Regulus

The Newsletter of the Kingston Centre of the Royal Astronomical Society of Canada - December 2004

Coming up…

RASC Kingston Center
Monthly Meeting
Queen's University
Stirling Hall (Physics)
Theatre D

Friday Dec 10th at 7:30pm
Speaker: Dr. Brian Hunter
"The Astronomical Tourist"
Also, the IMAX film "The Cosmic Journey"

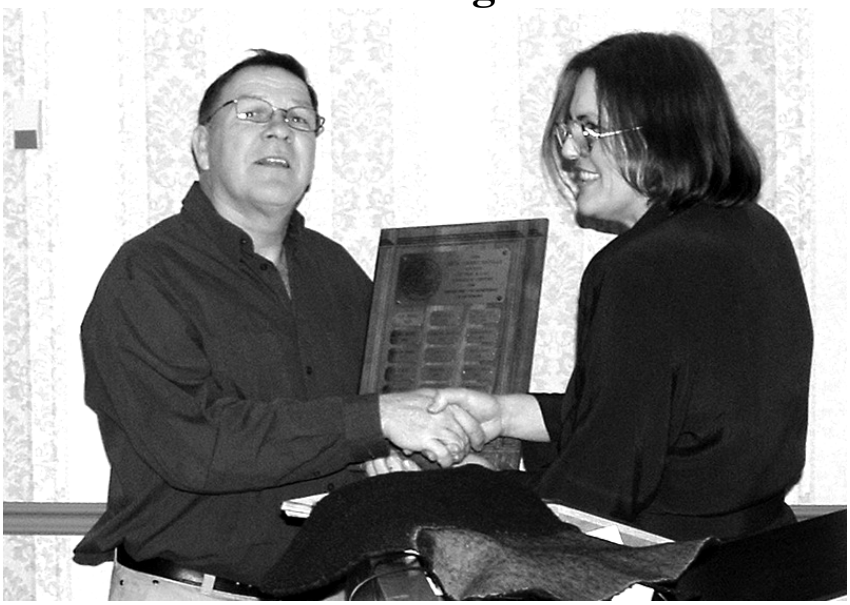
Friday Jan 14th at 7:30pm
Speaker: Dr. Sun Kwok
"Cosmic Butterflies"
Dr. Kwok is an expert in the area of planetary nebulae, and has written a book of the same name.

Public Observing
Queen's Observatory
Ellis Hall
Saturday December 11
Saturday January 8

AstroYak
Friday Dec 17th 7:00 pm
at the home of Kevin Kell and Kim Hay, 76 Colebrooke Rd. Yarker

Kingston Centre
of the Royal Astronomical Society of Canada
Box 1793 Kingston Ontario K7L 5J6
http://www.rasc.ca/kingston
infoline: 613-377-6029
email: kingston@rasc.ca

A. V. Douglas Award



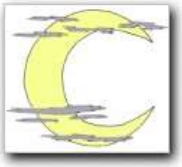
This year's recipient

The Douglas Award is the most prestigious prize from the Kingston Centre. It is given to a person, or persons, who have significantly contributed to astronomy through either discoveries or service and are not recognized by other organizations. The recipient this year, Don. Cooke, has involved himself in service to the Centre and the public since he first joined our group. He has headed up Astronomy Day for the last few years, looked after the Sky's the Limit Festival, assisted with public observing, lectured to groups of scouts, guides and others. Most recently, he was interviewed on CKWS tv prior to a public speaking session at the Little Cataraqui Conservation Area. Don is always open and frank in his speech. He considers himself a beginner astronomer even though he can help members of the public enjoy the night sky. Don is leaving the Kingston area early in 2005 and will be greatly missed

As is our custom, elections were conducted at November's regular meeting. Here is your current and new executive

2004 Executive (L to R)
John Hurley - Treasurer, David Maguire - Librarian, Dianne Tourney - Secretary, Doug Angle – Vice President, Peggy Hurly – President and N.C. rep.

2005 Executive (L to R)
Steve Hart- Secretary, John Hurley – N.C. Rep, David Maguire - Librarian, Kevin Kell - treasurer, Doug Angle - Editor, Kim Hay – President, Norm Wellbanks V.P. (not shown)



Editor's Corner

Doug Angle

As you will read in Peggy's report, Regulus has had a rough year. In case you are wondering why you haven't received your copy recently, it's because, through a series of setbacks, we have only had two issues this year. I am the new newsletter editor, and in perhaps foolish optimism, I'm hoping to get Regulus back on track.

