



# NOVA NOTES

*Newton's  
First  
Telescope*



BI-MONTHLY JOURNAL OF THE HALIFAX CENTRE  
JUL-AUG 1982 VOL.13, No 4

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NOTICE OF MEETING

The Camping-Observing Weekend (COW) will be held over the July 17 weekend. At Dr. Holden's invitation, we will be CO-ing on the South Mountain, not far from Middleton. There, we will be blessed with dark skies, happy observers and lots of space for tenting and unidentified frisbees. More details under separate cover.

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Over the past couple of months, notices of events have been rather tardy in reaching members of the Centre. This may have caused inconvenience to the members and frustration to some of the executive. I apologize to all concerned. The executive of this Centre is hard-working and efficient, and I would like to take this opportunity to thank them for their cooperation, help and forbearance.

Walter Zukauskas  
President (1982)  
Halifax Centre  
R.A.S.C.

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MINUTES OF THE JUNE MEETING

The June meeting of the Halifax Centre was held in Bridgewater on Friday, 18 June on the invitation of Wilf Morley. Wilf made the arrangements and advertised the event locally. As a result more than 40 people turned out at the DesBrisay Museum to hear a series of short talks and later to take advantage of the numerous telescopes and clear skies.

Walter Zukauskas chaired the meeting introducing in turn Roy Bishop, Peter Edwards, Randall Brooks and Michael Edwards. Roy introduced non-RASC types to the Observer's Handbook by listing some of the features of the Handbook and by assuring them that it was not so overwhelming as a first glance would suggest. Peter then made some comments on building your own telescope. He discussed some of the advantages and disadvantages of acquiring observing equipment by this route. Randall then explained some of the difficulties of astrophotography and suggested that the July lunar eclipse was an excellent chance to be initiated to astrophotography. Walter himself then introduced the topic of variable star observing, stressing the fact that the only equipment needed is your eyes or a pair of binoculars. He briefly discussed why stars vary in brightness and that you can choose a particular type of variable star to suit your observing habits. To bring the evening all together, Mike showed some of his astrophotos from lunar eclipse shots to aurora giving a good demonstration of what may be achieved with a camera with or without a telescope.

Although it was almost 10:30 by the time that we adjourned for goodies and observing, it was obvious that there are a number of very interested amateurs in Bridgewater and vicinity. With Wilf's enthusiasm, we may expect to see a group in that area to join the Valley Centre as satellites of the Halifax Centre.

R. Brooks  
Secretary

## OBSERVING AND TAKING MEDICATION

### THE EFFECTS

I take medication for a nerve problem, not in the sense that I am paralyzed but I am afraid to go anywhere. That is why I had to resign as Observing Chairman. What I hope to convey through this article is the effect of the drug I take, called Vivol (10mg). It is a tranquilizer to keep me or anyone else with the same problem "tranquil" so to speak. It also makes you tired to a degree.

One of the side effects of this medication is to at times forget certain things. For example, to forget what you were about to observe. This is the result of the drug affecting a certain part of the brain, which is quite noticeable when recording meteors. I can remember one such incident where I had my camera pointed to Ursa Major and a -9 meteor went through the field, the camera was cocked and I was holding the cable release. The meteor broke up and I just stood there looking. The normal reaction would have been to open the shutter immediately.

When it comes to lunar occultations your timing may be off by one second or more. This is your personal reaction time plus the time your finger takes to stop the stopwatch. As for planetary observing the effect is not present but can occur if concentration is not complete. If you do take medication it is a good idea to keep away from the planet Venus or you will see almost everything from the "Ashen Light" to dusky markings and this can also apply to Mercury. There is not much effect on variable stars, double stars, the sun or asteroids but if searching for comets, then look out.

In closing, the use of Vivol or Valium or any other tranquilizer can affect your observations as I have found many times. After all, no one wants to see a fuzzy spot in every part of the eye piece-field as I have encountered so many times. After a while you build up a tolerance to these drugs but you have to use your willpower and keep an open mind when observing. It is a good idea to record everything when observing and then you can determine later on to see if it was real.

