



# OBSERVER



Vol. 2013, No. 3

Newsletter of the New Hampshire Astronomical Society

March 2013

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The new "Observer" is  
designed, compiled,  
written and edited by  
Tom Cocchiaro

## Members Welcome New Meeting Format and Member-Centered Features



Over the years, I have heard many people say that winter is the best time for observing because of low humidity and long nights, but this is one Astronomer

who is definitely ready for Spring! This is a great time of year to observe because the bugs are not out yet and the nights are still crisp but not terribly uncomfortable. The snow is typically gone at YFOS by now translating into some wonderful opportunities to enjoy some time out enjoying the heavens.

With one quarter completed this year, I wanted to pause and share my thoughts on how we're progressing toward the vision I outlined back in January. In terms of our "In Reach" efforts, we changed the coffee house dates to Saturdays in an effort to align better with people's schedules. In addition, we advertised these events as a networking and mentoring forum. The Spring Messier Marathon back in March was a huge success with many members participating. It was wonderful to see many new members attend and get enjoyment out of the social event. Our marketing and education preparation currently paid off. Thanks to Ed Ting for the presentation and Larry and Linda Lopez for once again hosting. I am pleased with the new meeting

format and changes we implemented for our membership. The "Astronomer is In" sessions have been very productive with a lot of participation. The "Astronomy Shorts" session has also gone over well. On the negative side, I fell short with providing a web conferencing and audio capability. As you will recall, I viewed this as a vital prerequisite for helping to implement several programs for our membership. I will continue to manically pursue this over the next quarter.

We have a busy second quarter ahead of us including Aerospacefest at MSDC in June. You have already heard about this from Ted Blank. Ted has shared the tasks that need to be done so please sign up if you can provide assistance.

We had a productive, albeit off the script, Q2 officer meeting where we made progress on several topics that directly align with our "In Reach" efforts and I will report on those actions at our next meeting.

Overall, our trajectory is upward when measured against the vision but a lot of work remains which I am committed to complete.

**Clear Skies,  
Rich DeMidio  
NHAS President**



NHAS Director Ted Blank speaks to a crowd of more than 300 students at the Hudson Memorial School about the Mars Curiosity Mission among other astronomy-related topics.--Courtesy Photo

## Hudson Memorial School (March 11)

Ted Blank presented the indoor talk for the Hudson Memorial School in the school's cafeteria. Due to the student curriculum, the presentation focused on the Mars Curiosity rover and science laboratory now on Mars. There were more than 300 students in attendance. I began with the demonstration of the Moon's distance from Earth to get people involved, then moved to the Curiosity presentation. Some pictures are posted below. Although 175 students signed up for the skywatch later in the day, the observing session had to be cancelled due to cloudy conditions.

★ **Ted Blank**

## Derry Public Library (March 13)

About 20 adults attended the presentation at the Derry Public Library. I gave a brief indoor talk and then we went out to observe in the park next door to the library. It has a good horizon view, but there is a lot of light from nearby

streetlights. Skies were pretty clear and seeing was very good. We got the chance to observe a two-day-old crescent Moon, Jupiter, and a mag -2 Iridium flare. I set up Mr. T (the 14" T-Scope dob); **Steve Rand** had his 10" Orion dob, and **Herb Bubert** had his 12-1/2" Starmaster. I showed Jupiter, the Pleiades, Mizar, and Gamma Leonis. Once it got darker, I also showed M35, M37, M81/M82, and M42 (both with and without an O-III filter). Unfortunately we had to leave the park at 8:30 p.m. The head of the Derry Conservation Commission was there and said she would try to arrange for us to do a sky watch in a field that the Conservation Commission owns that is well away from artificial lighting. It sounds promising.

★ **Paul Winalski**

## Manchester Middle School (March 26)

We finally got lucky with the weather for the Manchester Middle School skywatch! More than 100 students, parents, siblings

and faculty attended our presentation and skywatch. The skies were very clear and transparent. Even with the rising full moon, the Orion Nebula was showing very nicely. I also showed Jupiter and the Pleiades. Members present with scopes included **Ted Blank, Rich DeMidio, Herb Bubert, Steve Rand, Pat Adams, Ed Ting, John Bishop** and **Gardner Gerry**.

★ **Gardner Gerry**

## Sanborn Regional Middle School (March 30)

A small but enthusiastic group of students attended our "What's Up in Tonight's Sky" presentation and afterward got to observe in clear, dry skies. I showed the Pleiades, the Double Cluster and Jupiter with my new-to-me Stellarvue 80/9D.

