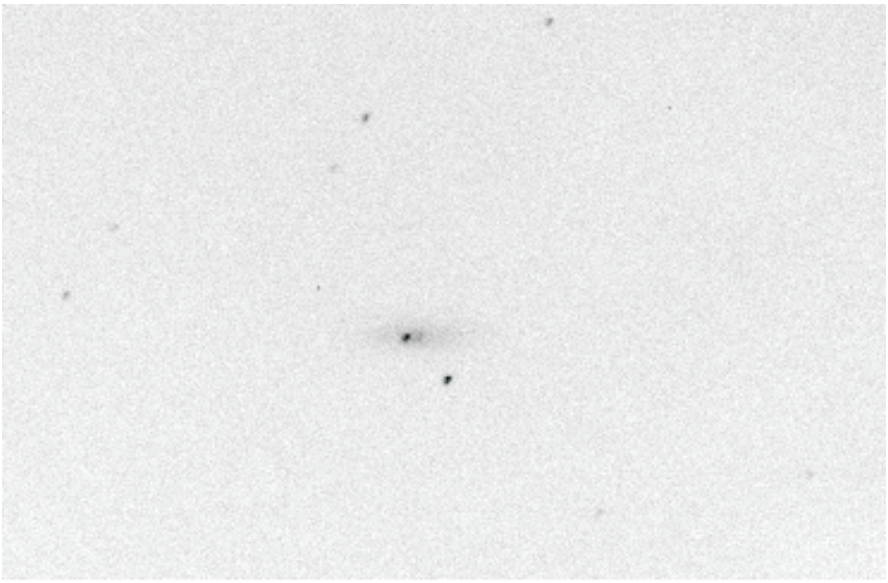
Regulus

March - April 1995

Newsletter of the Kingston Centre
of The Royal Astronomical Society of Canada



Supernova Discovered by the RASC Halifax Centre and Saint Mary's Astronomy and Physics Dept.

Supernova 1995F in NGC 2726 (in Ursa Major) discovered using the Burke-Gaffney Observatory. The discovery ST6-CCD image (negative) of SN1995F in NGC 2726, taken by David Lane, Paul Gray, and Beverly Werstiuk of Saint Mary's University and the Halifax Centre, Royal Astronomical Society of Canada on the evening of February 10, 1995. The supernova is the dark spot near the centre of the galaxy. It is currently at about 15th magnitude and is thus too faint to observe visually through all but the most gigantic amateur telescopes.

Astronomy Day is fast approaching. Volunteers and displays are needed. See page 7 for details

In This Issue

The Centre

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Astronomy Day	Cathy Hall	(000) 000-0000
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Observing	Steven Manders	(000) 000-0000
Light Pollution	Bill Broderick	(000) 000-0000
GA Bid	Peggy Torney	(000) 000-0000

Centre Address

RASC - Kingston Centre
P.O. Box 1793
Kingston, Ontario
K7L 5J6

Meetings and Events

March 10 — Globular Clusters
- Dr. Dave Hanes, Queen's U

April 7 — "Astronomy Workshop I: Telescope Night & Computer Demo"
A number of telescopes will be demonstrated, and questions answered. Kevin Kell will demonstrate some astronomical BBS stuff.

May 12 — "The Boltwood Observatory"
- Paul Boltwood, RASC Ottawa Centre

June 9 — "Through the Glass Clearly: Getting the Most Out of Your Telescope"
- Peter Ceravolo, RASC 2nd VP

July 14 — TBA
- John Gauvreau, RASC Hamilton Centre

Aug 11 — "Skies Over Parinacota: Eclipse Trip November 1994"
- Rob Dick, President RASC Ottawa Centre

Sept 8 — "Members Night"
Our annual "What I did during my (astronomical) summer vacation" meeting! Bring your slides, etc. to show at the meeting.

Meetings

Regular Meetings of the Kingston Centre, RASC are held on the **second Friday** of each month (unless noted otherwise) at 8 p.m., in Room B-201, ***Mackintosh-Corry Hall, Queen's University***.
Non-members are welcome. Executive meetings are at 7:30 p.m.

Regulus is published six times per year. Views and opinions expressed herein do not necessarily represent the official position of The Royal Astronomical Society of Canada or its officers and members unless so indicated.

SUBSCRIPTIONS: Members of the Centre receive REGULUS as a benefit of membership. Non-members may subscribe for $10 per year.

