

# Event Horizon

September 1998

Volume 5 Issue 10

## A Trip to See the Light Fantastic!

by Stephen Barnes

The day started with an e-mail notice from Carey Oler.

### SYNOPSIS...

**A** major coronal mass ejection is thought to be in-transit to the Earth following yesterdays major class X1.1/3B proton flare. The arrival of this disturbance is expected anytime between 06:00 UTC on 26 August and 24:00 UTC on 26 August, with a preference between 12:00 and 18:00 UTC on 26 August. Auroral activity is expected to rapidly reach major to severe storm levels immediately to a few hours after the arrival of the shock front associated with the coronal mass ejection. If conditions are as favorable as we expect them to become, visible auroral activity (at times very intense) could become visible as far south as northern California, Colorado, Kansas and North Carolina (see above). This is expected to be the strongest auroral storm so far this solar cycle. Whether it will reach that expectation remains to be seen, but the potential certainly exists.

Observers in North America should therefore watch closely for activity during the extreme pre-dawn hours of

26 August and during the evening of 26/27 August. The main phase of this disturbance could approach 24 hours in duration, providing most of the Earth's middle latitude regions with a good opportunity to observe activity.

The moon will also be out of the sky near and after local midnight, which will provide optimum dark-sky conditions for observing this event. As a result, auroral activity may be observed much farther south than would otherwise be possible.

This watch will remain in effect until 19:00 UTC on 28 August. It will then be updated or allowed to expire.

**\*\* End of Watch \*\***

You can sign up for e-mail notices at the following page:

<http://solar.uleth.ca/solar>

It had been a long time since I had seen a good auroral display and never from a dark site so I decided to take a chance on this prediction and organized a last minute road trip to the family's cottage near Dorset, Ontario. I had never photographed an aurora before so I rushed out and bought some extra film (Fuji SuperG 800) and got my cameras

and tripods ready. A quick call to a friend of mine who also loves astronomy and astrophotography and we were set to make the 3 hour drive after work. Well, sort of. I remembered that it might be a good idea to check with my wife and let her know what I was planning. Well wouldn't you know, she was actually interested in going too. We planned to leave right after work and come back in the morning (as soon as our 2 year old daughter Julia woke us up). My friend's wife also decided to go as she didn't have to be at work till noon the next day so the aurora expedition was set. We arrived about 9:30pm in deep twilight. Stepping from the car I could immediately see moving green bands of light overhead. I rushed to set up my two cameras and tripods and began shooting pictures. I thought that the dock would be a great place to take some pictures from as it looked north over the lake.

I was so busy running between 2 cameras every 20-40 seconds snapping pictures that I was sweating buckets. I laid down to take a break and take in the incredible beauty of the show. There were arcs of light stretching across the sky and moving from north to south. Subtle pinks were visible

*(Continued on page 5)*

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## Chair's Report

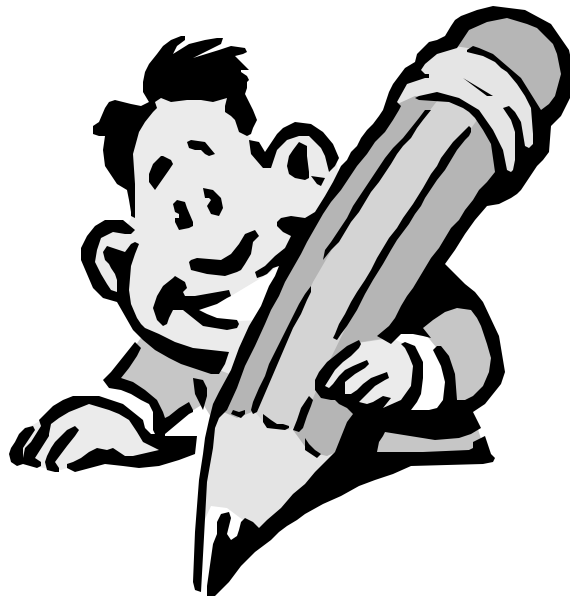
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ere we are at the beginning of a new season. Of course the membership year isn't over until the end of October. That means you still have time to start thinking about joining the council. We will finalize the new council at the November general meeting. If you would like to take a more active role in the club but are unsure about what is involved then a good introduction would be to become a Councillor-at-Large. This position only requires that you show up at the monthly council meetings and provide some input into how the club is run. Of course there are other positions available for someone who is willing to spend a little extra time.

