NOVA NOTES

BI-MONTHLY JOURNAL OF THE HALIFAX CENTRE

NOV - DEC 1982 VOL. 13 , No 6

COVER ILLUSTRATION

THE BURKE-GAFFNEY OBSERVATORY

The Rev. Michael W. Burke-Gaffney Observatory was opened at Saint Mary's University in 1972 and has been serving the needs of staff and students ever since.

The five metre dome is easily visible atop the 23-storey Ignatius Loyola Residence complex. Mounted upon a special pad, the dome houses the Observatories 0.4 metre reflecting telescope. It is used for general public viewing, student instruction and astronomical research.

The observatory is named for the late Professor Emeritus, Rev. Michael W. Burke-Gaffney, astronomer, engineer and educator who was at Saint Mary's University from 1940 until his death in 1979.

Visiting hours for the general public at the Burke-Gaffney Observatory are:

OCTOBER - APRIL: Saturday evenings, 7:00 p.m.

MAY - SEPTEMBER: Saturday evenings, 9:00 p.m.
Monday evening or daytime
tours by arrangement.

Phone 429-9780, extension 184.

The cover illustration is by A.W. Syperek and courtesy of Saint Mary's University.

1982 HALIFAX CENTRE EXECUTIVE:

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MINUTES--SEPTEMBER MEETING

The September meeting was held on the 17th and was presided over by the President, Walter Zukauskas. A few announcements were followed by Kathy Oakley who drew members' attention to some astronomical events and to an up coming observing session. Walter also asked members to make observations of Delta Cephei in October and Nov. with these to be collected at the November meeting for analysis. He mentioned something about a prize for the person making the most observations.

Cathy Chaisson was the first of the evening's speakers. She attended the Saskatoon General Assembly in May as the Centre's official representative. As our National Rep Cathy attended the National Council meetings, the paper sessions and several social functions organized by the Saskatoon members. She brought a number of photographs recording her trip and activities and from her report we gathered that she enjoyed her stay in Saskatoon. Cathy thanked the Centre for sending her and for allowing her to participate in another side of Society activities.

Peter Edwards was next in the limelight. His presention concerned the testing of mirror surfaces during the grinding and polishing stages of mirror making. He quickly reviewed the geometry of the optics demonstrating the difference between focal length and radius of curvature and the effects of deviations in the mirror surface. He then discussed, with the aid of slides, the purpose and use of the Foucault test as a means of quantitatively determining the shape of the mirror surface--a necessary procedure if spherical abberation is not to downgrade the quality of images. Finally Peter showed slides of mirror surfaces photographed through a Ronchi screen (actually his version is simply a hair comb). He advocated alternating this technique with the Foucault test as a means of quickly obtaining a qualitative impression of the mirror's shape without the tedious measurements and calculations of the Foucault test.

Walter Zukauskas returned to the floor to demonstrate the advantages and uses of small, simple telescopes. He

brought three small telescopes for demonstration-- a 4½ inch reflector of his own making which has greater light grasp than the other two; a 2½ inch refractor of f/15 useful for planetary observation and a 3 inch refractor rich field telescope ideal for observation of nebulous objects. This latter instrument was made by the Dal Physics Dept. after Dr. Bishop's design. Walter is an advocate of small, simple, quick and easy to use instruments as a means to enjoyable observing without the frustrations often encountered with larger instruments. Walter demonstrated some possible observing projects with such telescopes including how a piece of window screen can be used to form a spectrum of a star. Sydney Robertson confirmed at the October meeting that the principle works having tried it with his 6" reflector.

MINUTES--OCTOBER MEETING

The October meeting was held a week latter than normal (22nd) and at a new venue (Maritime Museum of the Atlantic Dispite this we had an excellant turnout.. The Vice-Pres., Dr. David Tindall, convened the meeting with a few announcements including the fact that memberships are due and that the'83 Handbooks are available for members to pick up. Additional copies can also be obtained for your friends at $7.00 (plus $1.00 postage if required). Kathy Oakley reminded members of the occultation of Mars on 19 November just as the Moon sets. An observing session will be arranged to correspond with the event which also happens to be our meeting night in November. David then introduced the evening's speaker, Dr. Robert Hawkes of the Physics Department, Mount Allison Univ.

The main theme of his talk was the structure of meteors. Bob opened with the question, What do the following have to do with meteors--1) a pea; 2) dynamite; 3) an umbrella and 4) glue? The answers???....

1) A pea is the size of a particle causing a bright fireball. However, the vast majority of meteor particles are much smaller with the smallest weighing a millionth

of a gram or less. Most of the meteors we see burn up 110-75 km above the surface of the Earth and the flash of light, only 1 or 2 meters across, is caused not by the hot luminous meteor particle but as a result of collisions between ions ripped off the meteor with atmospheric atoms.

