

The NHAS Observer

and

Chaco Canyon



Newsletter of the New Hampshire Astronomical Society

Vol. 2005 No. 12

"All the news that fits in print"

December 2005

Camping under the Stars

President's Message

Editor's Note: Matt has been out of commission electronically due to some hardware failures. The main issue he wishes to convey is the proposal to amend the constitution. Please review the proposal in this issue of the newsletter and be prepared to discuss and vote at the January meeting. Once Matt is back online, he will send out updates and offer his perspective. Rich DeMidio

* Matthew Marulla
NHAS President 2005

Highlights for this Month

At the November meeting, we were treated to quite a presentation regarding Chaco Canyon. In this month's article, the author Rob Veilleux provides the full report and several pictures. Read the full story on [Page 2](#). Our regular Astro photons section showcases the latest contributions. Read the full story on [Page 3](#) Our monthly contributor **Lew Gramer** is diverging this month to share his experiences with the Geminid meteor shower on [Page 4](#). The minutes from our October meeting can be read on [Page 5](#). Finally, there is a proposal to amend our constitution to include electronic voting. A copy has been included within this newsletter for members to vote on [Page 7](#)

* Rich DeMidio
NHAS Secretary 2005

Camping under the Stars

Editor's Note: A delightful story of helping in a great cause while enjoying some Astronomy. "I got up at 5:30am last Saturday, to join the Winter Star Party 'Camp Wesumkee' post-hurricane cleanup. Six of us SCASers caravanned down to West Summerland Key (Tim

Kahn, Nick Stingone, Jim Rose, Pat Saunders, Mike Smith and I), and started WORK by about 8am: hauling debris, chain sawing downed trees, replacing screens (all 14 chikki huts had trashed screens, plus the two-story



Photo provided by Jim Rose (SCAS)

Wheelhouse screens were mostly torn), etc. "The Florida Keys Astronomy Club was also much in evidence, as President George Tegzes and four other members joined us during the weekend, working hard on screens and cleanup with us. Meanwhile, the caretaker Malcolm and his lovely wife continued their arduous task of managing debris and sand. "Work finally quit after 5pm.



Photo provided by Jim Rose (SCAS)

Then we had dinner, and from 9pm to 5am I observed with the 20" telescope ("Frankendob") - taking 2 hours in between for naps. Tim joined me most of the night with his 8" refractor, while Pat, Jim and Mike all kept partial-night vigils on their own scopes. George

from FKAC also joined us in the evening, and he, Tim and I traded 'cool objects of the deep sky' for a nice little while with each other. "I actually slept from 5:30 to 7:30am, and then we all worked AGAIN around the site from 9am to 1pm Sunday. Then we had lunch in Marathon at a fine, cheap seafood joint, and drove back: imagine how tired I was Sunday night. :) "But my lord it was worth it - not only did the SCASers spend the weekend outdoors (we slept in the chikki huts, with their trashed roofs and screens). But also I got to use the 20" for more hours at once than I have in probably 3 or 4 years! (The marathon observing sessions I had done in New England and Texas in recent years were all with the big 36" "Godzilla"... The 20" scope, 'Frankendob' had been rotting in the garage up there, sadly neglected.) "The best part of course, was getting to know some wonderful people better: the SCAS and FKAC crew are all truly a warm, welcoming bunch - and their passion for the night sky makes me feel right at home observing with them.



Photo provided by Jim Rose (SCAS)

"And the stuff I saw that Saturday night... Crystal clear, cold-front sky all night long, gentle breeze off the beach (10' away through the trees) so no dew or mosquitoes - but a few sand fleas!
Continued on [Page 4](#)

Chaco Canyon by Rob and Nan Veilleux

Chaco Canyon

My wife and I spent six weeks as Park Volunteers this past summer at Chaco Canyon National Historical Park in the northwestern part of New Mexico.



Photo by Rob Veilleux

My interest in this area goes back to more than twenty years ago while teaching Astronomy classes at Central High School I was showing to my classes the Cosmos videotape with Carl Sagan in which he was describing the “Supernova” pictograph found there.