Michael Boschat

TWO OBSERVING SESSIONS - Past and Future

A small group of us (Dale Ellis, David Tindall, J-P and Walter Zukauskas, as it turned out) were invited to Boutilier's Point Elementary School to hold an observing session for the Grade 4 class of Murray Wickwire. This was originally scheduled for Thursday April 29th, but you may recall that the weather was rather bad; in fact, the writer felt rather silly doing his duty in calling around those who had expressed a willingness to go to call off the session, with snow falling outside.

Anyway, as luck would have it, the following Thursday (May 6th) was a beautifully clear night and we had a very successful visit to Boutilier's Point. At least 40 enthusiastic youngsters showed up (with about 15-20 adults) and everyone appeared impressed by the sight of Mars, Jupiter, Saturn, and even the nearly full Moon through the telescopes. It is quite interesting, in fact, to observe the enthusiasm expressed - one has become somewhat accustomed to the possibility of people becoming blasé about "small telescope astronomy" in these days of the magnificent, close-up, voyager pictures of the giant planets.

And now a date for your diary ....

We have been invited by the Dartmouth Parks and Recreation Department to hold a public observing session in Shubie Park on Wednesday August 11th (if cloudy, one day later). The

significance of the date is, of course, the maximum of the Perseid meteor shower (which should be quite favourable as the moon is near Last Quarter and therefore rises late in the night).

Everyone is invited, and encouraged to attend - with telescope or without. If you are planning to come with a telescope, please call me (office: 424-2340, home: 455-7456) beforehand. We will be giving a short introductory talk (primarily about the perseid meteors, but we have carte blanche) at 8:15 p.m. and I invite suggestions for the main speaker and topics which might be introduced. This will take place in the shelter just above the campground. The main observing session will start about 9:00 p.m., probably in the ball field (below the campground, towards the canal) - which should give a view further shielded from city lights.

PLAN TO BE THERE!

David Tindall

NOTICE!

To save on the greatly increased cost of postage, the executive has instituted a system of phoning members in the local dialling area, rather than sending out meeting notices in the 'non-Nova Notes' months. Most members of the executive have about eight members to call each month. It is hoped that this will also improve contact between the executive and other members of the Centre. An unfortunate consequence of this is that our out-of-town members may have not been as well served as in the past, and we apologise to them. We hope to remedy this by arranging meetings far enough ahead of time so that announcements can be made in Nova Notes.

There are some members, listed below, who have not been reached by telephone. If you are on the list, please call David Tindall (office: 424-2340; home: 455-7456) and give him a phone number at which you may be reached:

David MacDonald

Gerald Murphy.

SUBSCRIPTION RATES FOR 1982:

NOVA NOTES is available to non-members of the HALIFAX CENTRE R.A.S.C. at the rate of \$1.00 per single issue or \$4.00 for six issues per annum. For more information, please contact the editor.



### Handbook Sales

If you are searching for a way in which the Halifax Centre is the Top Centre of the R.A.S.C., you may be interested in looking at the following table compiled from data in the 1981 Annual Report of the R.A.S.C. (pages 4, 27 and 28):

#### Sales of Handbooks (net) per member 1981

Halifax	\$1.73	Calgary	} nil
Ottawa	1.43	Edmonton	
Niagara	0.49	Montreal	
Windsor	0.49	Quebec	
Hamilton	0.48	Saskatoon	
Winnipeg	0.39		
Vancouver	0.14	Victoria	-0.50
Toronto	0.08		
Kingston	0.06		

(4 other centres did not report in time for publication.)

It might be noted that this clear victory was achieved even though we paid for all 1981 Handbooks and our first shipment of 1982 Handbooks in 1981 (see Treasurer's Notes in Nova Notes 13, 27 - if we took Dale's "more reasonable" figure of \$500 for 1981 net income, we would change the figure to \$5.62 per member!)

