R E G U L U S

THE NEWSLETTER OF THE

ROYAL ASTRONOMICAL SOCIETY OF CANADA - KINGSTON CENTRE

SEPTEMBER, OCTOBER, 1985

STELLAFANE 1985

What a collection of people it was! More astronomers than I ever imagined would meet together in one place! There they were, all gathered on Breezy Hill, star-gazers from half a dozen countries, all interested in telescopes and the night sky and the prospects for observing some very faint objects there, under the clear dark skies of this mountain peak in the old Green Mountains of southern Vermont.

Like thousands of others, our Centre's Vice-President David Levy and I, had journeyed to this Mecca of astronomy for the weekend of activity known as Stellafane. Stellafane - sanctuary or temple of the stars, as the name suggests. Stellafane - the historic gathering place of telescope makers and observers. As one who had attended numerous conventions of stargazers but never a Stellafane, your editor was immediately struck by the numbers of people and the quality of observing equipment that had been brought to this renowned hill in the Appalachians. Even in the dark of the Friday night, with landmarks made faintly visible by the subdued glow of red-tinted flashlights, there was no mistaking that this was the fabled place known to all astronomy buffs from photographs in books and magazines, for it was possible to distinguish the clubhouse of the Springfield Telescope Makers and just beyond it the unique turret telescope on the observatory built by Russell Porter over half a century ago. And amid the ruddy glow of the hundreds of flashlights there was also no mistaking that there were dozens of fine home-made telescopes - exquisitely machined and carefully laboured over for hundreds of hours and finally brought here to be judged and tested on the night skies. Observing with the turret telescope and a number of others from ten to twenty-four (Yes !) inches in aperture was a rare experience to be relished through the all-too-short hours of the night until morning twilight sadly ended the session. And what a memorable session it was! A good number of the serious observers had caught their first glimpse of Halley's Comet. Others, less certain of having seen it, or wanting more time than was available to "really see it", had nonetheless had the observing experience of a lifetime. Many observers, this one included, had seen the Veil Nebula, thanks to twenty-four inches of aperture and a very transparent mountain-top sky, in such a clear and distinctly defined way as they had never witnessed it before. It simply stood out in the eyepeice as clearly as does the moon on a frosty December night.

In such a setting one quickly realizes he is in a place of great and long-standing tradition. Whether under the starlight of the Friday night or the sunlight of the Saturday afternoon, Stellafane becomes truly a "temple of the stars" with everything taking place within view of the famous clubhouse - temple-like with its high pointed roof and the Biblical inscription of its facia boards announcing to all that the Heavens proclaim the glory of God. Indeed, for over half a century the skies have annually been one of the attractions for the many who have made the annual pilgrimage to this shrine built by Porter and other pioneers of the Springfield Telescope Makers Club. The afternoon and evening programs of the Fiftieth Stellafane Meeting were memorable occasions. In the former, some of the foremost authorities on comets, and Halley's Comet in particular, dealt at length with a topic of concern to all observers. In the twilight sessions delivered by Walter Scott Houston and Robert Cox there were reminiscences over many decades of events and people who, had participated in Stellafane, some of them names that will be well remembered in the history of astronomy in the present century. It seems to many people that "Scotty", as he is affectionately known, is a man who must have been annually reminiscing and telling tall or humorous tales about Stellafane for almost as long as the event itself.

Some might find it hard to understand why a telescope builder would spend hundreds of hours constructing a masterpiece to bring it to this place, exhibit it, and have a chance of winning a blue or red ribbon with no monetary value; only those who realize the meaning of a ribbon won at Stellafane can understand why it is done. They then can understand the efforts of Duane Niehaus who this year brought his 12 1/2" Newtonian from Tucson, Arizona, or of our own member, David Levy who in 1979 took his "Talking Telescope" which was recalled in the feature presentation by Robert Cox. Stellafane is also meeting people, not just the famous journalists of the world of amateur astronomy, but also old friends; it is renewing acquaintances with those we see all too seldom. It is enjoying the traditional feast of Stellafane, a dinner featuring the delicious Green Mountain corn, without which it is said there could be no Stellafane at all, for the meeting is held each year, by tradition, in the dark of the moon after the Green Mountain corn is ripe.

Someone in the Heavens above Stellafane must have been smiling on the proceedings this year for the skies provided cloud-free viewing of the Heavenly Vault for a second night, and once again until the twilight of the Sunday morning appeared in the east, hundreds of observers pursued their fascination with the stars and the faint galaxies above the mountain-top.

