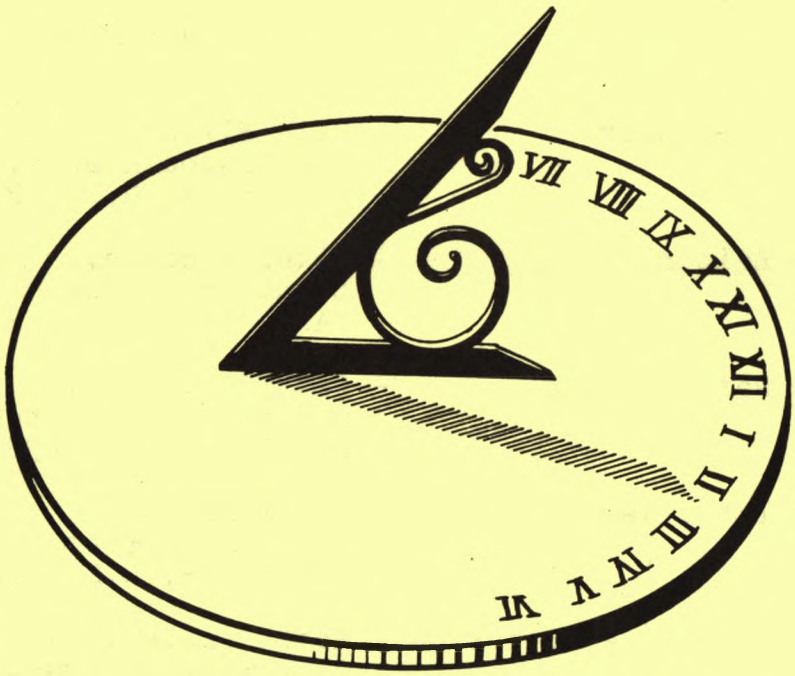
NOVA NOTES



BI-MONTHLY JOURNAL OF THE HALIFAX CENTRE

MAY-JUN 1982 VOL. 13, No 3

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NOTICE OF MEETING

Date: Friday, 14 May, 8:00 PM

Place: Nova Scotia Museum: Meeting to be held in lower auditorium/theatre. Access from parking lot and side door.

Speaker & Topic: TBA

* The Annual Dinner Meeting is tentatively scheduled for Friday, 28 May. More details via a newsletter and the May meeting.

MINUTES OF THE MARCH MEETING

The March meeting of the Halifax Centre was held on March 19 and opened by Walter Zukauskas. The speaker for the evening was Randall Brooks who had anticipated our prescence despite the reports of ominous consequences to the Earth as a result of the Jupiter Effect theorized by John Gribbin and Stephen Plageman to peak on 10 March. The talk was entitled "Why We Survived the Jupiter Effect". Randall began with introductory comments on what some people might take as evidence of the effect. He pointed out that the average number of earthquaks which cause damage in any year is about 100 or one every 4 days. He then detailed the chain of events which comprise the Jupiter Effect and how each was theorized to lead to successive links. These are breifly: the alignment of the planets leads to higher tides on the Sun which results in greater solar activity witnessed by an increase in sunspots and flares. As a result of the flares, energetic particles reach and enter the Earth's atmosphere causing changes in weather patterns which in turn would slow the rate of rotation of Earth. This slowing would, Gribbin and Plagemen theorized, cause earthquakes--most likely in California. Randall reviewed evidence for each of these links and concluded that, except for the relation of solar flares and particles entering Earth's atmosphere, there was very little to support the theory and the probability that the chain could be completed was zero--one might take your reading of this as a confermation that the probability was indeed infitesimal.

MINUTES OF THE APRIL MEETING

The April meeting was held on the 17th at the Nova Scotia Museum and was opened by Walter Zukauskas who reminded members that the next meeting would be on 14 May and that the annual Centre Dinner would be on May 28 at a location to be announced. The evening's speaker was Dr. Norman Scringer of the Dept. of Astronomy, SMU. His topic was Planetary Nebula and he began by showing slides of a few planetary nebulae noting the features which distinguish them from other nebulous objects. He described how old stars nearing the end of their existence gently blow off their outer atmosphere (about 15-20% of their mass)which then forms an expanding spherical shell. The expansion is at a leisurely rate of 20-30 km/seccompared to the violent expansion rate (1000 km/sec or more) associated with supernovae. Norman examined the conditions in a planetary nebula including temperature, density and composition of the gas. He showed spectra of several nebulae which demonstrated the lines were due to ionized hydrogen helium, nitrogen and oxygen. He further pointed out how even the shape of individual lines can be used to show the physical nature of the nebula. Norman concluded by theorizing that the observed structure of planetary nebula could be explained by magnetic fields in the nebula and associated with the white dwarf at the centre acting on the ionized (electricall charged) atoms. A slide demonstrated what nebulae might be expexted to look like under varying conditions of magnetic field strength and from different directions. The resemblance to observed nebulae was striking to the point that even the Helix Nebula was protrayed by the theory. Norman's talk generated a great number of questions--always a good indication that the talk was enjoyed by all.

Did you know that -

according to the law of General Relativity, space and time are warped or curved by gravity. Time is theorized to point into the black hole, an object, even light would have to go backward in time.

ASTRONOMY NEWS NOTES

Cuba, Jupiter and Venus;

Astronomy Education in Cuba

In some information recently prepared by Dr. Charles MacFadden of the Atlantic Institue of Education, I noted with interest a breakdown of the time spent in various subjects at each grade level. The figures even included astronomy. Totals were given for each subject over the 12 years of formal schooling. Here's a few: Spanish 1400; litature 520; math 2400; history 640; biology 640; physics 600; foreign language 800; music and dance 160; technical military preparation 80 AND here we are at the bottom of the heap, astronomy 40! At least those 40 hours are at the grade 12 level and required. In Nova Scotia most students get a few lessons in astronomy at the grade 6 or 7 level and then only at the discretion of the teacher. Hence we're even worse off. By the way, that 40 hours represents 0.3% of the total class time from grade 1-12!