Generally speaking, there is a good correlation between wealth of a centre and its lack of Handbook revenue, and perhaps this is not surprising. (One affluent centre even managed to lose money on Handbooks!) However, there are certain centres which are low in the above table and could certainly

benefit from increased sales. Some of the centres, of course, levy an additional membership fee - it is clear from our treasurer's report that this will be unnecessary for the Halifax Centre unless we wish to embark upon a costly project or our Handbook revenue fails to keep pace with inflation.

A little over half of our sales are made through the Nova Scotia Museum and any article about Handbook sales in Nova Scotia would be remiss if it did not mention the great assistance rendered by the staff of the Museum's Information Centre in this regard. They plainly deserve our warmest thanks and gratitude. Randall Brooks also deserves a special mention for building up Handbook sales over the years.

I would like to conclude by thanking all other members of our centre who have sold Handbooks and encourage all of you to help boost our sales in the future; persuade your friends and colleagues to buy a Handbook (which you can obtain from me at meetings, or give me a call.) Handbooks now cost 90 cents to mail, third class, so every one we can hand-deliver helps a lot.

David Tindall  
424-2340 (office)  
455-7456 (home)

FOCUSING ON CONSTELLATIONS

BOOTES: The Herdsman, Hunter, Ploughman.

There are several legends that have been associated with Bootes. One views Bootes as a herdsman with his two dogs, Asterion and Chara (also called Cor Caroli) in Canes Venatici, keeping the Great Bear away from his herd of animals. Another sees him as a hunter, eternally stalking the Great Bear around the skies. A third sees Bootes as a ploughman driving his oxen to pull his invention, the plough.

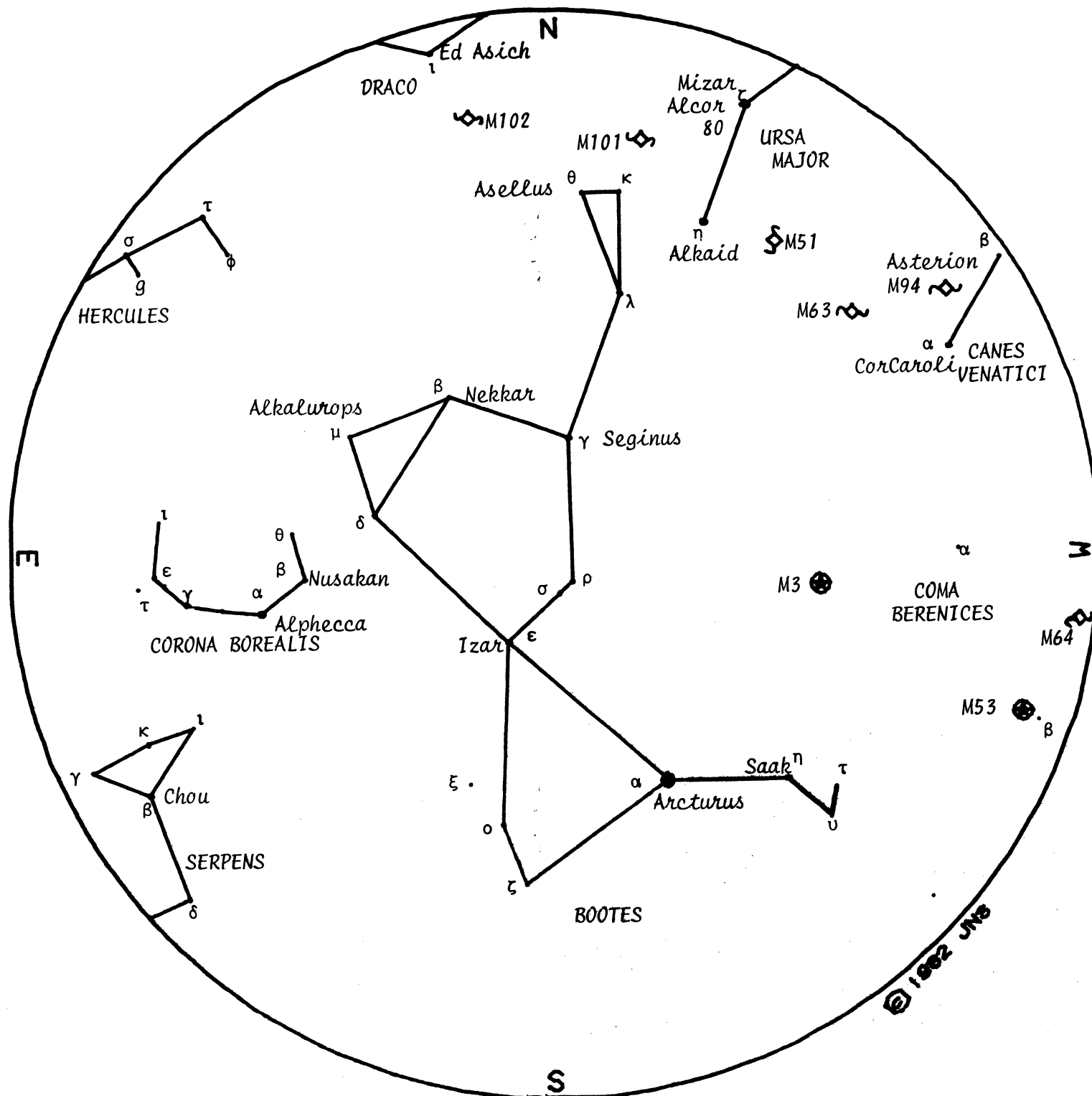
Bootes is often described as a kite-shaped constellation with the bright star, Arcturus, at the base. To make the kite on the accompanying diagram, join Seginus to Arcturus and keep only those lines  $\alpha$ - $\delta$ - $\beta$ - $\gamma$ .