ADVERTISING: Classified advertisements re items to sell, buy or trade are free to members of the centre. Commercial advertising is $25 per half page $50 for full page. Commercial advertisers must supply clean camera-ready copy.

CONTRIBUTIONS INVITED articles, notes on observation, humour, poetry artwork, anything on astronomy or related topics are invited. Submitted material may be edited for brevity or clarity.

Deadline for receipt of material is the 15th of the month prior to Publication.

National Council Meeting February 18 1995

Cathy Hall

The February National Council meeting was held in Toronto at the Royal Ontario Museum, thanks to arrangements made again by Ian McGregor. There were observers at the meeting from a number of centres, including Kingston, Hamilton and Montreal. It should be emphasized that observers are always welcome at these meetings, and encouraged to participate. Observers do not have a vote, but they can speak up on any issues they are concerned with!

Dr. Doug Hube, National President, mentioned various news items. He congratulated Terence Dickinson on being awarded the Order of Canada for his contributions to astronomy and education in Canada. Dr. Alan Batten's request for a telescope to send to Vietnam has come to fruition, and the equipment is on its way. Dr. Hube mentioned the centres he would be speaking to in his upcoming travels.

The Secretary's report, by Randall Brooks, was extensive. The Ontario Science Centre in Toronto has announced a special educational program for grades 6 to 8 centred around studies of Mars. The Royal Society of Canada has advertised for nominations for the MacNeil Medal, awarded for contributions to science. The Herzberg Institute of Astrophysics is planning to publish the results of a radio astronomy workshop. The University of Maryland will be holding a conference on astronomy education, and invites participants. Amateur astronomers in Algeria have requested a Handbook and newsletter exchange with the R.A.S.C.. Approval was given to exchange publications for a period of one year.

Closer to home, the Quebec Centre has requested an examination of its by-laws by the Constitution Committee. For those wishing our by-laws in French,a translation has been done by Raymond Auclair. A number of new members were accepted into the Society - 12 Canadian, 10 American, and 3 foreign. Revised pages for the R.A.S.C. manual are now available.

On an observational note, Finest N.G.C. Certificates were awarded to Randy Pakan of the Edmonton Centre, and Walter MacDonald of the Kingston Centre. A Messier Certificate was awarded to Cathy Hall of the Kingston Centre.

Peter Broughton, our R.A.S.C. Past President, talked about art article by Peter Jedicke in the London Free Press. He encouraged all members to continue to submit clippings, photographs, and memorabilia to the R.A.S.C. archives.

The Treasurer, Rajiv Gupta, presented the Finance Committee report. A motion was passed to invest the Society's funds in fixed income term deposits and GIC's with a maximum fixed term of 3 years. A revised travel policy was passed, which allows for various percentages of travel and accommodation reimbursement for elected, appointed, and other voting members of National Council This is to encourage wider participation and attendance at council meetings. A budget for 1995 was presented, and approved.

Items in the financial notes included an increase in the Executive Secretary's salary and RRSP contribution, and funds approved for the production of new R.A.S.C. pins. There was a transfer of $7000 from the general account to the Centennial Fund. At the end of 1995, the Centennial Fund will be closed out, with any balance transferred to the Endowment Fund. The Centennial Fund has, in the past, been used for such items as special centre projects. These projects will now be accommodated by other funds. The Long Range Planning Committee was asked to review the historical use of our various funds.

The Librarian, Walter MacDonald, mentioned that the computerized inventory of the National Library is being updated to include periodicals and should be available in time for the General Assembly.

The Journal Editor, Dave Turner, sent a report in his absence. He feels that greater flexibility is needed in the Society, and encourages greater involvement by the members in the Society's publications. It was noted by Peter Broughton that the overall aims and purposes of the R.A.S.C. are stated in the letters patent.

The Bulletin Editor, Pat Kelly, asked, in his absence, for reports from centres for the Society's Annual Report. Please have your centre secretary write up an article to let the rest of us know about your activities for the past year! Pat also appreciates photographs! The centres will be provided with some extra copies of the Bulletin, for distribution to new or prospective members.

The Handbook Editor, Roy Bishop, sent a report detailing estimated costs and press run figures for the coming year, compared to previous years. The 1995 press run has been decreased in order to avoid as many surplus copies as last year. It is estimated that paper costs will be going up in 1996.

