



## Supermassive Black Holes

### President's Message

I would like to thank the membership for your support in 2009 and your trust in me as your president of this great organization. Having gained your trust for a second term in 2010, I will continue to apply what worked in 2009 in a passionate and proficient manner.

We accomplished a great deal as a club in 2009 and our hard work is going to be leveraged in 2010. We spent a lot of time getting the pieces in place in terms of people and technology that builds the foundation for growth. This sets the stage for us to now embark on tactical efforts to in the spirit of our mission to be public facing. Several projects are in the planning state in the area of communications and infrastructure. For example, EOC will be implementing a procedure for online submission for sky watches and other public inquires.

The officers recently attended the quarterly meeting in which the primary focus was planning for 2010. The key areas that we addressed were 1) Infrastructure 2) Expanding our Outreach 3) Streamlining communications and 4) Membership contribution. I will go into these in more detail at the January business meeting, but I wanted to give everyone an idea what was discussed. With respect to membership contribution, I feel that is an area where we need to improve in 2010, which directly falls onto me for the vision and articulating the value. My approach this year is to work more closely with our committees and derive opportunities rather than

asking open-ended questions to the membership. There will be plenty of opportunities for people to contribute that have direct value to the club and public. You will observe many opportunities being defined by committees but some of you might also be individually targeted so be ready in case you are asked ☺ Being targeted is a reflection of your contribution and abilities but being a volunteer organization, saying no is perfectly fine.

One specific area that I want to make everyone aware of is Astronomy Day for this year. The McAuliffe-Shepard Discovery Center is planning even a bigger event this year meaning NHAS will play a key role. EOC will be leading this event and they will define their specific needs at which time we will have a lot of opportunity for the membership to contribute.

2010 should prove to be an exciting year for NHAS and I look forward to making it wonderful for our organization. Thank you again for the opportunity to serve in this fine organization.

Warmest Regards,

★ Rich DeMidio  
NHAS President 2010

### Highlights for This Month

As Rich said, there is a lot of activity going on to expand our educational outreach programs. As you can see from their meeting report, our Educational Outreach Committee has lots of irons in the fire. We hope you can contribute!

The Library Telescope Program's success continues to exceed all expectations.

Another excellent sidewalk astronomy event occurred this month.

December's business meeting saw also the awarding of most of the 2009 Recognition Awards.

Finally—and saving the best for last—we were treated to a wonderful presentation on research of supermassive black holes by no less than Dr. James Moran, Chairman of Harvard's Astronomy Department.

★ Paul Winalski  
NHAS Secretary 2010

### 2009 Member Awards

At the December business meeting, **Rich DeMidio** presented the 2009 member recognition awards. These were awarded by our President, based on nominations by one or more club members. Some award recipients were not present at the December meeting; we hope to present their awards in January.

#### Stealth Goat Award

To **Steve Forbes** for secretly keeping a careful eye on YFOS, reporting on its status. The observing field has been neatly trimmed, as though by an invisible herd of goats—until the perpetrator was finally caught in the act.

#### Behind the Scenes Award

To **Tom Cocchiaro** for researching ways to promote NHAS, for making himself a trusted advisor to EOC, and for promoting awareness of

events that NHAS should participate in.

### Public Sky Watch Extraordinaire Award

To **Mike Townsend** for his persistent presence at sky watches, always jumping in to provide advice and always having the answers. He is fantastic with children at public events.

### Stellar Spirit Award

To **Chase McNiss** for his excellent organizational and management skills, his ability to motivate the membership to contribute, and for taking on the tough tasks to coordinate.

### Excellence in Teaching Award

To **Ted Blank** for his creative projects in the area of education. He stepped up in a crisis situation for NHAS at short notice, when we needed to deliver an educational presentation, and he always promotes new ideas for the membership to consider.



**Award recipients, left to right: Tom Cocciaro, Chase McNiss, Steve Forbes, Mike Townsend, Ted Blank (Ken Charles photo)**

My own personal congratulations to all the very deserving award recipients for a job well done! You set an example for all of us.

★ Paul Winalski

## Directors' Report

The NHAS board met on Saturday 16th, 2010. Our two goals were to find the CD with the assets list and to review all the papers in the plastic tub of board papers.

We have found and copied the CD; it will be passed on to start our on-line inventory. We have found a number of papers which belong in other hands (such as the Treasurer's

or the EOCs'). These will be passed on.