No one has submitted colour pictures for our November Event Horizon cover yet. The deadline for submitting your Photos is at our next general meeting on October 9th. The reason for having a colour cover is to mark our fifth anniversary as a club.

Don't forget our star party September 18-20 at Silent Lake. The details were in the summer issue of Event Horizon. If you are reading this too late I'm afraid that means you missed another great general meeting. We have lots of good speakers for the 1998/1999 season lined up already. I am eagerly awaiting Rob Dick's talk about Life in the Universe in October. In November Paul Delaney will be giving us an excellent talk about High Energy Objects in the Universe. Paul gave this talk to an appreciative crowd at the Huronia Star Party this summer.

A couple of web sites worth checking out this month are "Todd Gross'



Weather and Astronomy" at <http://www.weatherman.com/welcome.htm> and the "Absolute Beginners Astronomy and Telescopes Pages" at <http://webhome.idirect.com/~rsnow/page1.html>. Todd Gross is a meteorologist and amateur astronomer in Boston. He has tons of weather links and information plus astronomy related product reviews and links at his site. As amateur astronomers both areas are of great interest. The second site is by a Canadian who has put in quite a bit of effort. A word of warning though, some of his technical details are faulty. For example M13 according to everything I've read is not 24 billion years old. He has links to a number of sites including an excellent one on barn door drives and another on wide field astrophotography.

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# HAMILTON AMATEUR ASTRONOMERS

# E

vent Horizon is a publication of the Hamilton Amateur Astronomers (HAA).

The HAA is an amateur astronomy club dedicated to the promotion and enjoyment of astronomy for people of all ages and experience levels

The cost of the subscription is included in the \$15 individual or \$20 family membership fee for the year. Event Horizon is published a minimum of 10 times a year.

### HAA Council

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## Chang-E, The Moon Lady

*A Chinese Legend transcribed by  
Denise Kaisler  
kaisler@astro.ucla.edu*

**T**he people of the earth rejoiced after the great archer Yi shot down nine of the ten wayward suns [see last month's EH]. Yi felt great satisfaction at having helped the people, so he decided to stay on Earth and do other heroic deeds.

Yi's wife, the goddess Chang-E didn't like this idea, yet could hardly tell her husband what to do. Instead, she asked him to finish his tasks quickly so that they could return to heaven and take their rightful places at King Di-Jun's celestial court.

So Yi set off in search of adventure. By the time a year had passed, the great warrior had rid the world of six evils : the chimera Zha-Yu, the minotaur Tao-Chi, Jiu-Yang, the winged hydra, the fearsome Roc of Quingqu lake, the great python of Dongting, and Feng-Xi, a giant boar. All of these creatures were once divine beings who had assumed monstrous forms to terrify and devour mortals.

Yi felt great pride at his own accomplishments. He thought that surely the Heavenly King must be quite pleased by his actions. Thus, he cooked a great joint of the slaughtered Feng-Xi and brought it on a platter to King Di-Jun, hoping to hear the sovereign's words of praise.

Yet the Heavenly King was most sorely displeased with Yi. "You shot down nine of my sons," he raged. "You killed other celestial beings for sport ! From this day forward, neither you nor your wife shall set foot in this court again. I hereby condemn you to live as mortals on Earth until the end

of your days!"

Yi returned to his wife with a heavy heart and told her what the king had said. Instead of being sympathetic, she was furious. 'Look at where your foolish desires have landed us! I am no longer a goddess! My home is forever lost to me."

Then sorrow claimed her. "Oh what a miserable ending for us. One day we shall die and then wander the earth as ghosts. What a terrible fate!"

The couple lamented together until, suddenly, Chang-E had an idea. "It is said that the Western Queen Mother has a special potion of immortality. If you could obtain some, we would not become ghosts."

Yi's hope and courage were immediately restored. The very next day he mounted a white horse and galloped away towards Kunlun mountain. This was where the Western Queen Mother lived.

His journey was an arduous one. First, Yi had to cross a range of fiery mountains which burned day and night. Next he had to cross a river which was so weak it could not even keep a feather afloat. Finally, he had to hike eleven thousand leagues to reach the palace of the Western Queen Mother.