Arcturus, the fourth brightest star in the sky, is a reddish-yellow giant star. In 1933, the light from Arcturus was focused on photoelectric cells and the current that was generated triggered the flood lights to officially open the Chicago World's Fair. Xi ( $\xi$ ) Bootes, a yellow and reddish-violet double with an apparent separation ranging from 1.8" to 7.3", has a period of 150 years. In 1984 these two stars will have their maximum apparent separation. Their magnitudes are 4.7 and 6.8.

Bootes is located near the north galactic pole, and as such is in a rather barren region. There are 3 nearby Messier galaxies in Canes Venatici (including the well-known M51, the Whirlpool galaxy). M101, another well-known spiral galaxy, is easily found above the outstretched arm of Bootes and actually lies in Ursa Major. Two globular clusters are also in our diagram, M3 in Canes Venatici, and M53 in Coma Bernices. All of these Messier objects are splendid when viewed through a moderate sized telescope.

A very striking constellation to find is Corona Borealis, the northern crown. This small constellation is more regular in shape than most, and forms a glittering and untarnished crown between Bootes and Hercules.

- Norman Scrimger.

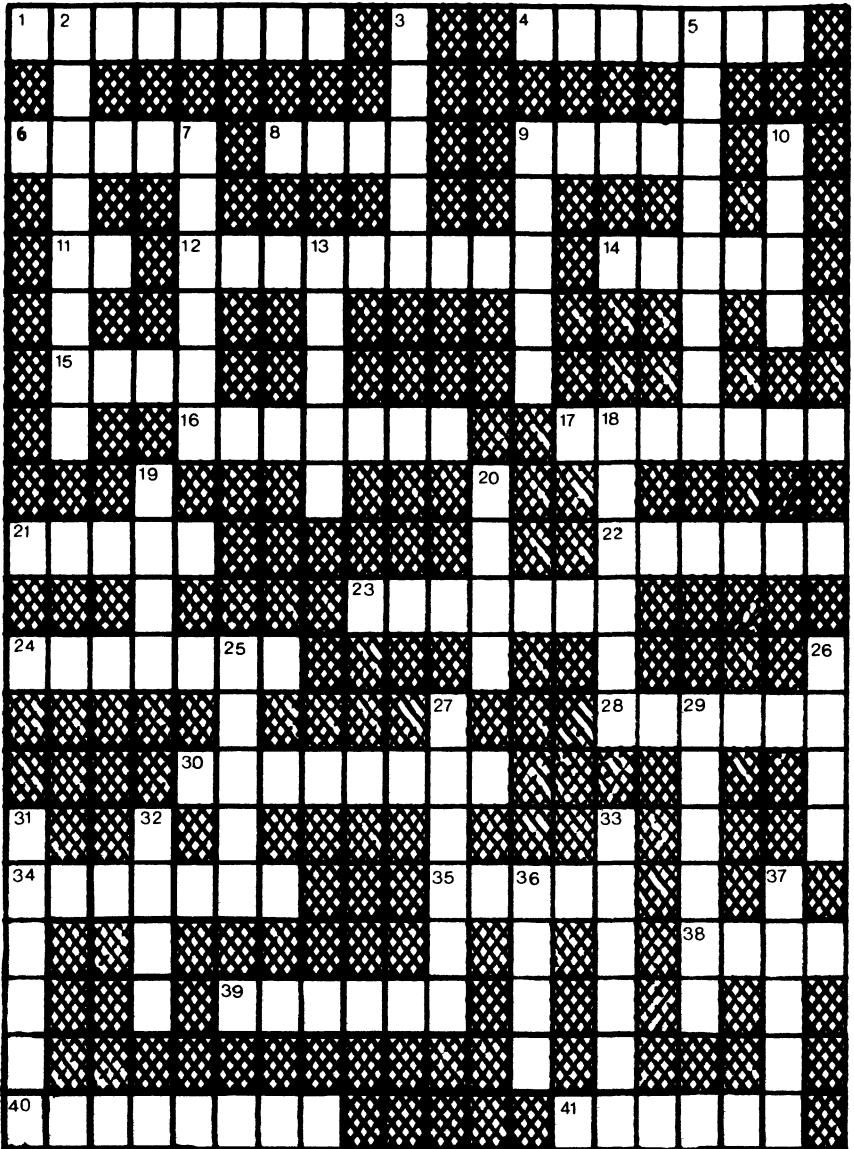


## PUZZLE CORNER

### ASTRO CROSS WORDS

Members of the Solar System