Jupiter's Satellites

A question was raised at a recent meeting. I think by Murray Cunningham, in which he wondered if and how often Jupiter's satellites disappear from view by virtue of being in transit across the planet's disc or by being eclipsed in the planet's shadow. Well, I've the following to report from the JRASC 7, 270, 1913. From "Astronomical Curiosities"by J.E. Gore (pub. c 1910)comes the answer: "This phenomenon was seen by Galileo, March 15, 1611; by Molyneux on Nov.12 1681; by Sir Wm. Herschel, May 23 1802; by Wallis, april 15 1826; by Greisbach, Sept. 27 1843; and by several observers on four occasions in the years 1867-1895. This phenomena again occured on Oct 3, 1907.. and will occur on Oct 22, 1913." It is interesting to note that the event observed by Galileo in 1611 allowed him to unambiguously determine the periods of the four galilean moons. The event was not essential but simplified the determination considerably. Now, who can tell me the date when Jupiter's Satellites will disappear from the sight of amateur telescopes?

Venera 13 and 14

On Feb 27 and 5 March, Venera 13 and 14 landed on Venus resp. at sites which were chosen in consulation with American planetary scientists. The Americans have mapped the Venusian surface through the clouds with the Pioneer Venus Orbiter which has been in operation since 1978. There are four types of terrain on Venus: 1) rolling plains which may be Venus' original crust and which cover 2/3 of the planet; 2) low lying basins which have been filled by lava flows; 3) two high plateau--Aphrodite and Ishtar Terra--which may be counterparts of continents; and 4) isolated peaks probably volcanic in origin. Anaysis of the rocks around Venera 8,9,10, 13, and 14 have confirmed types one and two terrain. Granites and basalts are the most common rocks and the degree of erosion varies as required by the estimated age of the areas studied. Venera 13 and 14 had two new functions e.g. they sampled and analysed the soil and surface rocks, and they were equipped to take colour photos. The rocks are brown and the sky bright orange. A report on the Venera probes may be found in the 11 March issue of New Scientist and we can expect more because of the US/Russian cooperation.

COMPILED BY RANDALL BROOKS

BLACK HOLES

When a star has three or more solar masses left after it exhausts its nuclear fuels, it can become a black hole. Like the white dwarf and neutron star, this star's density and gravity increases with contraction. Consequently, the stars gravitational escape velocity (speed needed to escape from the star) increases. When the star has shrunk to the Schwarzschild radius, named for the man who first calculated it, its gravitational escape velocity would be nearly 300,000 kilometers per second, which is equal to the speed of light. Consequently light could never leave the star.

Reduction of a giant star to the schwarzschild radius represents an incredible compression of mass and decrease in size.

As an example, mathematicians calculate that for a star of 10 solar masses (ten times the mass of our Sun) after exhaustion of its nuclear fuels, the Schwarzschild radius is about 30 kilometers.

The Schwarzschild radius becomes the black hole's 'event horizon', the hole's boundary of no return. Anything crossing the event horizon can never leave the black hole. Within the event horizon, the star continues to contract until it reaches a space-time singularity, which modern science cannot easily define. It may be considered a state of infinite density in which all matter loses all of its familiar properties.

Theoretically, it may take less than a second for a star to collapse into a black hole. However because of relativistic effects, we could never see such an event, This is because, as demonstrated by comparison of clocks on Earth, gravity can slow, perhaps even stop time. The gravity of the collapsing star would slow time so much that we would see the star collapsing for as long as we watched.

Once a black hole has been formed, it crushes into a singularity anything crossing its event horizon. As the black hole devours matter, its event horizon expands. This expansion is limited only by the vailability of matter. Incredibly vast black holes that harbor the crushed remains of billions of solar masses are theoretically possible.

Evidence that such superdense stars as white dwarfs and neutron stars do exist has supported the idea that black holes, representing what may be the ultimate in density, must also exist.

Courtesy NASA Educational Briefs

RESULTS OF RASC MEMBERSHIP SURVEY

Jenny deZoete and Dale Ellis
(19 February, 1982)

OVERVIEW

The membership survey conducted in October has proved quite successful; 28 out of 90 members responded and made some valuable comments.

Twenty members responded affirmatively for future contributions to meetings and observing sessions, 14 will help with Nova Notes, and five will help with planning.

Members are interested in meetings and a wide spectrum of topics; there is a strong interest in being informed of the latest issues, discoveries, etc., in astronomy. Members would like to know more about each others interests, and a member's night gets a favourable response. There was disappointment with the quality of some of the talks during the past year.

Nova Notes came in for some criticism the past year, and people seem to prefer the smaller format of previous years.

Many of our out of town members seem very keen, but find it difficult to attend meetings. Accomodation is expensive--can we billet them? It was also suggested that we hold a meeting in one of the other towns where there are a significant number of members.

The survey results should help us considerably in planning for activities during the coming year.

SURVEY QUESTIONS AND RESPONSES

Questionnaires were mailed to all 90 of our members, and 28 members responded. Not all questions were answered; some omissions were due to out of town members not attending functions.