2) Dynamite has less energy than a meteor for an equivalent mass. A meteor's energy is given by $E = \frac{1}{2}mV^2$ and when the velocity is 40-60 km/sec, the energy generated is quite tremendous as can be witnessed in lunar craters and Earth craters such as the Barringer and Chubb craters. Fortunately, the bombardment rates of meteors decreases linearly as the size increases and such catastrophic explosions as formed the Barringer and Chubb craters are widely spread in time.

3) The umbrella is used, of course...,during showers and Bob explained that meteors observed during meteor showers originate from the disintegration of comets. The majority of sporatic meteors also come from comets with only a very occasional meteor being of asteroidal origin.

4) Bob uses glue in his theory of the structure of meteors. The theory developed in the 50's and 60's used irregular, fluffy,fragile conglomerates as a model. Tiny particles collected by Brownlea would support this idea for very small meteors. However, he has also collected tiny spheres of more tightly bound structure. Neither type of particle will explain the theoretical light curve expected of a solid meteor--slow brightening/very rapid fading--nor of actual light curves which may suddenly brighten one or more times along the path. Bob theorizes that meteors' light curves can be explained by a conglomerate of particles held together by some type of "glue". The melting glue gives the slowly brightening component of the light while escaping grains cause the flashes.

The Giotto and Verera/Halley space missions planned to visit comets may answer some questions but in the meantime Bob is developing a detecting system to further study meteors. A lively question period followed a very well received lecture.

R. Brooks
Secretary

* Simon Newcomb Award *

At the meeting of the Council of the R.A.S.C. on May 21, 1978, a proposal from the HALIFAX CENTRE, the 'Simon Newcomb Award' was adopted. The award is named after a native of Nova Scotia, an astronomer who was the foremost man of science of his time in America.

Simon Newcomb (1835-1909) was born at Wallace Bridge, N.S. At age 18 he moved to Massachusetts and later to Washington, D.C. where he spent his entire professional life. In 1861 President Lincoln commissioned him as professor of Mathematics and Astronomy in the United States Navy. For 16 years he carried on astronomical observations at the Naval Observatory. From 1877 to 1897 he was Superintendent of the American Ephemeris and Nautical Almanac Office. Newcomb became the world authority on the orbital dynamics of the Moon and the Planets. Among the many honors which he received were the Gold Medal of the Royal Astronomical Society (1874), the Copley Medal of the Royal Society of London (1890), President of the American Association for the Advancement of Science, the first President of the Astronomical and Astrophysical Society of America (the present American Astronomical Society), and seventeen honorary degrees fro leading universities in the United States and Europe.

RULES

TOPICS

Awards will be given for articles relating to astronomy, astrophysics or space science. Topics should interest average to well-informed amateurs and may be of current or historical interest.

PRESENTATIONS

Articles should be 1000-2500 words, written in proper grammatical form and presented typewritten and double-spaced. Diagrams need not be in finished form but should be complete and ready for drafting. Photographs may also be submitted and if possible original negatives should accompany the submission. References should be included and according to the style used by the JOURNAL.

ELIGIBILITY

Any R.A.S.C. member in good standing may submit articles. The intent of the SIMON NEWCOMB AWARD is to recognize literary ability among non-professional members of the Society.

SUBMISSION OF ENTRIES

Articles must be received by the Awards Committee of the R.A.S.C. between January 1 and March 31. Members of Centres must first submit the entries they wish to their Centre Executive with the Executive choosing the entries they wish to represent their Centre. It is the responsibility of the Executive of the Centre to ensure the entries are received by the deadline above. Unattached mambers will submit their entries directly to: The Awards Committee, Royal Astronomical Society of Canada, 124 Merton St., Toronto, Ontario, M4S 2Z2.

JUDGING

Articles will be judged by the Awards Committee. Criteria shall include scientific accuracy, originality, and literary merit. To maintain unbiased judging, the identity of the author(s) should not appear in the body of the paper.

PRESENTATION OF AWARD

The award will be presented at the General Assembly by the Halifax Centre representative to the winner (or a representative of the winner's Centre). The award will remain in the hands of the winner's Centre for display and will be returned to the National Office by April 1 of the following year. If the winner is an unattached member, the award will be displayed at the National Office of the R.A.S.C. A photograph of the Award may be found in the R.A.S.C. NATIONAL NEWSLETTER, L81, Dec. 1978.

OBSERVING SESSION — Kathy Oakley

DIRECTIONS TO SHUBE PARK

If you live in the Halifax/Dartmouth area and want a close-to-home spot for observing, I recommend you try this open area on the Waverley Road. There is some light pollution but not as much as amny of us get in our own back yard.

To get to Shube, take the old Waverley Road turn-off from the Mic Mac Rotary. Drive 3.4 km to Jaybee Avenue (on left). The park is located at the top of Jaybee. The spot I recommend is the softball field, located just below the main entrance to the park - you can turn right or left when you enter. A dirt road going past the main gate will take you directly there.

The park is open all winter for day activities and I am told by park officials that R.A.S.C. members are welcome to go there any evening for star-gazing.