Laurie Burgoyne and Norman Scrimger



MEMBERS OF THE SOLAR SYSTEM

This issue's puzzle contains the names of various members of the solar system, from planets and their moons to asteroids and comets. Answers to this puzzle will be given in the next issue of NOVA NOTES. Answers to the last puzzle - Features On The Moon - can be found in this issue.

ACROSS

- 1) First Trojan asteroid to be discovered.
- 4) Sixth moon of Jupiter found.
- 6) Roman god of the underworld.
- 8) Fifth companion to Jupiter's father.
- 9) Aphrodite
- 11) Hottest of Jupiter's lovers.
- 12) This giant (companion to Saturn) lies under Sicily.
- 14) Name given to the twelve early giants.
- 15) Spanish for "bull".
- 16) Roman god of the sea.
- 17) Shakespeare's Queen of the Fairies.
- 21) This first asteroid was discovered by Guiseppe Piazzi.
- 22) Inner most and smallest of the retrograde moons of Jupiter.
- 23) King of the gods.
- 24) Companion to Uranus also takes good pictures.
- 28) First moon Nicholson ever discovered.
- 30) Spectacular fizzle of 1973.
- 34) Moon discovered with Ariel.
- 35) Nearest named moon to Saturn.
- 38) Near earth-crossing asteroid 1627.
- 39) Second asteroid discovered.
- 40) Small sulphur coated rock in orbit about Jupiter.
- 41) Fifth largest satellite of Saturn.