BACKGROUND INFORMATION

1. How many years have you been a member of the Halifax Centre?
   Total: 28 <2 yr: 8 2-5 yr: 10 >5 yr: 10
2. How many meetings did you attend from Sept. 80 to Aug. 81 inclusive?
   Total: 28 none: 4 1-4:10 5-8: 11 all: 3

3. Are you generally satisfied with what your membership provides?
   Total: 28 yes: 26 no: 2

4. Would you like to be more actively involved in the planning and programming of the Centre's activities?
   Total: 23 yes: 5 no: 18

MEETING PROGRAMS/OBSERVING SESSIONS

5. Have you found the monthly meetings interesting and of value?
   Total: 20 yes: 19 no: 1 ambiv: at least 5

6. Have you contributed in any way to these meetings?
   Total: 26 yes: 11 no: 15

7. Would you be willing to contribute in the future?
   Total: 26 yes: 20 no: 6

8. Please list topics you would like to hear about at future meetings?
   Total: 15

9. Would you like to know more about the interests of other members?
Total: 22 yes: 20 no: 2

10. Do you own a telescope? (Please give aperture and type.)
Total: 28 yes: 21 no: 7

11. Have you attended any observing sessions the past year?
Total: 28 most: 4 some: 7 none: 17

12. Did you take part in the 1980 General Assembly? If "no", why not?
Total: 26 yes: 12 no: 14

PUBLICATIONS

13. Do you read Nova Notes?
Total: 28 every: 23 frequently: 5 seldom: 0 never: 0

14. Are you satisfied with the content of Nova Notes?
Total: 24 yes: 17 no: 7

15. Do you like the present format of Nova Notes?
Total: 25 yes: 20 no: 5

16. Would you like to write for Nova Notes?
Total: 26 yes: 14 no: 12

17. Do you read the Journal?
Total: 27 freq: 22 seldom: 5 never: 0

18. Do you read the National Newsletter?
Total: 27 freq: 24 seldom: 3 never: 0

OTHER ACTIVITIES

19. What activities are you interested in? Add ones you like or dislike.
Total: 28 See "OTHER ACTIVITIES" below.

20. Would you like to see more activities planned?
Total: 19 yes: 10 no: 9

OTHER ACTIVITIES (Q. #19)

Activity	Total	Interested		
		Yes	Maybe	No
Societies Show	18	9	9	-
Astronomy Day	22	13	7	2
Observing Sessions	23	15	8	-
Annual Dinner	23	13	8	2
Camping/Observing Weekend	23	12	8	3
Annual Tour	18	11	5	2
Meetings	24	22	2	-
Telescope Making	19	10	5	4
Member's Night	20	11	9	-
Conversation and Cookies	1	1		

CHINESE METEORITES*

*This article originally appeared in the publication, GEOCHIMICA, 1978, No. 3, pp. 227-233 and was submitted for reprint here by Murray Cunningham.

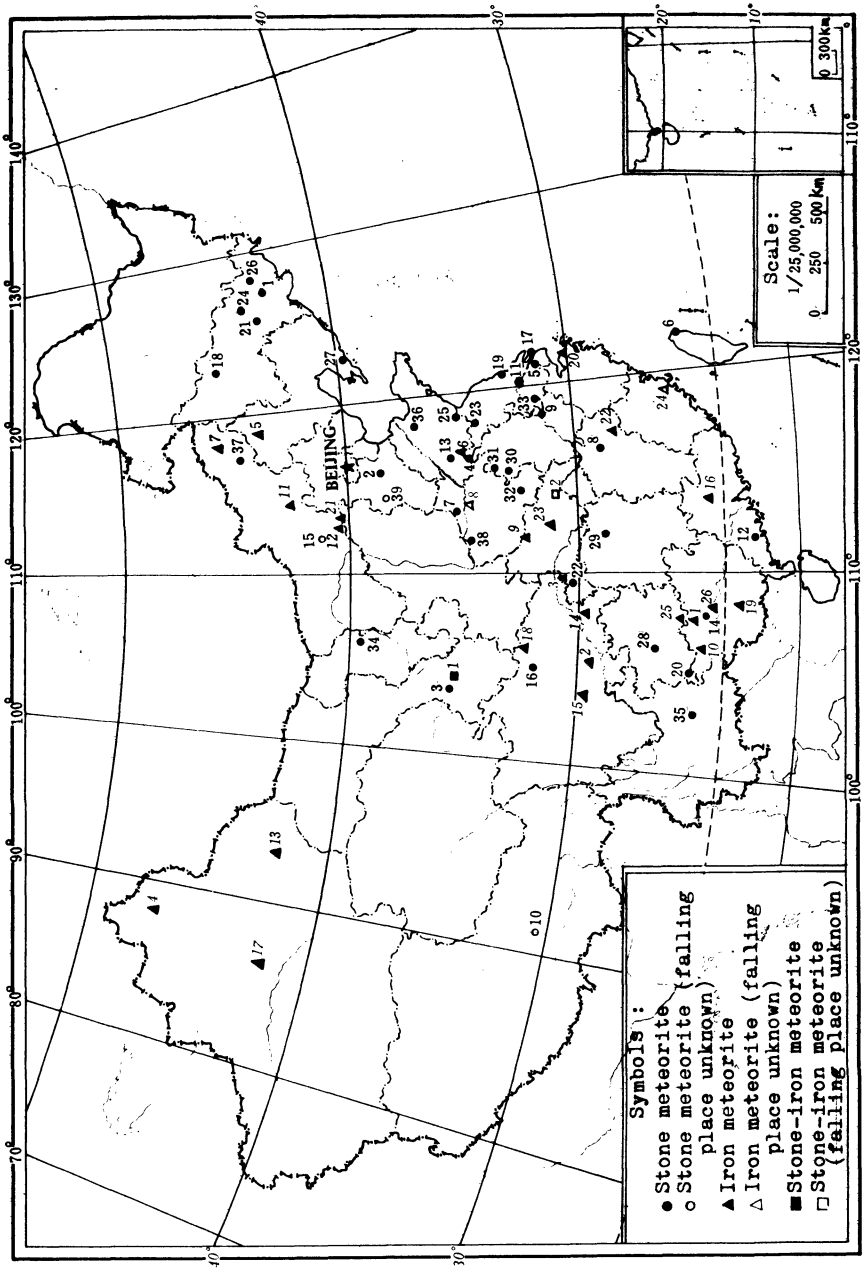
Thousands of meteorites, valuable samples of celestial bodies, have fallen on the 9.6 million km^2 expanse of China. But before the liberation in 1949, meteorite research (like most of the other branches of science) had essentially vanished. No effort was made to collect, preserve or study the meteorites.