The Stellafane events concluded with a Sunday morning visit to the museum at the Springfield's Hartness House Inn, a fine old New England hotel, once the mansion of the state governor. It is the site of a second and very distinctive turret telescope (a clear reminder that the age has passed when inventors were concerned to build a telescope with an eyepiece that was stationary no matter where the 'scope was pointed) and a display of some of the inventions that poured out of the mind of the amazingly gifted Russell W. Porter. To describe in detail all the branches of knowledge which he mastered and expanded would be a lengthy task: suffice it to say that he was an Arctic explorer who made many trips to the "top of the world", a painter of great skill, and an inventor of other things in addition to his being a renowned astronomer and builder of unique telescopes. In fact, it was his plans and designs that were used in the construction of the 200" Giant of Palomar. A visit to the "Porter Museum" is a very fitting way to conclude the "Stellafane experience" for one is reminded of the man who was responsible for it all happening many years ago.

As one returns home and reflects on the weekend, he remembers a few things about it certainly the equipment; which can only be called inspiring, for a friend on leaving has said he will be there next year with a telescope that he has been under construction for a long while, and also the smoothness of the event - in spite of the fact that there were thousands of people at an obscure (to non-astronomers) hilltop off a barely passable dirt road off an unnamed laneway near a small New England town.

A trip to Stellafane such as this one is an unforgettable event - one whose repetition can be awaited many times in the years to come. For those who have never had the experience, I can only hope that the chance will come.

BOOK REVIEW

Colours of the Stars by David Malin and Paul Murdin. Pages 198; 22cm X 28 cm. Cambridge University Press, New York, N.Y. 1984. Price U.S. $27.95 (hard cover).

Two seasoned British astronomy writers, David Malin, photographic scientist at the Anglo-Australian observatory, and Paul Murdin, of the Royal Greenwich Observatory, have produced an authoritative text on the topic of colour as seen and photographed in the heavens. Colours of the Stars deals with all aspects of colour in modern astronomy from the time of the newly-invented camera's first being directed to the heavens a century ago to the latest techniques of recording the colours of stars, nebulae, galaxies, dust clouds, and quasars. It is a book that will be noted for its fine colour reproductions and excellent black and white photographs - not everything is in colour, in spite of the title - as well as text that is clear, direct, and competently written.

The beginning chapter gives a basic review of the science of the visible portion of the electromagnetic spectrum and the development of photography about a century ago. It was with the development of photography that astronomy and astrophysics underwent rapid

surges forward to the "knowledge explosions" of recent decades, and this book is evidence of how photography and astronomical knowledge have marched hand in hand over the past century.

The authors pay a special tribute to Ainslee Common, an English amateur astronomer and astrophatographic pioneer, who almost exactly one hundred years ago (1883) became the first person to obtain photographs of stars too faint to be seen with the naked eye. His 37-minute exposure of the Orion Nebula is one of a dozen in the book of that object which has been more photograhed and studied than any area of the heavens.

Photographic techniques and film developments are discussed in their historical development - hypersensitization and chilled emulsions and other ways of tackling such problems as reciprocity failure. In the many stunning photographs in the book the publisher has used the techniques of unsharp masking, contrast enhancement, and three-colour addition to "turn up the colour" as one might on a television set in order to provide greater contrast and richer colour saturation. The result: superb photography of the heavens! Almost unbelievable vistas of deep-sky objects! Some of them alone make the book worthwhile; one is occasionally tempted to say that the text is only an addition. All the common objects known to the deep-sky photographer are here, and more: galaxies, planetaries, supernova remnants, emission nebulae, and dark nebulae, and many of them from the skies near the South Celestial Pole - a fact which makes parts of the book a special treat for denizens of our globe's northern regions.

We are clearly shown how the technique of unsharp masking of printed photographs has been used to reveal otherwise hidden structure within the disk of Ml04, the Sombrero Galaxy. Globular clusters about the disk and internal details never before seen can be glimplse simply because of this recent photographic development. Even more surprising was the discovery in 1980 of a series of shells surrounding otherwise normal elliptical galaxies such as NGC1344 and NGC3923 whose stunning photographs are shown with the shells, which at the moment are believed to be made up of stars diplaced because of an encounter with another galaxy.

It was with some of the first photographs of the Milky Way that E.E. Barnard discovered that areas of fewer stars were not "holes" in the heavens but clouds of interstellar dust within our galaxy. It was a consideration of the brightness and the colour of the stars in the Pleiades cluster that led Hertzsprung to his fundamental discovery that later became famous as part of the Hertzsprung-Russell Diagram, a cornerstone of modern astrophysics. Both of these event are clearly illustrated.

One of the of the interesting "sideshows" of the topic "colour of the stars" is the speculation relating to the question of whether Sirius has undergone a colour change since antiquity. The evidence from classical writers is examined with the conclusion that the change is "doubtful - a red herring to astronomy, however real the long-term changes of the colours of the stars." One of the few excesses of the book is the lengthy effort at ridiculing a Dr. T.J.J. See, a person who supported the idea of Sirius' colour change and went to great lengths to gather quotations - some admittedly quite questionable - from ancient authors; indeed, he may have been an "egotistical (the word is used twice) charlatan" in the eyes of his peers and his ideas on a completely different topic may, indeed, have been satirized in an 1899 issue of The Observatory, which is quoted verbatim and at considerable length. The point was well made without the lengthy and scarcely relevant quotation.

Among the five photographs of the Helix Nebula are two which show large loops of matter extending on either side so that it has a twin-lobed symmetry, another example of a discovery that would not have been made without the photographic amplification processes that are now available and are being used to bring into view details previously unsuspected.

One would be hard pressed to find fault with any of the amazingly beautiful photographs or the marvellous way in which they are reproduced. Photographically, the publishers have scored a coup. In the matter of text, there are places where the arrangement of topics could be improved. Not all of the discoveries are dealt with in chronological order, which might have been preferrable, and some other topics seem out of place. For example, the topics, atmospheric extinction and the reddening of sunsets and lunar eclipses, are matters that could have been dealt with elsewhere than in the chapter entitled "Dust Clouds of Sagittarius". Marginal "justification" of columns of print is something that is found in most high quality texts; in this case the publishers have chosen to leave the columns "ragged" - a minor matter in the overall presentation which is very good. Although its price may mean that this fine book is beyond the

means of some amateurs, the serious astrophotographer will probably want to own it as a collection of "what can be produced" when the modern camera is directed toward the skies and he will refer to it frequently as an inspiration for his own work.

CALENDAR CONVERSIONS, or "Fun With Figures"

[EDITOR'S NOTE: The last issue of REGULUS carried the first installment of our president, David Stokes' article Timely Reflections On The calendar. I am most pleased to have received the final part of the article for inclusion in this newsletter.]

There is a solar eclipse on Julian Day (JD) 2446382.091 . When exactly is this? Smart people refer to their personal copy of the Observer's Handbook; pages 20 and 76 will solve this one. The plodding computer hacker will have already written a few short subroutines that will give the answer at the touch of a button. The advantage of the personal computer lies in its speed and versatility and the real possibility of calculating the solar eclipse time from first principles.

If you intend to use a personal computer for date conversions, it is advisable to adopt a convention. Thus, for example, 1985 August 17 1800h can be written 1985.081725 where the 25 at the end represents 0.25 days or 6 hours after noon when the Julian Day begins. Thus, in a program we can write DAT = 1985.081725 to store the time, and then YY = INT (DAT) will store the year in variable YY, while MM = INT (1OO*FP (DAT)) will store the month in variable MM. In this dialect of BASIC the command INT extracts only the integer part of the number, while the command FP takes the fractional part, i.e. .081725. Similarly, one can store separately the day in DD. Note that we are using ten digits to represent time to within 0.01 days or about 15 minutes.

Suppose that we have broken the date down in this way and want to calculate the Julian Day Number, beginning at noon on August 17. The following algorithm will provide the answer in one single step:

```
JDN = 367*Y-7*(Y+(M+9)\12)\4-3*((Y+(M-9)\7)\100+1)\4+275*M\9+D+1721029
```

This is the most concise algorihtm ever written to convert Gregorian dates (in the Christian Era only) to the corresponding Julian Day Number. It was quoted in Sky and Telescope, May 1984, page 454 from the Astrophysical Journal Supplement Series 41, 1979 by Fliegel and van Flandern.

This programming tour de force was originally written in FORTRAN, operating in integer mode. I have converted it to BASIC and forced integer mode by writing the division sign as the backslash (\). Thus, if Y = 1985, M = 8, and D = 17, in our example, the arithmetic goes as follows:

```
1st term 367*1985                          =   728495
2nd term 7*(1985+(8+9)\12)\4=
         7*(1985+1)\4=7*1986\4             =    -3475
3rd term 3*((1985+(8+9)\7)\100+1)\4=
         3*((1985+0)\100+1)\4=
         3*(19+1)\4=3*20\4                 =      -15
4th term 275*8\9=2200\9                    =      244
                                         D =       17
                                +constant    1721029
                                   TOTAL  =  2446295
```

From the Observer's Handbook, page 20, the JD number for August 0 is 2446277.5; so, Oh August 17 is JD 2446294.5, and noon will be 2446295.

Some dialects of BASIC may require DIV for integer division, or some other approach. If your PC specimen does not do integer arithmetic, don't wreck it! In the same isssue of Sky and Telescope, two short programs are listed to convert any date to its JD number and tne inverse. These are based on algorithms devised by Jean Meeus and published in Astronomical Formulae for Calculators. In this title, I think the publishers are referring to the people who calculate and not to the hand-held calculator! Meeus's equations are for normal decimal arithmetic and are also simple to use, viz.:

for dates before 1582.1015 (That should look familiar!):

JDN = INT (365.25*Y) + INT (30.6001*(M+1)) + DD.dd + 1720994.5

Thus, for our example, let Y = 1985, M = 8, and D= 17.50 (noon, dd = .50).
Then, JDN = 725021 + 275 + 17.5 + 1720994.5 = 2446308.
Since our date is after the Gregorian reform of 1582 October 15, we have to add a correction; thus,
A = INT (y/100) = INT (1985/100) = 19, and then
B = 2 - A + INT (A/4) = 2-19 + INT (19/4) = 2 - 19 + 4 = -13.
So, the JDN = 2446308 - 13 = 2446295.
That 13 we have subtracted is the number of days' "error" in the Julian Calendar and corrected in our reformed Gregorian Calendar.

One neat trick for finding the day of the week uses the JDN. First calculate the JDN for Oh for the date concerned, e.g. 2446294.5 for 1985 August 17 and add 1.5 to get 2446296.0. This number is divided by 7 and the remainder retained, or in integer BASIC 2446296 MOD 7 = 6. If the remainder is 0, the day is Sunday, if 1 it is Monday, etc., etc., so that a remainder of 6 represents a Saturday. This exercise will hold true for all dates because the calendar reform of 1582 (and later in some countries) preserved the day of the week sequence. Thus, 1582 October 4.0 (midnight) is JDN 2299159.5 which leads to a remainder of 4 corresponding to a Thursday, following the above exercise. The next day, beginning the reformed calendar, Friday, October 15, 1582. Incidentally, the Julian Day numbering began at noon on -4712 January 1 (that is 4713 B.C.) which was a Monday, though I am not at all sure in whose calendar!!! [Editor's Note: This is a good point. In the fifth millennium before our era, certainly no one cared about days of the week. Our seven-day planetary week was not in comnon usage before the time of the late Roman Empire, that is, not before the third century A.D., though some sources claim that it existed locally beside the old Roman eight-day week as early as the first century A.D.]

This brings me full circle to R.S. Barrington's perpetual Gregorian calendar which started this tortuous train of thought. His program uses the one-liner of Fliegel and van Flandern carefully adapted for BASIC and a simple microcomputer. With the addition of ingenious routines for the calendar dates and, of course, and the routine for the day of the week applied to the first day of the month of any year. After changing the dialect to suit my PC, I present here the first Gregorian Calendar for October 1582. You will note that is is identical to March 1985, and that 1582 October 15th was indeed a Friday, as we expected.

SUN	MON	TUE	WED	THU	FRI	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

One final note of caution when working with dates before the Christian era: the astronomical year must be correctly indicated, viz.:

Calendar Year	Astronomical Year
3 C.E.	3
2 C.E.	2
1 C.E.	1
1 B.C.	0
2 B.C.	-1
3 B.C.	-2
etc., etc.,	
45 B.C.	-44

46 B.C., the year in which Julius Caesar introduced his reformed calendar, was astronomically, for our purposes, -45. 45 B.C. (astronomically -44) was a leap year, and the ususal rule applies to negative year numbers too!

If anyone finds all this confusing, - then, let's make a date. In the meantime, use Meeus or other schemes to write those subroutines, and then have some fun with figures.

2446295.0 D. M. Stokes

THE UNUSUAL AURORAL OUTBURST OF AUGUST 12-13, 1985

I would like briefly to share my observation of the unusual Auroral activity of the night of August 12-13, 1985 and am wondering if other observers in various parts of the country have recorded reports of similar observations on that night. One other member of the Kingston Centre, Mark Sorensen, made a very similar observation from a site thirty kilometers from mine.

In general, during the several months previous to this Auroral outburst I observed only very limited Auroral activity. Occasionally there were nights when a faint glow was seen low in the North, with generally almost no pulsation or other activity observed. On the night previous to the one with which I am concerned, namely August 11-12, I saw absolutely no Aurora at all, during a night spent observing the Perseid meteor shower.

The night of August 12-13 was very unusual because of the activity in the north and up to the zenith where there was the swirling of coronal activity,but most especially because of the band from east to west. The northern activity covered over 100 degrees of azimuth centred on the north point, was generally active with double arcs, flaming, and spikes up to 50 degrees in altitude and sometimes to the zenith, and lasted from when I began observing shortly after 10:30 E.D.T. (2:30 UT.) until midnight - 12:00 E.D.T. (4:00 UT) - with quite subdued activity thereafter, in fact, generally only a bright glow until 2:00 a.m. (6:00 UT.) when clouds made it impossible to continue observing.

The band was only the second of its kind that I recall seeing; it stretched from horizon to horizon, east to west, crossing the Milky Way at almost right angles, at first in the constellation Sagitta, and later moving southward a little and crossing in Aquila just south of Altair. The band was 4 to 5 degrees wide and was more intense in its western half; for a while it had very intense bars, like steps, within it in the area where it crossed the Milky Way. The whole sky took on the appearance of a giant letter "X" with the Milky Way forming one bar and this band-Aurora forming the other. This band did not last as long as the activity in the north. It was seen only from the time I began observing (about 10:30 E.D.T. - 2:30 UT.) until about 11:15 (3:15 UT.), that is, for less than an hour. The entire Aurora - both the northern Aurora and the band across the sky - was not a very colourful one, with no reds seen and only slight hints of green; yellowish-white was the predominant colour.

The previous and, I think, the only other occasion when I have seen an east-to-west band Aurora was on the night of August 29-30, 1978 from 4:40 to 5:10 UT., about seven years ago. On that occasion I also described the colour as mainly white with a few hints of yellow and perhaps some yellow-greenish tints. On that occasion the Aurora appeared to rise in the East and cross the Milky Way and was not as defined in the West as in the East.

It is interesting to note that it was a time of very low sunspot activity with very few sunspots seen during the weeks before and after this Auroral outburst; in fact, on several of the days both before and immediately after this strange Aurora not a single sunspot was visible. Of course, there may well have been a solar flare of which I am unaware, at the time of writing this report.

I am interested in hearing if there are other reports of this unusual one-night Auroral outburst.

INTERESTING CORRESPONDENCE

[EDITOR'S NOTE: Following the observation of the unusual aurora mentioned above, I reported it to a number of observers, one of them Father Lucien Kemble of Cochrane, Alberta, a member of the Calgary Centre of our Society and widely

regarded as one of the finest observer in the country. A grouping of stars in the constellation Capelopardalis bears his name, Kemble's Cascade. His well-received paper at the recent Edmonton General Assembly concerned his DAYTIME observations of planets, particularly his obsevations earlier this year of Venus when that planet was passing through inferior conjunction. In answer to my letter he sent a very interesting reply part of which is printed below.]

Cochrane, Alberta,
August 20, 1985.

Dear Leo:

Thanks so much for the letter especially the description of the aurora of August 12-13.

It is marvellous to think that we both saw the same phenomenon for so long a distance across the country. That evening I had a group of junior high kids from a parish in town. They were terribly disappointed when they arrived that it was fully overcast. So I showed them some slides of Voyager and when we finished and went outside, it had cleared. I set up the scope and one of the first things we noticed was a very bright narrow band of lovely bluish light extending from south of east to north of west (arc centred on the magnetic pole). It looked so unreal we all thought it might have been a jet trail, but then at the auroral zenith it showed shifting, rippling streamers. Like you, it was only the second time I have seen such a striking display. The first one in Saskatchewan years ago I have well documented on film. The streamer cut across the Milky Way and the whole scene was interrupted by at least a dozen or so bright break-up types of Perseid fireballs. (The kids broke out with cliché: "Really awesome!" "Wicked!" Almost all of them had never been exposed to the sky, let alone aurora, Milky Way, meteors, and so on.) We missed the previous night of the Perseids - overcast. Some of our club members saw a greatly reduced number of predicted Perseids the night of maximum at our RASC scope south of Calgary.

I now have 55 observations of Comet Giacobini-Zinner and it is brightening nicely. The other night it had a tail of at least 10 arc minutes, and one of our members, our president, Bob Loblaw, got a beautiful shot of it with his Schmidt. I took a few shots of it with 210mm. telephoto on piggyback. The big thrill for me, though, was my first sighting of Halley in the early morning of August 6. I had one of the most superb skies I've seen and though I am awaiting confirmation of my sighting from Edberg (who wanted my drawing of the star field and full description) I feel reliably certain I saw the extremely faint speck. Also I got a second on the morning of the 17th. I hope some of our guys saw it on their annual trek to Mount Kobau this past week-end. I also am awaiting confirmation of a sighting of a possible supernova in NGC5033, the one where there is a fading supernova of this early summer. Saw two specks side by side and phoned Marsden.

This is fine weather for observing out here, with relatively warm August evenings, although there has already been considerable snow on the Rockies 30 miles west. I shudder to think of winter already on its way.

Clear skies!
Luc

[EDITOR'S NOTE: Another interesting letter arrived from the west, this one from our past president, Angelika. With it were two of her astrophotos, both of them catching a Perseid meteor, and a newspaper clipping from the Victoria daily - the article reporting Victoria Centre member, Jack Newton's photographing Halley's Comet on August 10th and 11th. We thank her for so much news from the west coast and are pleased to print part of her letter.]

Burnaby, B.C.,
Aug. 21, 1985.

Dear Leo,

Another great issue of REGULUS has arrived and I enjoyed reading all about the G.A. activities. I'm sure that the year we leave Vancouver (if we ever have to) the G.A. will be held here, as it has been following me around everywhere!

The book review of Field Guide to the Stars and Planets is excellent -- I bought this

book when I still lived in Edmonton and have been using it ever since, on travels especially. What a useful guide it is! My first copy, however, was missing an entire section, the second one was missing a different section, and the third had defective pages with stains all over them! Now I have a good copy fran the same store in Edmonton which ended up sending the entire stock back. It might be wise to check if all the pages are complete, if anyone acquires this book. But they probably have all the problems cleared up by now.

