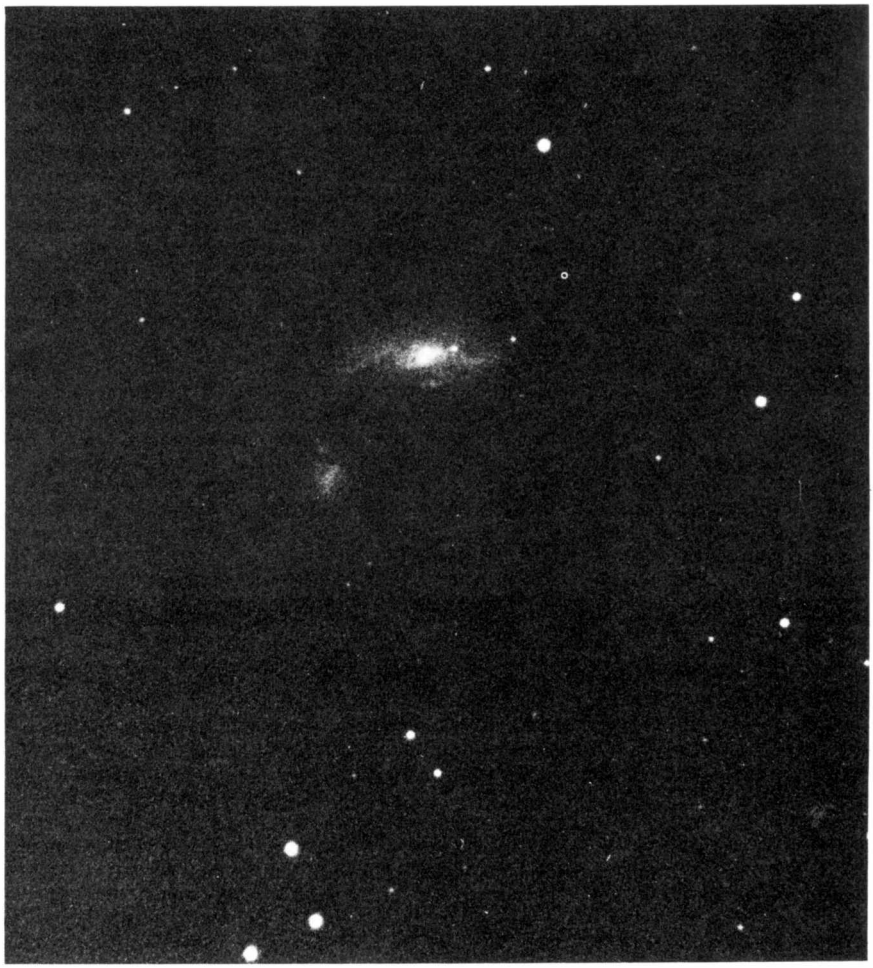
NATIONAL NEWSLETTER

August, 1982

Supplement to the JOURNAL OF THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

Vol. 76, No. 4



Supernova Wild in NGC 4490, photographed by Jack Newton of Victoria Centre. This prediscovery photograph was taken through Mr. Newton's 40 cm f/5 reflector on Ektachrome 400, and shows the magnitude 14.8 supernova immediately to the right of the galaxy's nucleus on the evening of 29 March 1982.

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That's Wild!

by Jack Newton
Victoria Centre

On March 29, I photographed two galaxies in Canes Venatici in my continuing search for supernovas, but cloud moved in and terminated my evening's observing. I decided not to process the film immediately as clear weather was forecast on the way. I also wanted to get a shot of the Eskimo Nebula at ambient temperature.

On April 19, I added five more photographs to the film and sent it off for processing. I got it back on the morning of April 21, and noticed a red star near the nucleus of one of the galaxies worthy of further investigation. That morning, I had a phone call from Chris Aikman of the Dominion Astrophysical Observatory in Victoria. A telegram had just been received indicating that Wild had a supernova suspect in NGC 4490.

I rushed home from work and gathered up my cold camera, and headed for my observatory to photograph the suspected supernova. At 1:00 am. I returned home to process the Tri-X film and nearly fell over when I pulled the film from the developing tank, the supernova was in the galaxy that I was examining that very morning on the photo taken 17 days preceding Wild's discovery.