There are two thick folders of historical information about the club, including newspaper articles and photographs of younger versions of various club members. If there is anyone who wants to volunteer to turn this archival data into a club history, send email to any board member!

We found a number of nice big astronomical photographs and maps of the Moon. They are for sale at one dollar apiece.

We also found a mystery object which will be exhibited in our next club meeting. We had no idea what it was—perhaps someone will!

★ John Bishop

Chairman, 2010 Board of Directors

## Educational Outreach Committee Meeting

Attending: **Matt Amar, Tom Cocciaro, Gardner Gerry; Peter Kelly, Scott McCartney, Chase McNiss, Rich Schueller, Marc Stowbridge**, e-mailing regrets: **Dave White**.

Topics Discussed:

### Website

Tom C reports that things are moving forward, communication within the team is working well and a projected launch day will be mid-April, approximately two-weeks before Astronomy Day. Note to the General Membership: there is a thread established in the forums serving as a "Suggestion Box". It is located at Forums/Educational Outreach/Suggestion Box direct link is

<http://www.nhastro.com/member/forum/viewtopic.php?t=973>

input/comments are always welcomed.

### NHAS on CCTV

Dave White has been in contact with Concord Public Access TV and is currently gathering info and training. The initial thought is to film various NHAS events and guest speakers for airing. EOC will be investigating needed releases to allow.

## Events for 2010

We're looking at participating in approximately six events other than the normal sky watch requests.

### Astronomy Day (Spring)

aka Aerospace Fest at the McAullife-Shepard Discovery Center. This is a two day event on May 1<sup>st</sup> and 2<sup>nd</sup>; we may add a Friday night public sky watch. **Ted Blank** and Tom Cocchiaro will be organizing.

### Portsmouth Market Day

June 12<sup>th</sup>.

### Sidewalk Astronomy Day

Date TBD; would like to coordinate with Sidewalk Astronomers—San Francisco's date as they are the originator of the event. They have not posted a date yet; typically it is in the Spring. Matt Amar to coordinate.

### Summer/Fall Astronomy Day

TBD. This will be an NHAS driven event.

### Holiday Stroll/Nashua

Day after Thanksgiving. **Ken Charles's** and **Joe Derek's** impromptu appearance was such a success that we'd like to adopt this one as an annual event.

### First Night Wolfboro and/or Portsmouth

NHAS participation TBD but a good possibility.

### Suggestions from the membership for other events welcomed.

Please note that events not listing a coordinator could use a member volunteering to be one, hint, hint.

### Library Telescope Program

NHAS currently has twelve telescopes with homes and mentors. We have a target of adding six through 2010. Finding a home is easy; finding an adoptive NHAS "parent" is not always. If you think that the town you live in or near would like a telescope in its library and you have a little time to be its caretaker, please contact Marc Stowbridge.

### EOC Budget

Now that EOC is being funded directly a budget needs to be established. Matt Amar and Rich Schueller to create a first draft by next meeting.

### Astro-Imaging/EOC/MSDC

McAuliffe-Shepard Discovery Center has offered to be the venue for Astro-Imaging classes; Gardner Gerry (chair of Imaging committee) likes the idea; details to follow.

### The Astronomical League

The Executive Committee has requested the EOC to investigate NHAS joining as a Member Society. General consensus is favorable; Matt Amar to provide a report for next EOC meeting.

### Night Sky Network Reporting.

NHAS is a member of this but does not actively report. Reporting not only increases NHAS exposure but will also provide recognition of our efforts assisting in efforts for grants, etc.

Tom Cocchiario is willing to forward reporting but needs info about events to be sent to him.

### EOC meetings will be switching to Friday Nights

during the Spring. Next meeting will be Friday, February 26<sup>th</sup>.

Closing thought—it looks like the EOC has more than one morsel on its plate for 2010. Any NHAS member that would like to help PLEASE raise your hand, come to a meeting, e-mail Matt Amar and/or Rich Schueller. Thanks and Clear skies.

★ Matt Amar

### Library Telescope Program

The Library Telescope Program continues to grow, particularly with the help of **Brian Cossette**, who monitors Craig's List and other sites for used telescopes. He has found two, and has delivered one to me that was new in the box, never even unwrapped! This ½ price scope will be going to Ossipee, where **Bob Gillette** has kindly agreed to be the foster parent. All that we are

waiting for is the printing and binding of the instruction manual.

