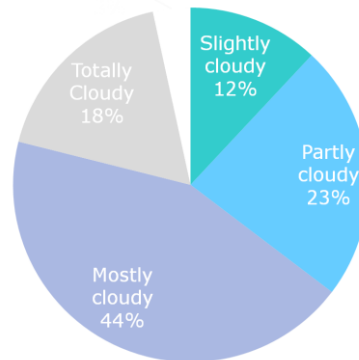
The Report

The LTP modification party at the end of March delivered 10 more scopes. The number of LTP scopes in the field has now crossed the century threshold.

The Top 3 News items of the past month, in reverse order:

- * Confirmation of gravitational waves related to cosmic inflation.
- * Occultation detects rings around an asteroid (10199) Chariklo.
- * A deep ocean confirmed near the south pole of Saturn's moon Enceladus. The ocean is under 40km of ice (the frozen surface).

Tiffany Nardino has asked NHAS assistance for the (daytime) manning of the solar telescopes in the observatory dome of MSDC.



A pie-chart by **Ted Blank** summed up the month of March (3% Clear).

Astronomy Shorts

Paul Winalski: split Sirius at the OzSky party in Coonabarabran, Australia.

Steve Rand: summarized the Dava Sobel talk at the Smithsonian on March 20. Also informed membership of David Butler's video book: *How Far Away Is It?* [See page 3. -Ed.]

Ken Charles: talked of Children's Day in Portsmouth, scheduled for May 4.

The Evening Presentation

The video of Dava Sobel's talk from last Fall at NEFAF was played. The talk was about Copernicus and Dava's book: *"A More Perfect Heaven."*

NHAS Treasurer's Report

(as of April 8, 2014)

Starting Balance:		\$10,194.79
Deposits:		
Membership	60.00	
Donations	20.00	
Interest	0.88	
Total:		\$80.88
Expenses Paid:		
GoDaddy	12.27	
Cynric Company, LLC	58.85	
Provantage, LLC	158.99	
Rackspace Cloud (Web site)	20.42	
Total:		\$250.53
Current Checking Balance:		\$10,025.14
Petty Cash:		\$100.00
Current Cash Balance:		\$10,125.14
EOC Share:		\$6,649.97

Membership	136	
Cash Renewals:	1x30.00	30.00
Cash New Members:	1x30.00	30.00
PayPal Renewals:	0x28.87	0.00
PayPal New Members:	0x28.87	0.00
Total:	2	\$60.00
Current Members:	138	

New Member
Michael Maas Nashua, NH

Donation		
Michael Maas	YFOS	20.00
Total:		\$20.00

Contact Information

<p><u><i>How to join NHAS</i></u></p> <p>Write to us: NHAS P. O. Box 5823 Manchester, NH 03108-5823</p> <p>Send Email to: info@nhaastro.com</p> <p>Visit our web site: http://www.nhaastro.com</p> <p><u><i>How to contribute to the Observer</i></u></p> <p>Email articles and snapshots to the Editor: ramax.astro@yahoo.com</p>	<p>NHAS Officers:</p> <p>President: Ted Blank Vice-President: Tom Cocchiaro Secretary: Paul Winalski Treasurer: David “Rags” Gilmore</p> <p>Board of Directors:</p> <p>Ken Charles Pete Smith Steve Rand</p>
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Upcoming Regional Star Parties and Festivals

Winter is past and in addition to all the local club events, Summer and Fall are already filling up with an array of wonderful astronomy festivals. Mark your calendar for these nearby astronomy highlights:

<i>When</i>	<i>What and Who</i>	<i>Where</i>
July 24-27, Thu-Sun	Stellafane (Springfield Telescope Makers)	Springfield, VT
Aug 19-23, Tue-Sat	Medomak Astronomy Retreat and Symposia	178 Liberty Rd, Washington, ME
Aug 22-24, Fri-Sun	Maine State Star Party (DEAA)	Cobscook Bay Campground, Dennysville, ME
Sept 19-21, Fri-Sun	StarFest (ASNNE)	Starfield Observatory, Kennebunk, ME
Sept 24-27, Wed-Sat	Stars over Katahdin Festival	Mt. Katahdin, Loop Road, ME
Sept 25-29, Thu-Mon	Acadia Night Sky Festival	Mount Desert Island, ME
Oct 17-18, Fri-Sat	New England Fall Astronomy Festival, (UNH/NHAS)	University of NH, Durham, NH