The goddess was sympathetic to Yi and gave him all the exilir she possessed. "It should be enough to grant both of you immortality," she said. "Yet if one of you drinks it all, you will regain your godhood."

Yi hurried home and gave the potion to Chang-E. He told her all that had transpired and then fell into exhausted slumber. Alone, by the

light of a single candle, Chang-E stared at the leaf containing the magical potion. Suddenly, the thought of immortality on Earth became distasteful to her. It was her husband's actions that caused her to be exiled to Earth. Why should she suffer for his foolishness?

Thus, Chang-E swept up the potion and swallowed it in a single gulp.

In a twinkling, her body became so light that she floated out the window of the cottage they shared. She drifted up towards heaven, rejoicing at being able to see her home once more. Then Chang-E was paralyzed by a thought. She could not return to the celestial court. The Heavenly King and all his courtiers would surely punish her for having left her husband.

Filled with sorrow, Chang-E flew towards the moon. The Moon Palace was lovely, yet desolate. The only living things in that place were a jade hare and a bay tree. Chang-E was seized by a bitter regret of her rash decision. Oh, if she could only fly down to Earth and be with her husband! But it was too late.

Some people say that if you look up towards the moon, you can see the outline of Chang-E as she dances in the cold light of her lonely palace.



# Vulcan, the intra-Mercurial planet

- Paul Schlyter

The French mathematician Urbain Le Verrier, co-predictor with J.C. Adams of the position of Neptune before it was seen, in a lecture at 2 Jan 1860 announced that the problem of observed deviations of the motion of Mercury could be solved by assuming an intra-Mercurial planet, or possibly a second asteroid belt inside Mercury's orbit. The only possible way to observe this intra-Mercurial planet or asteroids was if/when they transited the Sun, or during total solar eclipses. Prof. Wolf at the Zurich sunspot data center, found a number of suspicious "dots" on the Sun, and another astronomer found some more. A total of two dozen spots seemed to fit the pattern of two intra-Mercurial orbits, one with a period of 26 days and the other of 38 days.

In 1859, Le Verrier received a letter from the amateur astronomer Lescarbault, who reported having seen a round black spot on the Sun on March 26 1859, looking like a planet

transiting the Sun. He had seen the spot one hour and a quarter, when it moved a quarter of the solar diameter. Lescarbault estimated the orbital inclination to between 5.3 and 7.3 degrees, its longitude of node about 183 deg, its eccentricity "enormous", and its transit time across the solar disk 4 hours 30 minutes. Le Verrier investigated this observation, and computed an orbit from it: period 19 days 7 hours, mean distance from Sun 0.1427 a.u., inclination 12° 10', ascending node at 12° 59'. The diameter was considerably smaller than Mercury's and its mass was estimated at 1/17 of Mercury's mass. This was too small to account for the deviations of Mercury's orbit, but perhaps this was the largest member of that intra-Mercurial asteroid belt? Le Verrier fell in love with the planet, and named it Vulcan.

In 1860 there was a total eclipse of the Sun. Le Verrier mobilized all French and some other astronomers to find Vulcan - nobody did. Wolf's suspicious 'sunspots' now revived Le Verrier's interest, and just before Le Verrier's death in 1877 some more 'evidence' found its way into print. On April 4 1875, a German astronomer, H. Weber, saw a round spot on the Sun. Le Verrier's orbit indicated a possible transit at April 3 that year, and Wolf noticed that his 38-day orbit also could have performed a transit at about that time. That 'round dot' was also photographed at Greenwich and in

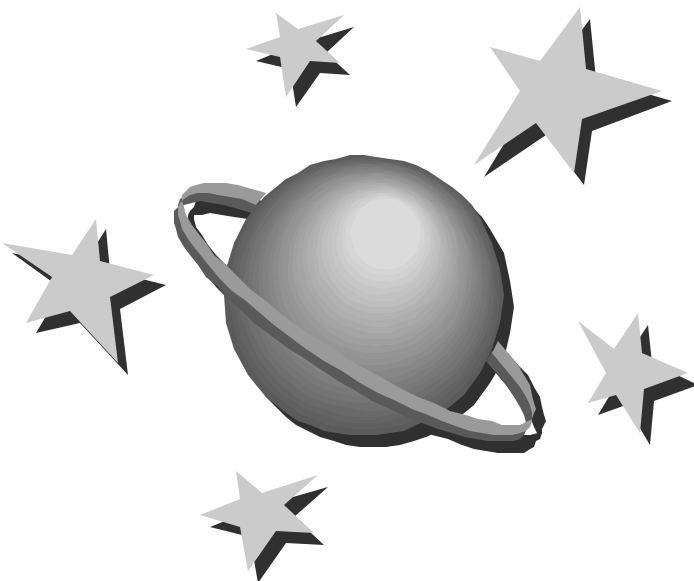
Madrid.