I was so excited, and upset at the same time, that I couldn't sleep the whole night. How could I have not realized that NGC 4490 was the same galaxy? The NGC number just hadn't rung a bell. If I had only processed my film earlier!

Anyway, here is a summary of my data on this supernova, as prepared by Mr Chris Aikman of the D.A.O.:

March 29.24 1982, NGC 4490 mag 14.8 EKT 400 colour
April 21.21 1982, NGC 4490 mag 14.5 EKT 400 colour
April 25.24 1982, NGC 4490 mag 14.6 EKT 400 colour

The magnitude on March 29 indicates the superuova may have been coming up at that time.

Oh well, it just instills in me a greater desire to keep on photographing and blinking galaxies for supernovas.

R.A.S.C. Centres Mark Astronomy Day

Several Centres of the Society had programmes to observe Astronomy Day 1982. Here is a summary of news received by press time.

Victoria Centre held a Star Party on the evening of 1 May at Victoria's Beacon Hill Park.

In Calgary the Planetarium began its Astronomy Day Programme with the opening on 29 April of a new meteorite display. Calgary Centre members participated in demonstrations of mirror grinding, and set up their telescopes and Centre displays for the public. Friday and Saturday saw star-gazing under mostly clear skies, with Centre members presenting talks on eclipse expeditions, astrophotography and other topics. This programme was very successful.

Once again Edmonton Centre members participated in a Public Star Night in co-operation with the Queen Elizabeth Planetarium. If past performance is any indication, the event, held on the evenings of 1 and 2 May, must have been a great success.

The Saskatoon Centre hoped to repeat the success of its first Astronomy Day mall display at the Lawson Heights Shopping Centre. The day-long programme was to include exhibits of telescopes, star charts, astrophotographs, and accessory equipment.

At Winnipeg, RASC members were to organize 5 displays during the afternoon of 1 May at the Manitoba Museum of Nature and Man's Planetarium. An evening Star Party was held at the Lyndale Drive Park.

Toronto Centre was once again invited back to the Bayview Village Shopping Centre to mount an Astronomy Day exhibit. Due to scheduling problems, the display, including several of the Centre's major instruments (a Questar, 4-inch Brashear refractor, and 12½-inch Dobsonian) and the Society's display boards, was set up from 22 to 24 April. This was a very well attended programme, and was followed on 27 April by a telescope demonstration by several members at a science fair at Silver Springs Public School.

COSPAR Meeting

by Clifford Cunningham
Kitchener–Waterloo Centre

The Committee on Space Research (COSPAR) which represents 36 countries, held its 24th meeting in Ottawa in May. Attracting some 1000 scientists, the meeting was a major forum for East-West relations. Even though the Soviet delegation was the smallest in 10 years, it included two cosmonauts. Prominent Canadian participants included Drs. Ian Halliday and Peter Millman (immediate Past President and Honorary President respectively of the R.A.S.C.) and Dr. Gerhard Herzberg, Canada's Nobel laureate.

U.S. astronaut Dr. Owen Garriott spoke on research highlights from recent space shuttle flights, and gave a preview of next year's Spacelab mission. This session was separate from the main meeting, which was held over a two-week period. The programme consisted of six simultaneous symposia, workshops and topical meetings.

In the first four days I attended the Symposium on the Giant Planets. This featured papers by Voyager mission scientists such as Drs. Ed Stone, Harold Masursky, Gary Hunt and Tobias Owen. Topics discussed included the plasma physics of Jupiter and Saturn, the atmosphere of Titan, planetary rings, and the Io plasma torus. Owen's paper on Neptune and Uranus emphasized how little we know of these distant worlds, a state of affairs which should change with the upcoming Voyager 2 fly-bys.

At the Symposium on Advanced Space Instrumentation papers described upcoming space missions, as well as grander future plans. Missions discussed included the U.S. Space Telescope, the French-Soviet Sub-Millimetre Telescope, the German Infrared Laboratory for Spacelab, the European Space Agency's Hipparchos astrometry mission, and the Japanese Planet A to probe Comet Halley.

Dr. Yash Pal, Secretary-General of the United Nations Space Conference to be held in August, addressed the Symposium on Space Science in Developing Countries. Much lively discussion resulted.

During the second week, I attended a topical session on the origin of life, where Dr. Frank Drake spoke of the search for other planets and civilisations.

