

The NHAS Observer

and
Skywatch Weekly



Newsletter of the New Hampshire Astronomical Society

Volume 2004 No. 10

"All the news that fits in print"

October 2004

October Is Skywatch Month

President's Message

FALL IS HERE

Well, I am glad it is finally fall,
I wonder what changes?

WHAT HAS LEFT

Mosquitoes are gone
Hot sticky weather gone
Moisture obscured atmosphere

WHAT COMES

Cool weather
Clear blue skies
It gets dark, earlier in the evening

ASTRO EVOLUTIONS

Still see some of summer milky way
And the fall galaxies come in to view

COOL SURPRISES

Lots of kids wanting to see space

IN CONCLUSION

So bring your scopes to sky watches
And go to dark sky locations
And eat all the star stuff you can.

Clear skies,

* Joel Harris
NHAS President 2004



Ring World courtesy NASA

Public Observing Highlights

The fall school observing season is going to start in October. Some of our events include the following dates. These skywatches are at locations that we have visited in the past, so many of you should remember them. More details will be available at the Friday Oct. 8 business meeting.

Oct. 18 Candia Library
Oct. 21 Loudon Elementary School
Oct. 28 Rundlett School (Concord)
Nov. 1 Mountain View School (Goffstown)

Nov. 9 Bow Elementary School

As always, if you print out the NHAS web calendar, check back periodically to check to see if any additions or changes have been made.

* Ed Ting

Public Observing Coordinator

YFOS Log Book

On Saturday Sept. 25, 2004, we had a work session at YFOS. I always run these things with very little management since once you have the materials, a reasonable idea of what you want to do, and good people, you are done. No grass was mowed by the way, thank goodness.

So many people showed up and so many things happened that it is difficult to know exactly who did what, but here is a stab at it.

Who attended:

Joe Derek Bonnie Derek
Don Ware Chase McNiss
John McLean Steve Forbes
Stephen Forbes II Quinton Forbes
Joel Harris Rich DeMidio

Jean DeMidio Mike Stebbins

Bob Sletten Larry Lopez

Carl dos Santos

Max, the wonder dog.

Joe's Box Truck (used to bring in wood)



Larry's Toyota (Used to pull rocks)

John's Ford F350 Diesel

Mike's Motorcycle

Larry managed to scrape his arm up a bit and Jean's help with the first aid kit put him back into action.

Jean replaced the external outlets at the warming room and observatory, replacing three with heavy duty ones and upgrading one to 20 amps. Larry brought the outlets.

Larry purchased a Stanley fiberglass door and delivered it to the site (\$149). Don Ware and Larry removed the old frame. Don and Todd and Larry put the new frame in. Steve Forbes transferred the old locks over and made a trip back to New Boston to get the needed parts. The old door came back with Larry in his truck.

(See YFOS, page 2)

Noteworthy News
Fishing for Stars.....Page 2

YFOS (from p. 1)

John replaced some of the shingles on the warming room.

Joe Derek brought the lumber from a deck that was torn down. His box truck was loaded with tools, nails, and many other needed things. Nail removal was done by many people (Miller, Richard, Jean, and others). Much of it was used and the remainder went home with Joe and Carl.

Bob built the pad for the propane tanks.



Steve, Steve II, Quinton, Larry, and Joel removed rocks and pads. Many people helped roll the big boulder down the hill. Joel placed one pad as another observation area, and Steve and Quinton might have dug that hole.

John made the stringers for the warming room stairs, Bob made the steps and the deck, and I think Joe made the ramp.



Joe designed the ramp for the observatory, Larry and Chase air hammered and barred the concrete until the Toyota moved it out of the way. Steve and Chase nailed the boards to the ramp.



YFOS Photos by Chase McNiss

It was somewhat hotter than expected which took its toll on some people.

Yours truly slept rather well Saturday night.