There was one more flurry after the total solar eclipse at July 29 1878, where two observers claimed to have seen in the vicinity of the Sun small illuminated disks which could only be small planets inside Mercury's orbit: J.C. Watson (professor of astronomy at the Univ. of Michigan) believed he'd found TWO intra-Mercurial planets! Lewis Swift (co-discoverer of Comet Swift-Tuttle, which returned 1992), also saw a 'star' he believed to be Vulcan -- but at a different position than either of Watson's two 'intra-Mercurials'. In addition, neither Watson's nor Swift's Vulcans could be reconciled with Le Verrier's or Lescarbault's Vulcan.

After this, nobody ever saw Vulcan again, in spite of several searches at different total solar eclipses. And in 1916, Albert Einstein published his General Theory of Relativity, which explained the deviations in the motions of Mercury without the need to invoke an unknown intra-Mercurial planet. In May 1929 Erwin Freundlich, Potsdam, photographed the total solar eclipse in Sumatra, and later carefully examined the plates which showed a profusion of star images. Comparison plates were taken six months later. No unknown object brighter than 9th magnitude was found near the Sun.

But what did these people really see? Lescarbault had no reason to tell a fairytale, and even Le Verrier believed him. It is possible that Lescarbault happened to see a small asteroid passing very close to the Earth, just inside Earth's orbit. Such asteroids were unknown at that time, so Lescarbault's only idea was that he saw an intra-Mercurial planet. Swift and Watson could, during the hurry to obtain observations during totality,

*(Continued on page 5)*



## Light....

*(Continued from page 1)*

from time to time and often violet colours could be seen. Suddenly bright pillars of light shot up from the horizon to near the zenith and a magnificent coronal aurora began. Lying on my back looking up I had a feeling of being in a space ship looking back as I shooting through a lighted tunnel.

Every once in a while the aurora would subside and I would take a break from photographing. I planned some more shots over the lake and we all made our way down to the dock. I asked our wives to sit at the end of the dock and look out at the aurora as I took a picture of them and illuminated them with my red flashlight.

We observed the aurorae till about 2:30am and then reluctantly I decided I better get some sleep for the 3 hour drive home at 8 am.

*Editors note: The pictures from this*

*trip can be viewed by visiting <http://worldchat.com/commercial/skyoptics/aurora.html>.*

*Unfortunately, they could not be reproduced well in the Event Horizon.*



**T**he next meeting of the Hamilton Amateur Junior Astronomers will be Tuesday, September 22st, 1998 at 7pm. All children between the ages of 4 and 12 are welcome to attend. Please note the new day. We will be switching from Monday nights to Tuesday nights.

If you require more information, or if you are interested in helping with HAA once a month (it is lots of fun!), please contact Rosa at 540-

## Vulcan...

*(Continued from page 4)*

have misidentified some stars, believing they had seen Vulcan.

"Vulcan" was briefly revived around 1970-1971, when a few researchers thought they had detected several faint objects close to the Sun during a total solar eclipse. These objects might have been faint comets, and later comets have been observed that later did pass close enough to the Sun to collide with it.

## Editorial

**I**would like to thank everyone who contributed to this month's Event Horizon. There are some good articles in this issue.

You will notice that I mentioned at the end of Stephen Barnes article that the pictures which go with his article are at <http://worldchat.com/commercial/skyoptics/aurora.html>. I tried to reproduce them here, but when the pictures are converted to black and white for Event Horizon they don't look nearly as good as they do in colour.

I hope everyone had a great summer

and is ready to start writing lots of articles. The deadline for the next issue of Event Horizon is Friday, October 2nd. Articles can be sent by regular mail or by e-mail.