The scheduled all-day session on meteorite research was cut in half due to cancellation of four invited

papers. Papers which were presented discussed the source of meteorites (G. W. Wetherill) and Antarctic meteorites (T. Nagata).

A two-day session on results from ultraviolet and X-ray satellite observatories featured papers on X-ray bursters, supernova remnants and galactic nuclei. The final session, dealing with cometary missions, was dominated by discussion of the Soviet, European and Japanese probes of Comet Halley.

Evening events during COSPAR included two receptions, three film nights, and a special session commemorating the 25th anniversary of the Space Age.

Un Rappel

par Damien Lemay

Lors de la réunion du Conseil National à Saskatoon le 21 mai dernier, il y a eu des remarques à l'effet que l'*Almanach Graphique* devrait être fourni à tous les membres francophones de la SRAC, étant donné que le coût d'impression est soutenu par une subvention de la SRAC. Que l'on me permette de vous rappeler que cette publication a toujours été distribuée gratuitement à tous ceux qui en ont fait la demande. Cependant, nous vous invitons à accompagner votre demande d'une enveloppe pré-adressée et affranchie. Si plusieurs membres d'un même centre en désiraient, il serait préférable que vous nous en fassiez connaitre le nombre total. Veuillez donc faire parvenir vos demandes à l'adresse suivante:

Centre de Québec de la SRAC
C.P. 9396
Ste-Foy, Québec
G1V 4B5

Sliding to the Stars at Jarnac Obervatory

by David H. Levy
Kingston Centre

Observatories make astronomy more fun, even for amateurs.

"Build an observatory? Me? With ten thumbs and a proven inability to turn a screwdriver? I haven't built a building since I was ten years! Build an observatory? Never!" For two decades I had gone through life convinced that I could do without an observatory. And even my new 16-inch reflector was being designed for portability, however impractical that might be.

All that changed one sunny afternoon in November of 1980, when George Collenberg at the Flandrau Planetarium mentioned casually that he had a wooden sliding-roof structure for sale. All I would have to do would be to move it, and in one day I'd have my own building. An offer I could hardly refuse! I'll never forget that first night with me and the telescope surrounded by four walls. George's work was excellent; he had taken the time and care to build a comfortable and durable house. It survived the move without any problems.

How could I possibly have observed for two decades without a structure such as this? During the next week my observing hours were the most delightful I had known, the only problem being a slight tingling in my left hand. Lifting the heavy roof had been a greater challenge than I had expected and I must have done some nerve damage. But not enough to stop my appetite for more, and soon I took a close look at a tiny garden shed that had been rusting away behind my house. Could this be a candidate for a tiny fun observatory?

Converting this little building, whose dimensions were only 3 feet by 4 feet, presented no challenge. I settled on a large piece of plywood that would act as a hinged roof and with a gleaming white coat of new paint this little hut was ready for her telescope.

But what telescope? I tried a C-90 at first, but now, the roof lifts off to reveal an 80mm f/5 refractor. I wonder if any other finder scopes are lucky enough to have their own personal observatory?

With these two as a start, I began to consider how, and if, I would go about creating an observatory for my 16-inch Dobsonian. Although I had designed the large telescope to be portable so that it could be

FIG. 1. The first building, completed in 1976 by George Collenberg and moved to Jarnac Observatory in 1980. (*Photos by D.H. Levy*)

rolled out, the idea of engaging in such exercise at 4 am. before a predawn observing session struck me as awkward. I knew also, that if the telescope could be set up within 5 minutes I would use it more often.

My decision came quickly one Sunday afternoon. I drove down the street and picked up a young high school friend named Dan Stowell.

"Hi, Danny! We're going into town!" Break it to him gently.

"What for?" Already my friend was waxing suspicious.

"I want to get some parts." We drove for almost half an hour, and as we entered the store Danny's curiosity finally got the better of him. Screwing his courage, he looked at me and asked,

"Parts for what?" I think by now he knew for what.

"Oh, for the telescope."

"What telescope?" He knew what telescope.

"The 16-inch."

Danny's face turned ashen. "Oh Gosh, another observatory." It will take only a week to build," I said with a burst of optimism.

FIG. 2. Station "4" – an observatory building for the 0.4-m reflector. The telescope housed here is now my main observing instrument.

