

R E G U L U S
THE NEWSLETTER OF THE

ROYAL ASTRONOMICAL SOCIETY OF CANADA - KINGSTON CENTRE
MARCH, APRIL, 1983

INTERNATIONAL ASTRONOMY DAY 1983

On Saturday, April 23rd, 1983, members of the Kingston Centre of the R.A.S.C. are joining with astronomers throughout the world in marking International Astronomy Day 1983. For the seventh year in a row amateur and professional astronomers in all parts of Canada, the United States, and other countries will be using a specific day to share with the public their interest in the fascinating science of Astronomy .

Activities such as shopping mail displays, evening observing sessions under the stars, and visits to observatories have been planned in many places--depending on the facilities and resources available and the interests of the local astronomers.

In Kingston there are two activities which we have planned to celebrate International Astronomy Day. The first will be our display at the Frontenac Mall from 10:00 a.m. to 7:00 p.m. The public is invited to view the many exhibits, talk to the local astronomers about their projects, and learn more about the wonders of the sky. Brochures will be distributed about our society and about what can currently be observed in the night sky, as well as information pages about Halley's Comet which will attract the interest of many people in the next couple of years.

Weather permitting, the second activity will be a Public Star Night that same evening from about 7:30 to 10:30 p.m. at MacDonald Park near Murney Tower. Telescopes will be set up and there will be a chance to observe the craters on the Moon, to see the bright and beautiful planet Venus, and just possibly the planet Mercury in the early evening, and maybe even Saturn, Jupiter, and Uranus after they rise in the late evening. There will also be opportunities to see star clusters, double stars, and other objects in the heavens.

It is hoped that this day will do a great deal toward increasing public awareness both of our society and of the satisfaction to be had from knowing and observing the wonders of the heavens.

EDDINGTON CENTENNIAL MARKED ON MARCH 11TH

Several centres of the Society have observed in recent months the one hundredth anniversary of the birth of Sir Arthur Eddington, but our centre was especially fortunate in the way in which it was able to mark the occasion. At our meeting of March 11th we were able to hear a very fine talk on the topic Eddington: Astronomer and Theoretical Physicist given by Dr. John Coleman, whose tenure as Head of the Department of Mathematics and Statistics at Queen's University has spanned the past two decades and whose doctoral thesis was based on Eddington's Fundamental Theory.

For several reasons our centre wished to observe the Eddington Centennial whose precise date was December 28th, 1982. The contribution made by Eddington to astronomy, astrophysics, and cosmology of the present century was

enormous, as pointed out in several recent magazine tributes to him. One of them, a special and extensive treatment in the latest Journal of the Astro-nomical Society of the Pacific, refers to an authoritative text called A Source Book in Astronomy and Astrophysics 1900-1975, and points out that of the 132 selections in 8 fields of astronomy, including contributions from all the great names: Russell, Shapley, Sandage, Gamow, Hubble, Oort, Einstein, only one astro-nomer made more than 4 contributions and that was Eddington who was the author of 5, co-authored a sixth, and had his articles appear in 5 of the 8 fields of Astronomy. His pre-eminence in the history of the science is beyond any doubt.

As was pointed out in the introductory remarks for the occasion, though 1982 may have been the centennial, 1983 marks several special anniversaries in the life of Eddington also: it is the 50th anniversaries of the publication in 1933 of Eddington's The Expanding Universe and the 60th anniversary of the publication of The Mathematical Theory of Relativity (1923), a book that Einstein himself regarded as "the finest presentation of the subject in any language."

Still another reason for having someone with the authority of Dr. Coleman speak to us on the occasion was the recommendation he received from our Honorary President. Here is the quote from his introduction on March 11th: "Dr. Coleman comes to us with what we regard as the highest kind of recommendation. It was Dr. Douglas, our Honorary President, who suggested that he be invited to address us, and anyone suggested by Dr. Douglas is someone we are very anxious to hear, indeed. Her talk on Eddington, given to the centre on April 19th, 1979 is one we will long remember; its tape recording is one I have cherished for a long time. The A.S.P. article mentioned above contains this sentence near the beginning: "Most of the biographical information in this article is from Dr. A. V. Douglas' 1956 biography, The Life of Arthur S. Eddington." Like any other piece of writing on Eddington, it could not be really regarded as serious without reference to Dr. Douglas' book."

Dr. Coleman began by saying that though his thesis was on the work of Eddington and he had corresponded with him, he still approached the subject with "considerable trepidation", because of the fact that Dr. Douglas, the authority, was in his audience. He was able to relate in understandable terms many of Eddington's theories and to share several unpublished anecdotes-some of them humorous but significant, including one about how several of the eminent scientists of the day received the 'fundamental theory' and seemed to accept it but did not wish to appear to have given it a second thought.

Our members in the Kingston area cannot be surprised at Dr. Coleman's sharing many anecdotes about Eddington's life, for his own interests and contributions to life in the area have extended far beyond the world of physics, mathematics, and theoretical cosmology; he is known in the social and political world and his travels in recent years have taken him to places such as China, Singapore, and Morocco.