Numerous notes and records regarding meteorites were written in our historic books for thousands of years but most of the meteorites have been lost; only a few of these older falls are still preserved.

Since the 1950s, our government and people have paid much attention to meteorites. Academic institutes, universities, museums, observatories and planetariums gradually began research of meteorites. They collected and exhibited meteorites as well.

The map shows the distribution of the meteorite sites discovered, and it is clear that, generally speaking, the number of meteorites is approximately proportional to the population density. This confirms that many more meteorites fall on China's territory than are recovered, and that a careful recovery program would collect more of these prime research materials.

Meteorites are rare specimens of celestial bodies. The results from the investigation of meteorites contribute valuable information to different fields of science.



Bian Depei,
Beijing Planetarium,
People's Republic of China.

ASTEROID OBSERVING:

Some of you are probably saying, "Why should I bother to look at a point of light?" Well, you don't have to if you don't want to, but the main purpose of this article is to get some of you out observing the asteroids now that the warmer weather is here.

The main asteroids to look for are; Ceres, Juno, Pallas and Vesta. The first and last one, when close to the earth, can be seen with the naked eye from a dark site or just point your SLR camera with Tri-X film and take a 20 sec. exposure of the proper region from night to night to capture it.

Those of you with telescopes can follow certain asteroids and make a contribution to astronomy by observing the ones listed in the 'HANDBOOK' or an astronomy magazine. At the telescope you find the field of the asteroid and then follow it from night to night, watching its magnitude change. Some asteroids change their magnitude by one. This is true for Eros, another asteroid. The reason lies mainly in the asteroid shape. Some are elongated and rotate on their axis. They will either point towards our planet with their axis with a dim light or rotate in a few hours and present themselves lengthwise to be seen brighter. Simply take a pencil and hang it from a string. It will rotate showing the point and then the long side. This is similar to asteroids.

If there is a chance that the asteroid will occulate a star, every effort must be made to observe the star's light change. It could fade and then brighten, or even fade again but on a shorter time. This would mean a complex occultation had occurred and this is worth noting by drawing a light curve to record the event. Good luck!

Michael Boschat

LEO: The Lion.

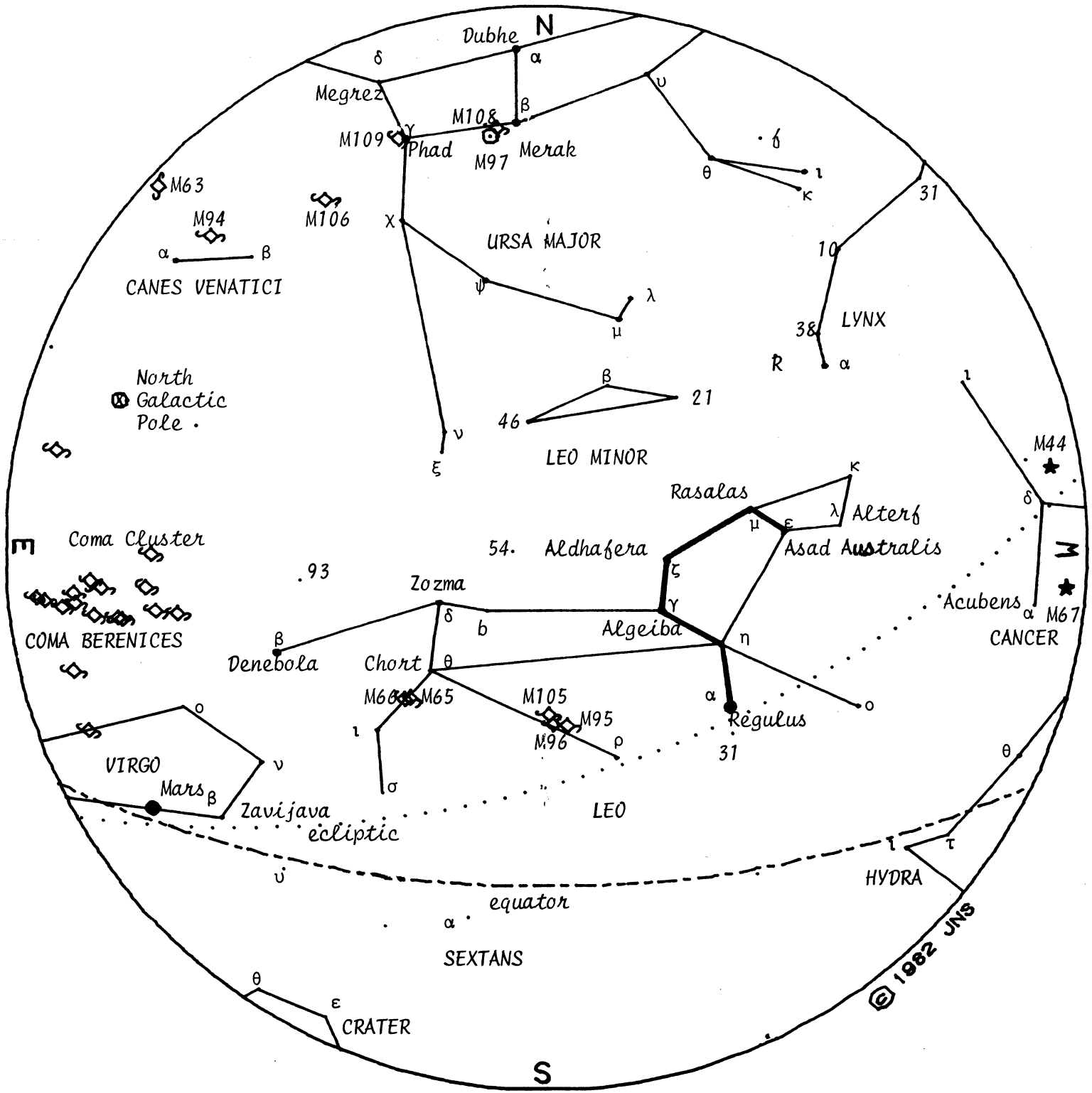
Leo is one of the original Greek constellations and supposedly represents the gigantic lion slain by Hercules. Leo, also one of the zodiacal constellations, is easily found lying just north of the equator under the feet of Ursa Major. Leo Minor, added to the list of constellations in the late 17th Century, separates the great bear from the lion.