- *Dwight Lanpher*



Orion XT6 – 6” Newtonian on a Dobson mount
 (custodian: Ted Blank contact: tedblank@gmail.com)

Equipped with:

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



Meade 8” Newtonian on a Dobson mount
 (custodian: Ken Charles contact: starnek2550@gmail.com)

Equipped with:

- Telrad finder with a dew shield
- 25mm and 10mm EPs
- Custom-built base (a Joe Derek/Chase McNiss original)



Coulter Odyssey 10” Newtonian on a Dobson 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 on loan, independent of the telescope, and in a separate slip-case:

- Sky Atlas 2000.0 by Wil Tirion and Roger Sinnott
- Sky Atlas 2000.0 Companion by Robert Strong and Roger Sinnott



Orion XT10 on a Dobson mount
 (custodian: Pete Smith contact: psastro60@gmail.com)

Equipped with:

- Telrad finder (replacing the original finderscope)
- Assorted EPs: 35mm, 25mm wide-angle, 17mm and 10mm.
- An EP case will be available in the near future.

Regional Astronomy Clubs

New Hampshire Astronomical Society
[NHAS] *Skywatches around the State*
Sidewalk Astronomy in Portsmouth
www.nhastro.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.asnne.org

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

Sky at Night
www.skyatnightmagazine.com

Astronomy Gear

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

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/

Event	Date	Time	Location
First Friday Skywatch for MSDC	Friday, May 2	7:00pm	MSDC, Concord NH
NHAS Members In-reach Skywatch	Saturday, May 3	7:00pm	Benedictine Park, Bedford NH
Winnacunnet High School Skywatch	Monday, May 5	7:00pm	1 Alumni Drive, Hampton, NH
Parkside Middle School Skywatch	Tuesday, May 6	7:30pm	Parkside Ave, Manchester NH
Goffstown High School Skywatch	Tuesday, May 6	8:30pm	Goffstown HS, Goffstown NH
Winnacunnet High School Skywatch (backup date)	Wednesday, May 7	7:00pm	1 Alumni Drive, Hampton, NH
EOC Meeting	Thursday, May 8	6:30pm	Public Library, Manchester NH
NHAS Business Meeting	Friday, May 9	7:30pm	St. Anselm, Manchester NH
Sidewalk Astronomy Skywatch	Saturday, May 10	6:00pm	Market Square, Portsmouth NH
Thorntons Ferry School Skywatch	Monday, May 12	7:30pm	134 Camp Sargent Road, Merrimack NH
Fuller Public Library Skywatch	Tuesday, May 13	7:30pm	School Street, Hillsborough NH
Massabesic Audubon Center Skywatch	Friday, May 16	7:00pm	26 Audubon Way, Auburn NH
Fuller Public Library Skywatch (backup date)	Tuesday, May 20	7:30pm	School Street, Hillsborough NH
Massebesic Audubon Center Skywatch (backup date)	Friday, May 23	7:00pm	26 Audubon Way, Auburn NH
Coffee House Night at YFOS	Saturday, May 24	5:00pm	YFOS
Rey Center Skywatch	Saturday, May 24	8:30pm	Waterville Valley NH
Gilmanton School Skywatch	Friday, May 30	7:30pm	Gilmanton School, Gilmanton NH
Alton Schools QUEST FEST Skywatch	Wednesday, June 4	5:00pm	Alton Central School, Alton NH
First Friday Skywatch for MSDC	Friday, June 6	7:00pm	MSDC, Concord NH
Sidewalk Astronomy Skywatch	Saturday, June 7	6:00pm	Market Square, Portsmouth NH
NHAS Business Meeting	Friday, June 13	7:30pm	MSDC, Concord NH
AeroSpaceFest Skywatch	Saturday, June 14	10:00am	MSDC, Concord NH

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

Date	Lunar Phase
Wednesday, May 7	 First quarter 3:15am
Wednesday, May 14	 Full moon 7:16pm
Wednesday, May 21	 Last quarter 12:59pm
Wednesday, May 28	 New moon 6:40pm
Thursday, June 5	 First quarter 8:39pm
Friday, June 13	 Full moon 4:11am
Thursday, June 19	 Last quarter 6:39pm
Friday, June 27	 New moon 8:09am

Credits

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

Ted Blank, Glenn Chaple, Gardner Gerry, "Rags"
Gilmore, Larry LaForge, Dwight Lanpher, Rob Mack,
Steve Rand, John Rose, April South, Marc Stowbridge,
Mike Townsend and Paul Winalski.