We had the best summer in all of Canada! For 6 weeks nothing but clear skies, then a week of rain, and now clear skies again. On Aug. 11, we were still in the city; so we didn't see any Perseids (nor stars for that matter!), but on the 12th we went to the west coast of Vancouver Island and had reasonable conditions. It was a bit hazy, but I tried some photos and here are two of them with what I believe to be Perseid Meteors in them. [EDITOR'S NOTE: They certainly are, Angelika. Congratulations!] We saw quite a few very bright Perseids on August 12, but, of course, they always "just missed" the frame of my photos! I saw a really bright and long one, with a trail of smoke, shoot right through Ursa Minor and was sure that I had captured it on film that moment, but there's nothing on the photo that looks like a meteor. I suppose one could take dozens of exposures in the hope of getting a meteor in a few of them.

Recently Berlitz gave ne an interesting job at an international conference in the Hotel Vancouver. It was all about car repairs and body refinishing, of which I don't know very much, let alone in German! But the speeches had to be translated instantaneously - quite a hair-raising experience, when there are one hundred delegates from Europe who speak only German! Needless to say, I was up all night looking up the terms, and my partner was doing likewise. We alternated every 20 minutes --it's really exhausting and I'm not surprized it's such a well-paid job!

Hope that everyone is doing well! Regards to the Kingston Centre!

All the best,
Angelika and Bob

[EDITOR'S NOTE: It is always a distinct pleasure to correspond with our Vice-President, David Levy, whether it is by phone, letter, or whatever means. His talk at our Centre neeting on July 26th was one of the best this editor has ever heard. This letter which he sent us a short while after is very much appreciated.]

Rt.7, Box 414,
Tucson, Az. 85747
Aug. 2, 1985.

Dear friends,

Thank you for the opportunity to speak at the last meeting. It was so good to see you all again and see so many people gather at this Kingston Centre meeting.

I hope the Centre can get together to accomplish a couple of good things to commemorate our anniversary next year. The first might be the creation of an award to honour the progress of a beginner to astronomy - an award with a twist - the recipient would not have had to accomplish a lifetime of work in astronomy, but instead could have completed some project to indicate that she or he shows promise. There are too many awards for advanced people - ours would be different.

I further suggest we name this award in honour of Dr. A. Vibert Douglas, our founder and Honorary President.

Also, wouldn't it be nice to complete a Dobson mount for our Centre's telescope? It would make it so much more useful.

I hope you will consider these suggestions and I thank you for your consideration.

Sincerely,
David H. Levy
Vice-President

A TREMENDOUS SPRING AND SUMMER SCHEDULE

What a tremendous series of meetings we have had over the past four or five months! As sure as shooting stars, there isn't a Centre in the country that wouldn't give the eyeteeth of its telescope (make that "the eyePIECE of its telescope") to have a lineup of special invited guests like ours.

Beginning in the month of May we had Peter Jedicke of the London Centre talking about Canada's involvement in space and the proposed space station of the 1990's. For that month's second meeting there was Rolf Meier of the Ottawa Centre, Canada's foremost comet hunter, who showed us some of his fine astrophotography and talked about galaxies of which he has observed more that a few! The activity of the next month was concerned with the General Assembly, the biggest meeting in the country and reports from it. In July there was the absolutely unforgettable meeting in which David Levy spoke about the discovery of Comet 1984t and the joys of observing in the shadow of Kitt Peak. In August we had a very fine presentation fran Dr. David Hanes, of Queen's University, who gave a keenly interesting talk about globular clusters which he specialized in studying for many years and in observing from many places on the globe, including southern Australia.

If only we could be so lucky as to continue this fine tradition! There would surely by no complaints about the quality of our guest speakers.

FOR YOUR COMPENDIUM OF ESOTERIC FACTS

We all know that William Herschel is credited with the discovery of the planet Uranus in the year 1781, but did you know that, in fact, the planet was discovered and recorded on a star atlas almost exactly 91 YEARS BEFORE Herschel made his famous discovery? It is true. When John Flamsteed was designing his famous nap of the heavens in the 1680's and 1690's, he catalogued what he thought was a sixth magnitude star in the constellation Taurus and gave it the number "34", for his was the still-used system whereby stars are numbered west to east in a constellation. The star numbered 34 Tauri was entered on his atlas in December 1690! That is why, if you look on Tirion's SkyAtlas 2000.0 Charts 4 and 11 and move your eye down the line marking 4 hours Right Ascension, you will see all the stars with the Flamsteed numbers from 30 to 40 except 34 which no longer exists. It has long since moved out of Taurus and has circled the zodiac many times since 1690 because, of course, it was the planet Uranus, unknown to Flamsteed. In fact, it is possible that the object could have been seen by many observers in various places in the sky long before Herschel finally recognized it as a planet of our solar system.

