# Orbit

The Official Publication of the Hamilton Centre of the Royal Astronomical Society of Canada

Volume 42 Issue 5

March 2010

# Issue Number 5, March, 2010
## Roger Hill, Editor

Clouds...again! For most of us anyway. Even Les in Chile has had to deal with all sorts of problems, from rain to earthquakes. He felt the Mag 8.8 one from about 1800 kilometres away!

Again the biggest event for the Centre this past month, was again the meeting at Discovery Landing. It was a great evening., and we came even closer to running out of chairs!

I was able to leave the house a little later for this one, as Peter Jedicke of the London Centre was going to deliver our speaker to us. Some may have wondered how her nerves would hold out after being in the passenger seat, and worrying about the drive home again, but Laura was in fine form.

I really must learn how to delegate...I spent a fair bit of time helping a number of people set up laptops to work with the projector, getting sufficient power to the middle table and the like, rather than spending time with our newest members. This month, I'll just set up the projector with my laptop, and anyone who wants to use it can test it out themselves!!

As with last month, promptly at 8pm, we were off and running. There was even less business than January, and after a quick run-down on the Centre, and what the RASC has to offer, we went into the presentations.

Ev gave another excellent presentation on Greek in the Round. She says she's not a public speaker, but she did a great job, and I hope it continues for a long time to come.

Andy gave us a quick overview of a really nice

Ed Mizzi, who you may have noticed wandering around taking pictures, brought us up to date on some astronomical news from January, and included some prizes for non-members to win for answering a couple of questions...nice touch Ed!

Glenn Kukkola brought along a very nice "grab and go" mount

After January, no-one wanted to follow Gary. This month, we learned that it was not a unique event. When I'd originally asked a few people to do five to ten minutes at the beginning of each meeting, I'd thought that we'd see a few pictures culled from the internet, and the whole thing would take less than an hour to put together. Gary however, likes to make sure the bar is set real high. Typical pilot!

Gary Bennet won the 'scope raffle, and from the depths of the audience was heard "oh...like YOU need any more telescopes!"

We've still got a couple left, and we're hoping to get some more, so look for this feature to continue 'til the June meeting.

Gary Colwell (there's that name again) produced a nice brochure, and, along with the IYA2009 photo cards, we've got something to hand to people when they enquire.

One of the things that happened that was really delightful was that we got a few people out who had never been out before. One person who did, was a young lad of about 12...full of questions and wonder, desperate to show he belonged, and trying so hard to impress. He was, I suspect, a lot like many of us. I hope so, anyway...he reminded me a lot of myself at the same age.

Unlike last month, it cleared up just after the meeting started, and I was the only one who'd brought a telescope along—my ETX90, newly installed on its GOTO mount. There was no place to really set it up, but I had a Black and Decker Shopmate in the van, so I sued that. It wasn't the steadiest, and the eyepiece that I had gave about 50x magnification, which was not enough for Mars. The seeing was lousy, and it was bouncing all over the sky, but at least people had a look through it. It would have been nicer if the Moon was visible.

I used my green laser to point out the constellations that Ev and Gary had pointed out, and showed them where to look for M42. I also told them to check every clear night to see how Mars moved against the background stars, that being why the Greeks called them Wanderers.

After everyone had had a chance to look, we went to Joe Dogs on Brant Street.

What a mistake. I was one of the last ones there, and after some overpriced wings, I was the last one to leave, about 40 minutes later.

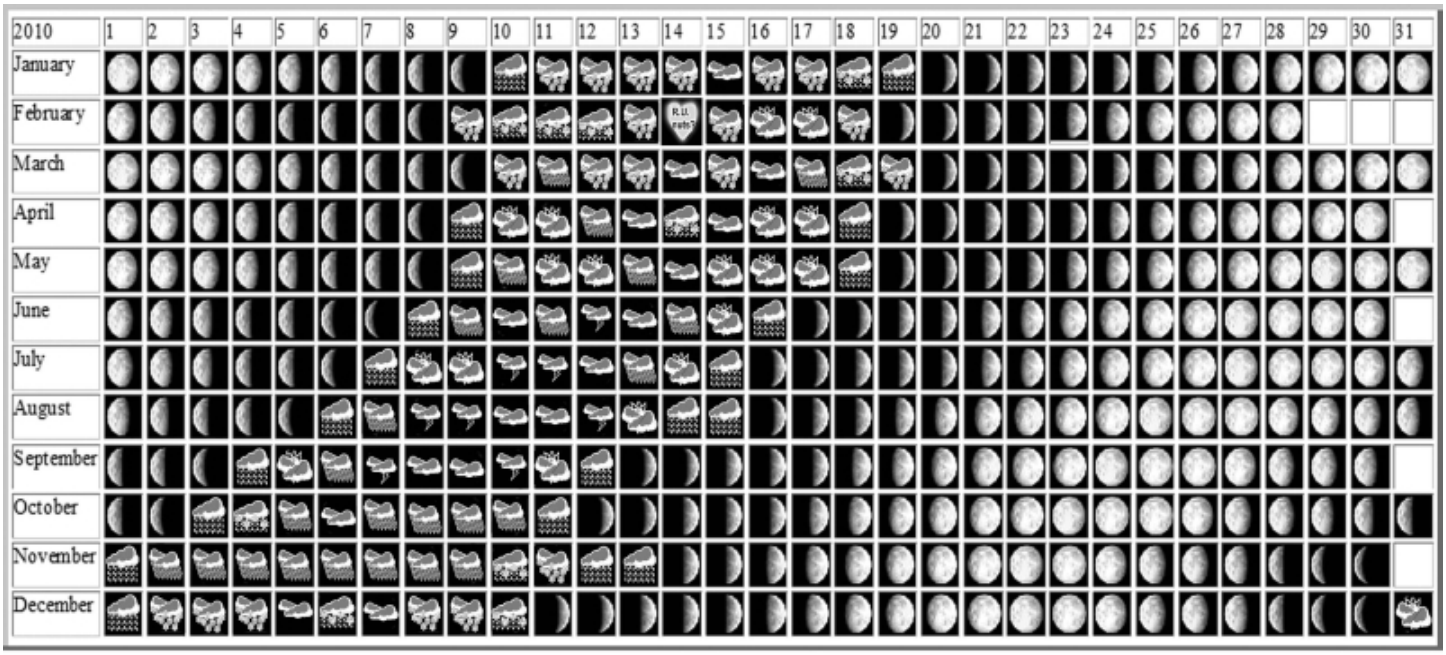
When you have to yell to the person next to you to be heard, conversation doesn't come to a standstill, as it never has a chance to get going at all. I asked one of the waitresses if it was always like this, I was told "Yes". So, despite their full menu until 2am, it's not the place for us.