Other members present were **Ted Blank, Jason Paul, Rex Gallagher, Joe Derek** and **Curt Rude**.

★ **Gardner Gerry**



## What's an Urban Astronomer to Do?

*I live in a condo community that abuse lighting so badly that the night feels more like the day. I want to do some observing but I don't know how to go about finding a place to set up at. YFOS is so far away. I wouldn't think you would be allowed in a public park at night or in someone's orchard? Do you just pull over on the side of the road? What's the protocol? I don't want to get mugged or have the cops called on me for trespassing. What's an urban astronomer to do???*—April

Edison flipped the switch on the first commercial power station in the country in September of 1882. Ever since that time the proliferation of his wondrous illuminating devices have slowly but surely turned night to day in urban areas wiping out the once heavenly views that were commonplace for millennia. Despite the challenge of today's bright nights there are still opportunities for the urban astronomer passionate about discovering the wonders of the night sky.

Most astronomy writers who have covered the subject of urban astronomy essentially agree on the approach—if you can't beat it (light pollution), work with it. Here is some of what they say. Urban astronomy requires the astronomer to adapt if he or she hopes to get enjoyment out of the hobby. Choice of targets, telescope equipment and your willingness to venture out away from your home or apartment are all considerations that will affect how much enjoyment you derive from the hobby.

If you can't get away from the city, concentrate on lunar or planetary observing. No matter how bright the

sky is, you can usually see the moon and planets through the glare. Pick up a medium-powered refractor that can easily be set up on a balcony or carried outside to a shaded spot. Big Newtonian reflectors or Dobsonian scopes (with few exceptions) are overkill in an urban setting as you'll never be able to use them for what they are designed for—teasing out the faint fuzzies some of which are difficult to spot even under a dark sky.

For those with a high level of passion, time and mobility there are more options. Find a public park nearby that is away from the bright lights of the city. Depending on the time of year, you'll probably have to get permission to stay beyond the closing time as most set curfews right about the time the sky is getting dark enough to observe—especially in the summer. Getting permission also provides a level of security as city officials know you're going to be there and will most likely give police patrols a heads up on your presence. Most experts say if you choose this option, don't go alone. Bring along an interested friend or invite your neighbors to join you for the observing session. It's a lot more fun that way. The same applies to non-public areas—get permission... bring friends.

Another option, you are already exercising, is to become a member of an astronomy club and participate in observing activities. With NHAS there are weekly opportunities to participate in observing activities, many take place under "darker" skies.

Other tips include: observe as close to the meridian as possible as the atmosphere is less thick there, use a dew shield or long lens shade to screen out nearby light sources, make use of light pollution reduction (LPR) filters on your eyepieces, observe early in the morning when the atmosphere is more stable—and there are fewer lights.

I know I've only covered the tip of the iceberg regarding urban astronomy, however, there are a lot of ideas and suggestions out there in cyberspace to sooth the soul of an urban astronomer. Some links are below. Enjoy.

### The Urban Astronomer's Guide

Sir Patrick Moore. Available on Amazon.com and elsewhere.

### The Urban Astronomer's Survival Guide

Free .pdf download

### Astronomy League Urban Club

*My husband has an "Ask the Astronomer" question: How do amateur astronomers discover comets or asteroids? - Amy*

The short answer is...with a lot of patience and determination. It also helps to be an insomniac. Before the automated telescope (BIG TELESCOPE) sky surveys directed at comet hunting, it was common for astronomers to average from 300 to 700 hours before hitting paydirt in the search—that is for those lucky enough to spot one and successfully log it with the Minor Planet Center. Some aspiring hunters search much longer than this and never get a hit.

There are generally two common ways of discovering comets—the old fashioned way with an 6-inch or larger Newtonian in the wee hours of the morning before sunrise, or with a battery of computer-controlled BIG telescopes that image a wide area of the sky on one night and compare those images with pictures of the same areas on subsequent nights. The comparison is done with computer that can spot something not on a previous frame from the 10s of thousands of stars and other objects—or an object that moves from one night to another. So you can see, beating a sky survey crew to a comet discovery is a rare feat these days. Some of the sky surveys that have discovered a number of comets since their beginnings in the 1990s include LINEAR (Lincoln Institute Of Near Earth Asteroid Research), NEAT (Near Earth Asteroid Tracking), LONEOS (Lowell Observatory Near Earth Object Search), SPACEWATCH, CSS (Catalina Sky Survey) and SWAN (Solar Wind Anisotropies). The most prolific amateur comet hunter is Australian William Bradfield credited with 18 finds. His picture is below.