COMETS (Part 2)

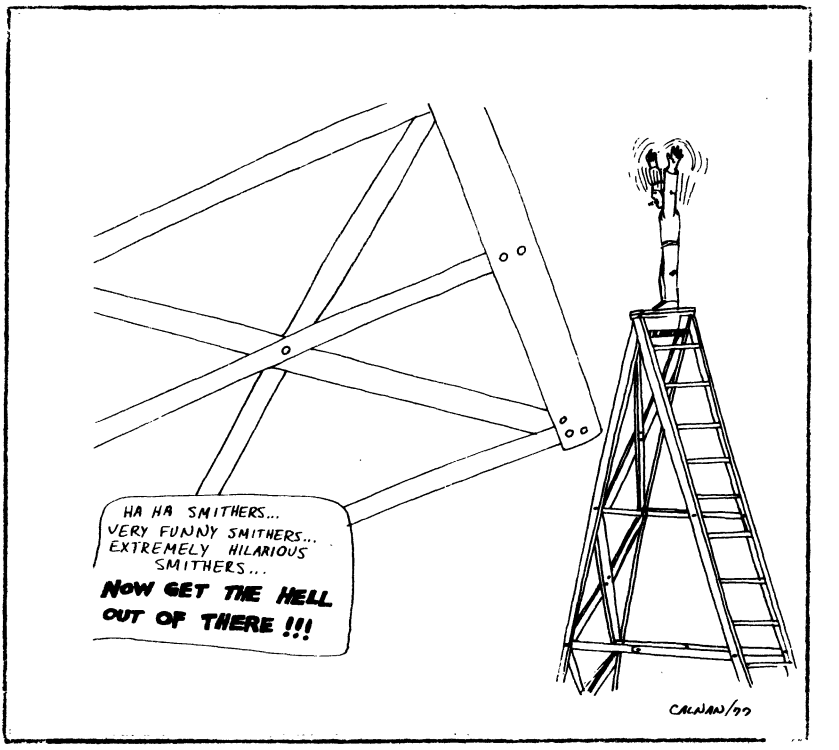
Most comets have two tails, a dust tail and a plasma tail. Dust tails are formed when dust particles in the coma are swept away by solar radiation pressure. The dust tail is curved, usually about 10^6 to 10^7 km long and appears yellow due to the reflection of sunlight by the dust particles. Occasionally, a comet will have more than one dust tail, each of which has a different curvature. Several comets, the best known of which is Comet Arent-Roland, have an anti-tail, a tail which points towards the sun. Anti-tails are really fan-shaped sheets of material ejected from the comet and following it in its orbital plane. The material is diffuse and can only be seen when the sheet is edge-on and the Earth is in the plane of the comet's orbit. This produces the appearance of a sunward pointing spike.

Dust Particles from the tail orbit the sun and contribute to the zodiacal light and also to meteor showers which occur when the Earth passes through the path of a comet's passage.

Plasma or ion tails are formed when ionized particles in the coma are coupled to and concentrated along magnetic field lines in the solar wind and are carried away from the coma. The plasma tail is straight, about 10^6 to 10^8 km long and appears blue due to emission of CO^+ and other ions. These tails do not usually appear until the comet is 1.5 to 2 A.U. from the sun but occasionally appear when the comet is further away and sometimes do not form at all. They also show knots and kinks which move away from the nucleus at varying speeds and sometimes even disconnect and drift away altogether.

About ten comets appear each year, a few of which are new comets entering the solar system for the first time while others are making a return trip. They appear in the skies, often as naked-eye objects, make their passage about the sun and then fade from our view to continue their journey in the darkness of space. They may return again in 10 or a million years or they may be just passing by on their way out into interstellar space.

J.S. Wells



FOCUSING ON CONSTELLATIONS

CEPHEUS

The constellation Cepheus complements our centre's observing project of the variable star δ Cephei. Cepheus, in mythology the king and husband of Cassiopeia, is located in a region of the northern sky devoid of bright stars. The brightest star in Cepheus, Alderamin, is only 2.4 visual magnitude. The star δ Cephei can easily be found at the south-east corner of the constellation.

