

OBSERVER

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Newsletter of the New Hampshire Astronomical Society

December 2013

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President's Message



Dear Friends,

First, let me say I'm extremely pleased and honored to be given the opportunity to serve such a wonderful group of dedicated and passionate individuals. I joined NHAS in 2007 with no special knowledge of astronomy and the ability to identify maybe three constellations, and being wrong on two of them. However, I had always had a desire to know more about the sky, the stars, the planets, and the Universe in which we live. I was hoping NHAS would help me achieve this goal, and I am very grateful for all the help I've received.

There is so much to learn that I still consider myself a beginner. Among the many ways my involvement with NHAS improved my knowledge were the classes taught by Paul Winalski, John Bishop and others, the one-on-one help offered by members at skywatches and outreach events, the presentations at our monthly meetings, discussions with other members, and, the opportunity to participate in outreach events.

I was told long ago that there is no better way to learn than to teach. I'm sure all the members who have given any kind of a class or talk would probably agree. When medical school graduates start their Residency, there is a "rule of thumb" they are told right away. To learn everything they need to know, in the short time they have available, the rule is: "Watch one, Do one, Teach one." Samuel Johnson's quote might apply here too: "*When a man knows he is about to be hanged in a fortnight, it concentrates his mind wonderfully!*"

You may not believe this but you know much more than you think you do, and there are so many people out there thirsty for your knowledge that you will

find sharing it to be very rewarding. The Club Powerpoint presentations are ready to go – all you need to do is let your own excitement and interest show and all will be well.

Let me end by thanking our outgoing President, Rich DeMidio, for setting the club on a course that I think has served us extremely well over the past year. I will do my best to keep us moving forward, and I encourage you to share any ideas you have for further improving our club and making it ever more useful to you, our members. I am also grateful to Rich for accepting the post of Membership Chair which I know he will fill with his usual zeal and passion. ***Please consider serving on the Membership committee with Rich.*** I also want to thank all of the other officers, board members, committee chairs, committee members and outreach participants who continue to serve.

Without all of your efforts, NHAS could accomplish little of value. ***Together we can reach the stars.***

Clear skies,

Ted Blank
NHAS President

Campbell High School, Litchfield NH, December 4

Cloudy daytime skies cleared to provide a successful SkyWatch as a culmination for Campbell High School's "Astronomy Week." Telescopes on hand were provided by John Bishop, Herb Bubert, Elaine Grantham-Buckley (with her new Celestron) and Gardner Gerry. Also present was Chet Orban, NHAS member and Campbell biology teacher. The waxing crescent moon and Venus had set by the time the observing session began, following my presentation to the 35+ folks at hand. The NHAS group, however, was able to show the Ring Nebula,

Albireo, M31 and M32, the Pleiades, and the Orion Nebula to mention a few. As Jupiter came up above the tree line, we were pleased to see the Great "Pink" Spot was in the middle of its transit across the planet's disk. The SkyWatch ended with Linnea Manley, our CHS host, presenting all of us with Campbell High School Astronomy Week T-shirts.

- *Steve Rand*

*Concord Schools * 3, Concord NH, December 12*

This combined Sky Watch was scheduled for **Concord High School, Rundlett Middle School, and Broken Ground Elementary School** to deal

with postponements of their previously scheduled events, and was itself postponed from Dec 5.

NHAS members taking part were John Bishop, Herb Bubert, Gardner Gerry, Elaine Grantham-Buckley, John Pappas, Steve Rand, and Ed Ting who was imaging the moon. There was an intermittent cloud cover, especially at zenith. About 30 students, teachers and parents came to view the sky through the scopes. All had a good view of the moon, as well as Jupiter and other objects. The SEE center staff offered hot chocolate and sandwiches after the event.

- *Elaine Grantham-Buckley*

Society Activities

Sidewalk Astronomy, Portsmouth NH, December 7, 2013

This night was the Christmas tree lighting ceremony and the Holiday parade. Barricades went up around the sidewalks at 2pm, but we had no trouble getting our gear set up just down the way from the Christmas tree. Our being there gave lots of folks something interesting and educational to do while they waited for the Parade to start and then for it to arrive downtown.

Steve Rand, Gardner Gerry, Ted Blank and Tom Cocchiario had four scopes set up, plus the 6" club loaner XT6 dob. Ted showed people the sun (some great solar prominences) from 3-4pm, then we showed people Venus from about 5pm to 7pm, followed by the Moon until Jupiter came out from behind a building around 9pm. Several people came back a second time to see Jupiter. Hundreds and hundreds of visitors on one of the most crowded (and coldest) nights I can remember. Lots of fun, tons of interested visitors, several cups of hot chocolate and good friends got us through the evening nicely.

- *Ted Blank*



Santa is pointing out the North Pole, but the elf would rather verify, with Steve Rand's assistance.



*Double Star power -- the poor XT6 dob in front didn't stand a chance!
(Photos: Ted Blank)*

In-Reach Event at Benedictine Park, Bedford NH, December 7, 2013

It was announced at short notice by Rich Schueller for Saturday Dec. 7th, was very well attended, and by all accounts, an unqualified success. NHAS members present were: Don and Melinde Byrne, Elaine Grantham-Buckley, Andy Jaffe, Steve Pearsall, Jim Roberge, John Rose, Peter Smith, April South, Ed Ting, Mike Townsend, and of course Rich.

The group met at the Park near the edge of the parking area around 4:30pm. There were about a dozen telescopes and at least half again as many people that ranged from novices looking for help with their scopes and learning the constellations to experts helping out.

It was cold and although there was no wind, the temperature seemed to drop even more as it got dark. But the skies were good overall. Seeing was somewhat less so near the horizon, but many objects such as M27, M57, M45, and Alberio, to name just a few, were observed through one's own telescope and those of others. The session lasted until about 10pm. Feedback from members present included comments such as:

"The help was there when I needed it, and I've learned some new constellations and deep space objects. There is such a sense of camaraderie in this club," "a terrific night, good conversation, oatmeal raisin cookies and a second sight of the Dumbbell, thanks to Ed," and "What a fantastic learning opportunity... it was a great night of observing for me!"

Looking forward, John Rose had a very good suggestion: "Perhaps there should be a reminder to members interested in a particular telescope or other equipment to post their interest [in response to the announcement of the event]. Then if another club member has it, they can bring it to the In-Reach for some show and tell."

Thank you, Rich! It couldn't have been done any better.