So, another recommendation was a place called Emma's Back Porch on Lakeshore Road. One member who got in touch with them said that they'll keep their cook around if they know we're coming (maybe we should have tried that with The Queens Head).

Lastly, the image below was sent to me by Derek Baker, and it was remarkably successful at predicting the conditions during January and February, although the cloudy period was much longer than just the time around the New Moon, there was no doubt about the essential truth to what it contained. So...I'm going to leave it there until such a time as it is essentially WRONG. Any bets as to how long it'll be there?

Clear skies, one and all,

Roger Hill
Orbit editor and President.

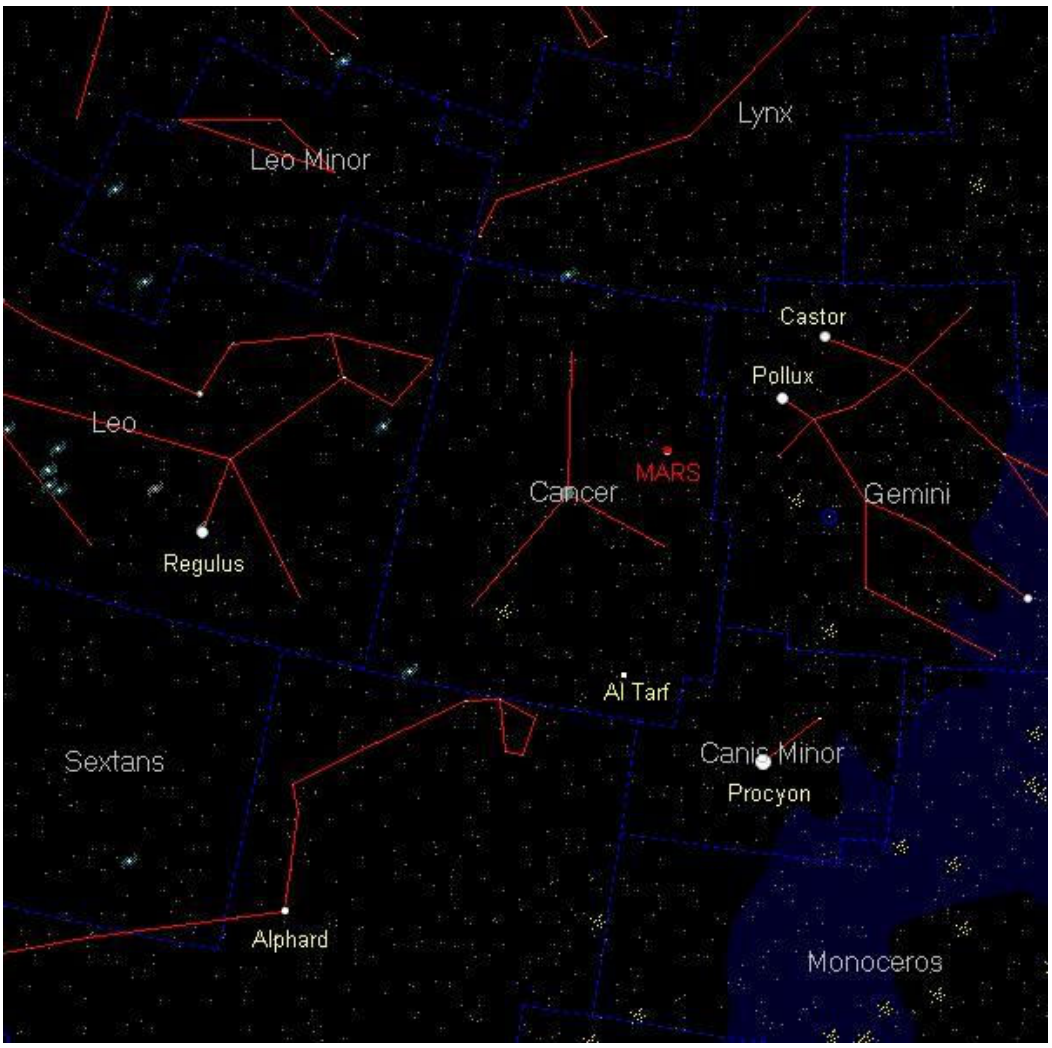


# The Sky This Month - March 2010 By Gary Boyle, Ottawa

## The Illusive Crab

If I were to hand the average person a star chart of the constellation Cancer the Crab and asked them to find it in the sky, I am sure they would be hard pressed in identifying it. Unlike bright celestial patterns such as Orion, the Big Dipper and so on, Cancer is not the easiest to recognize. However to the seasoned astronomer who know the sky like the back of their hand, Cancer is flanked with the Gemini Twins to its west and Leo (Major) the Lion to its east. Both of these bordering constellations possess bright suns.