Regulus, the regal star, marks the bottom of a large asterism known as the Sickle. The Sickle is shaped like a backwards question-mark and is shown by the heavy lines in the figure. Being so near to the ecliptic, Regulus is often in close conjunction with the planets and can be occulted by the moon. These occurances are observed as interesting shows by the astronomers, but are considered events of great mystic significance by the astrologers. Regulus was occulted by Venus on July 7, 1959, but will not again be hidden by Venus for several centuries.

Within the accompanying figure we find a large number of galaxies and parts of the Virgo and Coma clusters of galaxies. Many galaxies are found in this region of the sky because we are looking directly up (north), out of the plane of our Milky Way Galaxy, and there are very few gas and dust clouds in this direction in our galaxy that could obscure the more distant galaxies. The North Galactic Pole is marked on the figure. All of the galaxies shown are Messier objects and the region just to the east of Denebola is a wealthy area to scan with a telescope or binoculars.

Mars is plotted at its position for May 15th of this year, two days after it ended its retrograde motion and resumed its easterly movement.

Norman Scrimger.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Alterf
Asad Australis
54. Aldhafera
Coma Cluster
93
Zozma
Denebola
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Algeiba
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COMA BERENICES
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VIRGO
Mars
Zavijava
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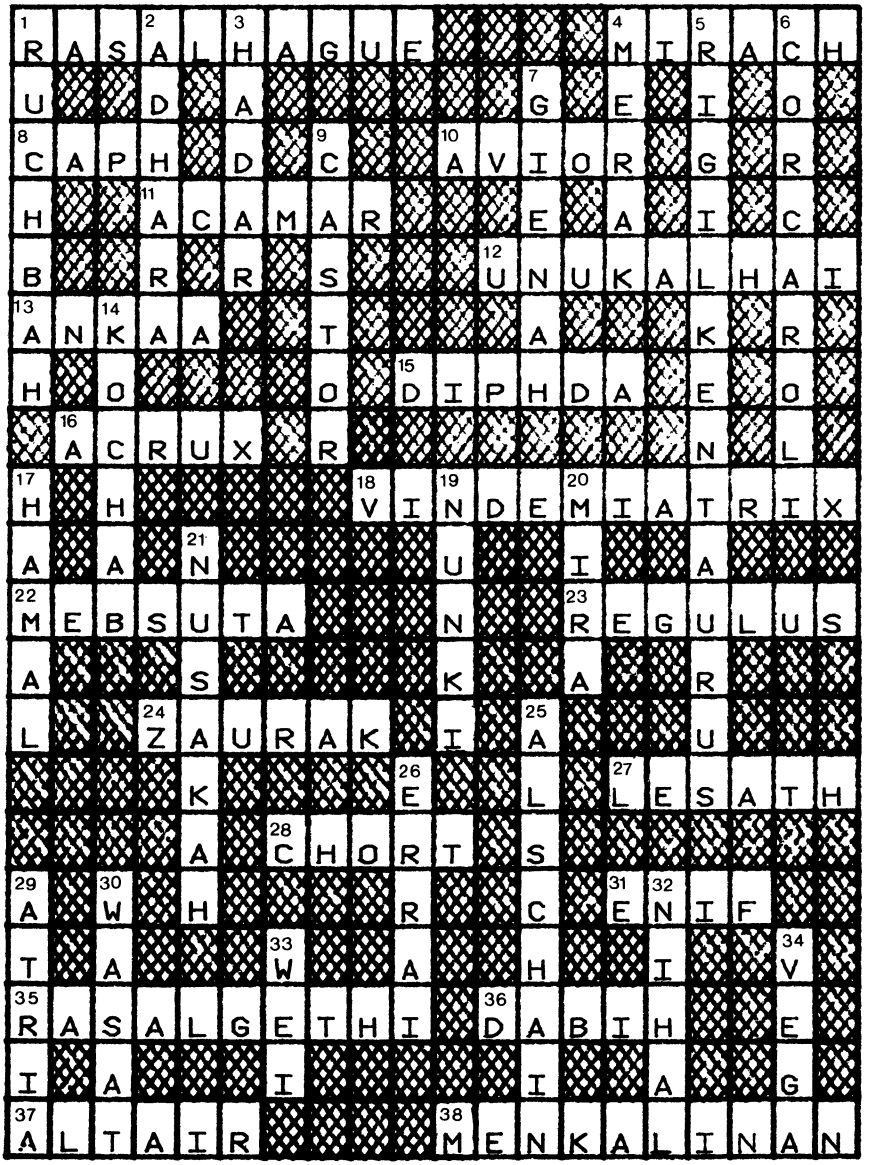
Answers to last issues Puzzle Corner!

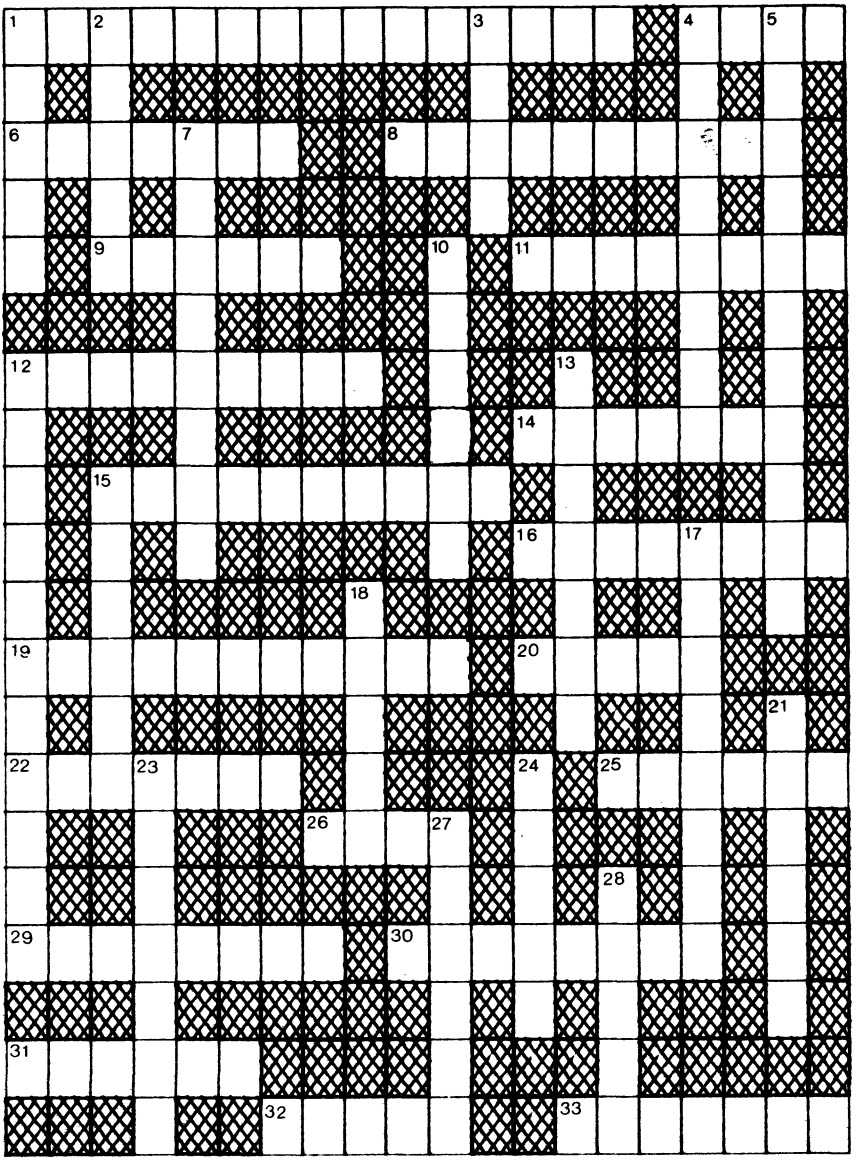
Laureen Burgoyne and Norman Scrimger



PUZZLE CORNER

ASTRO CROSS WORDS

Laureen Burgoyne and Norman Scrimger



FEATURES ON THE MOON

All of the answers to this issue's Astro Cross Words can be found in Norton's Star Atlas. Several other books having a map of the moon also list these lunar features. Answers will be given in the next issue. Answers to last month's puzzle can be found in this issue of Nova Notes.

ACROSS

1) Important craters on this "smooth" section include Cauchy, Arago, and Maskelyne.
4) Forms an equilateral triangle with Julius Ceasar and Arago.
6) Famous explorer's crater near Cook.
8) The "Monarch of the Moon" in Oceanus Procellarum.
9) Small ring with a central peak between Messala and Zeno.
11) Small bright crater near Riphaean Mountains.
12) Near Eudoxus, "_____ The Great".
14) This crater of divisions divides the Alps from the Caucasus Mountains.
15) 90 mile walled plain south of Herschel.
16) 28 mile crater with a large central peak; north of Ptolemaeus.
19) This crater 60 miles across borders on crater Mitchell.
20) Forms a pair with Mason, not far from Bürg.
22) Largest of the walled plains, well known by lunar observers, south of Tycho.
25) Largest crater on Mare Serenetatis.
26) This explorer's crater lies near Colombo.
29) Twin of Briggs; southwest of Schiaparelli.
30) 30 mile crater with broad walls south of Anaxagoras.
31) Its smaller companion is Hind.
32) 32 mile crater close to Schiller.
33) Smaller than nearby Franklin.

DOWN

1) Centre of the greatest ray system on the moon.

DOWN (con't)

2) Larger and older of the two neighbouring strong men.
3) Great ski spot on earth, but lousy on the moon.
4) Smaller companion of Grimaldi.
5) Irregular enclosure north of Tycho; diameter about 60 miles.
7) Twin of Campanus; on the edge of Palus Epidemiarum.
10) Prominent 20 mile crater east of Capaunus.
12) Brightest and youngest formation on the moon.
13) Crater with a prominent central peak touching Isidorus.
15) A low-walled, incomplete ring northwest of Davy.
17) Small but prominent crater close to Schickard.
18) 60 mile crater noted for the darkness of its floor.
21) 25 mile crater close to Altai Scarp.
23) 30 mile concentric crater on the border of Mare Humorum.
24) Distinct crater lying on Mare Tranquillitatis.
27) 22 mile crater having a prominent ray system.
28) Sometimes regarded as Kepler's twin.