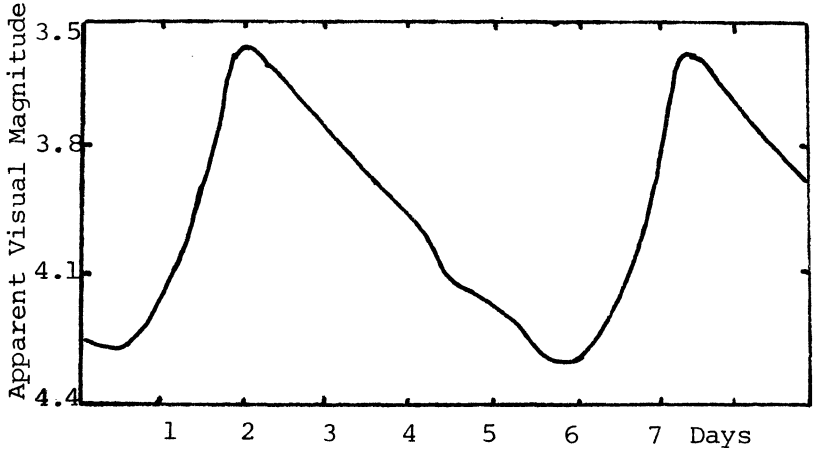
δ Cephei is the prototype of a very important class of variable star that has proved to be one of the most valuable distance indicators in the universe. Through an investigation of the apparent brightnesses and periods of these Cepheid-type variables, a Period-Luminosity Law has been established: "The longer the period of light variation a given Cepheid has, the brighter the star is". This relation seems to be rigidly followed by these intrinsically bright stars everywhere that they are found. Since the true brightness of the Cepheids has been determined, it is possible simply by identifying a new member of the class in a distant galaxy and determining its period, to estimate that galaxy's distance on the basis of the apparent magnitude of the new Cepheid.

Cepheid variable stars range in period from about 3 to 50 days. Their magnitude range is from about .1 to 2 magnitudes. δ Cephei itself has a period of 5 days 8 hours and 48 minutes, and varies in apparent magnitude from 3.6 at maximum to 4.3 at minimum. The light variations were first discovered in 1784 by John Goodricke. A light curve for δ Cephei is shown below. There are other Cepheid variables in the field of the constellation. Polaris is a short period, low amplitude Cepheid: Period 3.97 days, and magnitude range of .1 magnitudes.

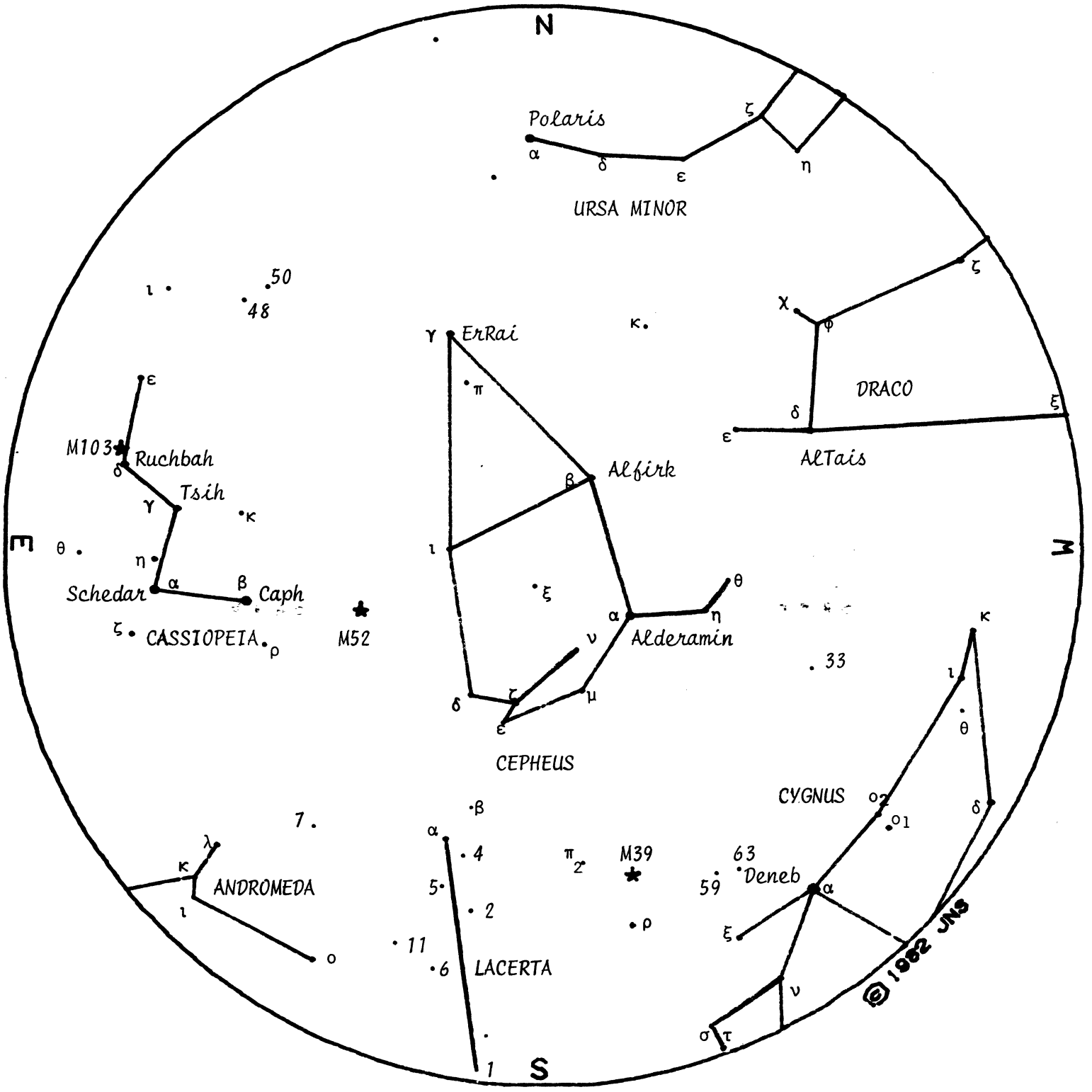
Delta Cephei is also a double star, with its companion being magnitude 6.3, and separated from the primary by almost 3/4 of a minute of arc. Such a separation, when coupled with the distance to δ Cephei, gives an actual separation between the two stars of about 13,000 times the separation of the earth and the sun. The orbital period for the pair would be at least 250,000 years.