So why bother to locate this less than impressive constellation? The only redeeming object the Crab has as a tenant is M44. Commonly known as the Beehive cluster, M44 is a beautiful wide open cluster that is best seen in binoculars. At about 570 light years away, M44 is one of the closest open clusters to us. Astronomers estimate its age to the tune of 600 million years. Back in the day, Galileo reported seeing about 40 stars but with today's telescopes, the number seen is now in the hundreds.

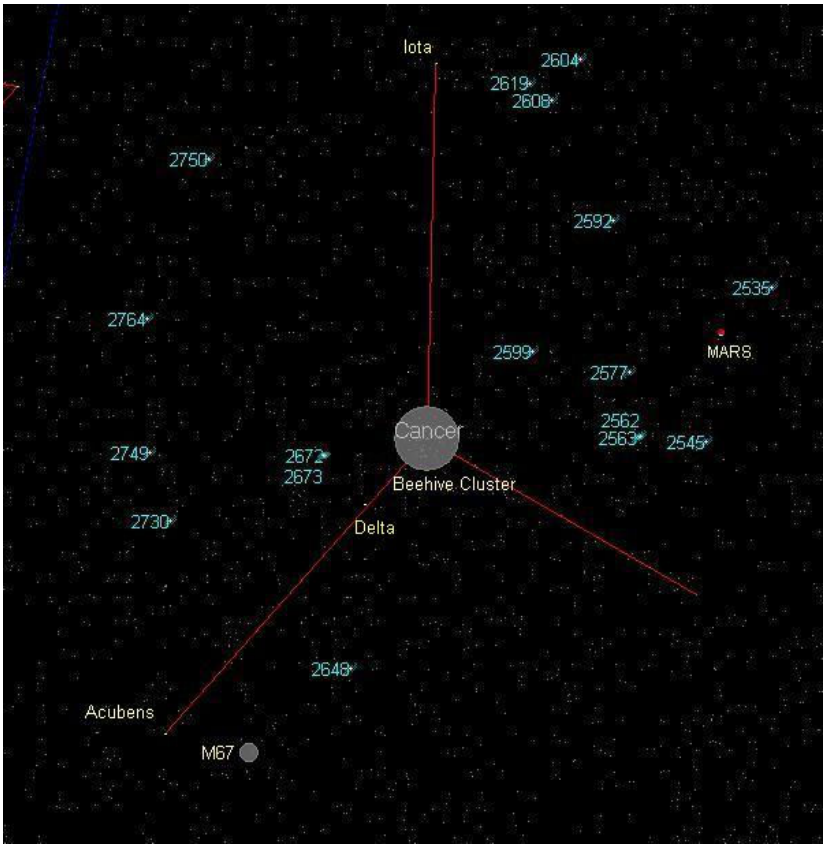



With Cancer situated on the ecliptic and a member of the astrological zodiac, planets from time to time slide through its boundaries as they orbit the Sun. Such is now the case with the Red Planet. On February 4th, Mars passed to the north of the Beehive by a little less than three degrees. Mars is still moving westward (retrograde motion) and will slow down and become stationary on March 10th. After that date, it then moves eastward and passes M44 by twice the width of the full moon on April 16th. Before it does that, Mars will scoot ten arc minutes or a third the width of the full moon, south of the 13th magnitude elongated galaxy NGC 2577 on March 31st.

In all constellations, stars with the brightest to faintest values or magnitudes, follow the Greek alphabet in descending order such as Alpha, Beta, Gamma, Delta etc. Such is not the case with magnitude 4.3 Acubens – deemed the alpha star. In fact is does not even rank second. Somehow Acubens stands behind magnitudes 3.8 Beta, 4.2 Iota and 4.2 Delta. But this class A star has strange absorption readings indicating a "metallic line" or making it an "Am" star.

Acubens is also a double star system with its companion is mere 0.1 arc second from the primary star. The two suns are very close together – comparable to the distance of our Sun and Jupiter. When the Moon occults Acubens, the star does not vanish instantly but fades over a very short time frame.

Beta Cancri – aka Al Tarf is 290 light years and shines 660 times that of our Sun. It is a class K giant star that would extend more that half way to planet Mercury. Now that is an orange giant, astronomers are now sure at what stage it is at but for certain is coming to the end of its life. Al Tarf rotates very slowly, in the order of one revolution every two earth years. By comparison, our Sun spins once every twenty-five days at its equator and about thirty days at its polar regions.