SUBSCRIPTION RATES FOR 1982 (6 Issues)

NOVA NOTES is available for non members of the HALIFAX CENTRE, R.A.S.C. at the present rate of $1.00 per single issue or $4.00 for six issues per annum. HALIFAX CENTRE members of course will receive free copies with their R.A.S.C. membership. For more information contact the editor.

RECENT OBSERVATIONS OF EROS

Michael P. Edwards

Observations of the February crossing of NGC 1647 by the minor planet Eros will possibly contribute to the earthly recognition of a new orbit.

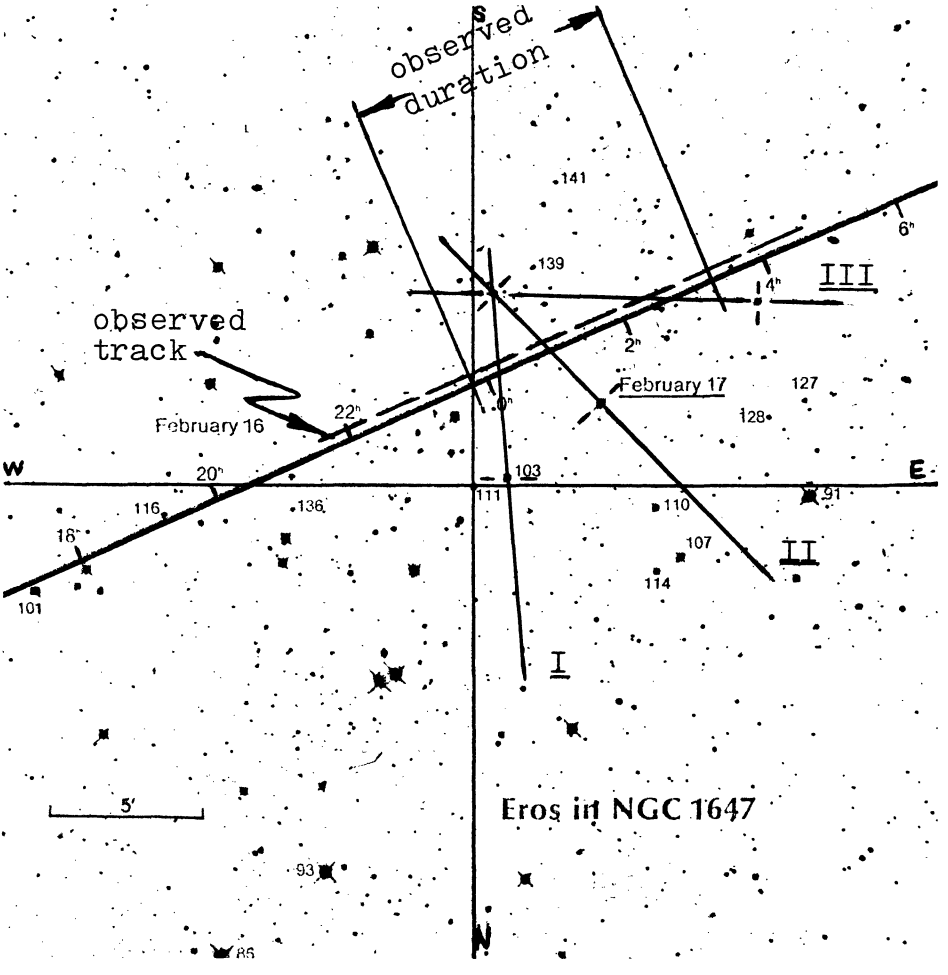
My information at the time of this writing is that the "Observer Page" of the May issue of Sky and Telescope will give details and observations of this recent crossing. Assuming you have not received or possibly have not taken the opportunity to read your issue of S&T I will continue. (Besides, the Editor wants to fill in space... that is space in Nova Notes.)

First locate your February '82 issue of S&T and turn to the Celestial Calendar, page 173. Now skim through the article about this event of February 16-17. This was an unusually clear night this past winter, though it was fairly cold at about 10°F.

The sketch (from S&T) on the next page shows by way of the dashed line that which was observed from Bedford at Lat.: 44° 43′ 21″, Long.: 63° 40′ 18″ and elev.: about 70'.

Three specific times and locations (alignments with stars as indicated) of the asteroid as it passed through Taurus, were noted as follows:

I	$0^h\ 43^m \pm 1^m$	
II	$1^h\ 22^m \pm 1^m$	(Times
III	$2^h\ 55^m \pm 5^m$	are in UT)



By scaling the observed positions with the predicted, a discrepancy of about 30 to 31 minute delay was observed. A southerly shift of the asteroid's track was also observed (about .38 minutes).

Dennis diCicco of S&T tells me that the southerly shift is within the expected limits and is due to parallax since the

published chart uses geocentric positions. You would have to be at the center of the Earth to observe the published track. He also pointed out that as a modern orbit was not available the times predicted for the various locations along the path were taken from a Russian ephemeris which "is several years old".

Over the three hour duration of my observations the magnitude dropped from about 10.3 to about 10.8. These observations were made with an 8" Celestron at 80X.

Though, as mentioned, the air was very cold, the clear skies were most alluring; and viewing an event which differed from predictions yielded part of the purpose for our interest in this scientific hobby -- and that is to witness nature reveal itself -- whether in an expected manner or in an unexpected manner as in the case of Eros crossing NGC 1647 last February.

Here is a new address from Barry Matthews.... Halifax Centre Founder.

mpe

"NEUTRON STAR"

Neutron Star, Oh Neutron Star,you're massive
And your tidal forces are intense.
You have crushed your atom shells to pieces
Neutron Star, your gravity is immense.

You were once a star like all the others
Shining brightly in the evening sky.
But your thermonuclear reactions
Consumed all your hydrogen supply.