Photo by Rob Veilleux

I also was intrigued by the 1980 article in “Science 80” describing the “Anasazi Sun Dagger” of Fajada Butte in Chaco Canyon. These two points along with my retirement after 35 years of teaching, and a letter in the October 2004 Astronomy magazine asking for park volunteers at Chaco got me e-mailing to learn more about Chaco, and eventually being selected to join as a volunteer astronomer and Campground Host at Chaco Canyon.. From AD 850 to 1200, Chaco Canyon was the center of a political, ceremonial, and trade network that encompassed a vast area of the southwest. Chacoans contributions to architecture, art, astronomy, and agriculture are part of the cultural legacy of Southwestern Pueblo Indians and are preserved for all to see at Chaco Culture National

Historical Park. The Night Sky Initiative at Chaco Culture National Historical Park has been in existence since 1991 when it began offering astronomy in its public interpretive programs. Programs which emphasized the practices of the Chacoan people a thousand years ago, as well as modern approaches to viewing the same night sky they viewed—in a remote environment with some of the clearest and driest skies in all of the United States.



Astrophotography work from a real dark sky using equipment at the site.

Photo provided by Bob Veilleux
The park established an ongoing partnership with the Albuquerque Astronomical Society (TAAS) in 1991. Star parties are offered twice yearly at Chaco Canyon. In January 1997, TAAS member John Sefick brought his astronomy equipment to Chaco. He was so impressed with the skies at Chaco that he donated a domed observatory and equipment to the park. The park began constructing a permanent observatory at the visitor center in 1997. In May of 1998, the park dedicated the Chaco Observatory. The observatory has added a new dimension to Chaco’s interpretation of astronomy, and now serves many different people.

- Over 15,000 visitors and school groups annually attend public astronomy programs
- Over 30,000 visitors per year who visit the park web site view the spectacular images that were photographed at the Chaco Observatory. To see these images you can visit: www.nps.gov/chcu. Go to [In Depth](#) section, the [Night Sky Darkness Project](#), and the [Image Gallery](#)
- Amateur astronomers who use the state-of-the-art CCD imaging system to conduct

research and help monitor levels of light pollution in the region.

- Volunteers who help the park present programs on Chacoan connections, our understanding of the universe, and hands-on use of a telescope.
- Hundreds of enthusiastic visitors, astronomers, and members of the TAAS who participate in bi-annual star parties, usually held in the dark times of May and September

The Chacoan people were intimately aware of all their surroundings. They were close observers of the skies and seasonal cycles, and their observations provided them with the invaluable ability to time their agriculture and ceremonial events, which were central to their survival, in such a harsh environment. Today, Puebloan descendants carry on many of these same traditions. Countless visitors are drawn to the park to learn about the monumental Chacoan sites, to view the pecked and painted images on canyon walls, to observe countless scattered pieces of pottery, and to ponder the greatness of the Chacoan world. It is natural for us to wish for a connection with the people who flourished in this stark and challenging place. The night sky, so clear and brilliant at Chaco Canyon, is a very special connection that we all share, as we look to the skies to better understand our place on Earth. Chaco is situated at over 6000 feet in the northwestern corner of New Mexico, it is a few hours drive to Albuquerque, Santa Fe, and the Four Corners area where New Mexico, Arizona, Colorado, and Utah meet. In June we had hot dry days with temperatures in the mid to high 80’s. By the first two weeks of July the temperatures reached into the 90’s. Our nights were cold with temperatures in the 30’s and 40’s. Every one of the nights in June we were glad that we had our electric blanket, especially after spending three or more hours out doing evening astronomy programs. As campground hosts we had water, electricity, and sewer at our site, not so at the other 49 primitive campground sites. Winter temperatures at Chaco are

often below zero, with a historical low of eighteen degrees below zero. Chaco is a harsh area for vegetation with no native trees, and no streams or ponds. Few years can Chaco be called green” There are a few cottonwood trees found in the canyon, the remains of the CCC efforts of the 1930’s to assist in soil erosion control because when the late summer rains do come they fill huge dry washes with torrents of water that are constantly eroding the soft sandstone banks.