Positioning your telescope two degrees to the west of Acubens to be rewarded with a superb star cluster catalogued M67. As large as the full moon and hovering around naked limitation, this magnitude 6.1 swarm of about 500 stars is estimated to be around four billions years old. It is believed that about one hundred stars are like our Sun in its physical properties as well as a couple of hundred white dwarfs.

The Beehive and M67 are the only two open clusters residing within the borders of Cancer. But there are a few great looking galaxies to locate, such as NGC 2775 situated to the lower left section of the constellation. Located some 60 million light years from us, this galaxy has produced five supernovas in just the last 30 years. NGC 2775 has delicate arm structure that shows a few areas of star formation.

Next we will look at NGC 2750. This peculiar looking galaxy is listed at 125 million light years away and is a faint, face-on galaxy that is almost triangle shaped. It appears that one of its arms is distorted or bent semi-straight.

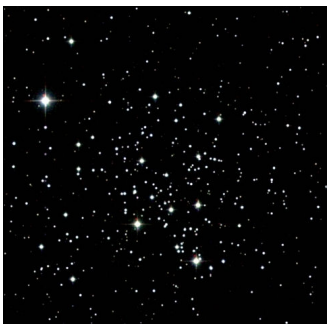
Located a little north and west of Mars is NGC 2535. This is another face-on galaxy whose two faint main arms are wide open with the southern one a bit brighter. Again, many star forming regions can be glimpsed in this magnitude 12.7 object. NGC 2536 located south is not elongated.

The planet Venus is climbing up the western skies. Like tag team wrestlers, Venus and Jupiter tagged and Venus entered the ring as Jupiter is bowing out. On the night of March 3rd Venus will slide south of Uranus by 41 arc minutes. This might pose a bit of a challenge as Uranus will only be only 12 arc minutes from the Sun.

Saturn is now rising about an hour after local sunset and on March 1st, will be eight degrees for the north and east of the moon.

Time change occurs on March 14th as we spring ahead one hour in most time zones. Six days later on the 20th, the Spring Equinox officially begins at 1: 32 p.m. EDST.

| Object | Type | Magnitude | Coordinates |
|---|---|---|---|
| M44 (Bottom left) | Open cluster | 3.1 | RA:08h 40m 6.0s Dec:+19d 59' |
| M67 (bottom centre) | Open cluster | 6.9 | RA:08h 50m 24.0s Dec:+11d 49 |
| NGC 2535 (bottom right) | Galaxy | 12.7 | RA:08h 11m 12.0s Dec:+25d 12 |
| NGC 2577 | Galaxy | 12.6 | RA:08h 22m 42.0s Dec:+22d 33' |
| NGC 2750 | Galaxy | 12.1 | RA:09h 05m 42.0s Dec:+25d 26 |
| NGC 2775 | Galaxy | 10.4 | RA:09h 10m 17.9s Dec:+07d 02 |



# A BLAST from the PAST.....

## Ancient Babylonian Astronomy and the Zodiac Calendar

Ancient Babylonian astronomy dates back to 1,800 BC and ultimately concerned itself in the establishment of an accurate calendar, the emphasis was on recording and calculating the motions of the Sun and Moon.

Babylonian temple astronomers called "Tupsar Enuma Enlil" observed the skies for centuries and recorded their findings in astronomical diaries and star catalogues. Using these observations Babylonian astronomers had the ability to predict lunar and later solar eclipses with fairly precise accuracy. From Babylonian astronomy the Saros-cycle was developed. The Saros cycle is a period of 223 synodic months, or 18 years + 11.3 days in reflection of the lunar and solar patterns.

The results of Babylonian astronomy predictions were also able to calculate that 235 lunar months are nearly identical to 19 solar years, with a difference of two hours. In conclusion to this observation, seven out of nineteen years should be leap years with an extra month.
Babylonian astronomy compiled detailed stellar catalogues becoming the principle of which we refer to as the Zodiac calendar.
Ancient Babylonian astronomy and astrological data records may have been motivated by religious reasoning. Such occurrences as a planets first and last appearance in the sky were taken to have astrological significance in foretelling human fate and destiny.

## A Diary of Ancient Babylonian Astrology

A typical diary of ancient Babylonian astrology consists with a statement on the length of the previous month, followed by observations made for the current month. Details such as the time between sunset and moonset are given as well as intervals between the risings of the waxing moon.
When eclipses are recorded notice is given of the visible planets and their positions including the duration of the eclipse. Significant attention is given to the appearances of Sirius in all recordings. The diaries of Ancient Babylonian astrology included details of atmospheric phenomena such as rainbows and halos, alongside various local events like fires and theft. Astrology was not studied as a personal aid, but for the benefit of the king and the land.

## Ancient Babylonian Astrology prediction and sexagesimal numbers

Calculations for accurate predictions were affected by use of the sexagesimal system of numbers. This system is still in use today. The sexagesimal system has a place value of 60 to measure time and angle. I.e. 60 seconds in a minute and 60 minutes in an hour. The ancient Babylonian sexagesimal system included dividing a circle into 360 degrees and the year into 12 parts.

## The Ancient Babylonian Astronomy Calendar

Babylonian astronomy calculations and predictions evolved into a calendar. The Babylonian calendar is based on a lunar year.
There were 12 months in a lunar year. These months were much shorter than the months we know today, and often an extra month was added. A Babylonian year started with the spring equinox. As an example of how ancient Babylonian astrology worked for the people and their beliefs. The position of the sun and the moon in the sky during what we know as the spring equinox was a good omen for agriculture, a time for planting, then by calculation they were able to predict when the next good omen for agriculture should appear.
The names of the Babylonian months are in reflection of the names given to star constellations:

Tashritu Arahsamna Kislimu Tebetu Sabatu Addaru Nisannu Aiaru Simanu Du'uzu Abu Alulu

The extra month was called the second Elul.