Leo Enright, the Beginners Observing Guide Editor, reported that sales of the guide were going well. Flyers are being done up for planetariums, and a bulk order is being arranged with Scouts Canada. Centres are encouraged to have the books available for sale at their Astronomy Day exhibits.

A pamphlet to promote the Society's various publications has been prepared by the Publications Committee, and will be distributed with the Observer's Handbook.

International Astronomy Day is Saturday May 6th, and our Astronomy Day Coordinator, Sandy Ferguson, sent a report and distributed information packages for all centre presidents and secretaries. This package includes suggested activities, a press release, and information on light pollution, one of this year's suggested themes.

The Awards Committee were pleased

to announce the following awards:

Simon Neweomb Award- Mike Watson
Chant Medal - Paul Boltwood,
Ottawa Centre
Service Award - Ron Gasbarini,
Niagara Centre
Service Award - Pat Kelly,
Halifax Centre

A number of motions were presented by the Constitution Committee. Among those passed was the creation of a temporary membership category, which allows centres greater flexibility in the case of members joining part of the way through their very first year.

The Historical Committee has been having discussions with some of the professional astronomers in Canada, and will be making some motions at the GA. with regard to a joint R.A.S.C./ C.A.S.C.A. committee for historical work.

Ruth Lewis of the Calgary Centre has resigned as Chair of the Light Pollution Committee, due to time constraints. A replacement will be forthcoming. Her work has been much appreciated.

The Long Range Planning Committee presented a rather dynamic report written by Peter Ceravolo. It commented on the nature of the Society, its evolution, and the important role of a unifying publication in the Society's long term goals. Although somewhat controversial, it is hoped that the report will serve as a useful means of encouraging discussion.

The Publication Revitalization Committee presented a detailed and extensive report on the launching of the Society's proposed new publication, 'Astronomy Canada'. This publication would replace both the Bulletin and the Journal, and better serve the needs of our membership. A budget of $7000, for the production and distribution of the prototype issue, was approved. The prototype issue will be distributed to the membership as a regular mailing, in lieu of one of the Bulletin issues. Approval was given to the committee to negotiate a contract with a publications professional to act as the first editor of 'Astronomy Canada', not to exceed $20,000 per year, with commencement of the contract subject to approval to proceed with the new publication.

The Windsor Centre, represented by John Hurley, handed out registration packages for the coming General Assembly. The early registration deadline is May 1st. For a registration package, write to: Mr. Frank J. Shepley, 344 South Middle Road, R.R. #2, Maidstone, Ontario N0R 1K0, or phone (519)-723-2389.

The Kingston Centre, with spokesman Leo Enright, distributed information packages for the 1997 General Assembly bid. Enclosed were invitational letters from The Premier of Ontario and the Mayor of Kingston, and information on the tentative schedule of events, to be held in this historic city.

The R.A.S.C. Calendar for 1996 was discussed, and funds of $9000 approved for production and distribution. The Vancouver Centre continues to produce an excellent product, with the 1996 version to be partial-colour.

The computer bulletin board network in Canada was discussed briefly. The Montreal representative presented an information sheet on the GEnie system. He was informed of the already existing - and very functional -network already in place. No guidelines were pursued by National Council, although they reserved the right to any future comments with regard to the use of the R.A.S.C. name.

The meeting adjourned about 4.50 p.m.. See you at the next National Council Meeting at the General Assembly in Windsor!

Notice to Centre Members

Please find attached the centre's membership listing as of the end of February. If there are any errors in the listing, please report them to the Regulus Editor or any member of council.

Eclipse Expedition To India

On October 24, 1995 the moon will move in front of the sun, plunging a narrow skip of land and ocean extending from Central Iran to the Mid Pacific Ocean to darkness. A total solar eclipse is one of nature's most dramatic and moving experiences. In minutes the whole earth-sky environment is transformed. Planets and bright stars appear. A 360 degree sunset glow rings the horizon. The sun disappears behind the dark silhouette of the moon which is ringed by the magnificent solar corona. The Alberta Science Centre and the Royal Astronomical Society of Canada, Calgary Centre, have designed a tour to a site in Northern India where weather prospects are excellent.

