

Black Forest Field Trip

President's Message

If there is anything with more inevitability than the Earth's annual trip around the Sun, I am unaware of it. Overnight it seems, the leaves have changed, the air has reacquired that familiar autumn chill and Orion is poking his head above the horizon well before the wee hours of the morning. Of course, the meaning of all this is that it has now been almost a year since you elected me as your president and the time is once again rolling around to do your annual NHAS civic duty! I am somewhat saddened to see that three of our long time positions (one officer and two chairs) will not be seeking another term. However, all three have done outstanding service to club and for far longer than most of us remember – they probably deserve the break! First, Barbara O'Connell will be stepping down as Treasurer – a job that is far from thankless, but it is at the same time both absolutely critical and (at least to me!) not terribly exciting. Fortunately Barbara has done a marvelous job of organizing the details so our new treasurer should be able to step into her shoes with little effort. Second, Bob Sletten will be giving up the chair of the membership committee in order to devote more time to getting a Radio Astronomy group up and running within the club. Once again, Bob has organized the details of his position so well that whoever takes over the reins will have no trouble. Finally, our long-time public observing guru, Ed Ting will be returning to life as a regular club member after 8 years of service to NHAS. We'll be looking for someone just as knowledgeable, personable and energetic to fill this critical position that makes up a good

portion of the club's "face" to the general public. So, everyone put on your "volunteer" hats and join us for the nominations at the next meeting in November. Remember: "Ask not what NHAS can do for you..."

* Matthew Marulla
NHAS President 2005

Photo Committee

Well we could say we had an informal meeting of the Photo Committee at YFOS this last Saturday. Gardner, Herb, Todd, Kevin and myself were all doing some type of astro imaging despite the fog and dew. I stayed there until 5AM to image Mars but the seeing never settled down. Gardner and Kevin were doing wide field piggy back imaging and Herb was doing prime work with his ED80 and Canon EOS. I think Herb might have even tried to get some images of Mars. Hopefully there will be some images to share at the next meeting.

* Chase McNiss
The Photo Committee will hold it's next meeting on Saturday, November 12th at the Nashua Public Library. The meeting will take place in the basement level East Wing and will start at 3:00 pm. The main topic of discussion will be about focusing techniques for the astro-photographer. Any NHAS member and their guest are encouraged to come.

* Mike Kertyzak and
* Chase McNiss Co-chairs

Black Forest Field Trip

I'm just back from the "Black Forest Star Party"
<http://www.bfsp.org/starparty>. It's an every-year event scheduled for Labor Day weekend. It officially ran from noon Friday to noon Sunday (but there's

more to the story, see later). The star party takes place in Cherry Springs State Park. The site is great from a dark-sky perspective. First, it's on a plateau in a state park in a state forest in a remote and rural area. Second, the state park people know about astronomy and run the place year round as an astronomy site. They really work hard to make sure that there are no local bright lights. No white lights are allowed at night. They're building berms along the roads to block the light from the few passing cars -- even though there are already thick trees between the road and the park. What this means is mag 6+ skies. Any clouds overhead are black. There are no light domes on the horizon and it is not just dark, it's really dark.



Picture by Gerry Santaro of Aurora taken at the 2002 BFSP

The Clear Sky Clock's light pollution map shows the park located in a blue zone, on the edge of a black one (<http://cleardarksky.com/c/ChrSprPkPAkey.html>).

Noteworthy News

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The Art of Collimation

The evening program was an "Astro Lab" on collimation. John Bishop started with a slide show explaining what collimation was and how to do it; the lab ended with a hands-on session.