"Uh huh. Who, uh, do you suppose might help you?" Next morning a somewhat hesitant Dan Stowell joined me to begin work. And during the next 17 days the observatory slowly took shape despite a number of severe problems, the worst of which was a bad wind storm which knocked down three of the four walls in the third day. A hard rain also interrupted construction around day 6.

My procedure of construction was patterned rather closely after the plan I used when I was ten; since that little house got finished I figured this one would too. Although I didn't waste any time with anything like plans or blueprints, I did base the structure around a metal garden shed, a plan which saved money but added to the time. Since these sheds are designed so that the roof supports the walls, my idea required large amounts of wood for extra bracing, both for the walls and for the moveable roof. If I were to build again, I most likely would use wood all around and forget the metal part.

Each of the 17 days would begin with a walk around the construction site during which I would make a mental note of the materials I might need for the day's work. Then I would go into town to buy supplies. One of the 4×4's set in concrete was not high enough, so I added some scraps of wood to make up the difference. This plan worked fine for Danny, who also did not get along with plans. And

during the 17 days he learned all about walls, roofs and bad language. Our only disagreement concerned the kind of music by which we would build; I wanted classical but he enjoyed country, but since I also wanted to finish the work eventually, we compromised on two weeks of non-stop rock music. Even though the main construction phase ended by December 17, 1980, refinements and additions stretched out for more than a year, and this more relaxed secondary phase of construction was an exercise in good will that left the observatory station a monument to friendship. Judy Stowell designed the weather flaps for the roof. Leo Enright came down from Canada and helped me put in some hinged shelves, while Derald Hye helped install the telephone. Duane Niehaus helped with the roof and Rolf Meier and Mike Magee spent hours of their time installing the sound system. Other friends who added their valuable help were Eric Clinton, Roy Stowell and Jim Scotti. Mrs. Larson, the neighbor, provided cookies. Truly, this was an international project!

The three observatories have added a new dimension to my observing, of which comfort is only one aspect. The structures also help to keep observing conditions more constant, so that availability of chairs, note paper and even red lights always is the same, resulting in more consistent observations. The carpet keeps the dust level down and the walls reduce the dew on the rare nights when that is a problem. And although I did not design the large building for more than one telescope plus observer, it does work reasonably well at star parties.

Because of its rather small size, the 16-inch telescope observatory has a set of hinged shelves that can hold atlases while in one mode, and act as light baffles in another. When the county installed a bright sodium light half a mile away last September, I responded by designing a large light baffle that mounts on the roof and lifts into place by a pulley system. And the telescope is positioned inside so that I get a good view of the lower eastern sky, where I do my predawn observing.

Perhaps the most useful advantage is more difficult to pinpoint, for it lies in a feeling that I did not have to the same extent before. Each observing session begins with a walk from house to observatory followed by a procedure of unflapping flaps and unhooking hooks. When all is ready the roof slowly slides backwards to usher in a sky filled with a thousand delights. And when the telescope rears its proud head to the stars, another night of observation, discovery, and thought is about to begin.

List of Observatory Buildings

Jarnac Station 1: My home at 120 Carey Street. I call it Station 1 because a transit telescope is more or less permanently mounted near the living room window, which, when opened, allows me to use this telescope without moving its 325-lb. weight outside.

Station 2: The building of wood that I bought from George Collenberg. It houses an 8-inch reflector.

Station 3: A miniscule 3-ft. × 4-ft. shed with hinged roof. Peter Jedicke calls this the "telephone booth observatory."

Station 4: The largest building, a sliding roof structure for the 0.4-metre telescope.

The name "Jarnac" comes from my grandfather's cottage, situated near Ripon, Quebec. From that site I did some of my happiest early observing sessions.

Rt. 7, Box404
Tucson, AZ. 85706

Amateur Achievement Award of the Astronomical Society of the Pacific

Mr. Ben Mayer, of Los Angeles, California, has won the 1982 Amateur Achievement Award of the Astronomical Society of the Pacific, given each year to a non-professional astronomer who has made significant contributions to the field.

Mayer is best known for his design of PROBLICOM, an inexpensive "projection blink comparator" which can be assembled easily by an amateur and can be used to search for quickly changing phenomena in the sky. While professional astronomers are very interested in such transient celestial occurrences as comets, novae and supernovae, they lack the resources to monitor all parts of the sky on a regular basis. Here is where amateurs play an important role and Mayer's invention is of particular value.

Astronomers have long used a special instrument called a "blink comparator" to compare two

photographs taken of the same part of the sky on two different occasions. The device is designed to display the two photographs in alternating sequence. Objects which looked the same on both occasions don't stand out, but those which have moved or brightened appear to "blink". Unfortunately, blink comparators have been too expensive for the typical hobbyist to afford one.

In the mid- 1970's, Mayer designed a home-made comparator using two ordinary slide projectors and a rotating wheel and then organized an international group of amateur astronomers to begin a systematic "blinking" survey of the sky. Recently he designed a VIBLICOM, a video version of his system. Both have been widely praised by professional astronomers who applaud the potential of the system for making significant discoveries.

Mayer is Chairman of the Board of Envel Corporation, a design and manufacturing company he founded. In his own words, he "aquired his first telescope to watch starlets, but quickly graduated to stars". His first project was a photographic search for meteors. In 1975, this project accidentally led to his taking a series of thirteen photographs of a star in the constellation Cygnus which later underwent a nova eruption. Such a large number of "pre-discovery" nova photographs is unique and Mayer's images were quickly used by professional astronomers to calibrate the outburst of this star.

Mayer has also been an enthusiastic and articulate spokesman for astronomy, writing for such popular magazines as *Sky and Telescope* and *Astronomy* and lecturing on the delights of observing to audiences across the country. He is also an avid astro-photographer, and has taken many impressive color photographs of the heavens.

Mayer will accept his award at the 93rd Annual Meeting of the Astronomical Society of the Pacific, to be held between June 26 and July 1, 1982, at the University of California, San Diego.

From a news release of the A.S.P.

A Letter to the Editor

Dear Sir,

The Astronomical Unit, a source for large and small astronomical telescopes, is no more. Those with outstanding orders with this company may find themselves out of luck in getting refunds. However, if you had placed an order for a set of large optics (and optics only), then there is a chance the order may be completed.

Gene Fair was the optician contracted to make the optics for the Astronomical Unit. He has been paid for orders of several large minor blanks but he has been unable to contact the company to get the names of those who have placed those orders. He is most interested in contacting the owners of these outstanding orders. If you had placed an order with the Astronomical Unit and are concerned over its status, contact Mr. Fair with the proof of the order (or down payment). His address is:

Mr. Gene Fair
1258 North San Antonio Avenue
Pomona, California 91767
U.S.A
Tele. 714-620-5515

Please print the above in the NNL. I am one of the lucky ones but it took a lot of phoning to get this far. This may save some of your readers a lot of anguish.

Yours sincerely
Robert Dick, Ottawa Centre

Planetarians To Gather

The 18th Annual Conference of the Great Lakes Planetarium Association will be hosted by Lakeview Planetarium of Peoria, Illinois, and the Illinois State University Planetarium, Normal, Illinois. Invited speakers at the meeting scheduled for 13 to 16 October 1982 include UFO authority J. Allen

Hynek, science fiction writer Philip Jose Farmer, anthropologist John White, and planetarian Donald Hall. For further information, contact:

Carl J. Wenning,
Department of Physics,
Illinois State University,
Normal, Illinois 61761, U.S.A.

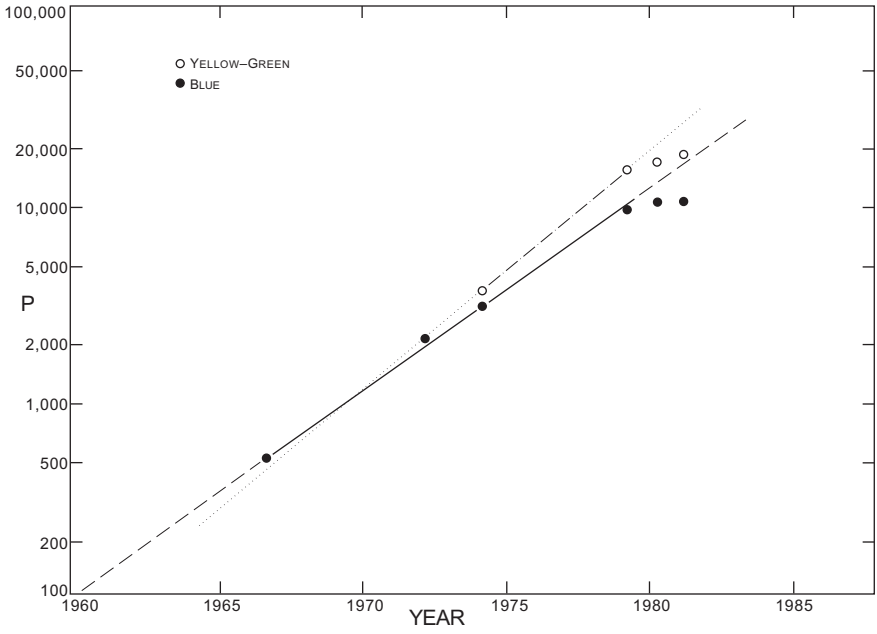
Growth of Light Pollution at the David Dunlap Observatory