You can help too, by writing an article. Tell us about your favourite astronomical objects, a memorable observing session, book or equipment reviews, your astronomical travels, or an essay on an astronomy or related science.
I can take most common formats, although I prefer plain text. Articles can be sent by email to Angle@personainternet.com or by paper mail to 1910 Keeley Rd. R.R. #1 Sydenham, Ontario, Canada K0H 2T0

President's Voice

Peggy Hurley
Outgoing President

Another year is approaching its end and some reflection is demanded. This was a difficult year. It started with all of the executive positions filled but not many of the committees had any members. Then the Murphy effect took hold. First we had communications problems with the Newsletter Editor, then the Exec published a newsletter and we found another Newsletter Editor. Another newsletter was published and then the new editor experienced problems. No other newsletters were forthcoming. Speakers were booked a few months in advance cancelled a few weeks before the meeting. This happened more than once. The executive scrambled. I would like to take this opportunity to thank all of those who helped with out last minute bail outs, especially Leo Enright who gave two talks this year and found another speaker for us. Another thank-you has to go out to Brian Hunter who has also filled in at the last minute. There was confusion over meeting nights as the April meeting coincided with Good Friday and had to be moved. Fall n'Stars was also held on one of our meeting nights making it hard for members to enjoy both. Tom Dean had a flood in his basement, where all of our equipment is normally housed. Fortunately, almost everything was out at the time and those things that did get wet have dried undamaged. The Centre had some very positive things happen this year as well. The Meade LX200 telescope arrived and Observing Nights with Queen's University really took off. These observing sessions take place at Queen's Observatory, 4th floor Ellis Hall, on the second Saturday of the month. There is an observing deck where RASC KC sets up the smaller telescopes while Queen's has their big 'scope in operation for the public. There have been over 150 people at several of these sessions. At first the public were going to be shown images from the 'scope on the plasma screen but people demanded to 'see' for themselves; so every 'scope is set up for observing with the eyes. As part of this project RASC KC members are being trained to use Queen's 'scope, CCD camera and other equipment. Another part of the grant that bought us the LX200 also purchased a CCD camera that is now part of the equipment loan program, with one condition: we want images we can show the public when we cannot use the telescopes.

Astronomy Day went well this year. We were set up at the Frontenac Mall with solar observing from the sidewalk. There were several displays on topics ranging from meteorites to light pollution. As always, more displays and 'hands on' activities are always appreciated. The Sky's the Limit Festival was well attended by the public but a little shy for volunteers. Still, those that went enjoyed the activities. Public Observing at Murney Tower was put on hold for the next two years due to our commitment with Queen's Observatory and

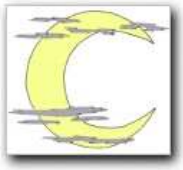
private observing had taken a hiatus. However, Ken Kingdon took up the vacancy and invited people to his home to observe the moon, and other things. This is now happening on a semi-regular basis. Kevin Kell and Kim Hay also filled in a gap from the private observing and started 'astroyak' on the fourth Friday of the month at their home. Both of these activities seem to be going well.

This year we were also looking at incorporation. This would allow the Centre to enter into contracts with other legal bodies without using National Office. This would also allow us to purchase or lease land. Members of the Centre have been actively seeking a good place for a dark sky observing site. So there has been a lot of good with the Murphy this year. I hope Mr. Murphy is finished with the centre for a while. At the moment there is one position still open on the executive, although a volunteer has come forward, and all of the committees have a least one person to serve for next year. I pass the presidency on to Kim with my best wishes and wish all of you clear skies for the coming year.

Peggy Hurley,

Submissions from Members

Telescope and Eyepiece Optics Part 2



Doug Angle

In the last article, I described how a telescope or other lens creates an image, and how to predict the field of view through the eyepiece. In this article, I'll cover some considerations for selecting eyepieces and some of the terms you may have heard.

Recall that:
Magnification = Focal length of the telescope / Focal length of the eyepiece
and
Magnification = Apparent field of view / Actual field of view

The first equation uses the ratio of lengths, and the second the ratio of angles. We can also look at the ratio of widths. The width of a bundle of light rays is called the pupil.