Gilford has received their scope. Both scopes will feature the Celestron 8-24 Zoom eyepiece. A second scope from Brian should be picked up this weekend and brought to NH for retrofitting.



### Very happy librarians at Guilford Public Library (Marc Stowbridge photo)

Plymouth's scope is on order and due in next week, thanks to the efforts of **Barrie Sawyer**.

Goffstown has their scope and are getting it cataloged. They expect to have it in circulation very soon.

They have a good sized waiting list, and **Bill Steele** as the foster parent.

Thank you all for your support!

★ Marc Stowbridge

### Our NASA/JPL Solar System Ambassador

The NASA/JPL Solar System Ambassadors Program is a public outreach program accomplished by volunteers across the nation who communicate NASA and JPL's exciting discoveries and plans for future exploration to people in their local communities. Last September I applied to be a volunteer for 2010, and to my surprise last week I received a letter of acceptance. This should be very interesting!

I'm really pleased that I'll have access to the NASA public outreach materials and training to help contribute to the club's educational efforts. We got off to a great start last year with the Cassini Mission overview and I want to continue that sort of outreach. I believe I am also on the list to call in case aliens land anywhere in New England.

Some background: The SSA program overhead is paid directly

from exploration mission funds, so I sure hope it isn't too big! It grew out of the smaller Galileo Ambassador program which began in 1997 with sixteen Ambassadors. By 1999, other missions were interested in participating and the program was converted to the present Solar System Ambassadors program. The first complete year as the Solar System Ambassadors program was in 2000 with 145 Ambassadors in forty-five states. SSA now has more than 500 volunteers nationwide in all fifty states, the District of Columbia, and Puerto Rico. New Hampshire and Maine have two other SSAs, Sally Jensen from Plymouth (who a few of us met at the TechFest and who is a Messenger Mission outreach specialist) and Joan Chamberlin who is educational coordinator for ASNNE in Kennebunk. Our own member **Tom Morin** was an SSA last year but due to other commitments could not continue this year.

The missions that currently support the SSA program are: Cassini, EPOXI, Voyager, Mars missions, Kepler, WISE, LRO/LCROSS, MESSENGER, New Horizons, Dawn, Spitzer Warm Mission, Stardust NExT, Earth missions and the Deep Space Network. Additional support comes from JPL's Informal Education Office and NASA's Solar System SEPOF (I think this is where they keep the frozen aliens). Additionally, SSAs support International Polar Year, International Year of Astronomy, NASA Astrobiology Institute investigations and Educator Astronaut Shuttle missions. Will I get to go to the South Pole? No. Will I get to volunteer at JPL's Open House in Pasadena next May? Maybe.

The SSA website is <http://www.jpl.nasa.gov/ambassador>. Ambassadors are asked to present at least four talks or demonstrations during the year to schools or libraries about some aspect of solar system exploration. If you are aware of groups who are looking for this sort of presentation, please send them to the site or have them

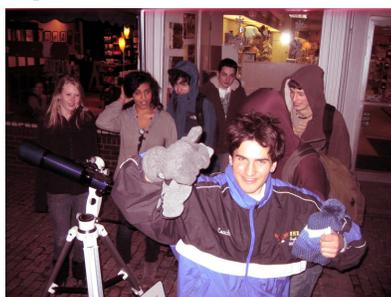
contact me directly. I look forward to taking these opportunities to spread the word about NHAS and the Discovery Center. As I learn more about the program I will share that information with the club, and I also want to acknowledge the club members for being so generous with their time and knowledge to each other. NHAS has been a great source of inspiration and learning for me, so many thanks to all of you.

See you at the next star party!

★ Ted Blank

### Sidewalk Astronomy: Portsmouth, 10 and 11 January

It's been clear and cold in the Northeast lately, so with some warm boots, long underwear and assorted hand and head coverings I set up on the Portsmouth sidewalk in front of Starbucks for a couple of hours each evening for the past few nights. Amazingly, it seemed like more people were interested in viewing through the scope than is typically the case in summer—almost 100% of people said sure and enjoyed the views. We looked at Jupiter on nights when I was out early, and Mars and the Pleiades for later events after Jupiter had set. I also took a peek at M42 when nobody was around, but due to the light-polluted sky it was less than impressive.



#### Sidewalk observers in Portsmouth (Ted Blank photo)

One of the Portsmouth parking meter readers (yes, the ones who give tickets) thanked me for giving back to the community. He has seen me many times in various spots around town. Jupiter's four moons were clearly visible, as was the jet stream blowing past the

planet. Cloud bands were vaguely visible at moments when seeing steadied, but these moments were few and far between.

One other thing—it's exactly 400 years ago this week that Galileo recorded sketches of Jupiter's moons in his notebook, later publicized in his "Starry Messenger".

★ Ted Blank

### Solar Activity?

Our Sun's sunspot activity generally follows a twenty-two-year cycle. Each cycle has two eleven-year periods, one each for north and south magnetic polarity, where sunspot, solar flare, and coronal activity rises to a peak, and then falls to a minimum.

The most recent period of activity peaked in 2002, and there was the expected fall to a minimum in 2007. What was not expected was for the solar minimum to continue for nearly three years of an almost featureless sun, as far as sunspots go. This is unprecedented in recent history, although there are known extensive periods of solar quietude in the past (*e.g.*, the Maunder Minimum, which occurred at the start of what climatologists call the Little Ice Age).

Are we in a new Maunder minimum? Perhaps not, as within the past month there have been two very fine large sunspot groups visible, after almost a year of the Sun being featureless in visible light. Maybe the new sunspot cycle, after an unusual delay, is finally getting started.

NASA's Solar and Heliographic Observatory (SOHO) website at <http://sohowww.nascom.nasa.gov/> is a wonderful resource for following day-to-day activity of our nearest star. Even at solar minimum, the Sun is always doing something interesting. Just in the past week we saw the passage of Venus in close apparent proximity to the Sun as it reached superior conjunction, a coronal mass ejection from a solar active region, and a comet plunge to its death.

★ Paul Winalski

### NHAS December 2009 Business Meeting

The meeting took place on 18 December at the McAuliffe-Shepard Discovery Center.

President **Rich DeMidio** presented a report looking back on our 2009 accomplishments, including:

- Expanded partnership with the McAuliffe-Shepard Discovery Center, including what was perhaps our biggest effort yet for Astronomy Day.
- The explosion of the Library Outreach Program, which has been more wildly successful than we ever imagined.
- Expanded public outreach
- Establishment of a foundation for future growth

Rich concluded by announcing that our 2010 plans will be discussed at the January business meeting.

#### Directors' Report

**John Bishop** reported that computerization of the club's asset list is in progress. Once that is done, we will be rationalizing assets and selling some of them off.

We need a tripod for the club's Lunt solar scope.

#### Public Observing

No report, as **Marc Stowbridge** was off playing Santa in North Conway on the Polar Express.

#### Educational Outreach

**Rich Schueller** reported that we are acquiring website software (DreamWeaver) for the website developers. We are making grant applications to the NH Charitable Organization and Raytheon.

Library Telescope Program: Pease Library in Plymouth is looking for a scope. We need volunteers to watch over the scopes that we place. We are delivering Goffstown's scope.

Sidewalk Astronomy: We are trying to find locations where we can set up.

#### Membership

**Bill Steele** reports that eleven attended the Astro 101 "Navigating the Night Sky" workshop, with

observing afterwards. He is looking for feedback on the presentations already given, and also is looking for additional venues where we can give presentations.

**Amateur Telescope Making**

**Larry Lopez** reports that there hasn't been a meeting in years. If you need help on an ATM project, we can direct or help you.

**YFOS**

**Larry Lopez** reports that plowing is good. The small heater is working. Fuel is there for the big heater, but we need to have a pro come by to light the pilot.

**Astrophotography**

**Gardner Gerry** that there is nothing new, but be sure to check out the pictures forum on the website. He is planning some Astro-101 type stuff. Send him email with any suggestions regarding topics and subject matter for the talks.

**Miscellaneous Business**

Note that since the first Friday of January is New Year's Day, when the Discovery Center is closed, the MSDC sky watch will be held on 8 January, not 1 January.

**Elections**

2010 elections for officers and junior Director were held. See the report in the December 2009 NHAS Observer.

**2009 Awards Presentations**

See the feature article elsewhere in this issue for the details on the awards presented at this meeting.