The rate of growth of light pollution at the University of Toronto's David Dunlap Observatory has slowed dramatically in the past two years according to Prof. Tom Bolton, Associate Director of the Observatory.

Light pollution is caused by light emitted upward by outdoor lights. Some of this light is scattered back toward the ground by dust and molecules in the atmosphere. This scattered light produces a bright hazy glow which makes it difficult to see faint stars and interferes with astronomical observations.

According to Prof. Bolton, sky brightness measurements obtained by Prof. J. D. Fernie show that the sky brightness in both the blue and yellow regions of the spectrum was increasing by more than 25% per year from 1967 to 1979. Since 1979, it has been increasing by less than 10% per year.

Calculations based on semi-empirical models of light scattering by the atmosphere indicate that most



Light pollution at the David Dunlap Observatory, measured relative to the natural, unpolluted sky brightness, as a function of time. The dashed and dotted lines are extrapolations of the measured trends of the blue and yellow sky brightness between 1967 and 1979.

of the light pollution at the David Dunlap Observatory comes from lights in Richmond Hill and Thornhill and adjacent areas of Markham, Vaughan, and North York.

Bolton believes that the decline in the growth of light pollution is due to two factors. Higher energy costs have caused governments and businesses to be more conservative in their use of outdoor lights. Second, the Town of Richmond Hill, the Regional Municipality of York, and the Ontario Ministry of Transportation and Communications have all cooperated with the Observatory by designing lighting systems to minimize light pollution.

There are a number of steps that can be taken to help control light pollution. One of the most important is to use no more light than is absolutely necessary. Lights can be shielded to insure that the light is directed downward, where it will do the most good, rather than upward. Most of the research work at the David Dunlap Observatory is carried out in the ultraviolet, blue, and red parts of the spectrum. The Observatory has therefore favoured the use of yellow lights, such as the golden-coloured high pressure sodium lights, which have very little blue or red light.

A number of commercial and residential developments, such as the Hillcrest Mall and Baif subdivision, have been built in Richmond Hill with lighting designed to minimize light pollution. The Ontario Ministry of Transportation and Communications also consulted with the Observatory regarding the lighting on highways 7, 11 and 404 to insure that the impact on the Observatory would be minimized.

The sky over the David Dunlap Observatory in 1970 was approximately 1000 times brighter than the natural, unpolluted sky. Since then, the sky brightness has increased by a factor of 10 in the blue and 20 in the yellow.

Bolton comments, "The sky over the David Dunlap Observatory is much too bright to allow us to carry out some kinds of research – especially research on very faint objects. However, we are still able to obtain high quality observation of stars, and we have an extremely active research program at the Observatory.

We have been very pleased with the cooperation we have received from various governments in our efforts to control light pollution around the Observatory. It is gratifying to see that these efforts are finally bearing fruit. If the present trends continue, light pollution will pose no threat to the Observatory research programs. However, there will be a great deal of new development around the Observatory in the next decade, so we cannot afford to relax our efforts."

News Release from the DDO

Canada Customs Tariff Changes

by Peter Steffin
Halifax Centre

Many recent queries about the importation of telescopes have prompted me to write this 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 2½″ 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 vary from postal station to postal station. 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.

Reprinted from *Nova Notes*

Astronomy Education in Cuba

by Randall Brooks
Halifax Centre

In material prepared by Dr. C. MacFadden of the Atlantic Institute of Education, there is a breakdown of time spent in various subjects at each grade level. Totals are given for each subject over 12 years of formal schooling: Spanish 1400, literature 520, mathematics 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 grades 1 to 12!