While you are looking at δ Cephei, cast your view around the field of Cepheus. There are several other kinds of variable stars, binary stars, and eclipsing binaries. Nearby U Cephei is a dramatic eclipsing variable. Being less than 9 degrees from the celestial north pole, it can be observed year-round. Having a period of just under 2½ days, this eclipsing pair drops more than two magnitudes, from 6.8 to 9.2, during the eclipse. The minimum last for two hours; it takes four hours to fall to minimum light.

Even nearer to the north pole (within 5 degrees) is the oldest known open cluster in our galaxy. NGC 188, which is thought to be between 12 and 14 billion years old, lies about 1000 light years above the plane of the Milky Way. It is about 5000 light years from the sun. Most open clusters are only tens of millions of years old, and are found in the youngest regions of the spiral arms of our galaxy. These clusters are also used to map the spiral structure in other galaxies because of their close association with young regions.



The Light Curve for Delta Cephei

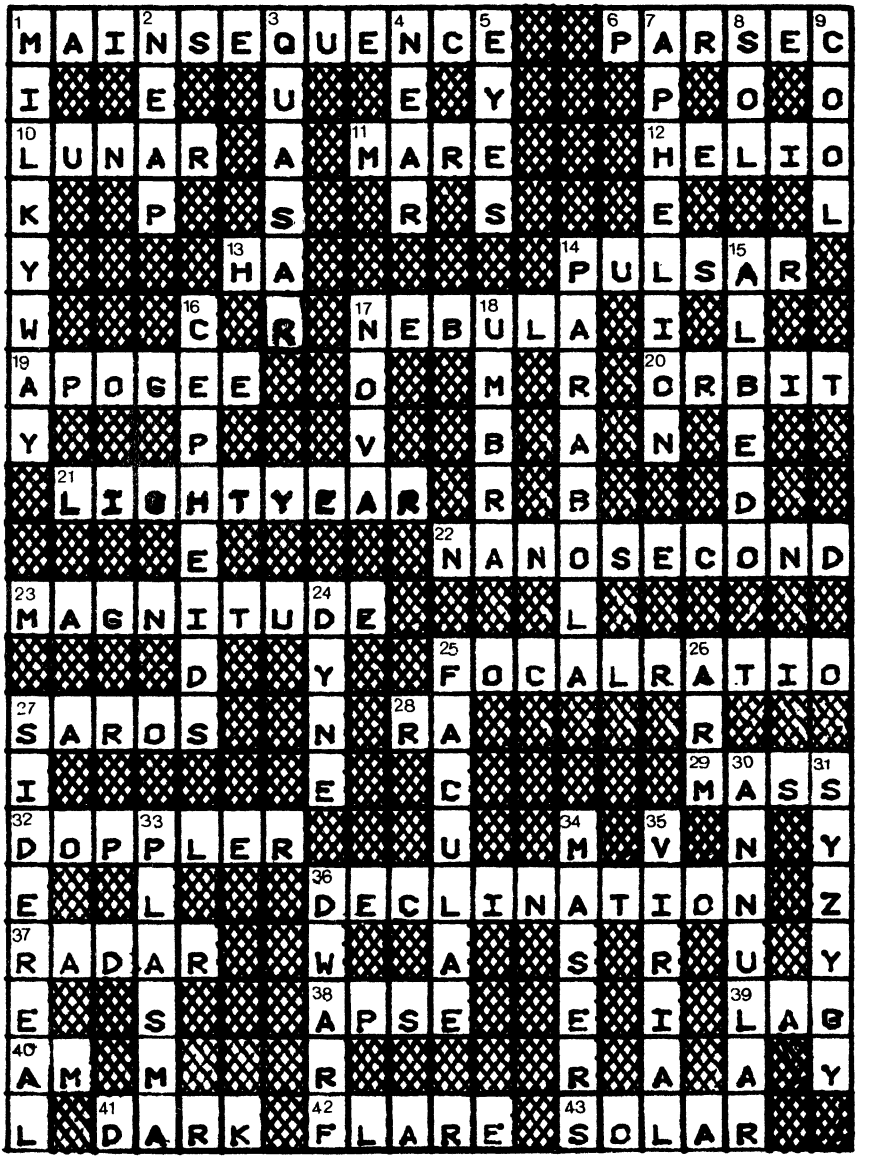


FOCUSING ON CONSTELLATIONS BY NORMAN SCRIMGER

Answers To Last Issues Puzzle Corner:

"Terms in Astronomy"

Laurie Burgoyne and Norman Scrimger



Is There a Planet-X?