Since no pictures were taken of the event itself, it is time for some more (edited) words. Not a thousand, but enough to convey the atmosphere, bar the cold. **Jim Roberge**, an NHAS member of 6 months' standing, writes:

"The in-reach event at Benedictine Park was the second I have participated in since joining the society this past summer. I went to the first one without a scope, mainly to ask questions and learn about the various types of scopes other members had brought. This time I was able to bring one of my newest acquisitions, a Skywatcher 12" Dob, which I had purchased based on a recommendation I received from a member at the first event I attended.

"The highlight of the event for me was the opportunity to assist a fellow member who was having trouble setting up her GEM GoTo mount and telescope. As I have been on the opposite end of that arrangement many times since joining the society, the satisfaction derived from being able to help another member get the most out of this hobby is rivaled only by the gasp you hear from someone viewing Saturn for the first time through a telescope at a sky watch. During the evening I had great views of Jupiter, the double cluster, Andromeda, the moon, M42 and a few other targets.

"The biggest thing I have noticed since joining is that help is always available (usually in abundance), the importance of which can't be understated for newbies like myself, so let's keep these in-reach events going!"

Elaine Grantham-Buckley, a member since October, continues:

"Rich spent quite a bit of time showing me constellations with the naked eye, giving me a better idea of where to find them in relation to the other ones I already know. That was a great help and I am slowly getting familiar with the late autumn, early winter sky. Even with a go-to scope, I want to know the sky and be familiar with each object's location.

"All in all, Benedictine Park was an excellent experience. Lots of fun and plenty of learning as well. I am so glad that I have chosen this astronomy community."

For **April South**, a veteran by comparison, who joined the club 2 years ago, it was a case of "what a difference a week can make." At the Nashua Winter Stroll, with only Venus to be seen through her XT10i Dob, and faced with a tedious trip back to her car with the scope on a dolly, she lamented about not having listened to 'expert' advice cautioning against big scopes to start off with. And now:

"I personally learned alignment tips for my Orion Intelli-scope (thanks Pete), as well as how to find M57 by star hopping. I also got to try out different filters and eye-pieces owned by other members so that I could have a better idea of what to buy and what not to buy. As an added bonus, Ed Ting (Telescope Jedi Master) took my 10" reflector and whirled it all over the sky, showing me just what my light bucket could do. I fell in love with my telescope all over again."

The Year-end Pot-luck

The evening at MSDC began conventionally enough, with Rich DeMidio announcing (in his last stint as President) that he was the only person standing between all the yummy food and the members in attendance (42 others by one count), but that he was going to “keep it short.”

A report on the Year in Review can be found on page 15, along with the results of the election of the 2014 slate of Officers (which was the next item on the agenda for the evening).

A Swap Table of astro-gear had been set up and twin slide-shows operated on a pair of laptops – Herb Bubert was covering all matters celestial by showing a stunning array of [astro-images](#) taken during the year at YFOS and other places (it was previewed last month and a sample of 6 images can be found in the November **Observer**), while Ted Blank was covering the terrestrial scene with snapshots of NHAS members participating in various events around the State through the year.



Rich DeMidio kicking off proceedings



Paul Winalski supervising the election

(All photos on this and the next page: Ted Blank)

The Party

The Swap Table was in operation throughout the evening. Once all the Officers for 2014 had been elected, the main order of business could be transacted, with some of the tables reconfigured for the pot-luck. After the break, the obligatory Rich DeMidio Charts salvo was fired, to be followed by the Awards ceremony and “networking.”



The Curious Bunch: Mack, Bubert, Gerry, McNiss and Townsend.



The Byrnes, April South & Rex Gallagher in front, Paul, Tom, Pete and the McCartneys at the back.



Steve Rand and Elaine Grantham-Buckley look on.

A Few Choice Moments



“You questioning MY numbers?”



“Do Astro-photographers always ponder along a line of declination?”



“Now, hold that thought for a moment!”



“Oh, no! YOU did that!!”



Above: The Outgoing and Incoming Presidents.



Right: The LTP Award winners, most of them anyway! From the left: Steve Rand, Pete Smith, Michelle Thomas, Scott McCartney, Ted Blank, April South, Gerry Smith & Rich Schueller.

In addition to Award winners mentioned on page 15, LTP Chair Pete Smith also recognized the contributions of the many NHAS members that ensured the continuing success of the program this year. A Year in Review report of the Library Telescope Program can be found on page 7.

The Swap Table

By all accounts, the swap table was the most innovative feature of the evening, and a lot of fun. Several members took the opportunity to unload excess and unwanted equipment – good, useful stuff including scopes, mounts, accessories, software and books.

Don and Melinde Byrne re-enacted the fable of the early bird getting the choice worm – they snagged a Kayuga Lunar Atlas at “a most reasonable price.” They also brought along a ton of astronomy books, and the few not taken were given to the MSDC library. Some other lucky member snagged a large genuine Pelican case (which was just a bit beyond my reach –*Ed.*) for \$50.

The snapshot to the right is a tale of two telescopes, in two different time-frames. A white OTA on a mount, and a red one lying on its side. The first one is a Meade 4504 4.5” reflector on an equatorial mount that would soon belong to Steve Rand’s nephew, right around Christmas-time. The fate of other one is not known, but for Paul Winalski, this area of the swap table was all of a sudden both a trip down memory lane and Christmas come early:



(Photo: Steve Rand)

“My first telescope was a Scope (TM) brand -- some anonymous Japanese 4" reflector re-branded – on a wobbly tripod. What do you know -- the advanced user's guide from Scope Telescopes was there [on the table]. I never had that -- it cost \$1 extra, which was significant back in those days. I grabbed the manual. And what do you know -- also there on the table was an F/11 4" OTA, fitted with the same crappy finder, and the same 20mm Huygens 0.985" eyepiece that my scope came with. This one was painted red, not blue, and the nameplate said Tasco, not Scope, but otherwise an identical twin to the scope my dad had bought for me and my brother back in 1970. And which still sits on its tripod in my living room. I was delighted to see that someone else owned one of these.”

As Dava Sobel would have it – the World does turn.

A door prize was generously donated by Tony Costanzo of the [Astronomy-Shoppe](#) in Plaistow, New Hampshire (consult the *Astronomy Resource Guide* on page 18).