Strictly speaking, the pupil in your eye doesn't actually refer to the black part inside the iris, but the size of the light beam that can pass through it. For a dark adapted eye, this entrance pupil is 6 or 7 mm. We can apply this same principle to the telescope, and as you may have guessed by now, it is also related to the magnification:

Magnification = Entrance pupil / Exit pupil
Or
Exit pupil = aperture / magnification

The entrance pupil of the telescope is the size of the objective lens or mirror. The exit pupil is the size of the bundle of light leaving the eyepiece. It doesn't actually correspond to a physical part of the scope, but it's just as real. More importantly, it needs to be matched to your eye. For example,
I have a 40mm eyepiece in the Venor telescope (D= 615mm, F=2820mm)

Magnification = 2820 mm / 40 mm
= 70.5

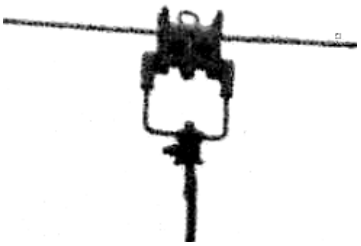
Exit pupil = 615 / 70.5
= 8.7 mm

Since the human eye only expands to about 6 or 7 mm, so the eye can't accommodate all the light. It's just like using a 16" telescope instead. It doesn't really hurt anything, it just means that we aren't using the full capacity of the scope. That's true anytime the exit pupil is bigger than the eye. Moderate exit pupils, between about 5 and 7 mm are comfortable, but sometimes a little sensitive to how you position your eye. Small exit pupils may highlight "floaters" (eye defects).

Another consideration when selecting eyepieces is eye relief. Unlike the other parameters we discussed earlier, this is a property of the eyepiece and has nothing to do with the telescope it's used in. Eye relief is the distance from the eye lens to a comfortable viewing distance. This used to be approximately equal to the focal length of the eyepiece, but newer designs have got past this limitation. If you are considering buying an eyepiece, put it up to your eye, and look for the field stop (the black ring at the edge of the field). If it's uncomfortable in the store, it will be uncomfortable when you are trying to use it in the telescope. Since it is usually more of a problem with short focal length eyepieces, one solution is to use a longer focal length eyepiece and a Barlow. This keeps the eye relief of the low power eyepiece but with the magnification of a higher power eyepiece.

The last property I wanted to cover is eyepiece aberrations. This is where there is some kind of blurring of the image. Most decent optics will give a sharp image in the center of the field, but often are not very sharp nearer the edge.

Both telescopes and eyepieces can suffer from a number of aberrations. This is due to both the type of optic and the quality of manufacture. Modern optical designs have wider fields, less aberration and are more forgiving of things like alignment. The price to pay is that they are more complex, and must be built to a higher quality standard. That translates to cost.



Picture taken through the center of the field of view. Note the wire loop and other fine details.

Same object, telescope and eyepiece but taken at the edge of the field. Details are lost because of telescope and eyepiece aberrations.

Because telescopes have their own aberrations, an eyepiece that performs well in one scope may be disappointing in another. If you are looking to buy an eyepiece, see if you can try one out first, preferably on your own telescope, or one of a similar design. In

Continued pg 6

Treasurer's Report for Year Ending Sept 2004

John Hurly

Revenue	Amount	Comments
Membership		
Membership Fees (Regular)	2,225	
Membership Fees (Basic surcharge)	620	
Life Membership Grants	141	Amount paid to a Centre for life members
Donations / Fundraising		
Donations	377	
Fundraising / Sponsorships / Grants	15,767	Trillium Grant
Educational Activities / Materials	25	
Interest and Dividends	226	
Publication Sales		
Sale of Observer's Handbooks	80	
Sale of Observer's Calendars	480	
Subscriptions		
Astronomy/ Sky & Telescope magazine	496	This is used as a clearing account for subscriptions.
Events		
Star Parties	0	Revenue from Fall 'n Stars will show on next year's report
Annual Dinner	775	Revenue received for the dinner
Miscellaneous	49	
	21,261	