* Larry Lopez

Fishing for Stars

I have an Orion correct image right angle finder scope. When I wanted to locate something precisely, I would put the object just to the side of the crosshairs, because, when the star was under the crosshairs, I couldn't see it. I replaced the crosshairs (don't ask me why I had to) with clear, thin fishing line. These act like a linear lens, and when I position a bright object at dead center, it shows through!

To rework the crosshairs, do the following, but do not attempt this unless you are confident you can do it. Before starting, locate some tippet line, which is the very thin fishing line one uses to tie a fly to a casting line.

1. The crosshairs are typically located in the rear lens tube. That is the part of the finder to disassemble. Carefully unscrew it and locate the crosshair ring.
2. Measure the distance to the ring for later use. This distance is important.
3. Locate the notches on the ring and carefully use a narrow blade screwdriver or similar tool to unscrew the ring from the tube.
4. Put the ring on a table top and tape two lengths of fishing line to the table so they cross the ring, pulling them tight. This lets you arrange the two lines in the ring's grooves (if any) and keeps tension on the lines.
5. Apply four touches of super glue. Let harden, and trim the excess. This gives a perfect crosshair.
6. Thread the ring into the tube assembly to the distance you measured

in step 2. Avoid touching the fishing lines!

7. Reassemble the finder and test it.

The fishing line works particularly well with stars; when one is centered, it almost flares in the eyepiece. Share and enjoy!

* Marc Stowbridge

Far Out Objects of the Month

This month features three spiral galaxies: M74 in Pisces, M77 in Cetus, and NGC676 in Pisces in between the other two objects.

Object: M74

Filters used: None

Category: Spiral galaxy [SA(s)c I]

Constellation: Pisces

Data: mag 9.4 size 11'x10'

RA/DE: 15h37m +15o47m

Description:

A quick shot to eta Psc, which is the star pointed to by and SW of alpha and beta Ari, then swing from eta NE 1.5o and you will find this bright, beautiful spiral galaxy in a near-empty field! This morning, with what appeared to be zodiacal light brightening at the horizon, M74 showed no less than *three* well-defined spiral arms, with two especially stark right near its core. It showed a very bright core, but with no hint of a stellar nucleus. There were several intriguing bifurcations in the spiral arms, but as I lacked time to apply higher powers, and considering M74's low altitude, a description of these will have to wait until some future observation, hopefully this Fall!

Object: M77

Filters used: None

Category: Spiral galaxy [(R)SA(rs)bP]

Constellation: Cetus

Data: mag 8.9 size 7'x6'

RA/DE: 02h43m -00o01m

Description:

From M74, my predawn Fall Galaxy tour moved on to M77! A fast swing down to delta Cet, then 1o ESE to this BRIGHT, but less detailed blur. Like M74 however, M77 still shows a striking degree of "spirality", with two well-defined arms hugged in tight to the core, but a relatively smooth surface

(See Far Out, p. 3)

Far Out (cont'd.)

brightness otherwise. (That is, no mottling.)

A bright core was apparent, with the spiral arms nicely defined as they wound all the way in nearly to the tiny, barely non-stellar nucleus at center. Again, I hope to see more of M77 as leaves turn yellow this year!

Object: NGC676

Filters used: None

Category: Spiral galaxy [S0a:sp]

Constellation: Pisces

Data: mag 11? size 4'x1'

RA/DE: 01h49m +05o54m

Description:

Last stop on the Autumn Express tonight, was a bright galaxy which I've never seen before, stuck about midway between M74 and M77: the weird little spiral NGC676. A readily found bright blur, near the center of the base edge of the isosceles triangle formed by the stars omicron, nu, and xi Psc. Too low and immersed in lightening haze to show much detail, other than a considerable brightening at its very tight, circular core, and a hint of elongation N-S in its halo.

* Lew Gramer

Looking Back at Last Month

Welcome. Don Ware opened the meeting and welcomed new member, Carl dos Santos.



Photos by Bob Sletten

ATM Comm. Larry Lopez said there had been no meetings recently.

Photo Comm. Chase McNiss noted a small turnout in August due to poor weather. The next meeting was to be on Sept. 11.

Web Comm. Barbara O'Connell reported that some work has been done on the new web design.

Membership Comm. Bob Sletten said there has been interest in another Astronomy course (Astro 301).

Public Observing. Ed Ting reviewed the Aug. 24 skywatch (25-30 visitors). The calendar was starting to fill up. Oct. 18 in Candia, Oct. 21 in Loudon, Oct. 28 in So. Concord, and Nov. 1 in Goffstown. Ed was to be a speaker at Astro Assembly in RI. He also gave away some old newspaper clippings about astronomy topics, which Steve Forbes accepted.

YFOS. A big work session was planned for Sept. 25. Some people talked about getting a mosquito magnet device for summer use.

Treasury. Barbara O'Connell reported that finances had not changed much. She plans to prepare a year-end report. She got approval to purchase Astronomy calendars from which the club would reap half the sale price.

Club scope. still at YFOS.

Objects in the sky. Saturn was rising at 1:40 a.m. and Mercury was at greatest western elongation.

Stellafane winner. John McLean talked about his self-propelled Goto scope that won two awards at Stellafane in August. The Cassegrain system consists of a 16-inch mirror mounted in a Sonotube form. The mount was made of birds eye maple. It uses three satellite dish actuators to form a tripod for leveling and polar alignment.

John polished and tested the primary mirror first. Then he made the secondary mirror and polished it with a pitch formed by a flower-petal-shaped mask.

He tested the system assembled and spent many hours fine polishing and examining a light source with a Ronchi grating.

He admitted that he built the scope as a challenge and only later decided to enter it at Stellafane.



Book of the Month. John Bishop read some intriguing passages from *Star Names, Their Lore, and Meaning* published in 1899.

Vapor Cloud. There was a discussion about a cloud that appeared recently at sunset. It turned out to be fuel dumped from a government satellite launch.

Stepper motors. Jeff Renk talked about customized drivers for stepper motors. The circuit he designed does microstepping or half-stepping of DC motors. It featured TTL logic, current control, full bridge DC motor driver, limit switch inputs, and solenoid driver.

Evening Talk. There was an open talk about recollections of Stellafane. Later, Chase McNiss initiated some talk about YFOS. He said we needed to revive the practice of having members report on observing sessions, which reports could go into the newsgroup. There was also more talk about getting a mosquito zapper.

* Michael Frascinella

NASA Space Place**Hunting Gravitational Waves: Space Technology 7**

by Patrick L. Barry & Dr. Tony Phillips

Among the mind-blowing implications of Einstein's general theory of relativity, direct verification is still missing for at least one item: gravitational waves. When massive objects like black holes move, they ought to create distortions in space-time, and these distortions should spread and propagate as waves in the fabric of space-time itself.

If these waves do exist, they would offer astronomers a penetrating view of events such as the birth of the Universe and the spiraling collisions of giant black holes. The trick is building a gravitational wave detector, and that's not easy.

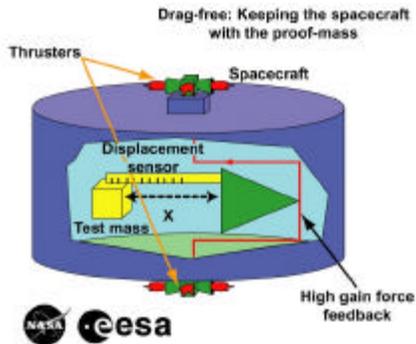
Ironically, the gravitational waves spawned by these exceedingly violent events are vanishingly feeble.

Gravitational waves exert a varying tug on objects, but this tug is so weak that detecting it requires a device of extraordinary sensitivity and a way to shield that device from all other disturbances.