The Babylonian people viewed celestial bodies as Gods. The planet Venus was the Goddess Ishtar, and Jupiter for example was the chief Babylonian god Marduk.

## A Brief Chronological Study of Ancient Babylonian Astronomy

Astronomers begin the old Babylonian period from circa 2000-1600 BCE when the Babylonian astronomers sought to master understanding of the duration of days and night, the rising and setting of the moon, and the appearance and disappearance of Venus.

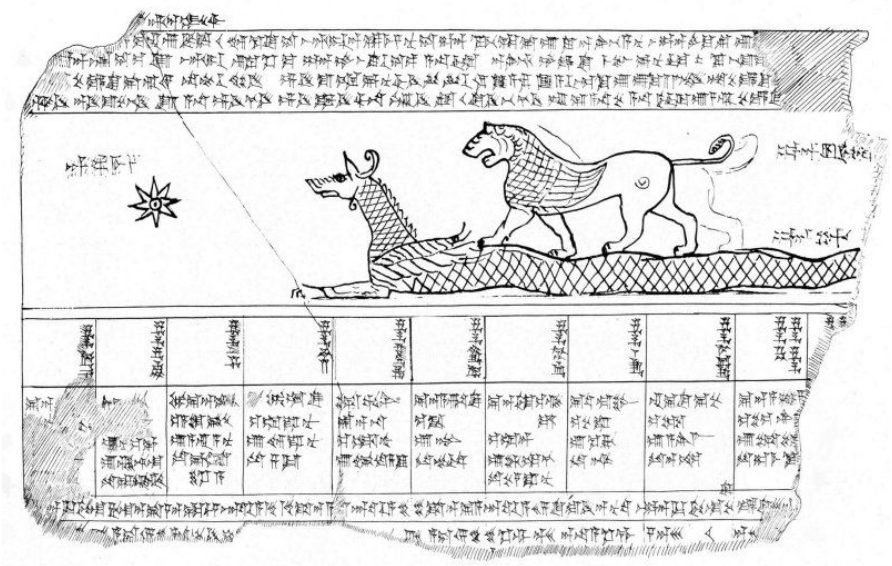
The Kassite Period of Babylonian astrology begins from circa 1570-1160 BCE where attention was given to planetary and stellar risings and settings. Observations continued on daylight lengths. During this period Babylonian astronomers divided the moon into 4 equal sectors to represent 4 counties, Akkad, Sabartu, Elam, and Amurra.

Between 1400-900 BCE Exact observations of the heliacal risings of fixed stars were recorded. Ancient Babylonian astronomy developed a scheme of 34 heliacally rising stars and constellations that became associated with 12 calendar months. 1150 BCE saw the start of simple mathematical astronomy.

Astronomy history records 1000-600 BCE as the Late Assyrian Period where detailed studies of the fixed stars and their risings were established. Zodiacal constellations were established with recognition of the zodiac path of the moon, the sun, and the planets. The seasons of the year were established, and observations and predictions of eclipses were refined.

626-539 BCE is the Neo-Babylonian period, also called the Chaldean period.5. The Neo-Babylonian (Chaldean) Period (626-539 BCE). This period saw progress towards the division of the zodiac into 12 signs of 30 degrees each. 630 BCE was the start of the most accurate systematic observations of the moon and the planets and their positions with respect of the fixed stars. 600 BCE saw the development of mathematical astronomy with evidence of the influence Babylonian astronomy in Greek astronomy.
In conclusion it is with credit for the ancient Babylonian astronomy diaries that more complex and refined mathematical systems have been developed in later history. The influence of ancient Babylonian astronomy is clearly evident in Greek astronomy and mathematical number systems.
Ancient Babylonian astronomy is responsible for the development of the zodiac calendar from which later calendars have been developed in reflection of the study and frame works developed in Babylonian times.

Most interestingly ancient Babylonian astronomy gave us the seasons of the year, or more exactly they provided us with a system to predict the occurrence of seasonal changes.



**Prayer to the Gods of the Night**

Text dating from the Old Babylonian period which refers to the Arrow (Sirius), the Yoke Star (Arcturus), the Stars (Pleiades), the True Shepherd of Anu (Orion), the Dragon (Hydra?), the Wagon (Ursa Major), the Goat Star (Vega) and the Bison (Ophiuchus/ Serpens). The text is known in three versions: Old Babylonian (*c*. 1700 BC), Hittite (*c*. 1200 BC) and Assyrian (*c*. 700 BC).

# GLOBE at Night 2010: 3 - 16 March

GLOBE at Night is an annual 2-week campaign in March. People all over the world record the brightness of their night sky by matching its appearance toward the constellation Orion with star maps of progressively fainter stars. They submit their measurements on-line and a few weeks later, organizers release a map of light-pollution levels worldwide. Over the last four GLOBE at Night campaigns, volunteers from over 100 nations have contributed 35,000 measurements.