*(Continued on Page 5)*



Picture Courtesy of Kym Thalassoudis



*Greg Snyder, a doctoral candidate in astronomy and astrophysics at Harvard, shares his research on the computer modeling of galaxy evolution at the March membership meeting at St Anselms College in Manchester, N.H. -- Tom Cocchiaro photo*

The March membership meeting covered a lot of ground including a number of items from the quarterly officers meeting and the presentation of original research on modeling the evolution of galaxies starting from the Big Bang to the present.

**Ted Blank** covered upcoming activities leading up to this year's New England Fall Astronomy Festival including an April 13 fundraising dinner hosted by the Manchester location of Shorty's Mexican Restaurant. Shorty's will donate a portion of the money spent that evening to the festival.

Other upcoming events include this year's New England Astronomy Forum scheduled for April 20-22 at Rockland Community College in Suffern, N.Y. Some members are looking to carpool to the event. Those interested in hitching a ride may check out the subject in the forums for more details.

This year's Aerospace Fest is scheduled for June 14 & 15 at the McAuliffe Shepard Discovery Center. **Melinde Byrne** and **Blank** are co-chairing this year's event and invite any interested members to join the fun. Since this is primarily a daylight event whomever can bring along a solar scope is especially welcome

During the meeting Society President **Rich DeMidio** covered some of the details from the first quarterly officers meeting where much of the discussion centered on "in-reach" to the membership. Several topics were discussed including club-sponsored Astronomy League membership, live web conferencing and streaming of

meetings and astronomy-related education sessions. The group also talked discussed interim membership responsibilities following the resignation of long-time Membership Chair **Bill Steele** who will be sorely missed in the position. Anyone interested in taking up the mantle of membership chair should contact one of the officers for an overview of the position.

March also marked the first of two Messier Marathons. Thanks to a handful of volunteers armed with snowblowers the observing field was clear of snow for the March 9 event. The turnout for the event was the best in a long time most likely due to the crystal clear skies that stayed overhead much of the evening. Thanks to **Larry** and **Linda Lopez** who once again hosted the observing evening...and to the many members and first-time participants who contributed a smorgasbord of tasty vittles. The February Marathon-prep presentation was highly effective in generating interest for the competition... many thanks to **Ed Ting** for his sharing his insight and experience in making the best of the evening. Some who were more focused on the marathon reported their scores for the evening: **Herb Bubert** led the pack with 98 objects, **DeMidio** reported 67 and **David (Rags) Gilmore** racked up 40 celestial check marks.

Guest speaker for the evening was **Greg Snyder**, a doctoral student in astronomy and astrophysics from Harvard University. He presentation entitled "Diagnosing the Formation of Galaxies with Supercomputer Simulations" covered groundbreaking

research in charting the evolution of the universe—particularly the formation of galaxies. He explained that in extragalactic astronomy, observational studies reflect a huge diversity in wavelengths of light, size scales, cosmic times, and galaxy types. "We cannot directly watch what happens to galaxies in the millions or billions of years before and after they are observed," said Snyder. "However, in this era of increasing computer resources, more comprehensive comparisons are now possible which brings me to my dissertation research which focuses on linking numerical predictions directly with observations and evaluating how interactions, mergers, and other processes among galaxies take shape. The result has been an simulation that ends up pretty close to what we have observed today. Snyder's presentation may be viewed on YouTube by clicking [here](#).

## Treasurer's Report

<b>STARTING BALANCE:</b>	\$10,286.79
<b>DEPOSITS:</b>	
MEMBERSHIP	\$90.00
DONATIONS	358.00
BANK INTEREST	0.00
<b>TOTAL:</b>	\$448.00
<b>ACCOUNTS PAID:</b>	
RYMES PROPANE	\$98.57
CYNRIC COMPANY, LLC	468.60
STEVE RAND (LAPTOP BATTERY)	80.99
TED BLANK (BOOKS)	67.00
PROVANTAGE, LLC	69.09
<b>TOTAL:</b>	\$784.25
<b>NET BALANCE:</b>	\$9,950.54
<b>PETTY CASH:</b>	100.00
<b>CASH BALANCE:</b>	\$10,050.54
<b>EOC SHARE:</b>	\$5,659.54
<b>CURRENT MEMBERS:</b>	131

### NEW MEMBERS:

**PETER J. WOLCZKO**  
AMHERST, NH

**ROBERT TUCKER**  
DURHAM, NH

**ALLEY LAFORGE**  
MILFORD, NH

### DONATIONS:

<b>TED BLANK</b>	\$303.00	LTP
<b>MANCHESTER LIBRARY</b>	\$25.00	GEN
<b>PETER J. WOLCZKO</b>	\$30.00	GEN



Produced by Ted Blank and David Gilmore (Rags)

Members of the March Messier Marathon Snowblowing Team pose with their big...and little... rigs after clearing the observing field of more than two and-a-half feet of snow.

**Astrophotography Workshop**

Nine NHAS members attended the long-awaited Planetary Imaging Workshop held March 15 at the Salem High School Library. Society Astrophotographer **Herb Bubert** led the session which featured some practical exercises using image processing “tools of the trade” including Registax, Astrostakkert and Castrator. Bubert had originally planned to include an imaging session with the workshop where attendees would shoot and process their own video of Jupiter or the moon, however concerns about weather and location prompted Bubert to concentrate on just processing video. The group used Jupiter video provided by Bubert to practice their technique. Attendees were: **Bob Tucker, Michelle Thomas, Larry Lopez, Gardner Gerry, Pat Adams, Walt Jablonski, Gary Duranko and Ted Blank.** “I thought it went pretty well once I got over my initial nervousness,” said Bubert. “I think everyone who attended will be coming to Part 2 which will be an imaging session this summer. The Salem High Library is a great location to hold these workshops. I’ll probably hold the imaging workshop there as well.”

★ **Tom Cocchiaro**

**Major Public Skywatch Events**

**CHILDREN’S DAY**--Starting in May society members will be supporting a number of large events starting with Children’s Day in Portsmouth set for Noon to 4

p.m., Sunday, May 5. More than 10,000 parents and children are expected to fill the streets of Portsmouth. Last year seven NHAS members supported the event providing views of the sun, Jupiter and Venus. “This is always a fun event,” said Tom Cocchiaro, NHAS vice president and a regular at the Children’s Day event. “The kids are excited and curious and the parents are highly appreciative of our efforts to get kids interested in the sciences. For a pictorial look at last year’s event, click [here](#) (photos by Ted Blank).

**MARKET SQUARE DAY**--Next on the schedule is Market Square Day in Portsmouth which will run from 9 a.m. to 4:30 p.m., June 8 throughout the downtown. NHAS members have supported the day-long event for many years now introducing some of the more than 50,000 visitors to the wonder of our home star and answering questions about astronomy, our solar system and the universe. Throughout the day members of the society operate a mini forest of telescopes and hand out astronomy-related materials generously provided by NASA, Astronomy Magazine and some of the major telescope companies.

For a look at NHAS’ participation in last year’s festival, click [here](#) (photos by Ted Blank).

Those interested in participating at the Portsmouth events this year should contact Cocchiaro to sign up at [tomcocchiaro@comcast.net](mailto:tomcocchiaro@comcast.net). All potential club volunteers are welcome even if they’re not equipped for solar

viewing. There will be plenty of things to do and solar-equipped scopes to go around.

**AEROSPACEFEST 2013**--Last, but not least, is this year’s Aerospace Fest which is scheduled for 10 a.m. to 6 p.m., June 15 at the McAuliffe Shepard Discovery Center in Concord, N.H.

**(Ask the Astronomer from Page 3)**

Asteroids are even more difficult to find because of their reflectivity. Comets start to sublimate and shine as they approach the sun—that brightening long tail and fuzzy appearance make them easy (a relative term) to distinguish from the background. Asteroids on the other hand are nearly invisible dark bodies roaming the space between the planets.

There are several ways to find an asteroid. One way is to use the same process used in comet hunting—compare images. Rather than using images widely spaced in time, the surveys use a series of exposures taken through red, green and blue filters with little time in between. Since asteroids are close to Earth, compared to stars, their “relative motion” is fast meaning they move across the field of view in a short time. While a more detailed discussion of that method is beyond the scope of this response you can find a full description of the process in the SLOAN link below. Another way to find asteroids is to watch the sky for blinking stars—stars that disappear for a few seconds and then reappear. This is the tell tail sign of an asteroid “occluding” or blocking out their light for a short period of time. There is a group made up of amateurs that use this method to find asteroids and determine their shape. They are the International Occultation Timing Association.

Again, this kind of search is best done using an automated system...unless of course, you’re a relative of Pluto discoverer Clyde Tombaugh and have a genetic predisposition to manually searching for colored dots or those tiny “blinks.” To find out more on the subject, check out the following links:

**Visual Comet Hunting—A Deeper Look**

**Visual Comet Hunting**

**Sloan Digital Sky Survey Technique**

**International Occultation & Timing Association**

**Don Machholz’s Personal Experience**

## Local Astronomy Clubs

### **New Hampshire Astronomical Society**

Monthly skywatches around the state including Saturday skywatches in downtown Portsmouth on the Saturday closest to the Quarter Moon  
[www.nhastro.com](http://www.nhastro.com)

### **Amateur Telescope Makers of Boston**

[www.atmob.org](http://www.atmob.org)

### **Astronomy Society of Northern New England** (Kennebunk, Maine)

[www.asnne.org](http://www.asnne.org)

### **McAuliffe-Shepard Discovery Center**

(Concord, NH)  
 Observatory and First Friday Observing  
[www.starhop.com](http://www.starhop.com)

### **North Shore Astronomy Club**

(Groveland, Mass.)  
[www.nsaac.org](http://www.nsaac.org)

## Magazines

### **Astronomy**

[www.astronomy.com](http://www.astronomy.com)

### **Astronomy Technology Today**

[www.astronomytechanologytoday.com](http://www.astronomytechanologytoday.com)

### **Sky at Night**

[www.skyatnightmagazine.com](http://www.skyatnightmagazine.com)

### **Sky and Telescope**

[www.skyandtelescope.com](http://www.skyandtelescope.com)

## Computer Software

### **Cartes Du Ciel** (aka Skychart) (Free)

[www.ap-i.net/skychart/](http://www.ap-i.net/skychart/)

### **Celestia**

[www.shatters.net/celestia/](http://www.shatters.net/celestia/)

### **Computer Aided Astronomy** (Free)

[www.astrosurf.com/c2a/english/](http://www.astrosurf.com/c2a/english/)

### **Earth Sky Tonight**

[www.earthsky.org/tonight](http://www.earthsky.org/tonight)

### **Google Sky** (free, online use only)

[www.google.com/sky](http://www.google.com/sky)

### **SkyMap Online**

[www.skymaponline.net](http://www.skymaponline.net)

### **Starry Night**

(many versions novice to expert)  
[www.starrynight.com](http://www.starrynight.com)

### **Stellarium** (free)

[www.stellarium.org/](http://www.stellarium.org/)

### **WinStars** (free)

[www.winstars.net/english/index.html](http://www.winstars.net/english/index.html)

## Online Live Observatories

### **SLOOH**

[www.slooh.com/about.php](http://www.slooh.com/about.php)

### **AstronomyLive**

[www.astronomylive.com](http://www.astronomylive.com)

### **Worldwide Telescope**

[www.worldwidetelescope.org/Home.aspx](http://www.worldwidetelescope.org/Home.aspx)

## Astronomy Gear

### **AstroMart**

(used astronomy equipment and advice)  
[www.astromart.com](http://www.astromart.com)

### **Celestron**

[www.celestron.com](http://www.celestron.com)

### **Explore Scientific**

[www.explorerscientific.com](http://www.explorerscientific.com)

### **Lunt Solar Systems**

[www.luntsolarsystems.com](http://www.luntsolarsystems.com)

### **Meade**

[www.meade.com](http://www.meade.com)

### **Oceanside Photo & Telescope**

[www.optcorp.com](http://www.optcorp.com)

### **Orion Telescopes**

[www.telescope.com](http://www.telescope.com)

### **Televue**

[www.televue.com](http://www.televue.com)

### **Vixen Optical**

[www.vixen.com](http://www.vixen.com)

### **William Optics**

[www.williamoptics.com](http://www.williamoptics.com)

## Other Web Sites

**Cloudy Nights** (Telescope, binocular and equipment reviews, astronomy forums)  
[www.cloudynights.com](http://www.cloudynights.com)

**Heavens Above** (spot satellites and the International Space Station)  
[www.heavens-above.com](http://www.heavens-above.com)

**NASA** (everything NASA)  
[www.nasa.gov](http://www.nasa.gov)

**SpaceWeather** (Solar activity, asteroid passes, sky activity reports)  
[www.spaceweather.com](http://www.spaceweather.com)