The winner of the raffle of the Celestron FirstScope 76 was none other than new member Elaine Grantham-Buckley, who had bought her second telescope just over a month ago: an 8" Celestron Advanced VX SCT with All-Star Polar Alignment and other refinements.

Some people have all the luck! On this day, in strictly planetary terms, Elaine would have been thought to be in retrograde motion, but come the New Year, prograde motion must surely be in the cards. And some lucky kid may soon have his or her own start in Astronomy.



Tony Costanzo with the lucky winner (Photo: S. Rand)

The LTP Year in Review

The Library Telescope Program started the year out fairly quietly in January 2013.

We delivered the last of the scopes from the Oceanside Photo and Telescope (OPT) grant of 2012, and only had 3 libraries on the waiting list. It seemed like 2013 would be a year of raising funds and maybe delivering a few scopes each month.

Then came February. Word about the LTP had spread via a library conference and by mid-month we had 15 requests on file and only two of those requests were funded.



Our next major event, also in February, was *Astronomy* magazine's **2012 Out-of-this-world award** to NHAS. We thank Craig Weatherwax at OPT for their generous grant that supplied 25 scopes in 2012 and also Rich Schueller, Matt Amar and Marc Stowbridge. It is through their efforts in 2011 and 2012 that made the Out-of-this-world award possible and provided \$2,500 more for the LTP program in 2013.

As we look forward to 2014, we still have 7 libraries and two schools on our list waiting for a donated scope. In addition, through the efforts of Rich Schueller of NHAS and Jim Zebrowski of the Aldrich Astronomical Society (AAS) in Massachusetts, the LTP program is being developed in Massachusetts as well. Jim Zebrowski attended the last two Mod parties to learn how to build an LTP scope and we expect their program to grow a lot in 2014. In the last Mod party, AAS bought and built two scopes that were delivered to libraries in Massachusetts.

I think "overwhelming generosity" best describes everyone that was involved in LTP this year. 28 members gave of their time to build and deliver 36 scopes in 2013. The funding for these scopes was provided by NHAS members, Friends of the Library organizations, private donations, *Astronomy* magazine, OPT and direct donations by some libraries. The NHAS LTP program also donates two scopes each year.

In November of 2008, Marc Stowbridge conceived the idea and delivered the first LTP scope to the Cook Library in Tamworth, NH. Over the next 5 years, NHAS has delivered a total of 89 "Stowbridged" telescopes throughout NH. Thank you Marc, for the wonderful idea, and thanks also to all the NHAS members that help bring the wonders of astronomy to NH residents.

- *Pete Smith*



A collage of photos taken at the Mod parties of 2013 and of deliveries to Libraries through the year. (Photo: Pete Smith)



Gerry Smith makes a point near the LTP display at the Year-end Pot-luck gathering. (Photo: Ted Blank)

Did you know that?

Last month at the Nashua Winter Stroll, cloud cover forced the issue. For the most part, we could only show a 30% crescent **Venus** and the bright stars of the Summer Triangle. Explanations flowed about the phases of Venus, and why it was so brilliant even when less than a third of it was visible from Earth.

Here are more factoids about our heavenly neighbor. Good skywatch-fodder, if used judiciously:

- Venus goes once around the Sun every 225 Earth days (d) – 224.698d for the purists – but it takes 243d to rotate once on its axis (-243.018d really). Therefore a “Sidereal Day” on Venus is longer than a “Year.”
- The negative number above is significant. Venus rotates clockwise (in retrograde rotation) when viewed from on “up,” and we all know what “up” means! It is one of 2 solar planets to do so [Uranus is the other one, though it is on its “side”]. Using Earth-like cardinal points, on Venus the Sun will rise in the West and set in the East, taking over 58d to get from horizon to horizon, if you can see it at all from the surface. A full “day” is about 116.75d (just like 24h on Earth).
- The axial tilt of Venus is now considered to be 177°, which implies that it is nearly upside down but “vertical” with respect to the ecliptic. The Earth is tilted at 23.5°, similar to Mars, Saturn and Neptune in the range of deviation. Mercury and Jupiter are practically straight-side up, with almost zero and 3° of axial tilt respectively. Uranus rotates at an incongruous 98° axial tilt.
- Venus has the least eccentric (i.e. most circular) orbit of all the solar planets. While Earth’s is the third least eccentric and Mercury’s is easily the most, the second least eccentric orbit is Neptune’s. Ranked after Earth are Uranus, Jupiter, Saturn and Mars. No wonder there were problems encountered by ancient astronomers with the orbit of Mars!
- The surface of Venus is the hottest in the solar system. It is hotter than Mercury’s, even though it is about twice the distance from the Sun and receives only a quarter as much solar radiation, 90% of which is reflected away by a permanent cloud-cover of SO₂ high up in its atmosphere. Such is the power of the runaway greenhouse effect of SO₂ and CO₂ in the atmosphere.
- The Venusian atmosphere is about 96% CO₂ and the rest is mostly N₂, while the atmospheric pressure is more than 90 times that on Earth. But unlike on Earth, Venus has no Carbon cycle. There is no bio-mass to absorb the CO₂, nor can it be ‘fixed’ into rocks and other features.
- Plenty of thunder and lightning has been detected on Venus, but the cause is as yet unknown. However, there is no rainfall of any kind on the surface, as it is too hot.
- As morning and evening stars, Venus was known to the early Greeks as *Phosphorus* and *Hesperus* (respectively). It was the 6th century BC before the pair was recognized as one planet, which was then called *Aphrodite*. “Venus” is the Roman name for it. A thousand years before the Greeks, Babylonian astronomers had recognized that there was a single planet involved, and called it *Ishar*. Similarly, Mercury was *Apollo* and *Hermes* at first to the Greeks, then just *Hermes*. The Babylonians needed only one name – *Nabu*. The Romans named it *Mercurius*.

It has been just over 3 months since I hesitantly volunteered to edit the **NHAS Observer**. So far it has been quite heady, and only occasionally harrowing, and I am happy to note that this issue is being published from India (and it is not a matter of out-sourcing). I am also resigned to the reality that I am never going to vote in an NHAS election in December, nor tuck into a pot-luck feast, Gryffindor style.

While Paul Winalski gazed around the room at MSDC in amazement at the number attending (there have been 30+ at the last 3 business meetings, 43 that day), Rich DeMidio was interpreting past membership numbers to show a healthy trend in member retention, as outreach programs started taking off in 2006. Meanwhile on the other side of the planet, I was struggling to deal with the long list of new members in the second column of Rags's report – row upon row of names that I really did not want to shrink further. Something is in the air, surely!