Expenditures	Amount	Comments
Library	82	
Publications		
Newsletter	393	
Handbook	120	Cost of purchasing OH, BOG, Calendar.
Calendar	546	
Events		
Meetings	30	
Star Parties	304	
Annual Dinner	1,154	
Product Expenses		
RASC promo items	55	
General Expenses and Audit	253	General Accounting/auditing expenses
Educational Activities	15,696	
Awards and Donations	141	
Observatory and Site Expenses	188	
Miscellaneous	639	
TOTAL EXPENDITURES	19,601	

SURPLUS OR DEFICIT ON OPERATIONS	**1,660**	
ASSETS		
Liquid assets	**18,423**	Banks account balance, petty cash, GIC, term deposits, etc.
Capital assets		We don't currently track Capital Assets
LIABILITIES	0	

particular check out how sharp the image is at the edge of the field.

In these articles I've tried to explain some of the common terms and things to consider when buying or selecting optics to use. I hope that you have found it useful, and that it helps you to enjoy your observing more.

Congratulations to:

Leo Brodeur on receiving his Messier certificate, and Arlyn Gillespie on receiving her Exploring the Universe certificate

For details about these and all the RASC observing certificates, see http://www.rasc.ca/observing/home.html

Public Observing Sessions

Public observing sessions are coordinated between RASC-KC and the Queen's Observatory. Sessions are held the 2nd Saturday each month. The Ellis Hall Observatory will be open to the public, and we will use the observing deck just beside the observatory. The next sessions are:
December 11
January 8
February 12
All sessions are from 7:30 9:30.

Dr. Judith Irwin at the Special Open House at the Queen's Observatory on Ellis Hall Wednesday October 27th for the Total Lunar Eclipse.

Several RASC-KC displays were set up at the entrance to the hallway along with free astronomy magazines from past supplies and many handouts and brochures. We had over 150 people attend to a cold weather event on the deck with some cloud clearing away early on.

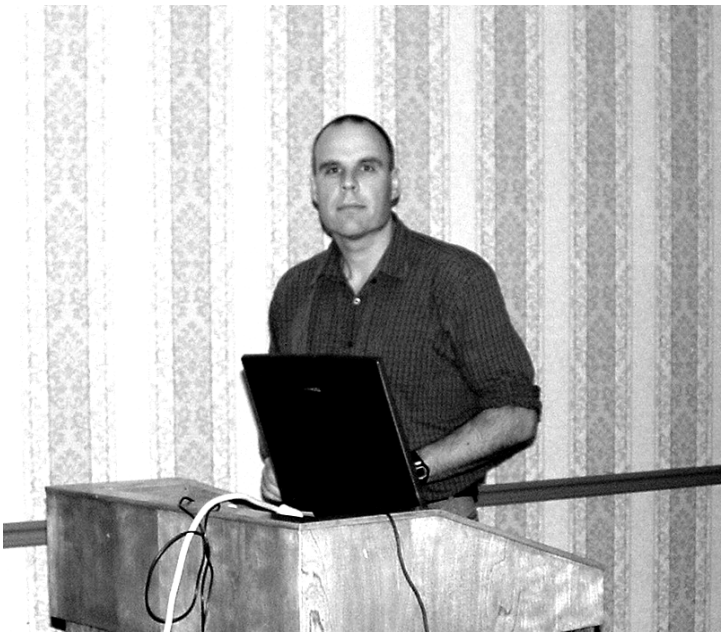
In the event of cloud we were prepared to use the internet to display live camera shots from other locations including the Canary Islands, Spain, Ireland and North Dakota, on the large screen television in the warm room. As it turned out, it cleared up for us, clouded over for most of the other locations, plus their internet hosts got overwhelmed by the traffic and most showed poor or no response at all the event.

This is my best image from the 2004 October 27th Total Lunar Eclipse. We have the misfortune of having a digital camera that does not to long time exposures, only up to 3 seconds and is not very low light sensitive.

This image was taken with a Fuji S3000 camera (3megapixel, x6 optical zoom) handheld up to the 40mm eyepiece of the RASCKC LX200 GPS telescope on the observing deck of the Ellis Hall Observatory on Wednesday October 27th at 21:43, past 2nd contact and before 3rd contact. f2.8, 1/20 second, manually focused at infinity. The LX200 has a focal length of 2000mm, which gives 2000/40=x50 power x the camera lens adjustment, which is mostly unknown

We look forward to getting a newer camera some day, that has better low light capability and more megapixels!