## Citizen Research Opportunities

**Galaxy Zoo**  
[www.galaxyzoo.org](http://www.galaxyzoo.org)

**Citizen Sky**  
[www.citizensky.org](http://www.citizensky.org)

**SetiQuest** (Join the quest for ET)  
[www.setiquest.org](http://www.setiquest.org)

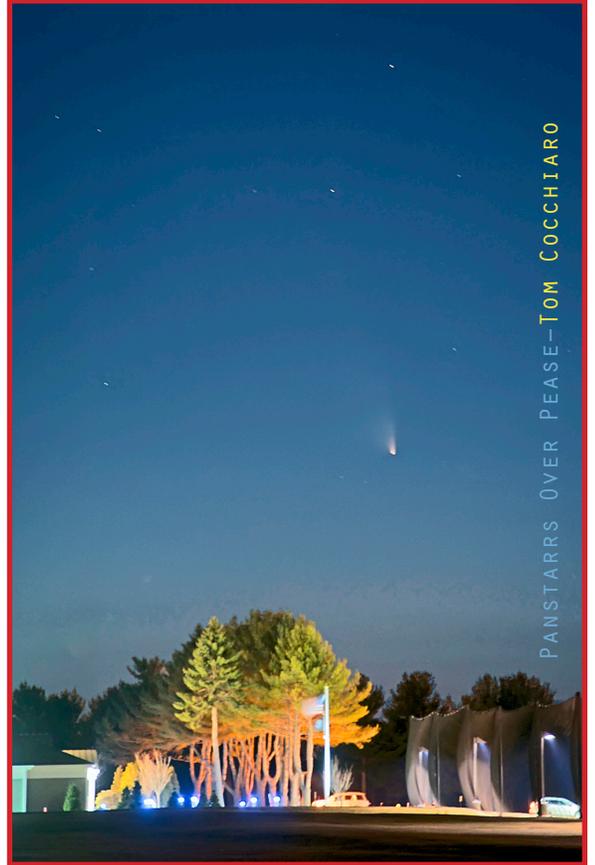
**SetiLive** (Listen in on real signals live)  
[www.setilive.org](http://www.setilive.org)

**Seti@home** (lend your computer downtime to track ET)  
[www.setiathome.berkeley.edu/sah\\_about.php](http://www.setiathome.berkeley.edu/sah_about.php)

Mobile Astronomy Apps	
<b>iPhone/iPad</b>	SolarWalk
3D Sun	Star Chart
APOD Viewer	Star Gazer
Distant Suns	Star Search
Exoplanet	StarMap
FlyBy	StarWalk
FourthDay	Voyager
Galaxy Collider	
GoSkyWatch	<b>Android</b>
Mars Globe	Astronomy Picture of the Day
MessierList	Google Sky Map
Moon Globe	Mobile Observatory
MoonPhase	Moon Phase Pro
MyCSC	NASA App
NASA News	Planet's Position
Perpetuum	Space Junk Pro
Planetarium	Star Chart
Pocket Universe	Sundroid Pro Sunrise
SkyMap	Sunset
SkyMap Pro	Vortex Planetarium
SkySafari	



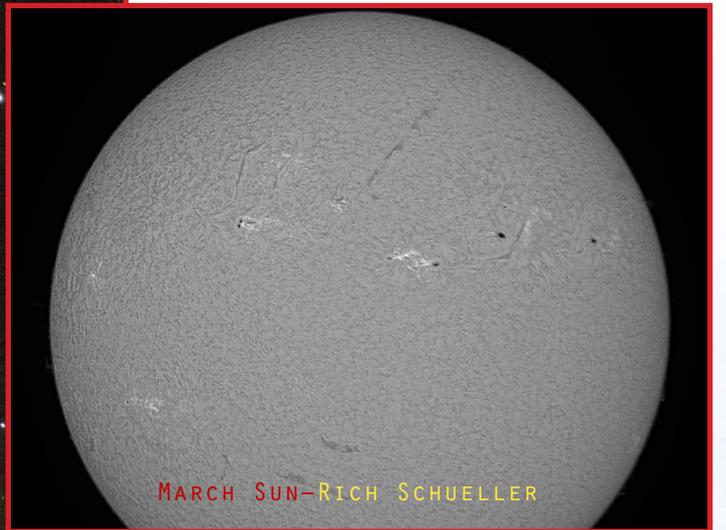
THE LUNAR "X"—HERB BUBERT



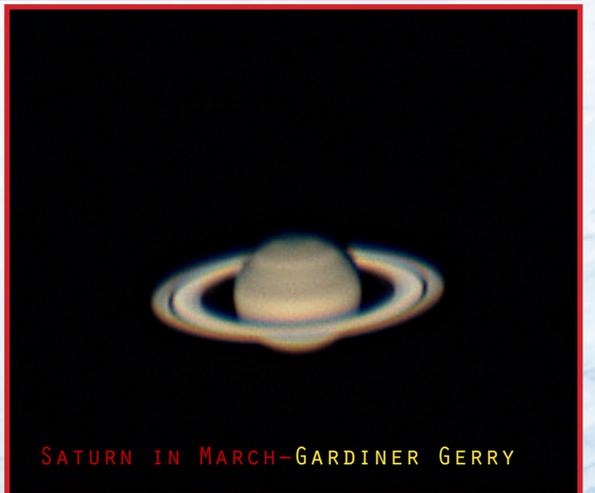
PANSTARRS OVER PEASE—TOM COCCHIARO



ORION NEBULA—DAVID WEAVER



MARCH SUN—RICH SCHUELLER



SATURN IN MARCH—GARDINER GERRY

**Wed Mar 13, 2013** - 6:45pm - 8:30pm, **Derry Public Library Skywatch**, Derry Public Library, Derry NH

**Thu Mar 14, 2013** - 6:30pm - 8:30pm, **Educational Outreach Committee**, Manchester City Library, Manchester, NH

**Fri Mar 15, 2013** - 7pm - 9pm, **Planetary Imaging Workshop**, Salem High School, Salem NH

**Mon Mar 18, 2013** - 7pm - 9pm, **East Kingston Public Library Skywatch**, 47 Maplevale Road, East Kingston NH

**Thu Mar 21, 2013** - 8pm - 9:30pm, **Skywatch for Bedford High School**, Benedictine Park, Wallace Road, Bedford NH

**Fri Mar 22, 2013** - 7:30pm - 10pm, **NHAS Business Meeting**, St. Anselm College, Manchester NH

**Sat Mar 23, 2013** - 6pm - 10pm, **Sidewalk Astronomy Skywatch**, Market Square, Portsmouth NH

**Mon Mar 25, 2013** - 7pm - 9pm, **Skywatch for Sanborn Regional Middle School**, 31 A West Main Street Newton, NH

**Tue Apr 2, 2013** - 8pm - 9pm, **Londonderry Middle School Skywatch**, Londonderry Middle School, 313 Mammoth Rd., Londonderry NH

**Thu Apr 4, 2013** - 7:30pm - 10pm, **Daniel Webster College Skywatch**, Daniel Webster College, Nashua NH

**Fri Apr 5, 2013** - 7pm - 11pm, **Skywatch for McAuliffe-Shepard Discovery Center**, McAuliffe-Shepard Discovery Center, Concord NH

**Mon Apr 8, 2013** - 7:00pm – 9:00pm, **East Kingston Public Library Skywatch (backup date)** - 47 Maplevale Road, East Kingston NH

**Tue Apr 9, 2013** - 7:30pm - 10:00pm, **Daniel Webster College Skywatch (backup date)** - Daniel Webster College, Nashua NH

**Thu Apr 11, 2013** - 6:30pm – 8:30pm, **Educational Outreach Committee** - Manchester City Library, Manchester, NH

**Thu Apr 11, 2013** - 8:00pm – 11:00pm, **Bridgewater-Hebron Village School Skywatch**, School House Rd, Bridgewater, NH



## How to Join NHAS

### Write to us:

NH Astronomical Society  
P.O. Box 5823  
Manchester, NH 03108-5823

### Send E-mail to:

[info@nhastro.com](mailto:info@nhastro.com)

### Fill out the online contact form:

[Click here](#)

[www.nhastro.com](http://www.nhastro.com)

## This Month's Contributors:

Rich DeMidio, Ted Blank, Tom Cocchiaro, Paul Winalski, Gardner Gerry, Herb Bubert, Rich Schueller, Bob Gillette, John Buonomo and Jason Paul.

## DEADLINE for April Issue:

April 28, 2013

### Email articles or photos to:

[vp.2013@nhastro.com](mailto:vp.2013@nhastro.com)