At the In-reach event held this month, I was struck by repeated expressions of “help is always available” – that too is very Hogwarts-ian! So I'd like to change my tune and add: Perhaps these events, held roughly 3 months apart, *should* be convened at short notice, avoiding weather-related cancellations and offering different seasonal skies. If one is missed, there'll be another Knight's Bus along before long. Of course it is up to Rich Schueller to conjure up the last-minute Park permits, but he seems to manage it just fine.

And once again I am soliciting articles. They don't have to be long-winded pieces like mine. A paragraph or two about novel experiences can be showcased 2 or 3 to a page. Interesting factoids can be used in a box, or even as fillers. This newsletter is a forum for a one-to-many transmission. Feel free to use it.

The Portsmouth First Night event will be covered in the January 2014 edition. And as I run out of space –

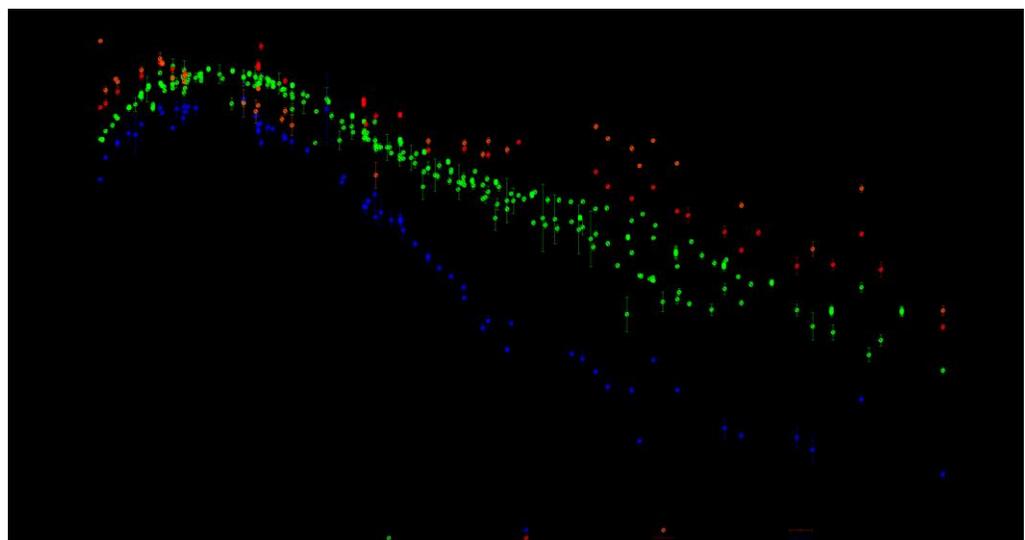
Happy New Year!

• Ramaswamy

Image of the Month

These are not swarms of fireflies conjured up by Hermione, but data points in the Light Curve of a supernova, and the last set shown (at extreme right) was submitted by Chris Krstanovic of NHAS to the AAVSO database on September 28, 2013.

Read all about it in the following pages...



(Image courtesy of: AAVSO)

Nova and Supernova

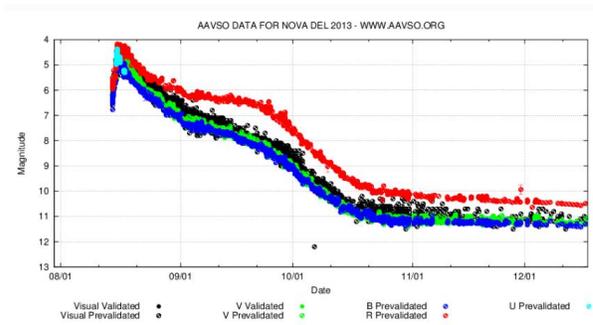
It began in late September as a comedy of errors. I was working on my story about the fading of Nova Del 2013 and asked Chris Krstanovic (NHAS member from Windham, NH) if he had been imaging the nova's decline since his initial shot of around August 20th. He replied that he had been doing so almost every week, and sent me a few files. They were all about something called SN 2013dy. It took a couple of days to sort the matter out and I got the images I needed to complete my story, but SN 2013dy stayed with me, and here, as they say, is the rest of that story. For the record, a sequence of shots similar to what I had been looking for can be found on page 76 of the December 2013 issue of *Sky & Telescope*, right down to the range of the AAVSO Light Curve. Thank you, Bob Naeye!

To me, Nova Delphini 2013 was special because it was my first nova. But to a veteran observer like Chris, it was mundane; SN 2013dy, a Type Ia Supernova in Lacerta, now had his complete, undivided attention. Different strokes for different folks, and before I report on his adventure, a quick primer on the differences.

A Nova

Despite its name, a Nova is not a new star, but an explosion on a star which was too dim until then to have been noticed much from Earth. A nova usually occurs in a tightly-orbiting binary star system, where a small but extremely dense and massive white dwarf accretes a stream of hydrogen gas from its companion.

After swirling in an accretion disk around it, the gas is funneled down to the surface. When this layer of fresh hydrogen gets dense enough, it explodes in a runaway hydrogen-fusion reaction on the white dwarf's surface — as a series of hydrogen bombs in fact, of immense 'yield.' The star can brighten by more than 10 orders of magnitude, but eventually fades back to obscurity once the hydrogen fuel has been used up. The underlying white dwarf remains intact, and as fresh hydrogen gas is accreted again, the process may repeat itself in a few years, or in tens of thousands of years.



The fading Nova Del 2013 (chart courtesy of: AAVSO)

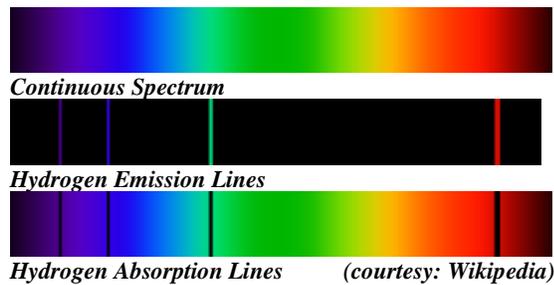
Nova Delphini 2013, which peaked at about magnitude 4.3 in mid-August, has dimmed to below 11.0 by year's end. The progenitor white dwarf is believed to be a magnitude 16.9 star prior to the August event.