Remember, if you want to become more involved in the HAA, this is the time to do it with the new council being formed in the next couple of months.

*Rosa Assalone  
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(905) 540-8793*

# Constellation of the Month

by Margaret Walton

## Aquarius - The Water Bearer

**T**his constellation is depicted as a god pouring the waters of life into a wet region of the sky. It is the 11th Zodiacal constellation and is composed of relatively dim stars, the brightest of which is mag 2.9.

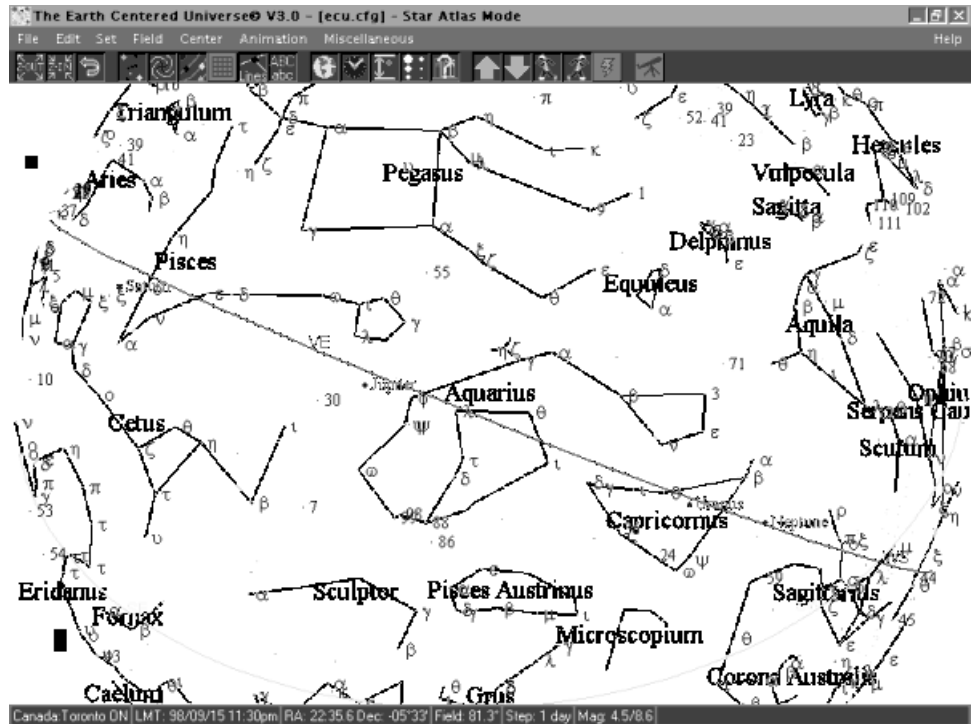
In ancient Babylon, the sun passed through Aquarius during the winter solstice. This was the wettest time of the year and the Babylonians saw it as a curse. The Egyptians associated Aquarius with the annual flooding of the Nile; essential to their agricultural success and to them the 'Water Bearer' was a symbol of good fortune.

In Greek myth, Aquarius is the boy Ganymede, whom Zeus, disguised as the eagle of Aquila, abducted and carried off to Olympus to be his cupbearer. Ganymede was the son of King Tros of Troy and was very beautiful. Zeus' queen Hera was upset and shamed by her husband's behavior. Her attitude angered Zeus who placed Ganymede among the stars to glorify him.

The two brightest stars in Aquarius were named by the Arabs as Sadalmelik meaning 'lucky star of the King', and Sadalsuud, meaning 'luckiest of the lucky'.

### Objects to See in Aquarius

M2 (NGC7089) - This globular cluster is visible with binoculars. It contains more than 100,000 stars, has a mag of 6.5 and is a very rich cluster.



The NGC rates this (!!!).

M72 (NGC6981) - This globular cluster has a mag of 9.4.

M73 (NGC6994) - This is an asterism of 4 stars. It is very unremarkable. Messier described it as having some nebulosity but none is visible today.

NGC7009 - The Saturn Nebula. This is a very beautiful nebula, greenish in color. It has a magnitude of 8 and is 1.7' in size. Its name comes from the shape of the nebula, which looks like the planet Saturn with its rings.