Harsh Weather – photo by Rob Veilleux
The park is now a World Heritage Site. It is now believed that it has a vital link in the histories of the Hopi of Arizona, the Pueblo peoples of New Mexico, and the Navajo of Colorado. For three thousand years there is record of Chaco being the home of numerous native southwestern people. People who worked especially hard from approximately 900 to 1200 AD to build the monumental stone structures of Chaco. There are nine “Great Houses” found in Chaco Canyon, all of which contain from 100 to 750 rooms. These structures were built for Ceremonial purposes and trade throughout the area.. Some smaller dwelling units were also built in the canyon. To connect to outlying villages a huge network of roads were also constructed. Some of these roadways went straight up over the tops of the high mesa cliffs by using carved stone steps into the cliff faces. All transportation throughout the area was done on foot, there were no horses or other pack animals in the southwest until the arrival of the Spanish centuries after the decline of the Anasazi’ s. For reasons not yet fully understood all of this came to an end around the year 1300 AD when it is believed that the the Chacoans stopped coming to the area.

Ancient Astronomers

Atop Fajada Butte Chacoan skywatchers commemorated the movement of the sun and the seasons. Sunlight passes between three huge boulder slabs vertically positioned so that a spiral “dagger” of sunlight moves down through a carved spiral petroglyph found on the stone cliff face behind. This “Sun Dagger” marks the suns position on the Equinoxes and the solstices.



Solstice – photo by Rob Veilleux

The Chacoans had sophisticated knowledge of the sun and moon as shown by this and numerous other sites throughout Chaco. Sun watching continues to play an integral role in the Pueblo world. Pueblo people use such markers to plan their agriculture, to set the ceremonial calendar, to integrate the physical and spiritual worlds, and to seek balance and harmony for all people. Our modern interest in this site was only “discovered” in 1978 when Anna Sofar climbed the 400 foot butte to photograph the area for an art shoot and she happened to be there at the right time to see this dagger of sunlight. Our modern interest in this site has forever impacted it. In 1989 researchers noticed that the light pattern on the spiral had shifted due to the slight slipping of the stone slabs. This was resulted by the human-caused erosion to the base of the rock slabs. For approximately 1,000 years the Sun Dagger accurately marked the passage of the sun by a dagger of sunlight moving over a period of many minutes precisely through the center of the spiral petroglyph, at noon on the Summer Solstice, the longest day, (June 21st). On the Winter Solstice, the shortest day of the year the spiral petroglyphs is empty of sunlight and is bracketed by two “daggers” of sunlight outside its nine and one-half spirals. On the vernal or Autumnal Equinoxes the “dagger” of sunlight passes off center of the spiral petroglyph and

exactly through the center of another smaller spiral petroglyphs to the upper left of the main spiral. This spiral petroglyph is also believed to precisely show the extreme northern most and southern most points of the 19 year cycle of the moon(Metonic Cycle) ZIA, The symbol of the sun seen throughout the southwest, is found in almost every phase of New Mexico graphics. Although the appropriate color of Zia is red, it may appear in any color of the rainbow. The four rays at the top of the symbol represent the four winds: North, East, South, and West. The four rays at the bottom represent the four seasons: Spring, Summer, Fall and Winter. The four rays to the left represent the stages of life: Infancy, Youth, Adulthood, and Old Age. The four rays to the right are the time of day: Morning, Noon, Sundown, and Night.

* Article written by Rob Veilleux
edited by Rich DeMidio

Astro Photons

Mars and Pleiades from YFOS 10/2/05 around 3 am, Nikon F2 with 85mm lens @ f/4, 5 minutes on E200, piggybacked on the GM-8 and 102. Mars over exposed, but this is what I envisioned the shot looking like when I exposed it.