A Supernova

A Supernova, as the name suggests, is a stellar explosion that is considerably more energetic than a nova. It is extremely luminous, and usually will outshine an entire galaxy before fading from view in a few months. In this interval it can radiate more energy than the Sun is likely to in its entire lifespan of 10 billion years.

To coin an expression, if a Nova is a flaring match-stick, a Supernova is a Hiroshima bomb.

Supernovae can be triggered in one of two completely different ways: by sudden re-ignition of nuclear fusion in the core of a white dwarf star, or by the sudden and cataclysmic collapse of the core of a supermassive star. In the first case, a runaway thermo-nuclear reaction is the agent, whereas with the second, it is the potential energy released by gravitational collapse.



Whatever the cause, a supernova is type-categorized based **only** on characteristics of its radiation at peak luminosity, by the shape of its Light Curve and by the emission and absorption lines of different chemical elements in its spectrum. The first division is based on absence (**Type I**) or presence (**Type II**) of Hydrogen **emission** lines (in the well-known Balmer Series). Each type is then sub-divided by the presence or absence of other spectral lines (*see Box below*).

Only Type Ia supernovae are caused by runaway thermo-nuclear reaction in the core; all others (Types Ib and Ic, and all the Type II categories) are caused by the gravitational effects of core collapse. And while the cause of Type Ia supernovae and ordinary novae is similar – accretion of mass by a white dwarf prior to the explosion – the mass of the progenitor white dwarf itself is key.

For a Type Ia supernova, the mass of white dwarf approaches, or exceeds, the Chandrasekhar Limit of 1.44 Solar masses (1.38 Solar masses is also mentioned), and usually destroys itself in the process. In the case of ordinary novae, the white dwarf accretes matter more slowly and does not approach the Chandrasekhar limit; the explosion is on the surface and does not ‘disrupt’ the star.

<i>Type</i>	<i>Spectral and Light Curve characteristics</i>	<i>Usual Core Remnant</i>
Ia	Presence of singly-ionized Silicon absorption line (Si II) at 635.5nm	None
Ib	Absence of Si II, presence of non-ionized Helium (He I) at 587.6nm	Neutron Star/Black Hole
Ic	Absence of Si II and of He I absorption lines	Neutron Star/Black Hole
II-L	Steady decline (Linear) of the Light Curve after peak luminosity	Neutron Star
II-P	Slower decline (with a Plateau) of the Light Curve after the peak	Black Hole/ Neutron Star
IIn	Presence of Narrow or intermediate width Hydrogen emission lines	Neutron Star
IIb	Weak Hydrogen lines disappear, becomes like Ib with Helium lines	Neutron Star

The fact that a Type Ia always goes supernova at about 1.44 solar masses means that it is always at the same level of peak luminosity (an Absolute Magnitude of -19.6), and that makes it a useful tool for accurately measuring the distance to its host galaxy. It can serve as a standard candle.

The Type Ia supernova has thus become a rung in the cosmic distance ladder (beyond Cepheid and RR Lyrae variables). However, early discovery is crucial, and in this respect SN 2013dy fared very well – it was detected 2 weeks before reaching its peak.

Supernova SN 2013dy

On July 11, 2013, Gianluca Masi and Francesca Nocentini reported the discovery of a supernova in NGC 7250 in the constellation of Lacerta. They were using (remotely) a 430mm robotic unit part of the Virtual Telescope Project facility in Ceccano, Italy. [The Central Bureau for Astronomical Telegrams](#) (CBAT) alerted the world of the event, and gave its coordinates and an initial estimate of magnitude of 17.0:

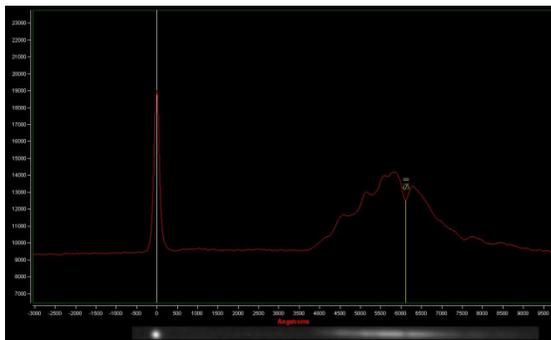
PSN J22181760+4034096 2013 07 10.45 * 22 18 17.60 +40 34 09.6 17.0 U 2W 25S N7250 L 0

It was soon established as a Type Ia supernova, and hundreds of amateur and professional astronomers around the world started charting its progress.

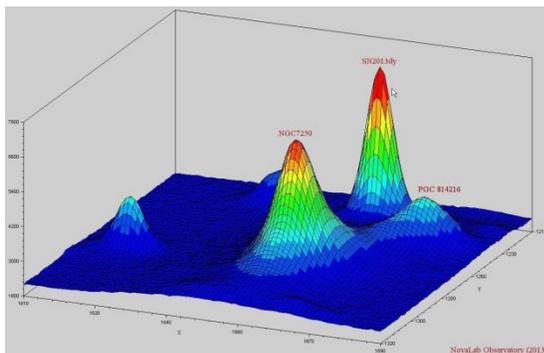
F. Ciabattari reported a pre-discovery detection of the event in an image taken for the Italian Supernovae Search Project. The object was just visible in an unfiltered image taken at the Borgo a Mozzano Observatory with a 500m Newtonian telescope with a CCD (FLI Proline 4710) camera in the early morning hours of July 10. The coordinates of the possible progenitor were given: 22h 18m 17s.77, +40d 34' 10".5 (UCAC-2) with magnitude 19.1 (limiting magnitude ~19.5). As it brightened to its peak luminosity of about 12.8 magnitude, astronomers were able to generate a pre-maximum light curve of the supernova.