The expedition will begin in New Delhi where you will attend a light and sound show illustrating the history of the region. We will also tour the Old Delhi and visit the Nehru Planetarium. The group will board coaches and travel to Agra where we will tour the Taj Mahal and ancient Agra Fort. We will depart Agra and visit Fatehpur Sikri which was once the capital of the Moghul Empire (between 1570 and 1586), but now lies in deserted ruins. We will then travel to Dundlod via Jaipur to stay in a deluxe tent camp near the Dundlod Castle. Everyone will receive details on how to safely view and photograph the solar eclipse from experienced eclipse chasers. Night sky viewing will also be available from this location. The group will depart early in the morning on October 24 to prepare for the total eclipse. Totality will be approximately 50 seconds. We will have coaches available to take us to the centre-line (elevation is only about 100m). Having had an opportunity to view the eclipse we will depart for Jaipur. We will

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Olaf Roemer and the speed of light

David Stokes

The collision of comet Shoemaker-Levy with Jupiter in July has drawn public attention to Astronomy and to Jupiter in particular. I was asked how far away was Jupiter and was there a significant time lapse in the events and our seeing them here on planet Earth. A quick check in the Handbook shows Jupiter 5.193 au from us on July 21. Light takes 499 seconds to travel one astronomical unit (au), defined as our mean distance to the Sun. So we were seeing events delayed by roughly 5 x 500 = 2500 seconds, or 41.7 minutes. The question reminded me that the speed of light was in fact first determined by timing events at Jupiter.

Galileo had discovered four moons circling Jupiter in 1610, using the newly invented telescope. He also contributed to the invention of the pendulum clock which was subsequently refined to keep accurate time. Thus we find Olaf Roemer, a Danish astronomer, measuring the times of occultation of Jupiter's moon Io, in 1675. A woodcut dated 1689 in Hoyles's Astronomy shows Roemer at his meridian instrument, two large pendulum clocks by his side and a smaller one attached to the wall. Roemer noted that the interval between successive occultations of Io grew longer as the earth receded and grew shorter as the earth approached Jupiter during the course of a year. This text book statement got me wondering just how Roemer had done this and how had he deduced a reasonable value for the speed of light.

Taking Handbook data for 1994, the relative positions of Sun, Earth and Jupiter are shown in Figure 1 where E5 and J5 mark the time of opposition (about May 1) and E11 and J11 the positions at conjunction on 1994 Nov.17.

It will be apparent from Figure 1 that when we are at opposition the distance to Jupiter is changing very little, but 3 months later, near quadrature,the distance has increased and the separation rate is at a maximum. Turning now to the Handbook data we find that near opposition (May 5 and May 7) the period between two sucessive occultation disappearances (I.O.C.D.) is 1.768056 days, or 42h 26m. This would be the approximate sidereal period of Io.

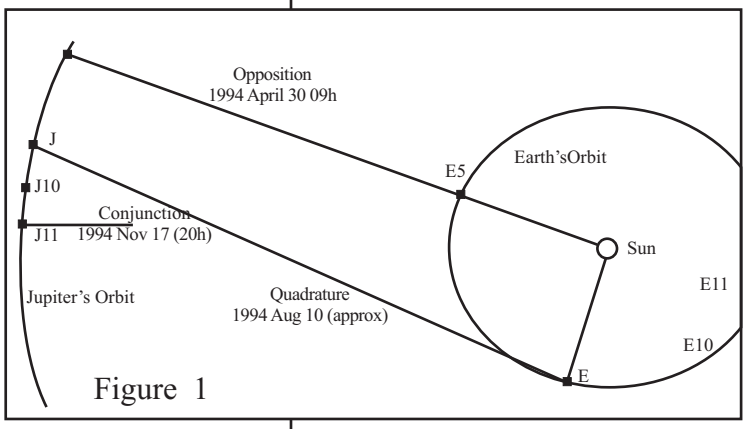

Figure 1

By August 5 and 7 the period is 1.770139 days, or 42h 29m. In the 3 month interval the apparent period of Io has increased by 3 minutes. By the end of September the period is 42h 30m 15s, using Sky & Telescope data. While this shows the trend it does not enable today's young Roemer to deduce the speed of light. For this we need to know the fractional increase in occultation times between sucessive events. To understand why, look at Figure 2 where E1 and E2 are sucessive positions of the Earth between sucessive occultation disappearances of Io, albeit on an exaggerated scale.

The Earth moves at roughly 30 km/s in its orbit so the distance E1 to E2 is accomplished in 42h 29m, the period of Io near quadrature. And this is the distance light must travel to catch up to the moving earth. The time taken will be the distance divided by the speed of light.

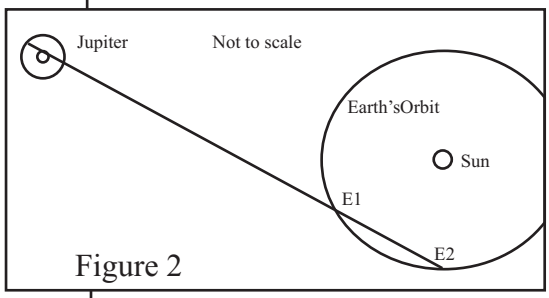

Figure 2

Writing this as a simple equation we have

distance=
30 km/s x (42x3600 + 29x60)seconds
=4,588,200 km

Since we know the speed of light is roughly 300,000 km/s then the time delay will be 4,588,200 / 300,000 = 15 seconds. Of course Roemer did not know this, he was measuring the time! Can we find a mean increase of 15 seconds from the Handbook data?

For an observer at a fixed observatory, the window of opportunity to observe Jupiter and to time an occultation disappearance of Io is about one-third of all such events predicted in the Handbook. Given clear skies ! an observer could have timed Io on 31 occasions between May 5 and September 29,1994, out of a posssible 83 occultations (these were all disappearances). Assuming we could have timed the events to the same precision as the Handbook data i.e. to the nearest minute, then these 31 events are the raw data for calculating the speed of light. We have only to show that events were occurring some 15 seconds later, on average, between sucessive occultations. To facilitate the reduction of the data it is convenient to enter month, day, hour and minute on a spreadsheet such as Lotus 123. Then events can be calculated in day number of the year. For example, our first observation may have been for May 5 at 8h 16m UT. May 5 is day number 125 and so the event was at day 125.3444.

With this as the starting point, revolution 0, the next event on May 7 at 2h 42m was day 127.1125, revolution 1. The interval is thus 1.768056 days. After 5 revs, we catch the next event on May 14 at 4h 26m (day 134.1847) and the interval is now 7.072222 days, or a mean period of 1.768056 days. Not much change there as we would expect since our distance from Jupiter is changing rather slowly in May (see Figure 1).

Proceeding in this way using a spreadsheet makes calculation of the mean period for Io very easy , and it is also simple to summarize the data as a graph showing that the period is indeed increasing as the earth recedes from Jupiter (Figure 3). That is not a very smooth set but regression analysis (again using Lotus 123) shows the constant is 1.767815 days for 21 observations, omitting early May and all of September. The slope, which is the mean increase in the interval between observations, works out to 3.8 seconds per revolution (with error 0.22s). That is a far cry from the 15s we expected!

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Table 1

Io position 1994 dn#= 120 may 0 151 june 0 243 sep 0
Practical events to observe 181 july 0 59 march 0
Occultn. disappear IOc.D. 212 Aug 0 273 oct 0

month	day	hour	min	Day	DAY.dec	rev #	T days	mean	delta-s	smooth			
May	5	8	16	125	125.344	0	Period						
	7	2	42	127	127.113	1	1.768056	1.768056					
	14	4	26	134	134.185	5	7.072222	1.768056	5E-10				
	21	6	11	141	141.258	9	7.072917	1.768229	15	8			
	28	7	56	148	148.331	13	7.072917	1.768229	0	8	<-		
	30	2	23	150	150.099	14	1.768750	1.768750	45	23	<-	15	
June	6	4	9	157	157.173	18	7.073611	1.768403	-30	7			
	13	5	57	164	164.248	22	7.075000	1.768750	30	-0			
	20	7	45	171	171.323	26	7.075000	1.768750	3E-13	15	<-		
	22	2	13	173	173.092	27	1.769444	1.769444	60	30	<-	22.5	
	29	4	3	180	180.169	31	7.076389	1.769097	-30	15			
July	6	5	54	187	187.246	35	7.077083	1.769271	15	-8	<-		
	8	0	22	189	189.015	36	1.769444	1.769444	15	15	<-	4	
	13	7	46	194	194.324	39	5.308333	1.769444	-5E10	7			
	15	2	14	196	196.093	40	1.769444	1.769444	5E-10	0			
	22	4	8	203	203.172	44	7.079167	1.769792	30	15			
	29	6	3	210	210.252	48	7.079861	1.769965	15	22	<-		
	31	0	32	212	212.022	49	1.770139	1.770139	15	15	<-	18.5	<-
august	5	7	59	217	217.333	52	5.310417	1.770139	8E-10	7	<-		
	7	2	28	219	219.103	53	1.770139	1.770139	2E-09	0	<-	3.5	<-
	14	4	24	226	226.183	57	7.080556	1.770139	-2E09	0			
	21	6	22	233	233.265	61	7.081944	1.770486	30	15	<-		
	23	0	52	235	235.036	62	1.770833	1.770833	30	30	<-	22.5	16 mean (3)
	28	8	20	240	240.347	65	5.311111	1.770370	-40	-5	<-		
	30	2	50	242	242.118	66	1.770833	1.770833	40	0	<-		15 mean (4)
september	6	4	48	249	249.2	70	7.081944	1.770486	-30	5			
	13	6	48	256	256.283	74	7.083333	1.770833	30	0	<-		
	15	1	18	258	258.054	75	1.770833	1.770833	-2E09	15	<-	7.5	
	20	8	48	263	263.367	78	5.312500	1.770833	2E09	0	<-		
	22	3	18	265	265.138	79	1.770833	1.770833	-2E09	0	<-	0	
	29	5	19	272	272.222	83	7.084028	1.771007	15	7			
									9				

Regression Output: file:- IO_OCD.WK1

Constant	1.76782		
Std Err of Y Est	0.00019	mean delta =	15 seconds
R Squared	0.93965		Velocity of light = 303883 km/s
No. of Observations	21	mean T =	1.77038 days
Degrees of Freedom	19		

X Coefficient(s) 0.00004 days/rev 3.80 s/rev
Std Err of Coef. 3E-06 + or - 0.22 s/rev

Regression Output: rev# 12 to #66

Constant	1.76782
Std Err of Y Est	0.000019
R Squared	0.93965
No. of Observations	21
Degrees of Freedom	19

X Coefficient(s) 0.0004
Std Err of Coef. 3E-06

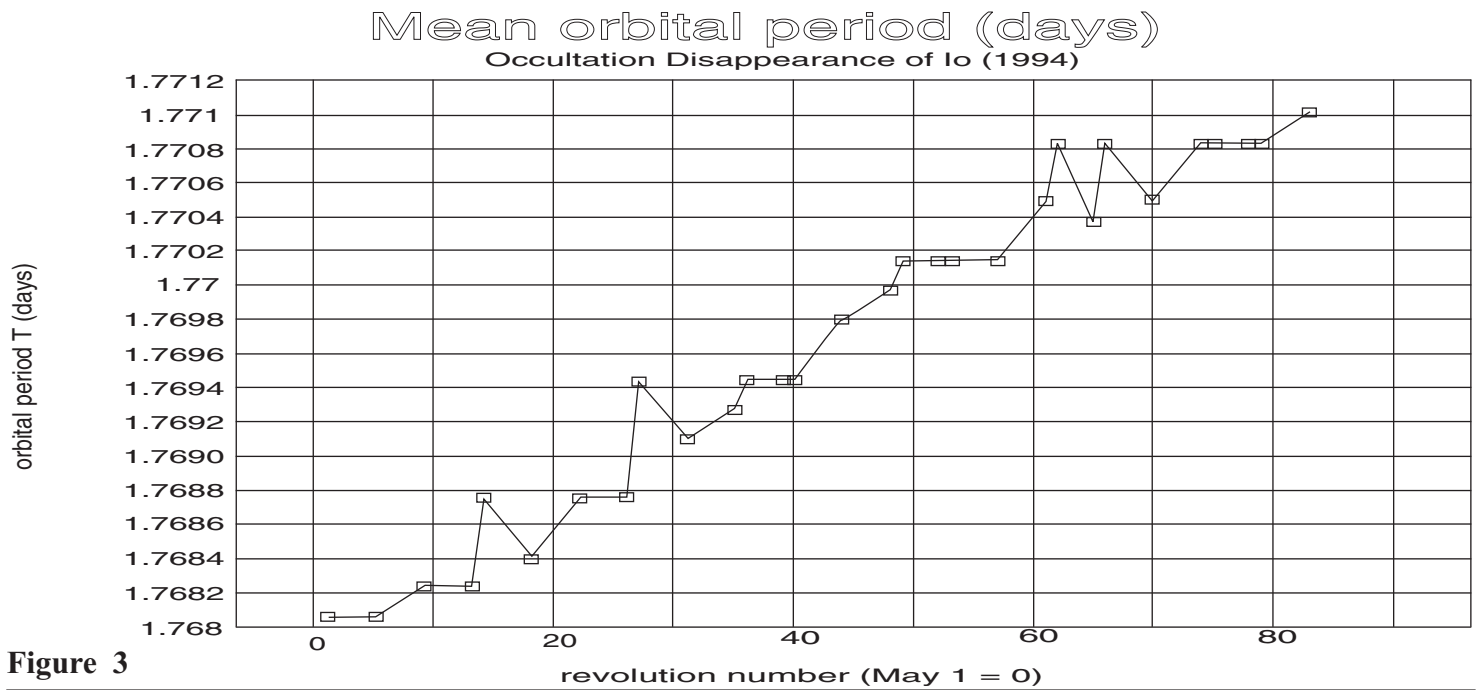

Figure 3

Astronomy Day Activities
May 6 1995

Cathy Hall

Saturday May 6th is International Astronomy Day, and the Kingston Centre is planning suitable activities!

In Kingston, we will have a mall display at Cataraqui Centre, and in Belleville at Quinte Centre. Both sites will have poster board displays on easels, tables with information handouts and small display items, and several telescopes. We have special permission at both sites to sell the Beginner's Observing Guide.

As organizer, I am after volunteers to help with display material, set up at the sites, and chat with the public. Mall displays are fun to help out with, and you learn a lot about the public's perception of astronomy! The theme for this year is 'The Stars Belong to Everyone', after the book of the same name by Dr. Helen Hogg. Light pollution is encouraged as a secondary theme.

- I will have signup sheets at the next several meetings for those interested. Basically, we need:
- poster board displays depicting R.A.S.C. Kingston activities, or astronomy in general
- table display items - such as star atlases, magazines, moon or star globes (inflatable or free standing), mirror blanks, etc.
- telescopes, several for each site
- extension cords, 50 ft. length, one for each site
- people to help out at both sites, for all or part of Saturday, in both Kingston and Belleville (astronomical attire is encouraged!)

I have already met with the administration at both malls, signed the official papers, provided the proper insurance data to them, and personally inspected the actual space we will occupy at both sites.

At Cataraqui Centre we will set up in front of Walters' Jewellers, on the upper level, and will staff the displays from 9.30 to 6.00. The entrance door will be by the Bank of Montreal, about 20 yards away, and the setup time is 8.00 a.m..

At Quinte Centre, we will set up in front of the Crossings store, and will staff the displays from 9.30 to 6.00 as well. The entrance door will be the loading door behind Toys'R'Us, near the dumpsters, and is perhaps 100 yards from our display site. The setup time is 7.30 a.m.

Peggy Torney will be supervising on-site for Kingston, and I will be supervising for Belleville. We will be coordinating and sharing available display items. Peggy has volunteered to provide both sites with all easels for holding the display boards. We can be contacted as follows:

Cathy Hall: home: (000)-000-0000
office: (000)-000-0000
e-mail: 00000000@xxxxxxxxxxxx

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Speed of Light Contined...

There is a way out of this dilemma which is probably nearer to what Roemer would have done. Tabulate the period obtained for each observations, averaging for 4 or 5 revolutions where these could not be timed individually, and then examine the difference between each result.

The results of this exercise are shown in Table 1 which was derived from the same worksheet. It will be seen that data smoothed this way yields more realistic values but shows that our precision of measurement is not really adequate, the plus and minus 30s and 45s values arise from making measurements to the nearest minute. Did Roemer do better than this? Perhaps he smoothed the differences again and then picked the period when the earth would have been receding at maximum speed. If we do this for the 1994 data the mean increase in intervals between occultations is then between 15 and 16 seconds which is very close to what we expect. This would have given Roemer correct. But just how well was that known and just how many observations did Roemer make to arrive at his result?

This leads me ask whether any amateur astronomers have attempted to repeat Roemer's work. How accurate is this method for the determination of the speed of light in a vacuum. It is interesting to note that the problem can be turned around to measure the radius of the earth's orbit, using a value for the velocity of light determined by more accurate means, according to one text book! This would require a very accurate knowledge for the motion of Io. I have not seen any description of this experiment or the results.

tour the Birla Planetarium and visit the spectacular Jai Singh's Astronomical Observatory. The evening will end with a post-eclipse celebration. The next day we will ride brightly coloured elephants to the impressive Amber Fort. We will view this 17th century fortress and examine its fine inlay work glowing against the Indian sun. Later in the day we will visit the City Palace museum and the Palace of the Winds.

Options are available to visit the beautiful beaches at Goa, or travel to Kathmandu, Nepal, where you can either stay at Tiger Tops or similar, in the heart of the Royal Chitwan National Park or try some trekking near Pokhara and the spectacular Annapurna peaks of the Himalayas.

Tour pricing is in both Canadian dollars and US dollars (subject to change) and inclusive of most taxes. All pricing is based on twin/double occupancy. Tour includes return airfare from cities indicated, domestic travel and hotel accommodation with continental breakfast daily (with some lunches and dinners also included). Tour programs are escorted by professional tour escorts from India (Tourcan), The Alberta Science Centre, The Royal Astronomical Society of Canada, Calgary Centre, and Let's Talk Worldwide Travel Ltd.

To talk to our leaders call:

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or call Let's Talk Travel Ltd. (Group Travel Dept.) in Calgary at (403) 265-8222

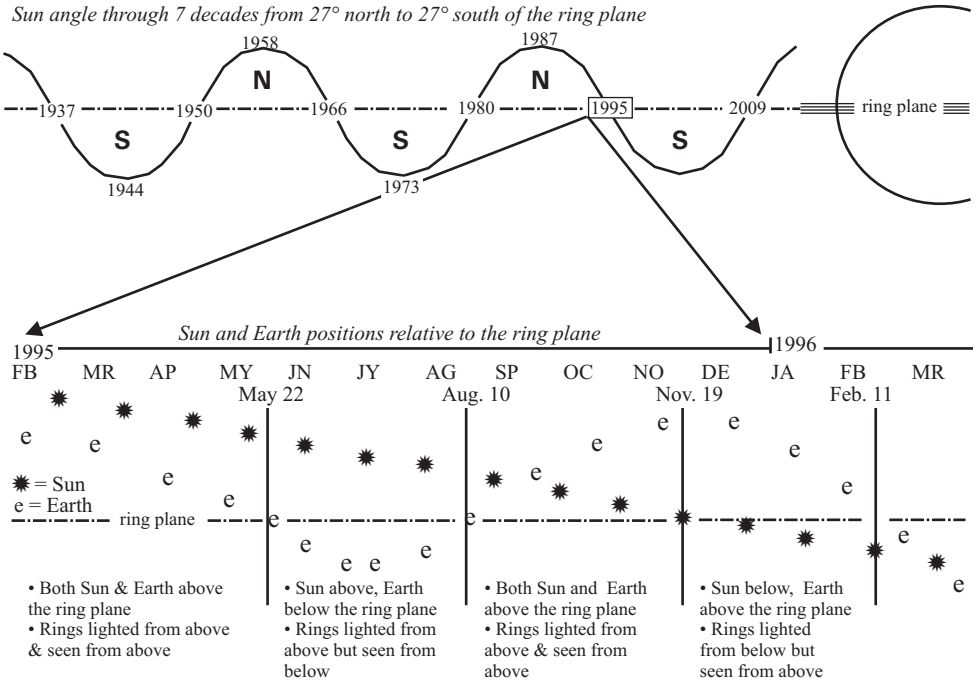
1995: A Good Year for Saturn

Jim Towgood

The Earth wobbles back and forth across Saturn's ring plane three times this year. Similar crossings do not recur until the year 2009. Adding to the show, the Sun also crosses the ring plane this year.

SATURN: Orbit: 29.4years Tilt; 27° Location: Aquarius(allyear)

Years of maximum tilt relative to the sun are shown at the peaks and troughs in the diagram below.



Challenge:

Look for "ghost rings" when the Earth and Sun are on opposite sides of the ring plane. The effect will be most pronounced in early July and in December/January. At this time ring material is back lighted by the Sun and lighted by reflection from the surface of Saturn and other orbiting material.

During our transit through the ring plane, and for a day or two on each side of the transit, the rings are invisible.

Astronomy Day continued...

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Astronomy Day is a great opportunity to let the public know about the R.A.S.C. - who we are, and what we do! Come out and join us on May 6th!