Photo taken by Gardner Gerry

Mars on 11-25-05. 30 Sec web cam AVI through 4x powermate and 2x barlow on an 8" f4.7 newt. seeing 3/5

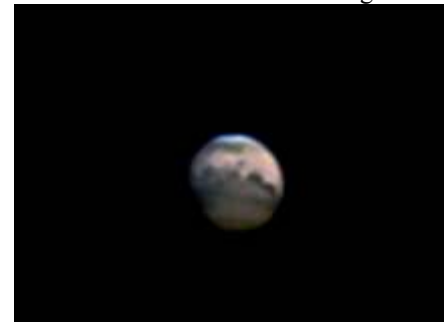


Photo by Nils Wygant

Deep Sky Object of the Month

Editor's Note: This month's report is on the Geminid's Meteor Shower.

We enjoyed yet another fine night of meteors at Pa-hay-okee Lookout in the Everglades two nights ago, Dec 13/14, from 03:15 UT to 06:50 UT. The temperatures were just slightly warmer than the night before (dropping from around 60 to 57oF), and the wind was a bit steadier (variable out of the N and W at 5-10 kts). Mosquitoes were just a very occasional nuisance. A mix of cirrus and cirrocumulus came and went in our Northern sky all night long, but never interfered with our observing to the South. Mike Smith recorded with me for the first time, and picked up the basics of the IMO technique with little effort - recording his own meteor magnitudes, showers, and Limiting Magnitude star counts for about 2 hours! Mike, enter your data into an email and send it to me this week, and I can help you put together a summary report of what you saw. The highlight of the night for me was at 06:18:50 UT, a very spiffy -4 fireball, blue-green in color with a 0.5 sec train. It was medium speed, about 7 deg long, and seen just 15o from the Geminid radiant: so although it lined up perfectly with the radiant, I had to call it a "G?" on my log sheet. But whatever it was, it was lovely and memorable. :) In total, I enjoyed THREE fireballs (-3 or -4) and FIFTEEN negative-magnitude meteors (i.e., brighter than Rigel or Betelgeuse) during the night, and Mike also caught many of these, I believe. The Geminids lived up to their bright "Old Faithful" reputation for me yet again this year... Below is a summary report for me that night: be sure to view the tables with a fixed-width font, so that the columns line up properly. Complete report for both nights will go to IMO and NAMN separately. Clear skies, all. Here's looking forward to the Ursids on 21-23 Dec!

NAMN Meteor Summary: 2005 Dec 13/14

Observer: GRALE (Lew Gramer)
Location: Pa-hay-okee Lookout,
Everglades National Park, FL USA

Coordinates: 25o22.5'N, 80o45.0'W,
1m elev

TENTATIVE SUMMARY (Subject to final revision):

UT Period	FOV	Teff	F	LM
GEM XOR MON PUP HYD SPO				
03:15-04:19	060+10	1.00	1.0	5.7 29
3 1 0 1 5				
04:20-05:28	080+10	1.00	1.0	6.0 43
0 1 1 1 10				
05:29-06:36	110+10	1.01	1.0	6.2 36
1 1 0 5 13				
06:37-06:50	130+20	0.20	1.0	6.3 6
0 0 0 0 1				

Total/Average: 3.21 1.0 6.1 114 4
3 1 7 29

Total Meteors: 158

Dead time / meteor: 2 sec
Total Break Time: 12 min

Magnitude Distribution:
[To follow]

Train Data:
[To follow]
REMARKS:

I recorded no constellations or DCVs (Distance from Center of Vision) tonight, in order to reduce the dead time per meteor.

Mike Smith also recorded with me using the IMO method tonight.

==

Once again, the natural beauty of the Everglades in moonlight and wind was an enchanting backdrop for the light show in the sky. Meteor highlight of the night for me was a -4 probable Geminid with a 0.5 sec. persistent train, 7o long seen in Gemini starting just 15o from the radiant at 06:18:50 UT. Other highlights, four meteors negative magnitude within TWO MINUTES, 03:44 and 03:45 UT; and two other Geminid fireballs mag -3 seen at 04:39:05 and 04:48:35 UT.