Reprinted from *Nova Notes*

Toronto Star Does it Again

We have recently been informed by Terence Dickinson, a life member of Toronto Centre and well-known science writer, that his weekly astronomy colunm in the Saturday *Toronto Star* has been cancelled. This is the second time in less than 2 years that the newspaper has decided to banish the weekly astronomy article from its pages, despite the high public interest in astronomical phenomena. Readers will recall that after Dr. Helen Hogg retired as writer of the Star's astronomy column in January 1981 (*National Newsletter* 75 (2): L20–L21, 1981) the decision to drop the weekly feature was reversed following a vigorous write-in campaign by members of the Society. Considering the sorry state of reporting of astronomical events (as was in evidence in Toronto-area reports of the recent lunar eclipse), it is clear that the *Star*'s astronomy column, which has appeared since 1940, fills a need by the public for accurate information on celestial happenings. I urge members of the Society to write the Managing Editor of the *Toronto Star*, One Yonge Street, Toronto, Ontario M5E 1E6, and show that there is still a large group of readers who wish to see a regular astronomy column in one of Canada's major newspapers.

B. Ralph Chou, Editor

July Lunar Eclipse

The total lunar eclipse of 5–6 July 1982 was one of the darkest on record. Preliminary reports of observations from coast to coast indicate that many Canadians successfully observed the event under clear to partly clear skies, and noted the dark red colour of the totally eclipsed moon. We hope to have eclipse reports from Centres in the next issue of the *National Newsletter*. Meanwhile, don't forget the next lunar eclipse on 30 December 1982!

Astronomy Marches Onward

by Steven Morris
Calgary Centre

Few amateur astronomers attempt to read through the articles found in the top-level research publications such as *The Astrophysical Journal*. Indeed, many of these articles are so specialized and esoteric that even the titles can be unfathomable. But the editor of *The Observatory*, a booklet published by the Royal Greenwich Observatory, regularly dredges up little gems of information that everyone can appreciate, and I've selected a few of his quotes from the research journals to share with you.

For example, *The Moon and Planets*, vol. 21(1979), p. 44, informs us that "The large density of Neptune suggests that this planet consists of the Astronomical Society of Australia." Another unlikely event is recorded in the *Report of the Science Research Council* for the year 1978–79: "The balloon rose to a height of about 40 kilometres above the Earth's atmosphere." A much more likely finding was published in *Sky and Telescope*, vol. 60 (1980), p. 28: "Moreover, radio observations of interstellar ethanol have led some astronomers to conclude that the Milky Way has a small bar in it."

Specialized terminology can produce astonishing results. The *Highlights of Astronomy*, vol. 5 (1980), p. 38, supplies this flight of fancy: "Magnetic wings were suggested to be important for a loss of angular momentum from rotating single stars." If you are not up on obscure optical techniques, you would be disturbed to read this title taken from the *Ann. H.C.O.*, vol. 76 (1975), p. 107: "Combined Out-of-Focus Results from Several Instruments." And for those who think that measuring distances is difficult in astronomy, I give you the title of another article from *The Astrophysical Journal*, vol. 242 (1980), L25: "Detection of CO Emission at 1.3 Millimetres from the Betelgeuse Circumstellar Shell."

Typing mistakes take their toll as well. One is distressed to read in "M.N.," vol. 132 (1966), p. 250, that "The calculations ... lead to the excessively small density of 5×10^{40} particles/cc for the envelope of Nova Herculis 1963." And no one would trust the results in *The Astrophysical Journal*, vol. 243 (1981), p. 411, given the phrase "A statistically significant (1.6% confidence level) ... "

But astronomers are a tough lot. As proof, I shall close this article with two quotes that resulted from the authors trying to give credit to previous researchers. The first, from *The Astrophysical Journal*, vol. 232 (1979), p.485, states, "The shell is modelled as a spherical moving envelope following Kanasz and Hammer ... " And if you think THEY have problems, then consider the herculean task faced by another, as recorded in the *Mem. Soc. Astr. Ital*., vol. 49 (1978), p. 350. It claims that "After core helium exhaustion, these stars ... enter a double shell-burning phase. These shells become thin and thermally unstable, but their instability is suppressed by Paczynski."

Reprinted from *The Starseeker*