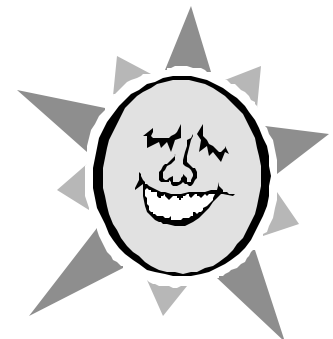
NGC7218 - This is a bright, elongated galaxy of mag 12.1.

NGC7293 - Helix Nebula. This is our nearest planetary nebula, 425 light years away. It is best seen

through binoculars. To view through a telescope, use low power and a nebula filter. It is faint and extremely large. The NGC rates this as (!).

NGC7371 - This is a bright, small elongated galaxy of mag 12.1.

NGC7723 - This is a bright, large elongated galaxy of mag 11.2.





### Cosmology Discussion Group

Join our philosophical study of the origins, evolution, and natural structures of the universe.

New topics welcome. Discussion is informal.

The next meeting is Saturday, October 3rd at 8pm in McMaster's Burke Science Building room B148.

For further information call Larry at 529-1037.

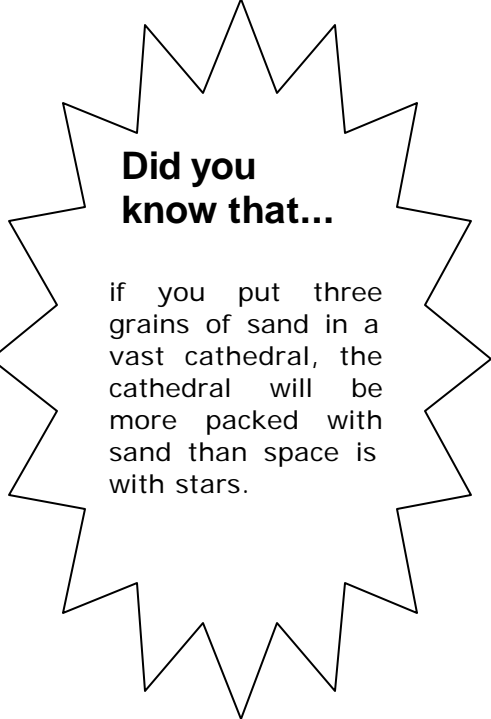
☆☆☆  
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 ☆ September 14th, 8pm  
 ☆ **'A Naturalists' Guide to Star**  
 ☆ **Gazing'**  
 ☆ by Terence Dickinson  
 ☆  
 ☆ A Free Presentation by The  
 ☆ Hamilton Naturalists' Club  
 ☆ Royal Botanical Gardens  
 ☆ Headquarters  
 ☆ 680 Plains Road West  
 ☆ Burlington  
 ☆  
 ☆☆☆

Please join us - everyone is welcome.

Our club is a 500 member non-profit organization dedicated to the study, appreciation and conservation of wild plants and animals. Everyone is welcome to attend our monthly meetings.

## HAA Sweatshirts & T-shirts

**G**ood news! The sweatshirts and T-shirts are ready and if you haven't already picked up your shirt you should contact Margaret Walton.



### Did you know that...

if you put three grains of sand in a vast cathedral, the cathedral will be more packed with sand than space is with stars.

## CALENDAR OF EVENTS

- Monday, September 14th, 8:00 PM **Hamilton Naturalists' Club Meeting** - Royal Botanical Gardens Headquarters 680 Plains Road West Burlington
- September 18-20th **HAA FALL STAR PARTY** - For information contact Juliana Light at (905) 846-8990 or e-mail at bx057@torfree.net
- Tuesday, September 22th, 7:00 PM **HAA GENERAL MEETING** - At the Spectator Building auditorium.
- September 18, 19, 25, 26, 8:00pm **HAJA MEETING** - McMaster Burke Science Building, room B148. For more information contact Rosa Assalone at 540-8793.
- Friday, October 9th, 7:30 PM **BINBROOK OBSERVING NIGHTS** - For confirmation or directions call Tony Wallace at 526-6154.
- Tuesday, October 20th, 7:00 PM **HAJA MEETING** - McMaster Burke Science Building, room B148. For more information contact Rosa Assalone at 540-8793.
- October 16, 17, 23, 24, 8:00pm **BINBROOK OBSERVING NIGHTS** - For confirmation or directions call Tony Wallace at 526-6154.