* Lew Gramer

Camping under the Stars (Continued)

Bright Winter Milky Way stretching from inky black, flat Southern ocean horizon even into the (sadly growing)

ugly light dome from Big Pine Key... And objects that I could never have seen up in Boston, or even in some cases out in the West Texas desert: things down on the very edge of the Southern sky, too far south for most Americans (outside Hawaii) to ever glimpse. "The highlight of the night for me was a trio of beautiful deep-sky objects down in the constellation Columba, just SW of Canis Major - NGC 1851 is a monster globular cluster, large, bright and extremely dense. And the pair of galaxies NGC 1792 and NGC 1808 are so pretty, and so distinct in morphology, that I presumptuously dubbed them 'the M81 and M82 of the South'. :) "Other objects shared with the group in the evening were IC 418, the Fornax Dwarf galaxy and some of its globular clusters, the Rosette nebula, NGC 891 and the fine cluster of galaxies next to it called Abell 347, and others! "I spent the last two quiet hours before dawn exploring some little-seen, faint 'fuzzy stuff' in and around Canis Major on my own - Cederblad 90, NGC 2626, NGC 2467 (I call this the 'Skull and Crossbones' nebula), NGC 2440, NGC 2452, Sharpless 2-301, Sh 2-294, and many anonymous (to me) open clusters. "All in all, the weekend was gorgeous - and very productive, too!"



*Lew Gramer

The Bottom Line

Starting Balance \$3,249.43

November Deposits: \$285.83
(memberships and interest)

November A/P: \$321.55 (award, binders)

Net Balance: \$3,213.71

Cash Balance \$3,213.71

Membership: 86

New members: Ray Ihly (Nashua) – Celestron, Fred Sladen (New London) – Dynamax, Carol Nelson (Lempster) - Meade 60mm, Mark Kibler (Dunbarton), Drew Zeiba (Derry), Richard LaPlante (Merrimack)

Donations: none known

* Barbara O'Connell

Looking Back at Last Month

Opening **Matthew Marulla** reported that we will nominate Ed for an office and threaten to vote him in so that he shows at the December meeting ☺ Matt has reviewed and entered the recurring events in the web site calendar for 2006. The good news is that the new moon and CMP sky watch will not conflict on the same Friday. However, one issue is that some business meetings conflict with the coffee house. After some discussion, it was decided to move the coffee house to mid moon when it conflicts with club meetings. Members typically plan on Fridays so the consensus was to leave it on Fridays for consistency and tradition.



Photo by Chase McNiss

Scope of the Month None.

Public Observing. Ed Ting was unable to make the meeting. **Paul Winalski** reported that the Reeds Ferry was packed with nineteen scopes and ton of people. Clarification upon inquiry of what constitutes a5 “ton” resulted in over 100 people in attendance ☺ The Concord sky watch was also very well attended, but no estimate of how many people participated. The concord folks

were interested more in the equipment than the objects in the sky.

Book of the Month, None
Committees. **Photo Club** **Chase McNiss** reported that the last meeting was on Saturday, 11/12 at Nashua Library. The topic discussed was focusing. **Ken German** talked about how to make a better Hartmann Mask. **Joe Dechene** had built his own focuser and demonstrated it. **Chase McNiss** demoed new KC33 software for capturing and downloading avi files with results to appear on the web site Astrophotography area. Due to the holidays, the next meeting will not be scheduled until January. Look for updates on the website and email distribution lists. Finally, the group started discussions on migrating photos from the nhas yahoo group to the NHAS website.



Photo by Bob Sletten

Web: **Matthew Marulla** reported that twenty-six people have registered on the web site. Matt asked the question on whether we should close the nhas yahoo forums. Much discussion followed focused primarily on the Astrophotography area. Various transition plans were discussed but no specific decision made. The consensus was to migrate to a single point of maintenance but the tactical details need to be worked out as action items.

Some of those details involve digests. Expect more on this in emails and at the next meeting. Finally, it was discussed about setting up an area on the web server for Larry to migrate data to make it easier. **ATMs:** **Larry Lopez** Larry Lopez reported that he, **Joe Derek**, and **Don Ware** are working on the remote control electronics with Joe's scope. Larry has the initial build of the software running, but several bugs need to be worked out along with additional testing..