Thanks to everyone who participated in the 2009 GLOBE at Night campaign during 16-28 March! Through GLOBE at Night, students — alongside teachers, parents and community members — amassed a data set from which they can begin to explore the concept of light pollution and to research the patterns of light pollution across the globe.

A record number of over 15,000 measurements were received in the 2009 campaign! See this data on the Map page.

An audio podcast (10 minutes) on light pollution and how to participate in GLOBE at Night:
http://365daysofastronomy.org/2010/02/03/february-3rd-the-globe-at-night-campaign-our-light-or-starlight/

**Five Easy Star-Hunting Steps:**

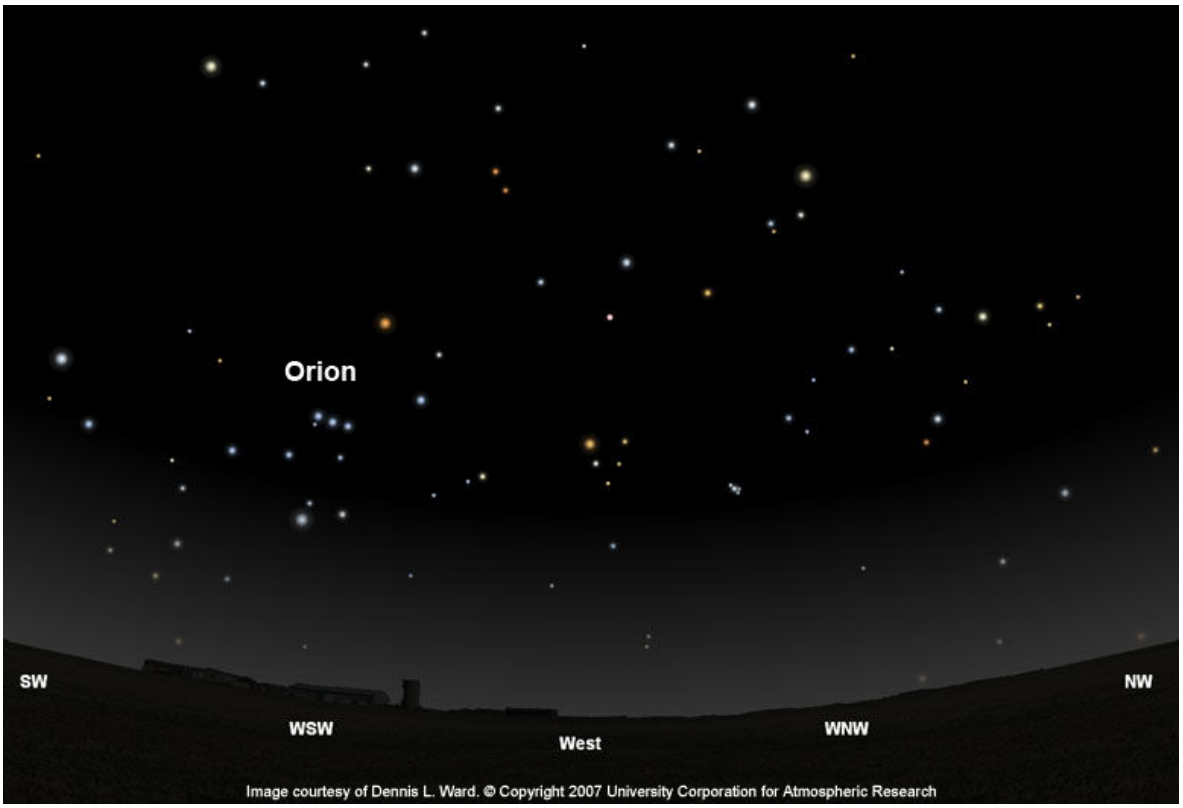
1) Find your latitude and longitude. Try http://www.satsig.net/maps/lat-long-finder.htm

2) Find Orion by going outside an hour after sunset (about 7-10pm local time).

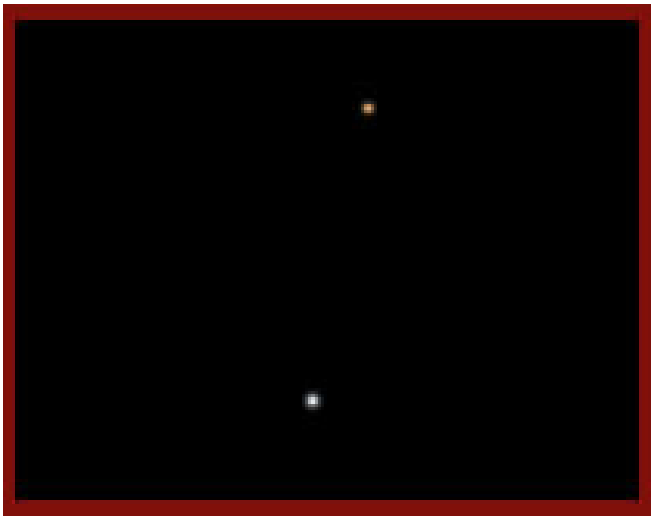
3) Match your nighttime sky to one of our magnitude charts.