Neutron Star, Oh Neutron Star,you're spinning
'Round and Round' with such a fever pitch.
You conserve your angular momentum
And speed up with every little glitch.

You were once a star like all the others
Somewhere on the Hertzsprung-Russel graph.
Now you're in the lower left-hand corner
And your stellar mass reduced by more than half

Neutron Star, Oh Neutron Star,you're pulsing
Twisting your magnetic lines lines of force.
And electronics spewing from your axis
Form a synchroton emission source.

You were once a star like all the others
'Till your hydrostatic balance failed.
And you lost your radiation pressure
When your outer chromosphere exhaled.

Peter Jedicke,
LONDON CENTRE, R.A.S.C.

THE RUSSIAN CONNECTION

During the past nine years I have been in contact with a group of amateur astronomers in the Soviet Union. The main group that I correspond with is located in the Crimea, near the city of Simferopol, where their observatory is located. It is not far from the Crimean Astrophysical Observatory where some of them go to observe.

The group consists mostly of university students who are deeply interested in astronomy, mainly in the study of meteors. This, of course does not mean that they study only meteors but they also study the planets and moon. At times other members study the sun and make daily drawings of its surface and record the Wolf numbers each day.

During the university months they study from monday to saturday and as summer comes the group starts to plan expeditions into the mountains to observe the meteor showers. In the afternoon the sun is studied by a portable 80mm telescope equipped with a hydrogen-alpha filter to study the surface. Other telescopes are brought to study the sun in white light and they are also used to study the corona and prominences.

At night the group observes meteors and they have discovered two new showers. It is hard work and to be a meteor astronomer takes from 5 to 10 years of involvement. Upon returning to the university they will take up to 2 or 3 years compiling the data they have collected in the field.

The equipment they have at their disposal includes a 30cm reflector, darkroom, observatory, a radio telescope and a coelostat using a flat mirror with fixed telescope. So this group is well equipped.

Most of these amateur astronomers either make or get their equipment from the government. It is free from the government (state) but that is one of the reasons why it takes so long to become an astronomer. My own philosophy so far is "Astronomy has no political affiliations".

Other than that, on occasion a few of the members get to use the telescope at the Crimean Astrophysical Observatory to study the asteroids. As mentioned earlier, they study the planets, but confine themselves to Venus, Jupiter and Saturn. As for the moon, they observe fine detail and I assume they have an interest in TIP's (Transient Lunar Phenomena). In ending, the group also collects minerals and fossils if time permits.

Michael Boschat

CANADA CUSTOMS TARIFF CHANGES

Many recent queries about the importation of telescopes have prompted me to write the following article. Much of the information has been gained first hand.

For many years amateur astronomers had been purchasing their telescopes from dealers in the U.S.A. The reasons for doing so were many, including variety to choose from, very often a lower purchase price and good follow-up service. The benefits were not always so tangible as it might seem. Until recently, all imported telescopes were subject to a 14.1% import tariff and a 9% Federal Sales Tax. These extra charges reduced the saving that one could otherwise enjoy. After much pressure from both professional and amateur astronomers and some excellent representation to the Tariff Board the federal government eliminated the import tariff from selected astronomical equipment. This became effective the 29th. Oct., 80.

Included under Canada Customs Tariff Item Number 46203-1 are:

1; astronomical telescopes having an objective mirror not less than 3" nor more than 20" in diameter,

2, astronomical telescopes having an objective lens not less than $2\frac{1}{2}$" nor more than 8" in diameter and

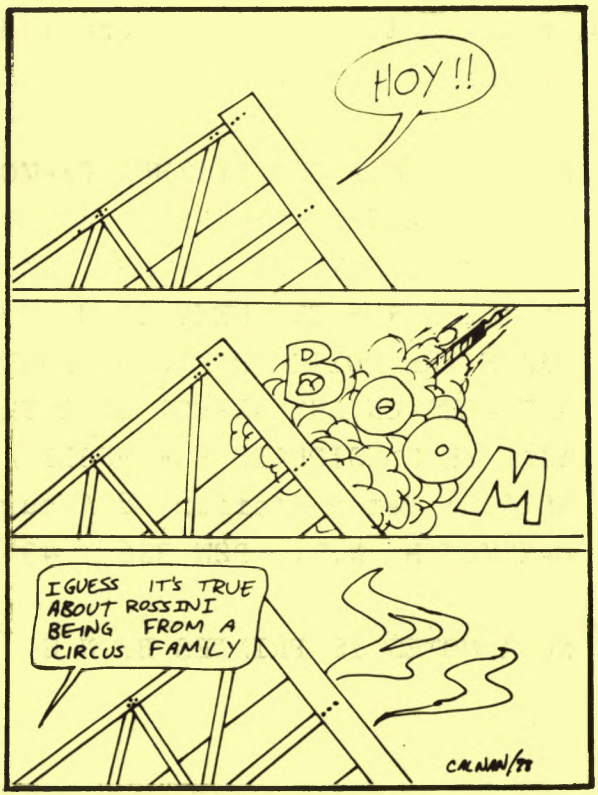
3, mountings therefore; parts of all the foregoing.

The items listed included most of the equipment that any financially endowed astronomer may want to order.

The two problems that one encounters are the exchange rate from Canadian to U.S. funds and the still applicable 9% Federal Sales Tax. The exchange rate on postal money orders is usually slightly higher than the 'going rate' and may change from postal station to postal station. Also when picking up astronomical equipment from Canada Customs be sure that your order is claimed under Canada Customs Tariff Item Number 46203-1 if it qualifies. Customs officers will charge the highest rate since their knowledge of telescopes is limited.

When thinking of purchasing a telescope be sure to shop around for the best deal by comparing import and domestic prices.

Peter Steffin



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