- R. Brooks

Since the discovery of Pluto more than 50 years ago, there have been occasional suggestions among astronomers, that a tenth planet may exist in our Solar System. Recent speculation has suggested that this object might be a very interesting body. One theory even considers the possibility of a dark star companion to the Sun, perhaps as far as 80 billion km. more distant than Pluto.

How does one attempt to locate such a body hidden among the billions of objects visible in the sky? Pluto was discovered in 1930 by a systematic inspection of images of each object on hundreds of photographs, while Neptune was discovered in 1846 because of its gravitational pull on Uranus and Jupiter. This pull perturbed or changed the orbits of these two planets sufficiently to allow astronomers to calculate the position and size of the more distant body. In a similar manner, given sufficient time and very accurate observations of the three outermost planets, a tenth planet might be found 5-100 time more distant from the Sun than Pluto. However, the effect of the perturbations from a tenth planet, if it exists, are so small as to be lost among the errors of the observations made up to this time.

As a result of the discovery in 1978 of Chiron, Pluto's Moon, Pluto's mass has been estimated to be only one fifth that of our Moon. This mass is so small that its perturbations on Neptune are undetectable. If any perturbations could be detected from existant or new observations of the orbit of Neptune, then a tenth planet's position might be determined. This method will take many years and better equipment.

Fortunately, an alternative exists to carry out the search for Planet X. The Pioneer 10 and

11 spacecraft, launched in December 1973, will speed up the process of confirming the existance of Planet X. Pioneer 10, now between Uranus and Neptune, and Pioneer 11, now between Saturn and Neptune, will both be more distant from the Sun than any of the planets next year. These satellites are "artificial planets" and ones for which their positions can be determined very precisely. A radio signal of known frequency is transmitted to the spacecraft. The frequency of the returning radio signal is measured and a change in frequency indicates a change in velocity of the satellite. This technique is so precise that the velocity can be determined to a fraction of a millimeter per second! By making periodic and continuous measurements, the trajectories or paths of the Pioneers can be determined extremely accurately.

Should any unexplained changes occur in the paths of the Pioneers, then these changes will reveal the existance of another body in the Solar System. The Pioneers are travelling out of the Solar System in roughly opposite directions. Because of this, the effects of a tenth planet on the two satellites will not permit an unambiguous determination of the unseen object's position but will indicate the line along which the body lies. However, the Pioneers will answer with certainty the primary question of whether there is indeed a tenth planet and results from the Pioneers will allow us to put constraints on the distance, size and type of the body. With that information different techniques can then be employed to look for the hitherto unobserved object.

Recently there has been some speculation on the nature of a tenth planet. First, if we were to accept that such a planet would be 8 billion km. beyond Pluto - a value predicted by Bode's formula of planetary distances - then the undiscovered planet would have to be 50,000 km. in diameter. A body that large, about the size of

Neptune, is easily within the light grasp of existing telescopes. In fact such a body would have been observed during the search for Pluto unless it was a very dark planet.

If the planet were more distant than suggested by Bode's formula, then there might be a body many times further away. But if the body is further away, it must be much more massive to exert the same gravitational pull. A body only 5 or 10 times the size of Jupiter would be a star and would have been seen long ago regardless of its direction in the sky. However, we could speculate that a large star may have evolved to become a dark object - perhaps a black dwarf star or even a black hole. This is remotely possible and, if correct, a black hole several times the mass of the Sun would have to be at least 130 billion km. from the Sun. Such a discovery would be astounding and would result in a flurry of fascinating new experiments and projects. However, we'll first have to wait for the results of this current experiment using the Pioneers before we can do anything more than speculate on the nature of Planet X.

When Henry Norris Russell, the Princeton astronomer, concluded a lecture on the Milky Way a woman asked him: "If our world is so little and the universe is so great, can we really believe that God pays any attention to us?"

"That, madam," replied Dr. Russell, "depends entirely on how big a God you believe in."

- Quoted by Bill Gold in the Washington Post

THE NEW KID ON THE BLOCK

I received a phone call a few weeks ago from our illustrious editor, asking me if I was interested in becoming a budding author. My brilliant reasoning told me that it was not my literary ability he was after but in fact something of astronomical interest that would fill a page or two of this issue of NOVA NOTES and so here I am.

For as long as I can remember I have been a star gazer but my equipment was always to say the least, far from adequate. There is not a lot that you can see with a 1½" reflector (yes, a 1½" reflector) and a pair of binoculars. The past three or four years have seen me on clear nights either in my backyard where the brightest object in the sky turns out to be the landing lights of an approaching aircraft, or at Lawrencetown beach with my trusty 7X35 binoculars and a star chart growing more and more frustrated.