DOWN

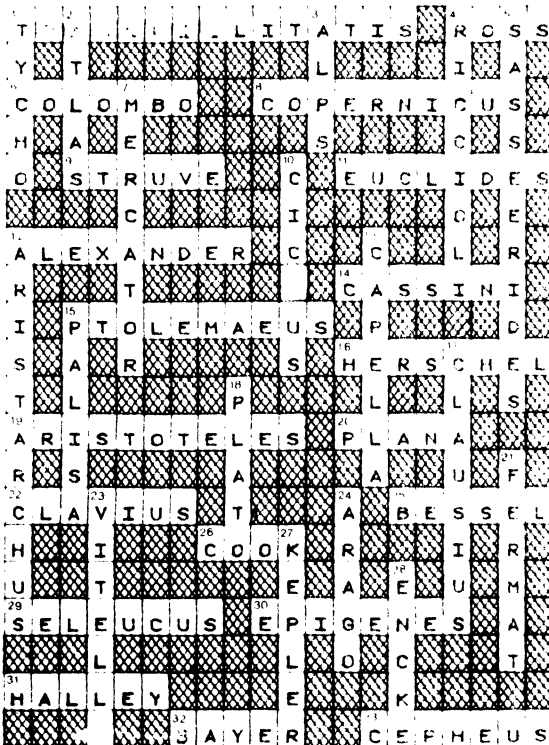
- 2) Second largest of the Galilean moons.
- 3) By Zeus, the mother of Tityus.
- 5) One of two moons discovered by Nicholson in 1938.

## DOWN (con't)

- 7) Married to 17) across.
- 9) Bright asteroid found in Capricornus in 1982.
- 10) Roman name for Zeus' queen.
- 13) Home sweet home.
- 18) Fellow who flew too close to the sun.
- 19) Satellite of Jupiter discovered in 1974 by Kowal.
- 20) Tall elegant flower.
- 25) Mother of 9) across.
- 26) Comet not-east.
- 27) Moon whose name means "terror"
- 29) Moon having a period of almost one year.
- 31) Another of Jupiter's mistresses.
- 32) Near earth-crossing cupid.
- 33) Became the mortal bride of 32) down.
- 36) Roman name for the Greek god Ares.
- 37) Moon discovered by Dollfus, 1966.

### Answers to the last PUZZLE CORNER

#### FEATURES ON THE MOON



APRIL LYRID METEOR STORM REPORT

On the night of April 21/22 the April Lyrid Meteor Shower was on. In the past I have observed this shower with the results being very low in numbers. At times 2 or 3 hours would go by without any meteors from this stream.

Well folks, on the above mentioned night I was out for an hour and did not see anything. The following day I received a phone call from Mr. Hal Povenmire in Florida who is into meteors. He told me that at 2:30 EDT the shower produced 5 meteors per minute, then nothing would show for the next minute and then another 5 would occur. This lasted for one half hour.

So what can be said about the upcoming meteor showers and will they produce high numbers? What about the Perseids in August, will they exceed 100 per hour or will the comet hit us?

I think that we amateurs should monitor these showers and then at least we will know if they are increasing or dying.

Unfortunately the weather in Halifax was cloudy for the Eta Aquarids on May 3/4 so I don't have any results as of yet.

All you have to do, is to plot them on a star chart with their color, MV, duration and any unusual sightings. If you have a SLR camera take a time exposure 26 degrees away from the radiant point for 20 seconds if in the city or 1 hour if in the country. Good luck.

Michael Boschat



THE U.P.E.I. PLANETARIUM

Going to P.E.I. this summer? 600,000 other tourists are! About 10,000 of them will visit the University of P.E.I. Planetarium--more if the weather turns out to be poor. The Planetarium opened 1 July last year under the directorship of Prof. Earl Wonnacott of the University's Physics Department. Since then more than 12,000 people have come under the dome to experience a planetarium show.