REPORTS AND OTHER ITEMS

1. In general, it seems to have been a fairly disappointing year for the Perseids. There had been expectations of a rich shower this year but numbers were barely up to average, even for single observer recordings made under dark moonless skies. It is true that a number of fairly bright ones were seen and over an extended period - in fact, over about three weeks. However at precise maximum the "heavy production" did not materialize.

2. Solar observations have generally shown that sunspot numbers are very low over the last two months. In fact there have been quite a number of days on which not a single spot could be recorded although the granulation and areas of faculae abounded on the solar disk.

3. Our Centre is very pleased to welcome Peter Glasgow of the Queen's Classics Department

to membership in the Society. I look forward to seeing him at many meetings in the future.

4. Over the coming months the following items will be worth watching:
(1) Halley's Comet. Of course! It is expected to brighten considerably in September, October, and November. With the information given in the Handbook on pages 130 to 133 and in Sky and Telescope and Astronomy magazines and the Comet Halley Handbook, it is not necessary to provide an ephemeris here. Plan your observing times around the "observing windows" over the next three months that is near the time of New Moon and when the moon is young and in the western sky and setting in the evening. The dates of New Moons are Sept. 14, Oct. 14, and Nov. 12.
(2) Comet Giacobini-Zinner. Don't forget to observe this comet which has provided some of us with so many fascinating views over the past two months. It is visited by the ICE spacecraft on September 11th and it passes only two degrees from Halley on September 14th. Let's try to capture it on film before it becomes any fainter.
(3) the mutual phenomena of the satellites of Jupiter, a good number of which are visible in September. For precise times consult the last newsletter or the September issue of Sky and Telescope, page 250.
(4) Mars and Venus which are interesting objects in the morning sky. They are especially so on the mornings of October 4th and 5th when they are extremely close together.
(5) certainly one, and possibly two, meteor showers. The Orionids, which are associated with Comet Halley, peak on the night of October 20-21. There is a slight possibility of a Draconid (alias Giacobinid) Meteor Shower or Storm on the morning of October 8th. More information about the latter will likely be given at one of our meetings.

5. I have been asked by the Treasurer to remind all our members that fees for the Membership Year 1986 are due OCTOBER 1. PLEASE PAY YOUR ANNUAL DUES AS SOON AS POSSIBLE.

6. Here is our calendar for upcoming regular Centre meetings:

Sept. 13	Leo Enright: Stellafane 1985
Sept. 27	Leo Enright: The Recording of Observations
Oct. 11	OPEN
Oct. 25	OPEN
Nov. 8	OPEN
Nov. 22	OPEN -- ALSO, ANNUAL BANQUET AND ANNUAL MEETING.

NOTICE IS HEREBY GIVEN THAT FOR A CONSTITUTIONAL AMENDMENT TO BE VOTED ON AT THE ANNUAL MEETING ON NOV. 22ND, A WRITTEN STATEMENT MUST BE SUBMITTED TO THE PRESIDENT AND SECRETARY BEFORE SEPTEMBER 23, THAT IS, 60 DAYS BEFORE THE ANNUAL MEETING.
Our meetings are at 8:00 p.m. in Room 222 in Ellis Hall on University Avenue. We hope to see you there.

7. Our address is: R. A. S. C. - Kingston Centre,
Box 1793,
KINGSTON, Ont.
K7L 536

Clear skies!
Good Observing!

Leo Enright

ABRAMS PLANETARIUM

SKY CALENDAR OCTOBER 1985

An aid to enjoying the changing sky

Use this scale to measure angular distances between objects on diagrams below.