4) Report your observation: http://edcommunity.esri.com/gan/2010/report.cfm

5) Compare your observation to thousands around the world: http://www.globeatnight.org/analyze.html




Orion, as seen from 40 degrees North



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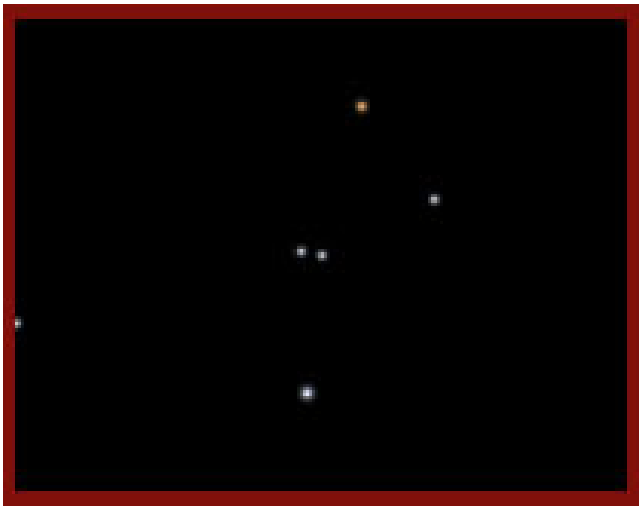

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Magnitude 3
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Magnitude 4
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Magnitude 6
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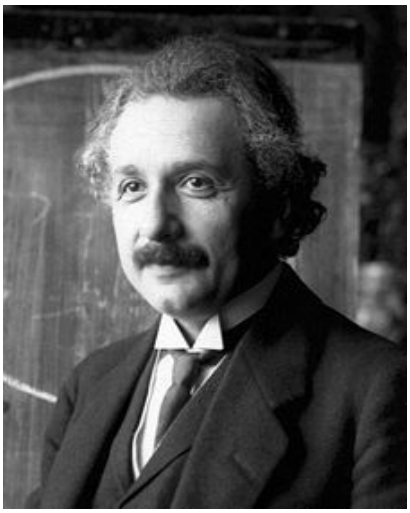
# Answers, from Last Month's Quiz