Photo by Chase McNiss

YFOS. **Larry Lopez** Larry Lopez reported that the main and backup heaters are operational. However, there has been some issues with the thermal coupling on the main heater and probably needs to be replaced. There was also a discussion regarding type of coupling on the backup heater and whether it would fit various propane tanks. The consensus was that older types of couplers will not work so it will have to be checked. Chase McNiss talked about a dew shield for the C14 and suggested that we get something to help the corrector plate. There is a flexible shield at Rivers for around \$90.00. Don Ware mentioned about putting some type of dew zapper to put around it. Dave W. mentioned about donating a Kendrick controller if we could get the band for it. It takes an RCA plug – 12V DC. **Membership:** **Bob Sletten** (acting) reported that he is resigning as membership coordinator to lead the newly formed Radio telescope group. The membership position is appointed office from volunteers. Bob described the tasks that he did while in the position. The most important one is to setup course and lab sessions for the membership. Bob had also desired to get a new membership welcome packet produced but was unable to complete the task. This might be a good idea for the new person who is appointed. **Radio Astronomy:** **Bob Sletten**

reported that the forum on the web page has been created and getting operational. The group is just starting to establish some traction with their vision and planned activities. One short-term goal might be to get a tour of a radio site in our area. Bob also expects more people to participate as more press for the group gets disseminated.



Photo by Chase McNiss

Other Topics. **Matthew Marulla** reported that the surprise for the meeting was a tribute to Ed Ting for his eight years of dedicated service to NHAS. The November NSL has the tribute articles written by several members. We will recognize Ed at a future meeting. Matt also reported that the Spitzer telescope (<http://www.spitzer.caltech.edu/spitzer/index.shtml>) has detected what is believed to be the first light from the earliest stars when formed in the universe.

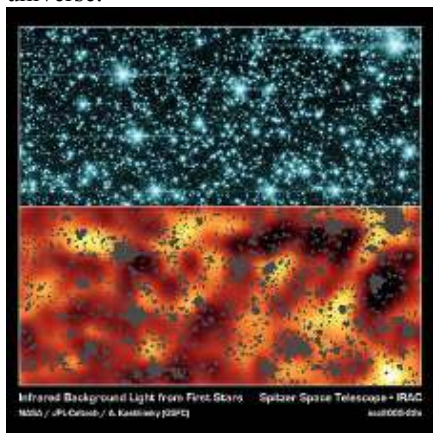


Photo taken from

<http://www.spitzer.caltech.edu/Media/releases/ssc2005-22/ssc2005-22a.shtml>

The above picture was taken in Draco from a region where scientists masked out all the known visible stars and infrared spectrums. There was some infrared that did not map to anything known so the thought is that it what they are seeing is light red shifted 13 billion light years in the infrared

spectrum. This would mean faint echoes of some of the very first stars. Matt also showed some images that came off the adaptive optics scope. One of them was a wide field image of NGC 1097 spiral galaxy zoomed in very closely. Scientists were able to see the actual center of the galaxy. A process was then applied that masked out light resulting in seeing material spiraling into the black hole.

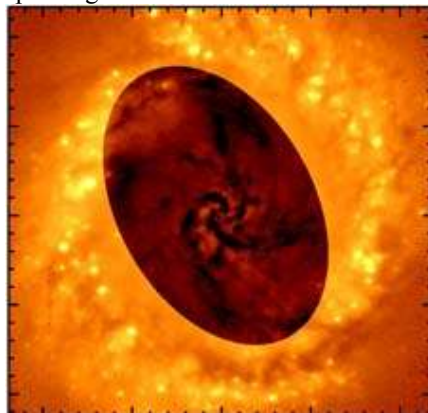


Photo taken from

http://www.pparc.ac.uk/Nw/eso_monster.asp

It reinforces a theory that many spiral galaxies after black holes at their center. **Matt** also led a discussion regarding membership cards. The membership has already decided that we do not need to go through overhead of printing cards each year. Instead, the card will be posted to the website so that folks can download if they wish. The issue with instituting this policy is that constitution needs to be updated while at the same time, updated to reflect the electronic age. Thus, the proposal is to amend the constitution to allow voting rules to be electronic in nature. Then, the membership can vote on changing the constitution to eliminate the printing of membership cards. Matt wants to do a write-up for the membership on this topic. Larry Lopez mentioned that we have some cassettes by Steven Hawkins about cosmology. **Bob Veilleux** reported about the new programs at planetarium. They are installing the latest technology for new projectors resulting in ten time better images and

sharper colors. Infinity Express is the name and will consist of two digital projectors. Bob works part time at the planetarium.