One night, a voice (Ithink it was Carl Sagan) called down from the Cosmos with the suggestion that the answer to my frustrations was quite simple. It said "Buy a C-8!" So without hesitation I ran to my nearest Celestron dealer and purchased one. That left me with one 'little problem'. I was confronted with so many figures and co-ordinates and technical terms that my simple simple star gazing was no longer simple and at times still very frustrating. In fact, there were evenings when it bordered on being no fun at all.

Out of sheer deparation I began to seek help and answers to my literally hundreds of questions in an attempt to salvage some pleasure out of what should be an enjoyable hobby.

I would like to thank a few people for guiding me through the "black holes" and enabling me to see the light at the end of the t _ _ _ _ (telescope). Firstly, Peter Steffin for helping to get the orange beast set up and aligned. To Mike Edwards for taking the time to suggest various objects to observe and how to photograph them during a weekend I spent in a dark corner of Pictou County. By the way Mike, it was cloudy all weekend. Thanks also to Walter Zukauskas for putting up with what must have sounded like a lot of foolish questions. A special thanks to Randall Brooks who had to suffer through more questions than everyone else combined and who will probably continue to do so in the future.

To help me answer a lot of the still remaining questions I have enrolled in an Astronomy class as one of my evening classes at Saint Mary's University. So at this point may we have a moment of silence for Norman Scrimger who finds himself in the position of having to put up with me for the entire school year and face all my questions. With any luck, as the year progresses I will be able to understand what is discussed at our monthly R.A.S.C. meetings and some day may even answer questions instead of always asking them.

For those of you who don't know me, I am the guy who sits in the dark corner at the back of the meeting room hoping that nobody says "listen carefully because there is going to be a quiz later on".

Craig W. MacDonald

THE LABOUR DAY AURORAE

It was an ordinary sunset evening on the 5th. September and I was preparing to hunt for and take a look at Comet Austin. However I was sidetracked because at 0058 (all times UT) I noticed an arc running towards the north with its base about 25 degrees in altitude. The arc got brighter and a "patch" similar to cirrus clouds was faintly seen extending from one point. Starting at position angle 39.5 degrees, it went over Ursa Major to Cassiopeia. At 0123, ray structures were evident, especially a bright red ray in Bootes which was 15 degrees across. By 0131 all the rays went however at 0133 they started to come back, but very faintly. At 0136, a couple of green rays were seen in Bootes but lasted only a few seconds and by this time the sky was only a glow.

By 0300 I deceided to go out again to see how it was progressing since I could not pick anything up on my shortwave radio. Once out, I was astonished at the aurorae. The whole northern sky from altitude 25 degrees to the zenith was just a mass of bright green rays and for a moment I thought it might cast a shadow, being so bright. As the rays met near the zenith the coronal arc formed what looked like an eagle's head with the rays being its wings. It was constantly changing, even with the moon up.

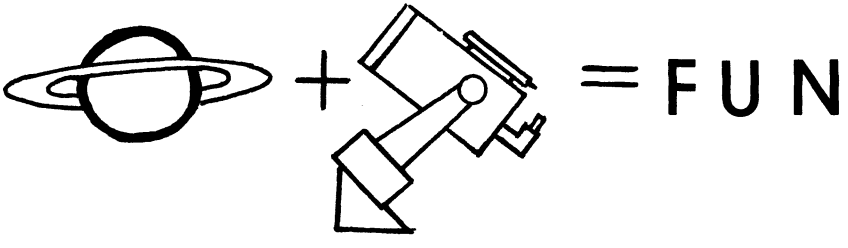
The red rays were becoming evident once again but mostly confined to the west and east with the north being a very bright green. Then the flaming arc began following the other arcs as they rippled violently to the zenith with an odd pulsation here and there.

Once again by 0335 the red rays that did merge with the green had a very curious effect. This was in the form of a white border separating away from the green and red rays. This was also noticed in the last observed auroraes. Was it a contrast effect or a true part of the aurorae?

By 0350 it quieted down somewhat but not for very long because by 0357 it became very intense again and lasted until 0400. At this time I was just too tired to observe any longer and as I was going in at 0402 the most intense bright patch of the night occurred below the three handle stars of Ursa Major. The effect must have been 15 degrees across and 12 degrees high. I did notice another effect. When a plane passed through the brighter part of the aurorae, it faded in a similar way when planes pass through cirrus clouds.

In conclusion, this aurorae was very beautiful and it may have surpassed the earlier one of this year or even last years. None the less, I hope that most of you saw it. If your shortwave radio acts up, don't take it apart, take a look out your window and you may see a real good aurorae. As for the spot count on the 5th., it was 57. The night of the 5/6th. September, 82 will be one to remember.

Michael Boschat



LUNAR OCCULTATIONS

Kathy Oakley

"Lunar occultation" is simply a scientific way of saying that a planet or star (other than our Sun) is going to pass behind the Moon, along our line of sight.