Kevin Kell,



Dr. Terry Bridges, Guest Speaker at the 2004 Annual Awards banquet of the RASC Kingston Centre.

The Kingston Centre of the RASC

Note: The mailing list manager software server (at clinlabs.path.queensu.ca) had a meltdown. Note that *ALL* email lists previously hosted at path.queensu.ca (either cliff or clinlabs) are dead dead dead and will never come back to life again.

We now host our Kingston executive email list and the kingston member chat list on the national email server, provided/donated by St. Marys University.

New email address:
kingston@rasc.ca

Exec email address:
kingstonexec@lists.rasc.ca

PO Box 1793, Kingston, On K7L 5J6

Infoline & answering machine:
613-377-6029
Web:
http://members.kingston.net/rasc

Regulus is published 6 times per year on paper and is available on our web site. Views and opinions expressed herein do not necessarily reflect the official position of the Royal Astronomical Society of Canada or its officers and members.
Subscriptions: Members of the Kingston Centre receive Regulus as a benefit of membership.
Advertisements are free to members of the Centre. Commercial advertising is $20/quarter,
$40/half page,
$100/ full page and should be in electronic format.
Contributions are more than welcome. Submitted material may be edited for brevity or clarity.

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

Newsletter Submission Info: The deadline is usually the 3rd Friday of each month. The preferred method of submission is E-MAIL file attachment.
E-mail:
angle@personainternet.com

Post: Doug Angle,
1910 Keeley Rd.
RR#1,
Sydenham Ontario Canada
K0H 2T0

Cosmic & Events Calendar December 2004 & January 2005

Kim Hay

For more detailed information, please refer to the RASC 2004/2005 Calendar, and the RASC 2004/2005 Observers Handbook. Available from your local promotions committee or from National Office, http://www.rasc.ca

Date & Time	Events
December 4	4th Quarter Moon at 19:53 est.
December 7	Crescent Moon occults Jupiter visible in Eastern Canada at 4:00 a.m.
December 10	**RASC-Kingston Centre Regular Meeting** Stirling Hall Theatre D 7:30 p.m. **Guest Speaker**: Dr. Brian Hunter
December 11	**KAON Observing Session**- Ellis Hall Queen's Observatory 7:30 - 9:30 p.m. for more information visit http://members.kingston.net/rasc/pubobs.htm
December 11	New Moon at 20:29 est.
December 13	**Geminid Meteor peak 5:00 pm for more information visit:** http://members.kingston/~rasc/meteor.htm
December 17	**Astro Yak** at the home of Kevin Kell & Kim Hay visit http://members.kingston/~rasc/indexsec.htm for directions
December 18	1st Quarter Moon 11:40 est.
December 21	Winter Solstice at 7:42 am
December 22	Ursid Meteor Shower 2:00 am est., visit http://members.kingston/~rasc/meteor.htm for more information
December 25	**Happy Holiday Season to Everyone from the Executive & Members of the RASC Kingston Centre**
December 26	Full Moon at 10:06 est.
January 1, 2005	Earth at perihelion 8:00 pm. (147,099,100 km)
January 3	Quadrantid meteor peak at 7:00 am. visit http://members.kingston/~rasc/meteor.htm for more information
January 3	4th Quarter Moon at 12:46 est.
January 8	**KAON Observing Session**- Ellis Hall Queen's Observatory 7:30-9:30 p.m. for more information visit http://members.kingston.net/rasc/pubobs.htm
January 10	New Moon at 7:03 est. Closest Lunar Perigee of 2005
January 14	**RASC-Kingston Centre Regular Meeting** Stirling Hall Theatre D 7:30 p.m. **Guest Speaker**: Sun Kwok- "Cosmic Butterflies" http://www.saao.ac.za/assa/html/kwok.html
January 17	1st Quarter Moon at 1:57 est.
January19	Moon 2.0ºbelow the Pleides 7:00 pm est.
January 25	Full Moon at 5:32 est.
January 28	**Astro Yak** at the home of Kevin Kell & Kim Hay visit http://members.kingston/~rasc/indexsec.htm for directions
January 31	Jupiter 1.5º of Moon best seen in Western North America

Effective 2004 January 11th WebSite Passwords for Member-only Secure areas:
RASC-Kingston:
RASC-National: