

# Regulus

R.A.S.C. Kingston Centre Newsletter  
1989-06/89-07 Edition

The 07-09 meeting of the Kingston Centre will be a night of discussions on a very pressing problem facing all Earth based observing. This problem is Light Pollution. Please plan to attend, and put forward your ideas on what we can do to keep our night skies. There are things that we all can do to prevent the spread of this daymare. If you only attend one meeting this year, make it this one. Perhaps, if we come forward as a group, we can do something.

The trouble with Light Pollution is that it is a secondary form of pollution. Your average citizen probably has never even heard of it, and when they do, they think, "who cares". Extraneous light is just a symptom of an overindulgent society. Turn back the night, damn the expense.

Actually, the amount of power wasted lighting our streets, and backyards is staggering. The amount of light that never reaches the intended target is so very wasteful of our dwindling power supplies. Curing Light Pollution would have a major effect on conservation. Putting light where it is needed, rather than creating glare and sky glow, also would increase the safety on our roads. Why spend the money to light the sky? Of course our Hydro company, whose mandate it is to sell lots of electricity, does not mind.

There are many problems in fighting Light Pollution. Firstly, people believe that high light levels decrease the rate of crime. Figures actually say the reverse. Aside from the fact that most crimes are committed during the day, high light levels just make a criminals job easier. The use of Low Pressure Sodium (LPS) lighting comes under attack, not because it is wasteful of energy, which it is not, but because it makes the streets a different colour than what people are used to. The use of LPS improves night vision and reduces glare. It also works better in hazy conditions. But ask someone about LPS and, if they know what you are talking about, they will say it makes their skin look a funny colour! Lastly, people say with Acid Rain, the depletion of the Ozone Layer, and the Green House Effect, who has time to worry about a piffing little thing like Light Pollution. The wasting of our resources, and the burning of fuels for energy are at the root of all of the above pollution problems. Therefore, the sensible use of electric lights will only help fight all of the above battles.

But I suppose that all makes to much sense!

The 89-03 issue of S&T arrived with half of John Kea of Cambridge Ont. address sticker precariously stuck to the back of it. Apparently S&T would like to know about these happenings, as they are having problems with the new mailing bags that they are using. I like the new mailer, because my issues do not come pre-read, complete with bent corners and smeared fingerprints anymore. I informed S&T of the problem when the 89-04 issue never arrived. I hope that John Kea eventually got his March issue. The April issue just came in the mail today, (05-09) and was in a paper wrapper.

Upcoming for the Centres meetings are:

89-06-09      A Forum On Light Pollution. Be there!

89-07-14      L. Enright: Slide from Voyager fly-bys.

Hope that we have a good turnout and generate some good observational reports. Meetings are at 20:00 EDT at Queens, Macintosh-Corry, room D-214. Deadline for next issue: 07-10. Any articles from anyone will be considered, and letters to the editor about any relevant topic will be greatly appreciated. Send them to:

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To arrange call back.  
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## An Observing Report From the Past-Editor

When I handed over to Mark the duty of being editor of *Regulus*, I promised myself I would be a frequent contributor. However, over the last few months, I have written less than I thought I would. I can only say that, according to someone or other's law (probably Murphy's), other tasks seem to fill up any anticipated free time. Besides, my job seems to have been awfully demanding of time in the last few months.

Nonetheless, I have decided to take pen in hand and share some thoughts on a few observing experiences over the first part of the year, with the hope that other members of the Centre can be encouraged to contribute a few notes from their observing logs, as well

Fortunately, in the first part of 1989, we have had a number of very good nights for observing. Yes, even in that very unpredictable month of February. A few members of our Centre may have decided that the brutal month of February was just a bit too inhumane, and taken up birdwatching instead, as an activity more suitable for such cold weather, especially if it could be done from inside the house, and preferable if it could be done from a warm living room while looking through a large window at dozens of our feathered friends.

The hardier types, still go out on bone-chilling nights to observe and photograph the celestial wonders that only the magnificent late winter and spring sky can give. Anyway, here are a few of the highlights from my observing Log.

There were several nights in January and February when the Zodiacal Light was excellent, sometimes as bright as, indeed even occasionally brighter than, the Milky Way.

On the night of 89-01-23, I thought I would try something I had not done previously, a Jovian Satellite phenomena marathon. I saw that it would be possible to catch eight of them that night, if I was lucky. I guess, without stretching the truth too much, I could say I did accomplish my objective, though while waiting for the last one, I fell asleep and when I woke up and rushed frantically to the telescope, it was already in progress. What I observed were four phenomena of Io, Jupiter's innermost Galilean satellite and four of Ganymede, Jupiter's largest and third satellite. Firstly, regarding Io, I observed transit's beginning and end (01:40/03:40 UT) and its shadow transit's beginning and end (02:52/05:02). As always, the transit of the satellite was very difficult to see except when it was near the limb, but the shadow was very distinct. Meanwhile, Ganymede was on the far side of the planet. Early in the evening, while there was still some twilight, I saw it disappear behind the planet beginning an occultation and 2:17 hours later it reappeared. This satellite was then in view for 2:41 hours. At 04:35, according to predictions in the Handbook, it was scheduled to disappear into the shadow of the planet, beginning the eclipse, and then emerge 2:17 hours later at 06:52. At the time of the predicted eclipse disappearance, it was evident that the satellite was becoming fainter. The times given are for the middle of the event. I was able to watch it becoming fainter and fainter for a full 5:50 minutes! (Question: Does that mean that if I had owned a good photometer and could catch the very first instant of its becoming fainter, I could observe the event happening over a period of almost 12 minutes? I was using the 36 cm with a 19 mm TV wide field at 206X.) At our 89-02 Centre meeting, we discussed with Terence Dickinson this long eclipse disappearance and concluded that there were several reasons for this: The Jovian atmosphere bends some of the sunlight and we can, with a larger telescope, see it actually going stage by stage into the shadow since Ganymede is a disk and not just a dot, and there may be another or other factors. (I would be interested in hearing if any of our readers have ever noticed that it takes quite a long time for the satellite to go completely out of sight when it is disappearing into an eclipse.) By the time Ganymede emerged from the shadow, the planet was getting low into the trees in the northwest. After my "sleeping problem", however, I managed to catch some of the reappearance. Once again, Ganymede slowly emerged, gradually reaching its usual magnitude. On top of all this there was an added bonus, while crossing the planet, the shadow of Io went very close to the Great Red Spot Hollow that was visible on the disk of the planet.

The following night (01-24), I noticed the Hollow was even more distinct, and more elongated, and was easily seen in the 20 cm. That was the night I observed the occultation of *Regulus*. The reappearance of the bright star near the far northern part of the Moon's limb was a very interesting sight as *Regulus* popped into view on the "dark side" of the Moon, though the dark side was a very slim crescent, since the Moon was not far from being full.

On the night of 02-04, I first saw the supernova in M66, Australian observer Bob Evan's 18th supernova discovery. It was fairly difficult in the 20 cm at 63X, at first, and I had to use averted vision, but later I saw it more easily. More recently, on 03-09, I found this supernova much more difficult under similar conditions and could, in fact, scarcely see it at all. I had to conclude that it was fading, and had certainly become fainter than the 12th magnitude it had displayed earlier.

On the night of 02-26, I tried shooting a roll of the new Konica 3200 film that we had discussed at our 89-02 Centre meeting. (Terry Dickinson brought back some great shots taken with this film on his recent Australia trip, including a fabulous one of the LMC showing supernova 1987A.) I was amazed at the fact that I could do a fairly decent first focus shot on the C14, reduced to f6, of the Orion Nebula in only two minutes! No need for a drive corrector here! This film is absolutely stunning. The grain is not too bad. The colour, especially the red, is fairly good, and the speed is awesome. Astrophotography never used to be like this.

The night of 03-04/05 presented a genuinely bizarre sight. I had never seen anything quite like it. A freezing rain storm was in progress at the time of the end of twilight. There were obviously enormous quantities of ice crystal in the atmosphere. As a result, each and every one of the artificial lights in the neighbourhood had a "column" above it. Denise and I were amazed as we drove around the area for a few minutes marvelling at the sight. We did not want to go too far because the roads were becoming icy. Of course, I had often seen columns above the Sun (especially the setting Sun in the wintertime), and even above the Moon on a recent occasion, but never had we seen anything like this.

One of the most interesting observations of the season was the fabulous Aurora of 03-13. This lasted all night and was very red in the northwest. There was a tremendous amount of coronal activity in the zenith and most of the sky was covered with green, yellows, and whites. All of it stemmed from a number of large solar flares which had occurred beginning on 03-06. Then there were several other flares on 03-10/11. It was reminiscent of those Aurorae of 81-04, when there were spectacularly red skies for over a week.

I am sure that all of our readers heard of those flares. In fact, they made the news on 03-13. On that date Hydro Quebec had a very major power failure, which left almost all of the province without electricity for much of the day, and the speculation was that it had been caused by the ground currents resulting from the solar flare and the subsequent Aurora.

Doubtless some of our readers observed the enormous sunspot group in the Sun's northern hemisphere in mid March, the one which was precisely in the area where the flares occurred. I think I have probably never seen such a huge group. Of course, sunspot numbers were very high for the whole period.

All in all, it has been an interesting time for observing. The remainder of 89 promises to be just as interesting. In May there will be an opposition of Pluto, when that planet will be closer and brighter than it has ever been since its discovery! In late summer, there will be a plethora of planetary activity. Saturn, Uranus, and Neptune will be very close to each other and doing a dance in the Sagittarius region of the summer sky. Our fund of knowledge about Neptune will increase enormously as Voyager makes its closest approach to that planet in late August. Mid August will see the finest prospects in several years for an excellent view of a total Lunar eclipse (weather permitting). Also in late summer, we will be looking at comet Brorsen-Metcalf, a comet that in many ways is similar to P/Halley and should reach naked eye brightness. Any wonder I am looking forward to the rest of 89? On top of all these prospects, there are sure to be some pleasant surprises, just as there have been in the last few months.

Let's have everyone who has observed, write a few words about their recent trips to the eyepiece (hear, here, MK). Our editor and readers would be delighted to hear from you.

Clear skies! Happy viewing!

Leo Enright

The night skies of June and July are brief. By the time the stars come out, most people are in bed, and, especially in June, the stars are only out for a few hours before the long twilight of morning begins. The nights are warm, and often humid. Humidity is both good and bad. The moisture build up on glass surfaces can be profuse, but when it is humid, the air is usually still, and the seeing will be surprisingly good. I will catnap during the daylight, so that I can observe at night, and still be able to make it up for my 06:00 EDT tee off time.

Those who wait up until after 23:00 EDT for the end of twilight are well rewarded. The summer Milky Way is so bright compared to the winter side, as we are now looking across into the Sagittarius Arm, and the heart of the galaxy. There are a good number of globulars, open clusters, and nebulas to gaze at, imbedded in a rich background. It is a pleasure just to start in Cepheus and wander south, in broad sweeps, until the southern horizon gets in the way. There are so many targets to bump into along the way. M39 is a good place to start, this is a loose, large open cluster in Cygnus. Farther south is M29, in almost a hole in the Milky Way, this poor example of an open cluster is very near to the bright central star of the cross of Cygnus. Another small cluster is NGC6910, so close to gamma, that it is hard to pick out sometimes. Farther south, in Vulpecula is M27. This is an interesting deep sky object, one that should be included when showing the sky to greenhorns, as it is quite out of the ordinary. Not far away, in the squished in constellation of Sagitta is a dim globular, M71, although easy to find, it is sometimes called a galactic cluster because of its sparseness.

Keep on moving south, because the best is yet to come. One of my favorite clusters, even front the heart of downtown Toronto, is M11. This huge, bright, dense cluster is a superb object, quite a contrast to the nearby faint M26. Then there are the nebulas, often with accompanying open clusters M8, 16/18, 20. There is a wealth of detail and sometimes with good conditions, and large aperture, colour.

The end of May saw prominent Jupiter leave the sky for its conjunction on 06-09, but it will quickly reappear in the morning sky in July. Saturn, low in the south east will soon move into the night sky to take over. Mars has zipped ahead of Jupiter to hold onto a place in the twilight sky, for June, but by the end of July, will have lost the battle of the glare. Unfortunately, it will just be a small red disk, without detail. Venus will also be flirting with the horizon, look for her with the crescent Moon around 06-05/06. Mercury will also hug the horizon, for 06-18 elongation, when it will be near Aldebaran, and then will quickly zip back into the Sun. 06-26 sees asteroid Vesta at opposition, when it will be at magnitude 5.3, refer to the handbook for more details. The outer planets will all be well placed for summer viewing, as they are all grouped with Saturn in the rich southern Milky Way. Apparently Leo had the good fortune (and aperture) to spot Pluto when it was at opposition in May. 89-06-21-09:53 UT heralds the solstice of summer. It's all down hill from here till December!

MK

### Book Review: Non-fiction

A Brief History of Time by Stephen W. Hawking, c1988 by Bantam Books. This is an easy to read book, outlining the latest ideas about the origin of the Universe and the latest theories of modern physics. Hawking's style is very informal and quite witty. He has succeeded in explaining his views on the state of physics today. Beginning with a brief synopsis of classical theories, he quickly move into explaining the more recent ideas of relativity and quantum physics, then on to today and strings and black holes. He did not have to resort to mysticism to explain physics and his easy going style made this book quick reading. He also included a brief biography of a few prominent physicists. I will re-read this book again soon, to help clarify and retain the physics he explained.

MK

From the Eyepiece

Starting as a thin pale green band in the northwestern sky, the aurora gradually grew to fill the entire sky. I have never witnessed such a spectacular display. A band of blood red, mixed with orange, running from the Pleiades, though the heads of Gemini and Leo and arcing on to a pinkish hue near Arcturus low in the south east. The rest of the sky was filled with green or white pillars, and to the north a wavering band. All of the rays focused on a swirl in Leo, where the sky pulsated with green and red. Added to the effect, seeming to come from the sky itself was the creaking and moaning of the ice of the lake freezing harder in the -18 degree cold. Setting in the northwest were the Moon, Mars, Jupiter and the Pleiades. By 06:30 the display was so bright, it was hard to see any stars at all. In the house, the effect was eerie. The glow from outside flickering through the windows cast a green glow on everything. Truly a spectacular display.

This aurora was caused by a huge outburst on the Sun, earlier in the week. Leo goes into more details about the flare, and the related sunspots.

Observing conditions in March, on the whole, were fair, to say the least. I only set up on a couple of occasions, and did not view for long before clouds put an end to the sessions. Observations of the Supernova in M66 proved to be a disappointment, because the star had faded to nearly background noise level. Funny, I had looked at this galaxy trio earlier, when the supernova was more readily visible, but since I did not know it was there, I did not know anything was amiss. Some trained observer here, n'est pas?

The new moon of April was a blow out. Lots of cloud, and rain. Save the clear weather for when there is a full moon. That is what we deep sky observers like to see. Any excuse to get a good nights sleep!

During the last quarter, however, there were some good nights. The April sky is much more pleasant than the ones in February. Crisp, but not too cold. The galaxies of spring are high overhead, and easy to view. It is a real treat to wander down through Coma Berenices, and into Virgo, on a clear dark night.

I was watching the twilight deepen, while cooking outside, and got a bit confused. As the sky darkens and the stars appear, gradually a bright pair of stars appeared in the west. Jupiter and Mars, I thought to myself. Looking higher up, another pair, Castor and Pollux? No, one of them is far too red for that. Then higher up yet another pair. Wait a minute! That is Jupiter and Aldebaran, then Mars and beta Auriga, and then Castor and Pollux. Aldebaran and Mars were the same colour and brightness. A few nights later, the motion of the planets had upset this group of pairs and it was not confusing any longer. (Except for Castor and Pollux, they hadn't moved anywhere except closer to the horizon.) This was a beautiful demonstration of planetary motion. Unfortunately there were not any of the crowd that say "prove it", when I point out the planets around to see this display.

MK

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This newsletter does not necessarily voice the opinion of this Centre. The editor is responsible for all the views stated within.

## Book Review: Fiction

This issues selected title for fiction is Alternities, by Michael P. Kube-McDowell, c1988, by Ace. This is a parallel Universe story and this book is the best I have read that deals with this topic. An Earth, very similar to ours, has discovered a way to travel between Universes, that on the surface are the same, but in the details are divergent. The characters quite often have parallels on the other Earths, but they are slightly different. The book revolves around several main characters, some who are operatives that explore the other parallels, some are people that are trying to take advantage of the discovery. The cast are well developed, and some of the characters are downright chilling. It is also interesting the view that the people of one "real" Universe hold toward the people of the other "fake" Universes. This book kept me reading from cover to cover, and had a good ending. It was also one of few SF books that I have read that takes place in the past, albeit the near past. Usually once a story has been dated, it loses something, but not this one. This definitely was a good read.

MK

## Important Notice

I would like to take this time to announce to all concerned that I (Mark Kaye, rain god) will NOT go to view the total eclipse on 1991-07-11. For all of you that were waiting to know whether (weather) or not I was planning to attend, you can now rest assured that the skies will be clear, and that the eclipse can be enjoyed to its fullest.

This does not mean that I do not want to go. If there is anyone out there that is interested in doing a scientific experiment to prove, once and for all that I am, or am not, a rain deity, I would happily submit to this experiment. To check this out, all that one has to do is send me a cheque for air fare, and accommodations, (I would like the Baja site please). Careful notes and timings of all overcast conditions and rainfall will be kept, and at least one paper should be forthcoming from the results. If anyone takes me up on this kind offer, for me to further the cause of Science, I will give everyone plenty of notice to change their reservations to another site.

MK

## Electronic News Notes

My horizons have expanded to include several other Bulletin Boards (BBS) in the Kingston region, and the interest in Astronomy is actually quite good. I have had some requests from BBS users for the newsletter, and I answer and discuss astronomical topics. The Mystery BBS in Kingston has responded to my interest in astronomy by acquiring celestial software. I have these files in my archives now, for anyone who is interested. Still have not had a lot of interest (any) in putting the phone lines to use for astronomical purposes among our members. In fact even computer users still insist on sending me hard copies of their submissions to this newsletter. Save our trees, use a disk, it will be returned! Better still invest in a modem. They are cheap, especially compared to the initial cost of the computer, and once you learn how to use them, there is a whole new world out there waiting at your finger tips.

Programs that I now have include:

ADDMAC	.BAS	A program to add double star magnitudes.
ALTAZ	.BAS	Computes Alt-azimuth to R.A. and Dec.
ANGSEP	.BAS	Calculates angular separation.
AST	.COM	Views, constellations and R.A. and Dec. to Alt-azimuth.
ASTRO	.COM	Planetary Simulator.
ASTROB7	.COM	Same, but with math co-processor.
CAWD	.BAS	Converts Julian to Civil.
COMET	.BAS	Figures out a comets R.A. and Dec.

GLOB1	.BAS	Plots out a globular cluster.
CMST	.BAS	Converts Local time to UT.
GREGOR	.BAS	Perpetual Gregorian calendar.
HELIAC	.BAS	Heliacal rise And set times.
INTERP	.BAS	Lagrange interpolation program.
KEPLER	.BAS	Orbital mechanics program.
LENS	.BAS	Simple aplanatic lens figuring program.
LUNAR	.BAS	Calculate Lunar heights from shadows on photos.
MOONS	.BAS	New and full moon times.
ORBIT	.COM	Two body orbit calculations program.
PHOTON	.BAS	Photometric reduction calculations.
SAROS	.BAS	Program for computing Saros number.
SHUTTER	.BAS	Calculates shutter speeds and reciprocity failure.
SIDE	.COM	Real time Sidereal time on-screen.
STAY	.BAS	Figures out how long an object is inside Earth's orbit.
STEPPR	.BAS	For use with stepper motors.
SUNSHI	.BAS	Length of daylight.
VIEW	.COM	A simple planetarium.
WAVEL	.BAS	Wavelengths of spectrum lines.
XYZ	.BAS	Figures out X,Y,Z position of Sun.

.BAS programs are written in uncompiled BASIC, and could be adapted to run on any computer. .COM programs are compiled for IBM-PC. and will not run on a computer that does not run PC-DOS. I have not signed up to Compuserve yet, not because I do not want to, but because I can only assimilate so many new things at a time. Soon, I will join, and then I will report on the Go Astronomy section.

This newsletter is available straight from my Hard Disk. Not only does this save paper, but you don't have to depend on Canada Post to deliver. If you are interested, the files are first available on the tenth day of odd numbered months. Call 613-353-2313 to make arrangements for downloading.

Mark Kaye