Evening Program: Presentation on Chaco Canyon by **Bob Veilleux**.

* Rich DeMidio

In the next Issue

The next issue will start off the New Year with a report on the elections from the December 2005 meeting. A technical article relating to refraction, field reports, plus a few surprises.

* Rich DeMidio

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Proposal to amend the NHAS Constitution

Article IX – Proxy Votes

Currently reads:

“A shareholder may register their vote, on an item the Society must vote upon as defined by the constitution or by-laws as requiring a minimum membership attendance or minimum membership vote, by Proxy. Proxy forms will include the text of the items being voted on, space for the shareholder to indicate their choice on each item being voted on, the name of the shareholder, the signature of the shareholder and date signed. Proxy forms will be published in the Society newsletter at least one month prior to the date the vote is to take place. The completed Proxy must be delivered to the Secretary or designate prior to the indicated vote. The proxy will be voted as indicated by the club Secretary or their designate. The Proxy shall only be effective for the duration of the meeting in which the vote is scheduled. The shareholder may revoke the Proxy at any time prior to the vote.”

Proposed New Version:

“A shareholder may register their vote, on an item the Society must vote upon as defined by the constitution or by-laws as requiring a minimum membership attendance or minimum membership vote, by Proxy. Votes may be conducted via paper proxy forms or electronic means.

Paper proxy forms will include the text of the items being voted on, space for the shareholder to indicate their choice on each item being voted on, the name of the shareholder, the signature of the shareholder and date signed. Proxy forms will be published in the Society newsletter at least one month prior to the date the vote is to take place. The completed Proxy must be delivered to the Secretary or designate prior to the indicated vote. The proxy will be voted as indicated by the club Secretary or their designate. The Proxy shall only be effective for the duration of the meeting in which the vote is scheduled. The shareholder may revoke the Proxy at any time prior to the vote.

Electronic votes may be conducted via email, web based forums, or other electronic means as available. However conducted, essentially the same information will be made available to members; i.e., the text of the items being voted on, space for the shareholder to indicate their choice on each item being voted on, etc. The email address or username of the member will substitute for the member’s signature. Electronic votes shall be valid until the required quorum is reached and the issue decided. Paper proxy forms shall be made available to those members unable to access electronic votes.”

_____ I wish to vote FOR this proposal

_____ I wish to vote AGAINST this proposal

Member Name (Print)

Signature of Member

Date

DEADLINE Jan2006 Issue: 5 PM Jan13

E-mail articles to the Editor.

CHANGE OF ADDRESS – Notify the Treasurer of changes

to postal or e-mail address.

How to Join N.H.A.S.

Write to us:

NHAS

P.O. Box 5823

Manchester, NH 03108-5823

Attn: Treasurer

<http://www.nhastro.com/>

Send E-mail to:

info@nhastro.com

Use our web site:

This month's contributors:

Mathew Marulla, Larry Lopez, Barbara O'Connell, Chase McNiss, Bob Sletten, Lew Gramer, Nils Wygant, Don Ware, John Bishop, Jim Rose (SCAS), and Gardner Gerry



2005 Officers
President: Mathew Marulla
Vice President: John Bishop
Treasurer: Barbara O'Connell
Secretary: Richard DeMidio

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



NHAS Upcoming Events

Event	Date	Time	Location
CMP Skywatch	Jan 6	7:30 pm	Planetarium Concord, NH
Jan Business Meeting	Jan 20	7:30 pm	St Anslems
Coffee House	Jan 27	Dusk	YFOS
CMP Skywatch	Feb 3	7:00 pm	Planetarium Concord, NH
Feb Business Meeting	Feb 17	7:30 pm	Planetarium Concord, NH
March Messier Marathon	Mar ??	??	It is not too early to think about it!