*The discovery image in the CBAT Telegram
(Image: G. Masi and Francesca Nocentini)*



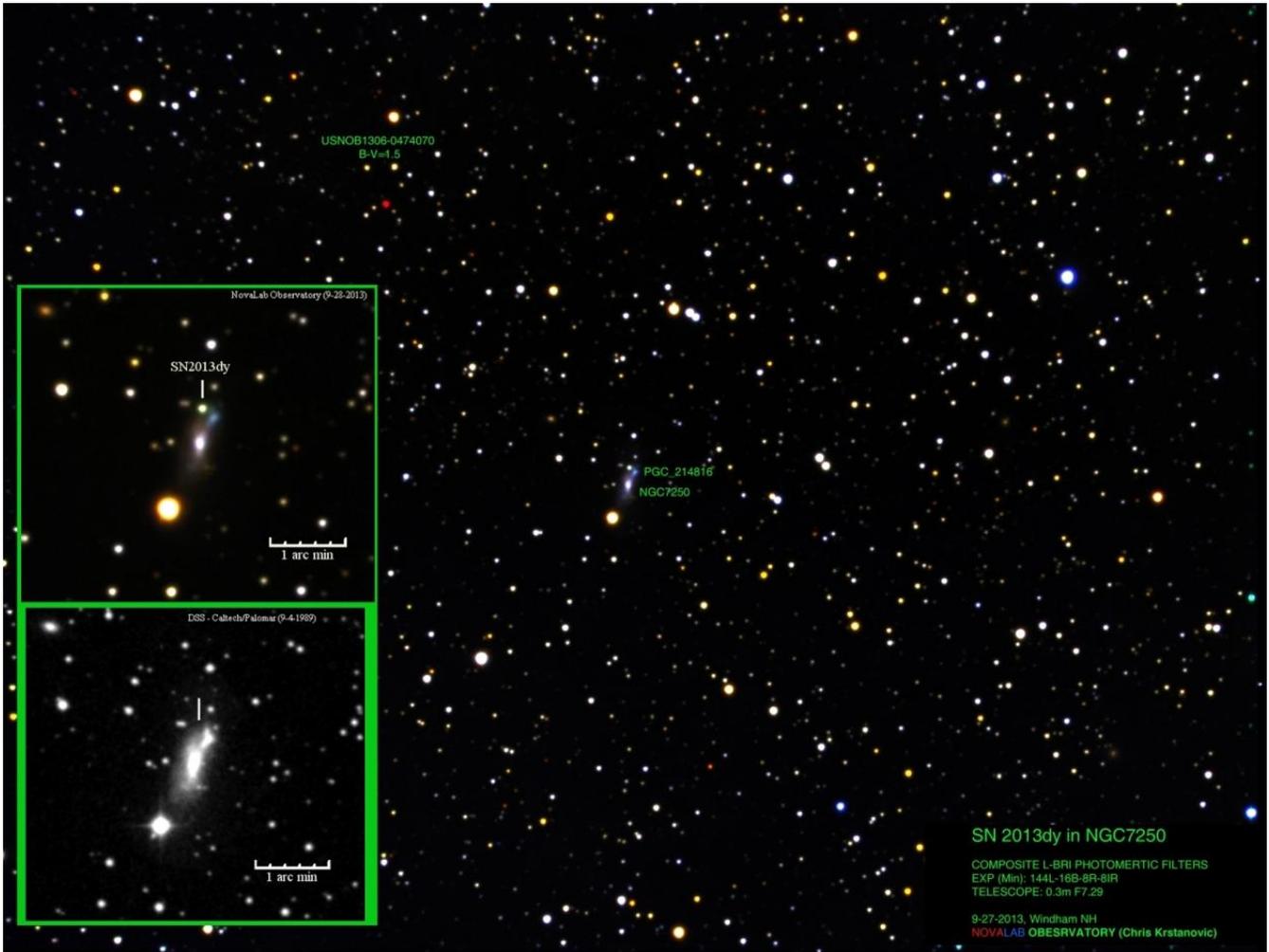
Spectrum showing the characteristic lines of Type Ia



*The Brightness profile of SN 2013dy and neighbors
(Both images: Chris Krstanovic)*

From his NovaLab Observatory in Windham, NH, Chris Krstanovic contributed 4 sets of photometric data points in September to the AAVSO Light Curve database, each time with B, V R and I photometric filters. A spectrum taken using a 2100-second exposure and a 100 lines/mm grating showed the tell-tale Si-II absorption line, identifying the supernova as a Type Ia (graph is mirrored on the negative axis due to grating dispersion). To round things off, he did a 3-dimensional brightness profile showing how the supernova really compared to the host galaxy NGC 7250.

The other bluish and faint nearby galaxy in the image is PGC 214816 (Principal Galaxy Catalogue). The distance to PGC 214816 is not known. NGC 7250 is a 13th-magnitude spiral galaxy (type Sdm) and based on recessional velocity, it is estimated to be about 55 million light years away, with a redshift-independent distance measurement of some 45 million light years. Given its apparent size, the galaxy is about 25 thousand light years across. So, assuming that the supernova is in NGC 7250 (and every indication is that it is), it is about 45 to 55 million light-years away.



SN 2013dy in NGC 7250 (center) in the tail of the Lizard between 1 Lac and 6 Lac

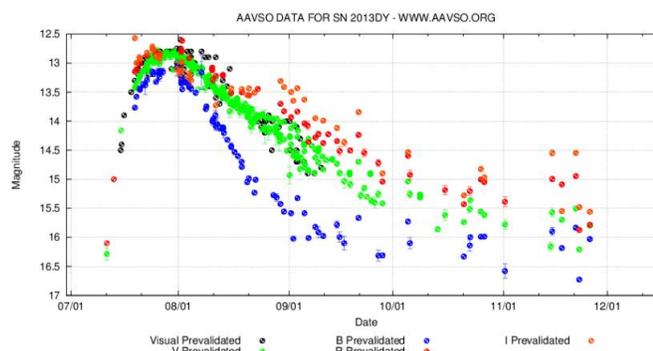
(Image: Chris Krstanovic)

On September 28, Chris submitted his last set of data points on SN 2013dy to AAVSO, extracted from the plate above. The Supernova is shown in the center, and also in the top inset, with the Palomar DSS reference image (from 1989) below. The yellow star immediately below NGC 7250 is TYC 3203-450-1, a 10.93 mag. object with B-V index of 1.3, while the prominent red star at the top left-center of this L-BRI image is a Mira-type variable, **FV Lac**. Chris measured its luminosity from these images and got values of B=16.819, V=15.544, R=13.528 and I=10.971, with a B-V index of 1.275 (± 0.012). **FV Lac** is radiating about 250 times more intensely in infra-red than in blue wavelengths. It looks very red because the filters used are not L-RGB, but L-BRI (R=Ic, G=Rc, B=B). Also, the image colors were corrected to match a G2 type star flux, similar to our own Sun, in order to get a more realistic view.