The Planetarium dome is actually a dome within a dome. The outer shell is a truncated geodesic dome 50 feet in diameter and 34 feet high. But inside is a second dome 30 feet across that seats 60 expectant visitors and it is this inner dome which becomes the screen for the Spitz A3p star projector, the battery of other projectors and special effects apparatus.

The heart of the Planetarium is the star projector consisting of a sphere for projecting the 2500 star images and consisting of suspended cages to project images of the Sun, Moon and planets. The brightest stars are projected with lenses incorporating filters to give realistic colours to the stars. The Milky Way and Andromeda galaxies and the Magellanic Clouds are also projected by the star sphere. Beneath the sphere in the cages are motorized systems for projecting the motions of the Sun, Moon and planets and with these projectors, the operator can simulate the skies at any time of the year, past present or future and for an observer anywhere on the Earth. Thus equipped, the planetarium becomes a powerful educational tool for fundamental astronomical concepts.

However, to balance the educational role of the planetarium the audience is entertained with a light and sound show. The various special effects, projectors and sound system are controlled by the projectionist from a consol surrounded with switches and knobs which, for the more demanding shows, require a high degree of coordination and timing. Eight slide projectors and a film projector are controlled by a microprocessor and this light show dazzles the audience as the projectors flash, fade, zoom and switch back and forth across the dome.

The main show this summer runs three times each day and is called "To Worlds Unknown". This show was produced by the Hansen Planetarium in Utah and is an hour long dramitization of NASA's recent missions to the planets and highlights the very successful Voyager missions to Jupiter and Saturn. The mixture of visual stimulation and presentation of scientific results will "wow" any audience. In addition two other shows produced by the U.P.E.I. Planetarium alternate on a daily basis. The Sky Tonight and Summer Skies'82 acquaint would be astronomers with the constellations and planets and will give an appreciation of the types of objects astronomers study.

The U.P.E.I. Planetarium is the first major planetarium in Atlantic Canada (Halifax's planetarium, the first public planetarium in Canada, is somewhat out classed by this new facility). Few other types of museum or entertainment will enthuse you and the kids like a visit to the planetarium and you'll probably be astonished by the knowledge children have about space and astronomy. Astronomy is the science best adapted to meet public interest,--the fact that almost a million Canadians visited a planetarium last year proves the acceptance of this form of scientific presentation. Perhaps the isolation of an island will help you envision and enjoy a trip to outerspace through the magic of a planetarium show. After a trip to the planetarium you'll certainly have a better appreciation of the mysterious objects overhead once you emerge from the dome into the clear summer skies of P.E.I.

R. Brooks

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## ASTRONOMY - AN OVERVIEW

The Science of Astronomy. Webster's Dictionary describes Astronomy as the science of the celestial bodies and of their magnitudes, motions and constitution. As apt as this description might be, it sounds very cold and abstract to someone with an amateur interest in astronomy. This is not necessarily true, especially if one has a good look at the field of astronomy - ancient and modern. Once an understanding of astronomy is achieved it will readily become apparent that there is something of interest for everyone.

Ancient Astronomy. Astronomy is perhaps the oldest of the sciences, yet there must have been a time somewhere back in pre-history when the first person looked up at the sky and consciously wondered what it all meant. Curiosity of ancient peoples concerning day and night and the sun, moon and stars led eventually to the observations that the heavenly bodies appear to move in a regular manner. This appreciation of that knowledge became very useful in determining time. So it can be said that astronomy grew out of the need to establish with precision the proper time for planting and reaping of crops, for religious celebrations and to find bearings on long trading journeys or voyages.

Eventually, man in the north temperate zone noticed that daytime and nighttime were unequal in length. It also became obvious that the relative position of the sun among the stars changes gradually. The Egyptians were the first to notice that the sun moves completely around the sphere of the fixed stars in about 365 days and nights.