**Evening Presentation**

Dr. James M. Moran, the Donald H. Menzel Professor of Astrophysics and Chairman of the Department of Astronomy at Harvard University gave us an excellent presentation of his research into the supermassive black holes Sagittarius\* (at the center of our own Galaxy) and in the core of galaxy NGC 4258 (also known as Messier 106).

These objects are difficult, if not impossible, to observe in visual light (Milky Way dust lanes completely obscure our view of

SAG\*), but they are prominent objects at radio wavelengths.



**Dr. Moran explains radio interferometry (Ken Charles photo)**

Dr. Moran presented an excellent summary of the formulae from the orbital mechanics of Kepler and the gravitational equations of Newton that allow us to deduce from the orbital velocities the masses of objects in mutual revolution about a common gravitational center. With precision radio images we can see the motion of large stars around a massive "something" at the center of our Galaxy. The observations set bounds for the diameter of this object called by radio astronomers Sagittarius\*, and the observed revolutionary velocity of the stars around it set a lower limit on its mass. Based on these factors, it is nearly certain that a black hole of millions of solar masses occupies our Galaxy's center.

NGC 4258 is a galaxy that exhibits maser (microwave equivalent of laser) activity in its nucleus in the microwave emission line of H<sub>2</sub>O, indicative of an accretion disk around a central area of some 40 million solar masses.

These astoundingly precise observations are made by very long baseline interferometry, using arrays of radio telescopes continents apart.

Dr. Moran has never actually seen NGC 4258 visually through a telescope. Alas, M106 is very low in the north this time of year, and due to technical glitches we were not able to find it for him in the Discovery Center's 14" Celestron Schmidt-Cassegrain telescope. We hope that Dr. Moran will visit us sometime in the future to enjoy M106 with us visually.

For me this was one of the best and most fascinating talks we've had at NHAS on current astronomical topics. I'm most grateful to Dr. Moran to take the time to come and present to us breaking research on supermassive black holes.

We owe Dr. Moran a good view of M106.

★ Paul Winalski

**The Bottom Line**

<b>Starting Balance:</b>	<b>\$7455.87</b>
<b>Deposits/Credits:</b>	
Membership:	559.00
Donations (EOC)	20.00
Bank interest	3.37
Calendars (sold 36)	49.00
Total :	631.37
<b>Accounts/Paid:</b>	
Total:	<b>0.00</b>
<b>Net Account Balance:</b>	<b>\$8087.24</b>
<b>Petty cash drawer:</b>	\$100.00
<b>Cash Balance:</b>	<b>\$8187.24</b>

**Membership:** 95

**New Members:**

**Chester Orban**, Fremont, NH  
**Rick Walters**, Meredith, NH  
**Gary Doody**, Goffstown, NH

★ Ken Charles  
 NHAS Treasurer 2010



**2010 Officers**  
**President: Rich DeMidio**  
**Vice President: Mike Townsend**  
**Treasurer: Ken Charles**  
**Secretary: Paul Winalski**

**DEADLINE February 2010 Issue: 5 PM February 13**

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

**Send E-mail to:**

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

**Use our web site:**

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

**This month's contributors:**

Rich DeMidio, John Bishop, Matt Amar, Marc Stowbridge, Ted Blank, Ken Charles

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



## NHAS Upcoming Events

Event	Date	Time	Location
NHAS Business Meeting	January 22	7:30 PM	St. Anselm College, Manchester NH
Solar Sky Watch	January 28	8 AM	Alton School, Alton NH
Discovery Center Public Sky Watch	February 5	7:00 PM	McAuliffe-Shepard Discovery Center, Concord NH
“Freeze Your Buns” Coffee House Night	February 12	5:00 PM	YFOS
Evening Sky Watch	February 12	6:30 PM	Alton School, Alton NH
NHAS Business Meeting	February 19	7:30 PM	McAuliffe-Shepard Discovery Center, Concord NH
Educational Outreach Committee Meeting	February 26	6:30 PM	Ralph Pill Building, Concord NH
Cub Scout Pack 75 Sky Watch	March 4	7:00 PM	2010 Bow Community Building, Bow NH
Discovery Center Public Sky Watch	March 5	7:00 PM	McAuliffe-Shepard Discovery Center, Concord NH
Coffee House Night	March 12	5:00 PM	YFOS
NHAS Business Meeting	March 19	7:30 PM	St. Anselm College, Manchester NH