1 **Sir Christopher Wren**

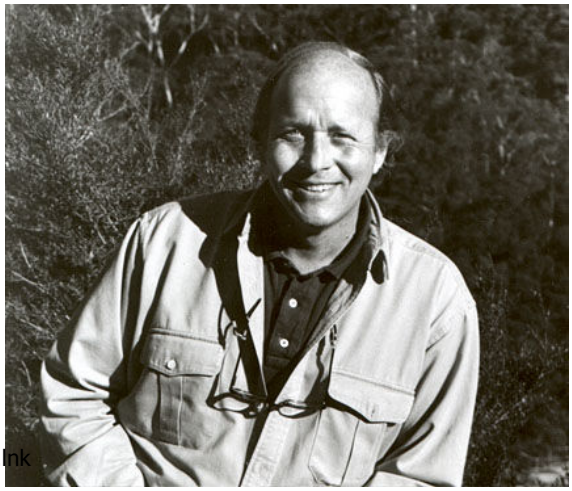
2 **Edmund Burke**



**Albert Einstein**

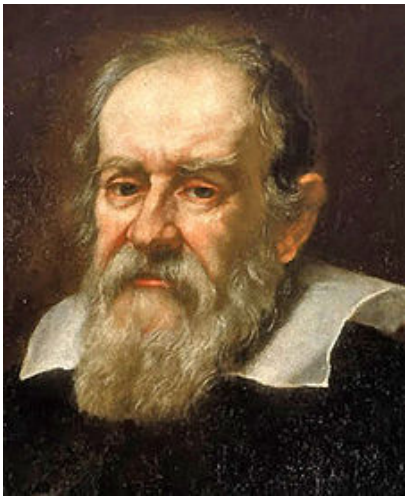
4 **Peter de Vries**


5 **Arthur Koestler**



6 **H. Jackson Brown**

7 **Dr. Beverly Crusher,**



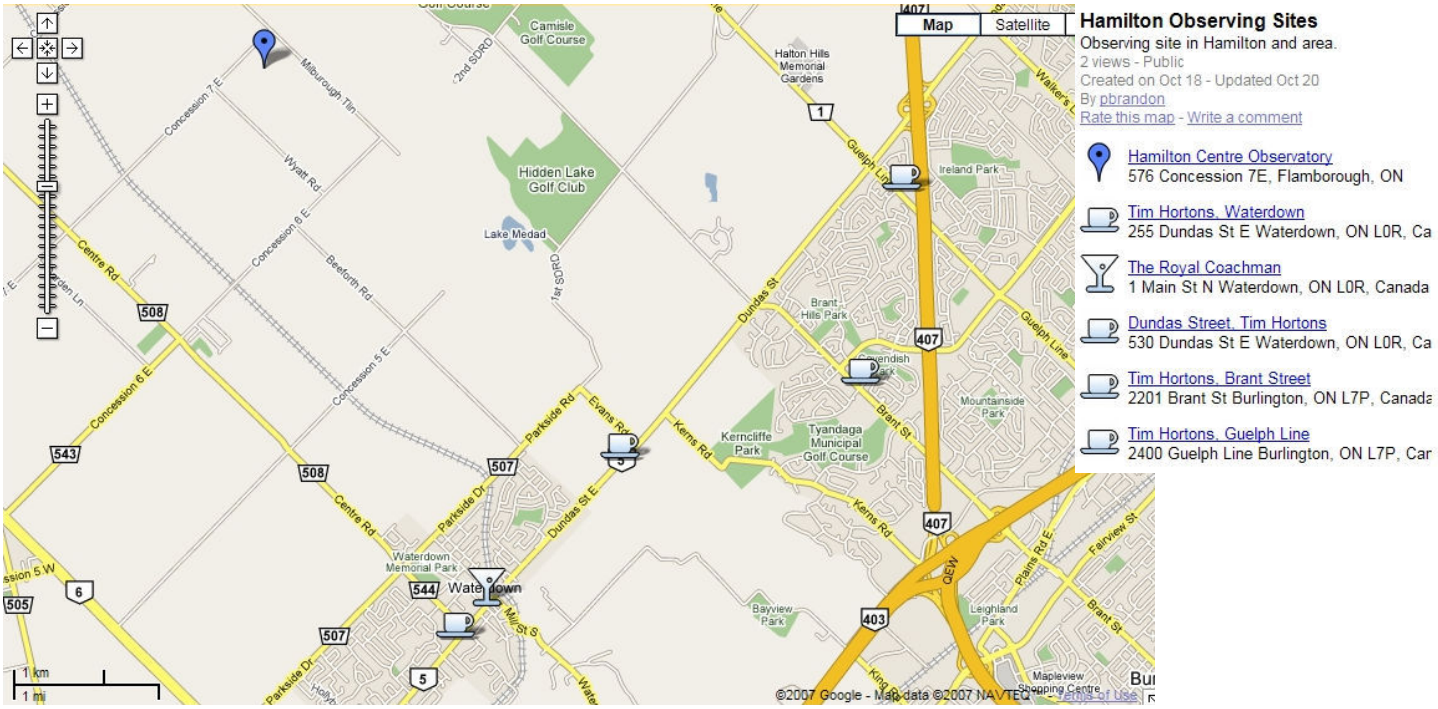
8 **Galileo**

9 **Arthur C. Clarke**

# What you missed last Month!

We had our second general meeting at Discovery Landing in February, and it was another huge success! Our speaker was Laura Thomson, of the University of Western Ontario who told us about the Centre for Planetary Science and Exploration (CPSX) at the University of Western Ontario. One of the things she is involved is the Haughton-Mars project on Devon Island. But that wasn't the entire story that night. Ev Rillett talked about Greek in the Round, Gary Colwell talked about what's coming up in the sky in February, Andy Blanchard told us about a great feature of ImagesPlus, Ed Mizzi brought us up to date on some interesting news from the world of Astronomy, and Glenn Kukkola taught us a bit about Grab and Go telescopes.. We held a raffle, and the prize of a GalileoScope was won by Hamilton Centre member Gary Bennet.

Thanks to Ed Mizzi for the pictures!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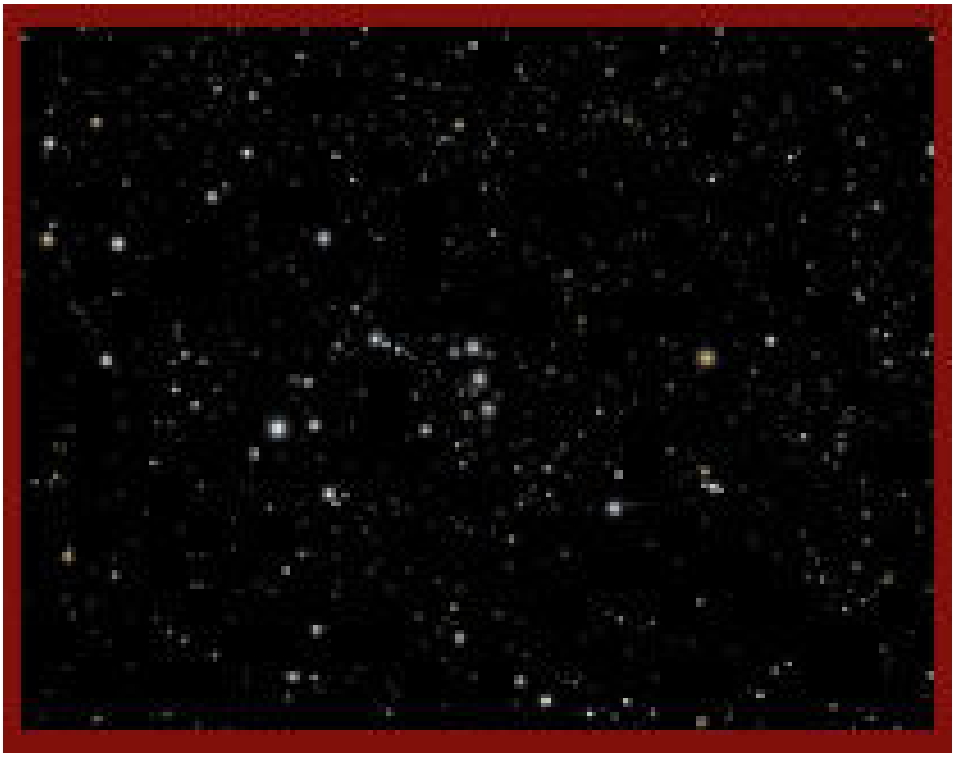
Front Cover from Roger Hill—M1 using the Centres 16” RC. What you Missed pictures by Ed Mizzi



Just for interests sake, this is the Mag 7 chart for 20 degrees south. It’s for Les, who lives there, and all the other Hamilton Centre members who are headed down to Chile this month.