Further study showed that the sky held six other objects, the moon and five bright planets. These bodies together with the sun, move around the star sphere within a narrow belt called the zodiac. Man in ancient times imagined that these celestial events, especially the planetary motions, were connected with his own fortune. This belief, called astrology, encouraged the development of mathematical schemes for predicting the planetary motions and thus furthered the progress of astronomy during ancient times.

Interesting constellation maps and some useful calendars were developed by several ancient peoples, notable the Egyptians, the Mayans, the Chinese and the Babylonians. The Babylonians may have invented the system of calculation. However it is the Greeks who made important theoretical contributions to astronomy. Scientific contributions are associated with the names of Thales of Miletus and Pythagoras of Samos. Probably the most original of ancient astronomers was Aristarchus of Samos. He believed that motions in the sky could be explained by the hypothesis that the earth turns around its axis once every 24 hours and along with the other planets revolves around the sun. This view did not prevail at that time. Other, more simplistic views (the geocentric theory) remained popular and unchallenged for almost two thousand years.

Medieval (Pre-modern) Astronomy. The history of astronomy took a dramatic turn as a result of the contributions of the Polish astronomer, Nicholas Copernicus. His theory showed that the planetary motions can be explained by assuming a central position for the sun rather than the earth.

The Copernican theory was supported with evidence discovered by Galileo Galilei, the Italian astronomer. With a small refracting telescope he discovered that the planets do indeed revolve around the sun. The phases that Venus showed indicated that this was so. Galileo also discovered four moons of Jupiter and the rings of Saturn. From the scientific point of view, the Copernican theory was only a rearrangement of the planetary orbits yet Galileo's support of this theory brought him much personal abuse from ecclesiastical authorities.

The Danish astronomer Tycho accumulated much data on the motion of the planets which was very helpful to his student, Johannes Kepler, who later using much of Tycho's data, discovered the laws of planetary motion. The British physicist, Isaac Newton advanced a simple principle to explain Kepler's laws of planetary motion. By mathematical reasoning, he proved that an attractive force exists between the sun and each of the planets. This force which depends on the masses of the sun and the planets and on the distance between them, provides for the basis of the physical interpretation of Kepler's laws. Newton's mathematical discovery is called the law of universal gravitation.

Modern Astronomy. After Newton's time, astronomy branched out in several directions. These are astrometry, the observational study of the positions and motions of heavenly bodies (not movie stars); celestial mechanics, the mathematical study of their motions as explained by the theory of gravitation; astrophysics, the study of their chemical composition and physical condition from spectrum analysis and the laws of physics; and cosmogony, the study of the universe as a whole.

Before the invention of the telescope, the stars were regarded as merely a convenient backdrop for scanning the wanderings of sun, moon and planets. The first person to study the area beyond the solar system with a telescope of significant size was the British astronomer William Herschel. He constructed the largest reflecting telescopes of his day and used them to explore the cosmos. His discoveries include the planet Uranus, several satellites, many double stars and a large number of star clusters and nebulae. Herschel's discoveries led to his hypothesis of the existence of the Milky Way Galaxy. The Milky Way contains great quantities of dust and gas particles scattered between the stars. This interstellar matter intercepts the visible light emitted by distant stars so that observers on earth cannot view in detail distant parts of the Milky Way. A solution to this problem was found and a new branch of astronomy came into being when the American electronic engineer Karl Jansky discovered in 1931 that radio waves are emitted in the Milky Way. Radio waves emitted by distant parts of the galaxy can penetrate interstellar matter, which is opaque to visible light and thus enable astronomers to scan with radio telescopes those regions normally hidden from observation by optical telescopes.

Spectrum analysis of the light from exterior galaxies shows that the stars comprising these systems are composed of the same chemical elements known on earth. Current research on distant galaxies provides data useful in determining the over-all behavior of the universe and its beginnings.

Peter Steffin

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