0° 10°

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
PLANETS AT DUSK: **Jupiter,** brightest evening object, is in SSE to S as sky darkens. **Saturn** is very low in SW to WSW, and disappears near month's end. **Evening diagrams** show sky ¾ hour after sunset.	**PLANETS AT DAWN:** **Venus** is brilliant "star" in E to ESE as sky brightens. **Mars** is faint, reddish, nearby; see diagrams. Planets 2° apart Oct 1, 0.4° apart Oct 4 & 5, 16° apart Oct 31. **Morning diagrams** show sky ¾ hour before sunup.	1 • Regulus Morning: ✶ Venus • Mars E ESE	2 • Regulus Morning: ✶ Venus • Mars E ESE	3 Mornings: High SW to WSW Moon ○ Friday Oct 4 Aldebaran Pleiades Hyades Moon ○ Oct 3	4 Morning: Face east. • Regulus Venus Venus-Mars within 4° apart this morning and tomorrow. Mars	Morning: • Regulus Mars Venus
6 Morning: • Regulus ✶ Mars Venus	7 Mornings: High ESE to SE Castor • Pollux • Moon at Last Quarter Mon Oct 7 Moon Tues Oct 8	8 Using telescope, watch Jupiter's moons from 8:15 pm to 8:24 pm EDT. Europa, 2nd moon E of Jupiter, then fades by 2 mags and brightens again, as Io's shadow sweeps over it.	**Comet Halley** now 164 million miles from Earth and 207 million miles from Sun. On Oct 9-25, two hrs before sunup, there is little or no moonlight, and dark skies for viewing Halley! See box below.	10 Moon • Regulus Morning: • Mars ✶ Venus	11 Morning: Regulus • Moon ✶ Venus • Mars	Morning: • Mars ✶ Venus Moon E E
13 Morning: Just 18 hr until New Moon from E Coast. • Mars ✶ Venus Very old Moon (use binoculars) E ESE	14 New Moon 12:33 am EDT (9:33 pm PDT Oct 13). **Comet Halley** tomorrow morn: ½° N of 4.6-mag x' Ori. Tomorrow night (Oct 15) about 7:45 pm PDT, Europa fades by 1.3 mag. Event similar to one listed Oct 8.	15 Evening: Moon, 42 hours old, is easy for naked eye. But look early, before it sets! Antares • Saturn SW Young Moon WSW	16 Evening: Antares Saturn Moon SW	17 Evening: Moon Antares • Saturn SW	18 Morning: • Mars ✶ Venus E ESE	**Comet Halley** is 134 million miles from Earth and 195 million miles fr Sun. Compare Oct 9. Se box below.
20 Evenings: SSE to S Jupiter ✶ Moon ○ Monday Oct 21 Moon at First Quarter ☽ Sunday Oct 20	21 Peak of Orionid meteor shower, associated with **Comet Halley.** Look in predawn darkness hours. Comet itself is ¾° N of the 4.4-mag star x' Orionis. See Comet Halley notes below.	22 Gibbous Moon rises today about two hours before sunset. From northern U.S. Oct 22-30, Moon rises less than half an hour each day. West Coast viewers: Watch Europa 10:05 pm — 10:12 pm PDT. See Oct 8.	23 Morning: Mars • ✶ Venus E ESE	24 Watch Moon rise farther north each evening through November 2nd.	25 Moon rises slightly south of due east just over an hour before sunset (as seen from latitude 40° N).	Moon rises just north of east within an hour befo sunset.
Oct 27, morning: Mars • Venus ✶ E ESE	28 ○ Full Hunter's Moon. Exact time of opposition to Sun is 12:38 pm EST. Total lunar eclipse overhead in Indian Ocean, not visible in North America.	29 Evening: Can you still see Saturn & Antares? Using binoculars, also try for Mercury. All are higher & easier from southern states. Antares Saturn SW Mercury WSW	Oct 30, morning: can you see Spica yet? Try with binoculars. Mars Venus ✶ E Spica ESE	Mornings: 31 Face west. Aldebaran Moon ○ Thurs Oct 31 Hyades Pleiades Moon ○ Wed Oct 30		**COMET HALLEY,** speeding rapidly toward Earth and Sun, attains top speed toward Earth—35 mi/sec—on Oct 4. Halley's motion against stars increases from less than 0.1° WNW per day Oct 1 to nearly 0.9° W per day Oct 31. See Oct 9, 14, 19, 21. It rises in evening, but is highest in dark sky just before morning twilight begins. At 10th mag in mid-Oct, it is within easy reach of 3-4 inch diam telescope. Use low power! By mid-Nov Halley will be up all night and may be within reach of binoculars.

Magnitudes: Venus −3.9; Jupiter −2.6 to −2.3; Mercury (late Oct) −0.2; Saturn +0.6 to +0.5; Mars +1.8; Comet Halley 11 to 9. **Motions:** The **Sun goes 31° E, crossing from Virgo into Libra Oct 30. Mercury passes 4° S of Saturn Oct 29, but event is too low in eve twilight to be seen from N states. Venus goes 38° E, crossing from Leo into Virgo Oct 10. On Oct 4 & 5 Venus appears within 0.4° of Mars. By Oct 31 Venus has moved to 16° E (lower left) of Mars. Mars goes 19° E, crossing from Leo into Virgo Oct 16. See [illegible] Jupiter ends retrograde and turns eastward on Oct 3. Jupiter is then 6½° W of 4th-mag Theta Capricorni, and will closely pass that star in early December. Saturn goes E about 0.1° per day in Libra. At midmonth Saturn is 7° W of Beta Scorpii and 15° from Antares. Comet Halley goes 12° N in Oct, crossing from Orion into Taurus Oct 23. See Oct 14, 21. On Oct 25 Halley passes 0.4° N of Zeta Tauri. Halley's southern horn, b[illegible]**

Robert C. Victor, Jenny L. Pon, Robert D. Miller