(See Space Place, p. 4)

Space Place (Cont'd from p. 3)

Enter Space Technology 7 (ST-7). This mission, a partnership between NASA's New Millennium Program and the European Space Agency (ESA), will place a satellite into a special orbit around the Sun where the pull of the Earth's and Sun's gravities balance. But even the minute outside forces that remain – such as pressure from sunlight – could interfere with a search for gravitational waves.



To make the satellite virtually disturbance-free, ST-7 will test an experimental technology that counteracts outside forces. This system, called the Disturbance Reduction System (DRS), is so exquisitely sensitive that it can maintain the satellite's path within about a nanometer (millionth of a millimeter) of an undisturbed elliptical orbit.

DRS works by letting two small (4 cm) cubes float freely in the belly of the satellite. The satellite itself shields the cubes from outside forces, so the cubes will naturally follow an undisturbed orbit. The satellite can then adjust its own flight path to match that of the cubes using high-precision ion thrusters. Making the masses cube-shaped lets DRS sense deviations in all 6 directions (3 linear, 3 angular).

ST-7 is scheduled to fly in 2008, but it's a test mission; it won't search for gravitational waves. That final goal will be achieved by the NASA/ESA LISA mission (Laser Interferometer Space Antenna), which is expected to launch in 2011. LISA will use the DRS technology tested by ST-7 to create the ultra-stable satellite platforms it needs to successfully detect gravitational waves.

If ST-7 and LISA succeed, they'll confirm Einstein (again) and delight

astronomers with a new tool for exploring the universe.

Read more about ST-7 at <http://nmp.jpl.nasa.gov/st7>. For kids in a classroom setting, check out the "Dampen that Drift!" article at http://spaceplace.nasa.gov/en/educators/teachers_page2.shtml.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

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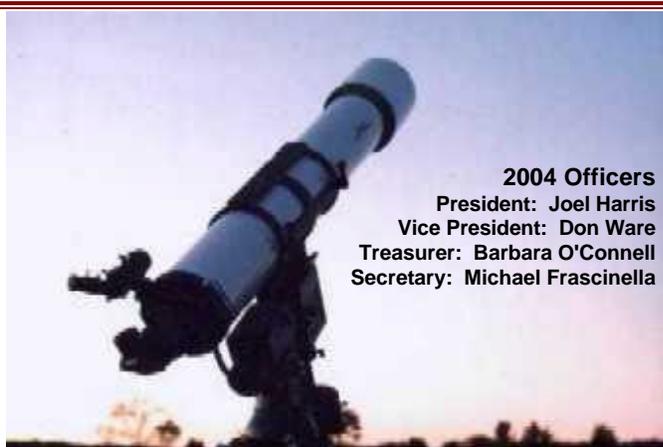
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This month's contributors:

Joel Harris, Ed Ting, Larry Lopez, Bob Sletten,
Barbara O'Connell, Lew Gramer, Marc Stowbridge



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Sky Show, Oct. 8, CMP

NHAS Upcoming Events

Event	Date	Time	Location
Oct. Business meeting	Oct. 8	7:30 p.m.	Planetarium, Concord, NH
Coffee House	Oct. 15	6:00 p.m.	YFOS
Photography Comm.	Oct. 16	6:30 p.m.	YFOS Observatory
Candia Skywatch	Oct. 18	7:30 p.m.	Smyth Public Library, Candia, NH
Loudon Skywatch	Oct. 21	7:00 p.m.	Loudon Elementary School, Loudon, NH
Rundlett Skywatch	Oct. 28	7:00 p.m.	Rundlett Middle School, Concord, NH
Mountain View Skywatch	Nov. 1	7:00 p.m.	Mountain View Middle School, Goffstown, NH
CMP Skywatch	Nov. 5	7:00 p.m.	Planetarium, Concord, NH
Bow Skywatch	Nov. 9	7:00 p.m.	Bow Elementary School, Bow, NH
Coffee House	Nov. 12	5:00 p.m.	YFOS
Nov. Business meeting	Nov. 19	7:30 p.m.	St. Anselm's College, Goffstown, NH