Have you ever looked at the "Lunar Occulatations 1982" section of the Handbook, and thought to yourself, "What do all those little numbers mean?". Well, the tables are easy to use and understand if you take a few minutes to become familiar with the entries.

General descriptive data of predicted occultations is given in the first column of the tables. The remaining columns give specific information under the headings of the various standard observing stations. Notice that all predictions for the Atlantic area are listed on pages 69 and 70.

The date of the predicted occultations is given in the first column. If you check the month of November for the Halifax area (p. 70), you'll see two listings for the 19th. The next entry is the Z.C. (Zodiacal Catalogue) number of the object to be eclipsed. The 4000 series is reserved for planets; 4004 is the Z.C. number for Mars. Next is the object's magnitude at the time of the forecast event (1.2 in our Mars example), and a "D" or "R", denoting whether the object will be disappearing or reappearing. The last bit of data in this column is the Moon's forecast elongation from the Sun, here 45 degrees. A glance at page 18 of the Handbook will show that this can be interpreted as a measure of the phase of the Moon, and that 45% corresponds to an age of 3 to 4 days.

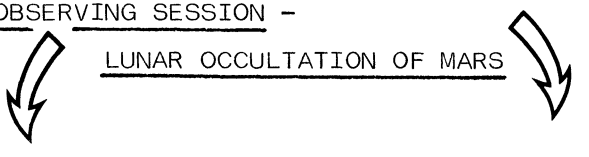
The information for each station consists of the precise time for each event (Universal Time), two values, "a" and "b", which can be used to interpolate the exact time of events if the observer is not at the longitude of the given station, and the "PA", or position angle on the Moon's surface, at which the occultation will occur. The usual convention is to measure from the north in an easterly direction from 0-360 degrees. If observing

through a telescope, don't forget to allow for the inverted image.

Looking back to our example, we see that Mars will disappear behind the Moon at 22h 27.9 m UT, and will reappear at 22h 36.7m UT. Checking the times of moonrise and moonset on p.64 (note that the given times are local, not UT as indicated on p.53) shows that the Moon will be getting close to the western horizon when the occultation gets underway, but with any luck at all, and a measly few minutes of clear sky, will be visible to those with binoculars or a telescope.

Sounds like a perfect opportunity for an observing sesion, doesn't it....

OBSERVING SESSION - LUNAR OCCULTATION OF MARS



A lunar occultation of Mars is predicted for 19 November, and an observing session is planned for the event. The precise time and location will be given in the November Notice of Meeting.

* FLASH....FLASH....FLASH....FLASH *

This is going to be a grazing event with the path running through Rockingham. Sounds like an honest to goodness opportunity for an expedition by Centre members to make useful observations of the precise grazing line. Call Kathy for details--she's volunteered to co-ordinate although she doesn't know it yet. But that's what Observing Chairpersons are for, eh, Kathy! See front cover for phone no.

* THE 1983 *

→BURKE-GAFFNEY AWARD←

The Burke-Gaffney Award was established several years ago to promote the development of the writing skills of non-professional members of the Centre. The Award also acknowledges the contribution of the Centre's first Honorary President to the formation of the group and to his long and tireless efforts to educate the public in the mysteries of astronomy. This years contributions for the Award must reach the President, Editor or the third person of the Judging Committee by 18 March 1983.

RULES

1. Topics. Awards will be given for articles relating to astronomy, astrophysics or space science. Topics should interest average to well informed amateurs and may be of current or historical interest.

2. Presentation. Articles should be 1000 - 1500 words, written in proper grammatical form and presented typewritten and double spaced. Diagrams should be complete and ready for drafting and photographs should, if possible, be submitted with the original negatives.

3. Eligibility. Any member of the Halifax Centre in good standing may submit articles with the exception of those with graduate degrees (any field of study).

4. Judging. Articles will be judged on scientific accuracy, originality and with a strong emphasis on the overall literary merit.

Papers must demonstrate that the author(s) has/have read widely and has contributed some original thought to the discussion. Judging will be carried out by the President, Editor of NOVA NOTES and a third person appointed by the Halifax Executive.

5. Prize. The Award will be given once anually. The winning contribution the becomes the Centre's official entry in the Simon Newcomb Award competition which is held anually on a nation-wide basis. The winner of the Burke-Gaffney Award will have the choice of one of several prizes offered.

6. Submission of Entries. Entries will be received anytime until 18 March, 1983. You may direct inquiries concerning the rules to the President.

7. Previous Awards. The Burke-Gaffney Award has been won on four previous occasions by Bill Calnen (1979 and 1980), Dianne Brooks (1981) and most recently by Michael Boschat (1982). The winners are eligible to go on to enter the Simon Newcomb Award at the annual General Assembly.

ELECTION OF OFFICERS:

The election of Centre Officers will take place at the November meeting. Your ballot which you should have received by now must be returned by the time specified. Late ballots will not be counted. Please Note, you must be paid up for the 1983 Membership year to vote. You may include your cheque in the outer envelope when returning the ballot.

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