Telescope: C11-CF @ F/7.12 with Starizona SCT Corrector Lens and temp. compensated Clement Focuser, on CGE-Pro mount.
Filters: Astrodon B/Rc/Ic Photometric Johnson Cousins filters with Baader Luminance filter.
Exposures: L 144min (9 min x 16@0.54"/pix), Colors are photometric B 16 min (2 min x 8), Rc and Ic 8 min (1 min x 8) each.
Colors: sampled at 1.6"/pixel (bin 3).
FOV: 30' x 24'
Sky brightness was 20.13 mag./arcsec.
Seeing was 3.1arcsec @ Image Altitude of 75°. No image enhancement done, except for color saturation.

Three months on, the worldwide interest in Supernova SN 2013dy appears to have run its course – there have been no submissions to its AAVSO light curve in December. The supernova has now dimmed to the level at which it was first spotted on July 11th, as the graph to the right makes clear.

Farewell, SN 2013dy!



SN 2013dy Light Curve in late December, 2013 (courtesy: AAVSO)

Supernova Nomenclature

Unlike comets, the name of the discoverer is not part of the name of a Supernova, and unlike minor planets and asteroids, no one is honored in the naming of it. The system now in place was first used in 1885, whereby the name begins with SN for obvious reasons, with the year of discovery appended. The Alphabetic code that follows is a single Block letter for the first 26 supernovae discovered in the year, from A to Z. SN 1885A was the first one thus named, discovered in mid-August that year, and is still the only one to have been detected in the Andromeda Galaxy (it is also known as S Andromedae).

1987 was the last year when a single Letter designation was sufficient. It is amusing to look back at the renowned SN 1987A in the Large Magellanic Cloud as the first discovery of that year, a Type II-P that was sighted on February 24, 1987, reaching its peak in May. This year SN 2013A was spotted on January 1st, and that says so much about advances in technology and worldwide interest in supernovae detection.

At a distance of 168,000 light years, SN 1987A was the closest and the brightest supernova in 400 years, and is still being studied. Neutrinos from the core collapse were the first ever detected on Earth emanating from a supernova, launching the field of Neutrino astronomy. The timing of that detection was also used as evidence against the ‘faster-than-light neutrinos’ controversy last year, detected as they were only 2 or 3 hours before visible light was, after travelling for 168,000 years. No neutron star has yet been found at the site of Sandulek -69° 202, a supergiant that collapsed. The search continues, and for a black hole too!

In all of 1947, there was only one supernova discovery – SN 1947A. These days anywhere from 200 to 400 supernovae are detected each year (2007 had 572!), so a system of double lower-case letters is used beyond the 26th one tagged as Z. The next set of 26 events is given the suffix of ‘aa’ to ‘az’, followed by a set of ‘ba’ to ‘bz’ and so on, going down the list of alphabetic characters, accounting for 702 events. Thus SN 2013dy was the 129th Supernova to be observed in 2013. At last check, SN 2013hl had been discovered on December 13, the 220th of the year, by none other than **Koichi Itagaki**, the discoverer of Nova Del 2013 in August! And yes, SN 2013hl is a Type Ia supernova in the constellation of Leo.

Historical supernovae are known simply by the year in which they were first observed, such as SN 1054 (the Crab), SN 1572 (Tycho’s Nova) and SN 1604 (Kepler’s star), which was the last supernova in the Milky Way galaxy visible to the naked eye, even in daytime. But it was just a new star, a guest star.

Five years later, Galileo Galilei would turn his spyglass toward the heavens, and a new age would dawn.

- *Ramaswamy and Chris Krstanovic*

NHAS December 2013 Business Meeting Report

The December business meeting was held at the McAuliffe-Shepard Discovery Center on Dec. 20th, with a record attendance of 43 members and our out-going President Rich DeMidio presiding for the last time. Election of the 2014 slate of Officers was held before the pot-luck. The Treasurer’s report by “Rags” follows on the next page.

President’s Report

Key accomplishments of the year were listed: the implementation of member in-reach programs such as the “Astronomer is in” prologue to monthly meetings, Benedictine Park sky-watches, and clinics for scope collimation and Messier Marathons.

The Club delivered on more than 50% of the scheduled public sky watches, and the Library Telescope Program kept expanding and was also awarded the Astronomy 2012 award for Public outreach.

In the coming year, the focus on member in-reach will sharpen with a stable membership committee in place, and processes streamlined to free up more time for officers and committee chairs. More creative ideas for increasing membership participation in club activities will be sought out and implemented.

Correlation between expansion of out-reach programs and member retention was illustrated graphically, showing a dramatic increase in continuing membership after 2006.



Ted Blank, President 2014
(Both photos: Steve Rand)

The Awards



The Public Observing Award to **Gardner Gerry** and **Paul Winalski** for organizing and delivering on 43 sky watches in 2013. Considerable behind-the-scenes work is involved, from phone calls and email correspondence with parties requesting the events, to gauging weather conditions on the day and herding enough scopes (and owner cats) to handle anticipated public interest. On occasion, they have been the only astronomers representing NHAS at a skywatch.

The Sky Watch Wanderer Award to **Ted Blank** for his tireless travel all over NH helping out at sky watches and special events like NEFAF and AeroSpaceFest at MSDC. He is the “Astronomer in Residence” at NHAS business meetings and a NASA Solar System Ambassador.

The Footprints in the Sand Award to **Pete Smith** for managing the ever-expanding NHAS Library Telescope Program, fielding requests for scopes, coordinating acquisition of equipment and funding, organizing Modification parties and delivering scopes to the libraries (complete with instructions on their use), and making it look easy.

2014 Officers Election

There were two announcements regarding the 2014 election:

- * Tom Cocchiario declined his nomination for President, and
- * John Bishop declined his nomination for Vice President.

An additional nomination was made (and seconded):

- * Ted Blank for President.

A motion to close nominations was made, seconded, and passed. The official nominees were:

- | | |
|-----------------|----------------|
| President: | Ted Blank |
| Vice President: | Tom Cocchiario |
| Treasurer: | David Gilmore |
| Secretary: | Paul Winalski |
| Director: | Pete Smith |

A motion was made and seconded that the assembly forego the vote by secret ballot and approve the uncontested, complete slate of candidates by voice acclamation.

This motion was seconded, and passed by unanimous voice vote. A voice vote was then taken to approve the uncontested slate of candidates and it passed unanimously. So the above are the 2014 officers and director.