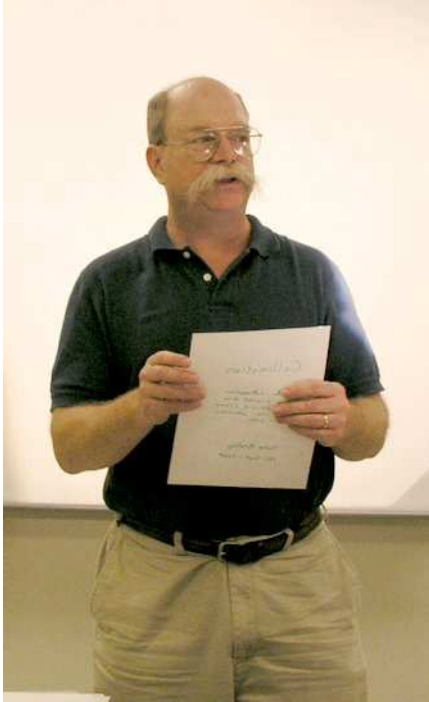


Photo by Bob Sletten

Many of us have at one time or another have struggled with collimation of our reflecting or Schmidt-Cassegrain telescopes. We tend to think of "collimation" as a mystery but in reality it's conceptually simple and easy to do if you take your time. Understanding what you're doing is the key: if you know what you are trying to accomplish, the individual actions and their sequence will make sense. Put simply, collimation is the alignment of the axes of your primary mirror and your eyepiece to achieve the least distorted image possible. This is because the best images are formed on the "optical axis" of the mirror and the eyepiece: flaws such as astigmatism and coma get worse as you look at parts of the image further from the axis. For example the formula for the size of the coma blur in a parabolic mirror is: $\text{Coma} = (\text{aperture})^2 \times (\text{distance}) / (\text{focal length})^3$ where "distance" is the linear distance from the optical axis. An interesting anecdote regarding the derivation of the word "Collimation" is that it was copied incorrectly. The

earliest document is a reference in one of Cicero's writings, where he speaks of "Collineation": lining up two axes. In the 1600's a mis-reading of that text read the "ne" as "m", giving the "Collimation" we now use. A consequence of the formulas is that misalignment is worse for big apertures and short focal lengths. A 4-inch f/10 is very forgiving of collimation errors, but a 10-inch f/4 is not. We have 2.5 axes to align: the primary axis, the eyepiece axis and the tube axis. The latter only gets a half because it only needs to be well enough aligned to prevent vignetting. The secondary is part of that half, too. The secondary mirror has no optical axis in a Newtonian because the secondary is flat. (As an etymological aside, "Vignetting" comes from "vine"; decorative vines used to be carved around openings in wooden screens. The word came to mean the little view through the opening). "Vignetting" means to cut off part of the view.



Photo by Bob Sletten

For example, if the tube were badly miss-aligned, part of the primary would be shaded and no light would get to it, making it effectively just like a smaller mirror. For another example, part of the light reflected from the primary mirror would be cut off from the eyepiece if the secondary were not properly collimated. John showed how to collimate by starting at the eyepiece end and working to the primary mirror. There were many diagrams in the slide set showing what misalignments looked like and what it would look like when it was correctly aligned. He encouraged us to make a simple collimation tool out of a 35-mm film canister, and had a bag of canisters for people to use. Paul Winalski lent his 14-inch T-scope as a demo model,

and various stages of collimation were shown on that telescope.



* John Bishop

In **Part II** of the astrolab, **Matthew Marulla** described how collimate a Schmidt/Cassegrain (SCT) utilizing the three adjustable screws on the secondary. Unlike a reflector, there is no adjusting of the primary mirror and objective lens. The process only involves the movement of only the secondary mirror. Many people fall into the trap of centering a bright object in the FOV, then tediously adjust the secondary screws moving back and forth by checking the position of the centered object; typically a bright star. There is actually a much easier procedure utilized by moving the scope off axis instead of moving the secondary. The procedure works because humans are good at judging concentricity. In other words, we are good at judging centers and telling the difference between an ellipse and a circle. In short, we leverage this strength by centering object in the field of view and then move telescope in the proper direction until the bright object becomes aligned in a concentric manner. At this point, the object is off center relative to your field of view. Now, chose the appropriate adjusting screw to re-center the object. It might take a bit of practice until you chose the right adjustment screw. This becomes a habit with some practice. To summarize, find a bright star such as Polaris. Center it in your FOV and adjust the focuser until you can see the concentricity. Move the scope around the FOV until the image becomes a circle. Use the adjusting screws to re-center the object in the middle of the FOV. This procedure is a lot easier than twiddling with the secondary adjusting screws and with practice; it will be easy

to quickly get your scope to optimal viewing.

* Article written by Rich DeMidio from description by Matthew Marulla

Astro Photos

October brings us to clear skies (well, at least some of the time) good transparency and seeing conditions. Hence, our Astrophotography frequency seems to increase dramatically. Here are some wonderful photos taken recently by some club members. With Mars on close approach again, **Herb Bubert** did not let any time go to waste with this wonderful shot.



Photo by Herb Bubert

Herb Bubert also snagged this wonderful photo of the Swan Nebula.



Photo by Herb Bubert

Deep Sky Object of the Month

Observer: Lew Gramer
 Your skills: Intermediate
 Date and UT of Observation: 1996-06-16, 04:10 UT
 Location: Bath, ME, USA (44N)
 Site classification: rural
 Limiting magnitude: 7.1
 Seeing: 2 - medium poor
 Moon up: no
 Instrument: Reflector 12.5" f/4.8
 Magnification: 55x, 85x, 110x, 170x
 Filters used: none
 Object: M10

Category: Globular cluster
 Constellation: Oph
 Data: mag 6.6 size 15.1'
 RA/DE: 16h57m -04o06m
 Description: A complex and pretty object, especially when compared & contrasted with its near globular neighbor M12. At higher power, it exhibits a poorly defined center, along with a more diffuse concentration that is visible over 40% of its surface. There is also a concentration or secondary core of stars to the NNW, visible at 55x. Using 170x, 10 stars were resolved in the granular mass of M10. Some other clumpings which may have been field stars were apparent at a greater distance from the loose core.

* Lew Gramer

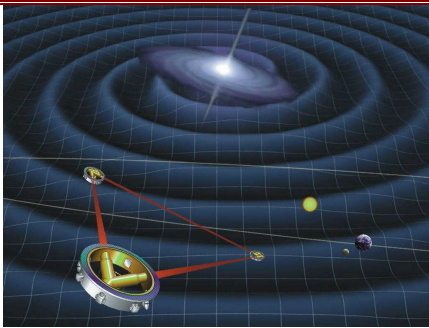
NASA Space Place

A Wrinkle in Space-Time

By Trudy E. Bell

When a massive star reaches the end of its life, it can explode into a supernova rivaling the brilliance of an entire galaxy. What's left of the star fades in weeks, but its outer layers expand through space as a turbulent cloud of gases. Astronomers see beautiful remnants from past supernovas all around the sky, one of the most famous being the Crab Nebula in Taurus. When a star throws off nine-tenths of its mass in a supernova, however, it also throws off nine-tenths of its gravitational field. Astronomers see the light from supernovas. Can they also somehow sense the sudden and dramatic change in the exploding star's *gravitational field*? Yes, they believe they can. According to Einstein's general theory of relativity, changes in the star's gravitational field should propagate outward, just like light—indeed, at the speed of light. Those propagating changes would be a gravitational wave. Einstein said what we feel as a gravitational field arises from the fact that huge masses curve space and time. The more massive an

object, the more it bends the three dimensions of space and the fourth dimension of time. And if a massive object's gravitational field changes suddenly—say, when a star explodes—it should kink or wrinkle the very geometry of space-time. Moreover, that wrinkle should propagate outward like ripples radiating outward in a pond from a thrown stone. The frequency and timing of gravitational waves should reveal what's happening deep inside a supernova, in contrast to light, which is radiated from the surface. Thus, gravitational waves allow astronomers to peer inside the universe's most violent events—like doctors peer at patients' internal organs using CAT scans. The technique is not limited to supernovas: colliding neutron stars, black holes and other exotic objects may be revealed, too. NASA and the European Space Agency are now building prototype equipment for the first space experiment to measure gravitational waves: the Laser Interferometer Space Antenna, or LISA. LISA will look for patterns of compression and stretching in space-time that signal the passage of a gravitational wave. Three small spacecraft will fly in a triangular formation behind the Earth, each beaming a laser at the other two, continuously measuring their mutual separation. Although the three 'craft will be 5 million kilometers apart, they will monitor their separation to one *billionth* of a centimeter, smaller than an atom's diameter, which is the kind of precision needed to sense these elusive waves. LISA is slated for launch around 2015. To learn more about LISA, go to <http://lisa.jpl.nasa.gov>. Kids can learn about LISA and do a gravitational wave interactive crossword at <http://spaceplace.nasa.gov/en/kids/lisaxword/lisaxword.shtml>. This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Caption: *LISA's three spacecraft will be positioned at the corners of a triangle 5 million kilometers on a side and will be able to detect gravitational wave induced changes in their separation distance of as little as one billionth of a centimeter. Editor's Note: Article copied from link provided to the editor by Nasa Space Place.*

Black Forest Field Trip (Con't)

It's darker than YFOS, which is only in the green zone. I've been "north of the notches" (in Randolph, NH) and observed there. It's also in the blue zone. There's a clear difference between green and blue. The best way I can come up with to describe the darkness is to say it's as though you took YFOS's zenith sky on a good night and stretched it over the whole sky dome, all the way to the horizon. The bottom line: you have to go a long way to get a better sky than this one. Accommodations are somewhat primitive: there's field to camp in, there are pit toilets and a fair number of "Porta-Potty"s. There were 475 people, and it was jammed. I mentioned earlier that the place is run year-round as astronomy campsite. I met several people who knew this and had arrived one or even two days before-hand. This let them pick the best spots. Those who arrived at the official opening time, like me, had to take spots at the edges and thus lose the horizon they're close to. I would up missing some South and a lot of West. If I go again, I'll try to arrive a day ahead. While the camping is primitive, there's food service: "May's Munchables" is a trailer with hamburgers and egg sandwiches and the like. It was of course lit only with dim red lights -- and the grille was in a tent so the flare of a flipped burger didn't ruin your dark- adapted eyes! The food was

good, and surprisingly cheap. They were open 24 hours. I had planned to make my own food, but May's was too good a deal to pass up. I took my OA-6.5. The OA was a minnow in a pod of whales. The typical telescope there was a 14-incher; the biggest I saw was a 32-inch. There was a 30, a couple of 25s, several 20s and so on. Besides the big Dobs there were a fair number of big APOs (5-inch Tak, several 6-inch APs, a 7-inch APO of some brand). One really neat telescope was a 6-inch f/15 old-style achromat in a brass tube. Despite looking like a survivor from the 1840s, it was actually new. The lens was a D&G doublet and the tube was actual brass (as was all the hardware!). I looked at Jupiter in it and the view was quite nice: no false color visible at all. Most people were doing their own observing, but some were showmen -- the owners of the big dobs in particular seemed to welcome visitors. I got a view of the Cat's Eye in a 30-inch. The central star is a pretty aqua. NGC 890 is a neat edge-on galaxy, at least in a 30-inch (I either couldn't find it or couldn't see it in the 6.5-inch). Friday night was the better of the two, and I now wish I'd worked harder to stay up on Friday -- but I was tired from the trip. Neither night had great seeing, but both were clear, with good transparency. Despite having a high Western horizon, I looked at Venus and Jupiter before they set. I found and resolved Uranus and I think I resolved the disc of Neptune (confirmed by a neighbor with a 6-inch AP). The OA was a bit small to make galaxies good targets despite the darkness, so I mostly looked at globulars and planetaries. Early Saturday night the seeing was very good, and I split pi Aquilae (1.4 arc-seconds, mags 6 and 7). The Double-double split into four stars at 60x. The North American Nebula was visible without a filter, as I'd expected. But the Veil was also visible without a filter -- in my 6.5! Lessons learned: 1. Take cash and eat at May's Munchables. This saves time and space and it ensures a hot meal when you need one. Bring a big insulated mug for coffee (just one dollar to fill a big mug!). 2. Arrive early and stake out a spot with elbowroom for your scope and tent. 3. Bring a canopy and a table and chairs, so you have a

place to hang out that's not in the sun. 4. Bring some friends to hang out with. 5. Bring a big dob. All the really cool people there seem to have silver covers for their big dobs, too. 6. Stay up late the first night -- you can sleep during the day. 7. If you want something being raffled off, buy more tickets -- each item has a separate can of tickets, so it's possible to "flood" one can for not much money and up your odds for the less popular items. 8. It takes 8 to 9 hours to drive there and the last 50 miles is the slowest part. Adjust your plans accordingly. 9. Make an observing list and organize it by hours, or you'll find yourself tired and punchy and looking clueless up at these great skies but not knowing what to look for. 10. It gets cold -- bring cold-weather gear. You can always wear less, but you can't wear more if you don't have it.

* John Bishop

The Bottom Line

Starting Balance: \$4,128.59
September Deposits: \$ 739.37 (shirt sales and memberships)
September A/P: \$1,909.25 (Insurance, logo merchandise)
Net Balance: \$2,958.71
Cash Balance: \$2,958.71
Membership: 47
New members: Craig Wofsy
 Contoocook, NH, Matt Amar
 Pembroke, NH, Krista N. Lidman
 Newport, NH
Donations:
 Matt Amar \$10.00
 Frank Alvarado \$5.00

* Barbara O'Connell

Looking Back at Last Month

Opening Matt Marulla welcomed one new member and provided the agenda for our meeting. He also mentioned briefly a few topics he would address in the miscellaneous portion of our meeting. **Scope of the Month.** None
Public Observing. Ed Ting reported that the official season started with 3 scheduled in October and expecting a lot more. On October 26th, there is a Reeds Ferry sky watch at the Elementary school. This is not the traditional reeds ferry sky watch, but another school is using the facility. 11/2 is the normal large Reeds Ferry sky watch, which will be held in Merrimack. Ed is really asking for a lot of people to show up for this one, as it is very big. **Joe Derek** presented a thank you note from the kids at the recent Plansfield, NH sky watch.

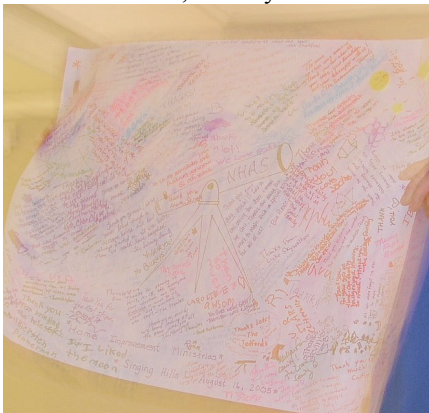


Photo by Bob Sletten

Larry said on 10/2 there is a New Boston picnic and he has been doing solar observing in the past. **Book of the Month.** Joel Harris. None

Committees. **Photo Club Chase McNiss** reported that the monthly meeting is scheduled for tomorrow at the Nashua Pub Library (east wing) 3pm.



Photo by Bob Sletten

The agenda will be an open forum centering around CCD cameras. Some examples will be shown. Members only but you can bring quests. Typical 90 minutes to 2 hrs. Tomorrow is also organizational meeting to finalize some business. The YFOS labs just never worked due to weather. **Web:** **Matthew Marulla** reported that the forums are up and running. Eight people have registered so far with a lot more expected. Please visit this when you get a chance. Currently, there is no online chat but that is being considered for a future enhancement. Members can also see who is currently logged into the webs site. An officers forum has also been provide with passwords provided to them. The new site would make it possible for the Photo committee to transition over should they desire to. . Note that all the forums are private to NHAS since they are in the password-protected member's area. **ATMs:** **Larry Lopez** reported that he and Don Ware have been working on Joe Derek's scope on a wireless capability for the drives. Don is designing the pushbutton hand controller while Larry is working on the software for it. Some members inquired about using infrared technology but the current thinking is that too much heat would need to be dissipated thereby possibly affecting

the mirror. **Membership:** Bob Sletton introduced John Bishop as the presenter for the evening program regarding Collimation. This represents the continuous series on Astro Labs run by membership. There was also a question regarding membership cards. Matt explained that their needs to be an officers meeting for other topics anyways, so this would be discussed. **Barbara O'Connell** reported that she received a donation of \$250.00 from the Plansfield skywatch. She also sent them an official letter acknowledging receipt and our thanks. One new member, Dave White. We now have 133 members with dues currently being collected for next year. Balance of \$4128.59 is artificially large because we just got the invoice for our apparel. The anticipated balance will be around \$3,000.00 next month after payment is sent. During the meeting break, she would like to sell her remaining stock of polo shirts, hooded sweatshirts, and a few of the water repellent ones. Any others remaining will be brought to future meetings or contact Barbara if you have questions. **YFOS.** **Larry Lopez** reported that no more mowing is required for this year. There has also been no formal work at the site. Much has been planned but weather and schedules have conflicted. Still hoping for some painting to be done before winter so watch boards for postings to work events. Matt reported problems with the bug trap and that he has been talking with the manufacturer about. If their ideas do not work, they will send us some replacement parts. Don Ware talked about Gemini battery dying and proposed we replace once per year for maintenance. **Other Topics.** **Matthew Marulla** reported that there has been lots of solar activity lately. We are currently ten months away from Solar Minimum. Matt provided a video of a massive that occurred on September 9th. This flare was called X17 and is the 3rd largest ever recorded. It Erupted eight times in six days. In 2005, there were four severe Magnetic Storms and 14 X Flares. In 2000, 3 severe magnetic stores and 17 X flares occurred. A question was about What is Solar Minimum? Matt explained that the Sun goes on twenty-two year cycle from maximum sunspots to minimum amount at the eleven year mark. Thus,

we have eleven years from peak to peak. Scientists believe that we are at Solar minimum now. Matt also explained that these recent bursts have caused a lot of Aurora's so he showed us several pictures some with curtain effects. Light was also going to Zenith and pulsing. Matt also reported that the owner of the Great Northern Moose Lodge where Matt stayed asked if NHAS would want to do astronomy with him. This lodge is very north of Notch and extremely dark. Matt is going to stay in touch and see about possibly doing some Astronomy there. He described the skies as Inky black with great difficulty in making out the constellations. If we do have such a sky watch, several brought up the fact that we should plan on a realistic scenario of a Moose wandering into camp. At first, there were a few chuckles but everyone realized that it was a definite possibility and what we should have a plan. Matt also showed his customized guide scope to mount on his astrophysics scope.



Photo by Bob Sletten

Joel Harris built some custom parts while others were commercially purchased. **Evening Program:** **John Bishop and Matthew Marulla** "The Art of Collimation". Please to the feature article.

* Rich DeMidio

Chaco Canyon

The November 18th meeting will feature a slide presentation and summary of research done at Chaco Canyon in New Mexico by **Rob & Nan Villeux** who spent six weeks onsite. The presentation will consist of a slide show and discussion. At the October

meeting, we watched a DvD summarizing many of the theories and artifacts discovered.

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Radio Astronomy

A Radio Astronomy committee is being established in the club. The initial response has created an interest group of about 15 members. We will be starting slowly with this committee, as most of the feedback has been to start at a very basic level. Thus we will be doing learning and investigatory type activities to start. Some time before bitter winter sets in we will organize a tour of the deep space network site in Hancock NH. Where the committee goes from there is completely up to the group. First impressions are that Radio Astronomy is very expensive but as has been shown to the club in the past there are rewarding aspects that can be done at low cost. As with all committees this one is open to all club members. Much of our communication will be via email so if interested please join in the forum. So, as they say, Stay Tuned.

* Bob Sletten

DEADLINE Nov2005 Issue: 5 PM Nov14

E-mail articles to the Editor.

CHANGE OF ADDRESS – Notify the Treasurer of changes

to postal or e-mail address.

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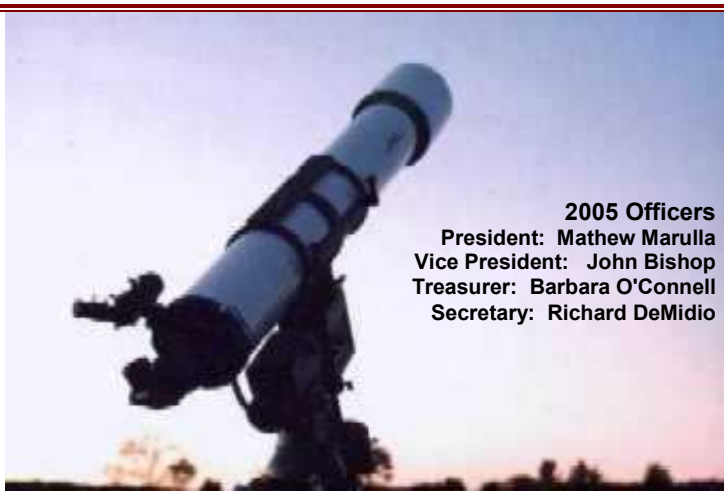
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2005 Officers

President: Mathew Marulla
Vice President: John Bishop
Treasurer: Barbara O'Connell
Secretary: Richard DeMidio

This month's contributors:

Mathew Marulla, Larry Lopez, Barbara O'Connell, Chase McNiss, Mike Kertyzak , Bob Sletten, John Bishop, Lew Gramer, Herb Bubert

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



Chaco Canyon Part II, 11/18 St. Anslems

NHAS Upcoming Events

Event	Date	Time	Location
Coffeehouse	Nov 4		YFOS
CMP Skywatch	Nov 4	7:30 pm	Planetarium Concord, NH
Nov Business Meeting	Nov 18	7:30 pm	St Anslems (Evening Program - Chaco Canyon Part II)
Coffeehouse	Dec 2		YFOS
CMP Skywatch	Dec 2	7:30 pm	Planetarium Concord, NH
Dec Business Meeting	Dec 16	7:30 pm	Planetarium Concord, NH (Elections)