Ted Blank decided to resign his position on the NHAS Board of Directors and serve solely as NHAS President. Club by-laws dictate that a special election be held at the next meeting to fill the remainder of Ted’s term on the Board of Directors. The person replacing him will only serve Ted’s remaining year on the Board – that is, just the calendar year of 2014, and not a 3-year term.

NHAS Treasurer's Report*(as of December 18, 2013)***Starting Balance:** **\$11012.88****Deposits:**

Membership	1,136.49	
Donations	445.00	
Calendar sales	42.00	
Interest	1.04	
Total:		\$1,624.53

Expenses Paid:

United Site Services (Porta Potty)	56.45	
Rackspace Cloud (web site)	22.55	
Total:		\$79.00

Current Checking Balance: **\$12,558.41****Petty Cash:** **\$100.00****Current Cash Balance:** **\$12,658.41****EOC Share:** **\$6,690.79**

Membership	78	
Cash Renewals:	22x30.00	660.00
Cash New Members:	13x30.00	390.00
PayPal Renewals:	3x28.87	86.49
PayPal New Members:	0x28.87	0.00
Total:	38	\$1136.49
Current Members:	116	

New Members

Lawrence Daddario	Nashua, NH
Bob Domings	Merrimack, NH
Robert Gaimari	Hollis, NH
Leo & Deb Lapierre	Weare, NH
Kristy Laudenbach	Lee, NH
Kimberly Lazarski	Lee, NH
David Lewing	Hopkinton, NH
David Long	Nashua, NH
Dan Mack	Hudson, NH
Tiffany Nardino	Allenstown, NH
Douglas Novielli	Londonderry, NH
Julie Sterner	Lee, NH
Max Stokes	Lee, NH

Donations

Lawrence Daddario	EOC	70.00
Bob Domings	YFOS	20.00
Tom Cocchiaro	GEN	5.00
Rex Gallagher	GEN	20.00
David Long	GEN	100.00
Douglas Novielli	GEN	20.00
Tim Printy	YFOS	10.00
Julia Sterner	GEN	30.00
Max Stokes	GEN	30.00
Concord School District	GEN	20.00
Epping School District	GEN	120.00
Total:		\$445.00

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 (2014):

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

Board of Directors (2014):

Chairman of the Board: [Currently Vacant]
Senior Director: [Ken Charles](#)
Junior Director: [Pete Smith](#)



Orion XT6 – 6” Newtonian on a Dobson 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, a Moon map, and a red light
- Richard Berry’s “Discover the Stars”
- Orion XT6 user manual

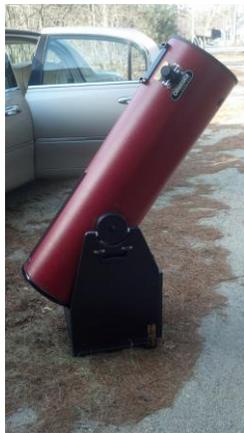


Meade 8” Newtonian on a Dobson mount

(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 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: Ted Blank contact: tedblank@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 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)
Planetarium and Observatory
First Friday Observing Event
www.starhop.com

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.agenaastro.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

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

NASA
www.nasa.gov

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

Google Sky (Free, online use only)
www.google.com/sky

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, 3 January 2014	19:00	MSDC, Concord NH
Coffee House Night at YFOS	Saturday, 4 January	17:00	YFOS
Rey Center Skywatch	Saturday, 4 January	18:30	Rey Center, Waterville Valley NH
Heronfield Academy Skywatch	Wednesday, 8 January	18:30	Heronfield Academy, Hampton Falls NH
Heronfield Academy Skywatch (backup date)	Thursday, 9 January	18:30	Heronfield Academy, Hampton Falls NH
NHAS Business Meeting	Friday, 10 January	19:30	St. Anselm College, Manchester NH
Sidewalk Astronomy Skywatch	Saturday, 11 January	18:00	Market Square, Portsmouth NH
Heronfield Academy Skywatch (second backup date)	Monday, 13 January	18:30	Heronfield Academy, Hampton Falls NH
Rodgers Memorial Library Skywatch	Tuesday, 14 January	18:30	Rodgers Memorial Library, Hudson NH
West Manchester Library Skywatch	Wednesday, 22 January	18:00	West Manchester Community Library, Manchester NH
Rindge Town Skywatch	Friday, 24 January	18:30	Rindge Recreation Dept., Rindge NH
West Manchester Library Skywatch (backup date)	Wednesday, 29 January	18:00	West Manchester Community Library, Manchester NH
Bethlehem Public Library Skywatch	Thursday, 30 January	18:00	Bethlehem Public Library, Bethlehem NH
Bethlehem Public Library Skywatch (backup date)	Friday, 31 January	18:00	Bethlehem Public Library, Bethlehem NH
Coffee House Night at YFOS	Saturday, 1 February	17:00	YFOS
Rey Center Skywatch	Saturday, 1 February	18:30	Rey Center, Waterville Valley NH
Parkside Middle School Skywatch	Wednesday, 5 February	18:00	Parkside Middle School, Manchester NH
Parkside Middle School Skywatch (backup date)	Thursday, 6 February	18:00	Parkside Middle School, Manchester NH
First Friday Skywatch for MSDC	Friday, 7 February	19:00	MSDC, Concord NH
Sidewalk Astronomy Skywatch	Saturday, 8 February	18:00	Market Square, Portsmouth NH
NHAS Business Meeting	Friday, 14 February	19:30	MSDC, Concord NH
His Mansion Ministries Skywatch	Saturday, 15 February	19:00	His Mansion Ministries, Deering NH

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

Date	Lunar Phase
Wednesday, 1 January	 New moon 11:14am
Wednesday, 8 January	 First quarter 3:39am
Thursday, 16 January	 Full moon 4:52am
Friday, 24 January	 Last quarter 5:19am
Thursday, 30 January	 New moon 9:39pm
Thursday, 6 February	 First quarter 7:22pm
Friday, 14 February	 Full moon 11:53pm
Saturday, 22 February	 Last quarter 5:15pm
Saturday, 1 March	 New moon 8:00am

Credits

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

Matt Amar, Ted Blank, Herb Bubert, Melinde Byrne, Tom Cocchiaro, Rich DeMidio, Gardner Gerry, "Rags" Gilmore, Elaine Grantham-Buckley, Chris Krstanovic, Steve Pearsall, Steve Rand, Jim Roberge, John Rose, Rich Schueller, Pete Smith, April South and Paul Winalski.