We feel that on March 11th, the Kingston Centre was very lucky to have had such an informative and fascinating talk by Dr. Coleman. The Eddington Centennial will be remembered for a long time.

AN AMAZING MESSIER MARATHON

Over a year ago, our observer in Tucson, David Levy, joined the "Nine-Planet Club" by an amazing one-night observing feat; now he has done it again. This time it is an amazing Messier Marathon.

David has informed me that on a clear night three weeks ago he was able to observe no less than 109 of the 110 Messier objects currently listed

in the Observer's Handbook edition of the Messier Catalogue. Only the Globular Cluster, M30 in Cassiopeia, escaped his observation and his telescope was pointing at it in the morning twilight which had become too bright for it to be distinguished.

In my opinion, David's seeing 109 Messier Objects in one night is a singular accomplishment which puts him above all other Messier Marathoners and even ranks among the great accomplishments by observers of both the present and past centuries. Several observers, as recorded in a respected astronomy magazine, have observed over 100 Messier objects in a single night but their feat does not rank with David's, and for several reasons. Most of them were done as part of a Messier Group Marathon -- an event in which several observers found the objects and all present who wished to record a sighting then viewed the objects which were often located by someone else; David was alone -- he alone located all the objects and carefully recorded his observations of each one. Secondly, David used the Observer's Handbook listing which gives 110 different objects; the Messier Catalogue given in a number of other sources and given in all editions of the Handbook up to 1979 listed only 103 objects with two of them (numbers 91 and 102) being listed as duplicates, so that the actual total number on such listings was usually 101. I am unaware of anyone ever claiming to have seen all of them, even when looking on the date in March when viewing is most favourable, and even when using the listing which gave 101 different objects.

Congratulations to David for a rare and magnificent accomplishment in astronomical observing. 109 Messier objects in one night!

THE FIREBALL OF FEBRUARY 8TH, 1983

While I was observing some familiar objects in the sky on the night of February 8th, I saw what was the brightest meteor I have ever seen. At 9:06 p.m. E.S.T. (2:06 U.T. Feb. 9, 1983), I was startled, in fact, almost terrorized by an extremely bright and sudden glow that surrounded me and lit up the yard where I was observing. Turning away from my telescope and to the north, I saw an extraordinarily bright and green meteor descend through the sky from a point about 30 degrees in altitude and 345 degrees in azimuth. It took about five to ten seconds for the object to descend to the northern horizon as it seemed to move down through the constellations Cepheus and Cygnus. Its flaming and almost blinding brightness easily matched that of the brightest full moon. I could confidently estimate its brightness as between -10th and -12th magnitude.

I have found out that the colour left in the "ionization" trail of a meteor depends on both the kind of gas through which the particle travels and the material in the meteoroid itself. It is known that an orange-yellow glow is an indication of sodium in the meteoroid, and a brilliant green is an indication of magnesium. Probably this latter metal was found in relatively high proportion in the meteoroid causing the fireball of February 8th; the greenish trail was certainly distinct.

For several days afterward there were radio, television, and newspaper reports of a "very bright object in the sky" having been seen in a number of places throughout south-eastern Ontario--from Ottawa to Peterborough to Kings-ton. Those people who saw it were often at a loss to explain it because of its tremendous brightness.

LETTERS FROM MARYLAND AND ALBERTA

This is the seventh consecutive newsletter containing correspondence from Gus Johnson in Maryland. His superb Messier Report Album was received, accepted, and a copy was sent to the National Library. A citation has been prepared for his Messier Certificate and we are sure he will be awarded one at the next National Council Meeting. Here are parts of two recent and very informative letters from the finest observer we know in the eastern U.S.

RD 2, Box 67
Swanton, MD 21561
Feb. 21, 1983

Dear Mr. Enright,

Observing has not been too good in recent months, but I did get some chances to test some new equipment. I had mentioned in the Dec. 30 letter of ordering a 32mm Konig from University Optics; it came and while a fine eyepiece, did not have the advertised 65° field (perhaps only in 2-in. 0.D. format) so I returned it. It had about 48°. Had I not had an Edmund 28mm RKE I would likely have kept the 32mm, but there was too little advantage. It also was heavy, overbalancing the telescope somewhat, when used on an equatorial. Not knowing what eyepiece to buy to give me the very wide field, I then ordered a new 50mm finder from Crown. My first one of a few years ago had excessive chromatic aberration. The new one came and has much better optics, not as good as my Unitron 40mm and 60mm finders but acceptable. With my old Edmund 28mm (not the RKE) I get about a 5°! field at 9x; the 20mm Erfle also gives 5°! at 12x. I made a wooden adapter so I could use various eyepieces. It can focus an 8mm RKE (30x) but chromatic aberration shows up too much then. The lens is f/4.8, so shouldn't be expected to do too much at the higher powers, unless it was an apochromat. It is very reasonable in price and as a finder does quite well. Then I thought, why not write to the president of Meade and tell him of my early 50mm lens; he wrote back saying I could return it. I did and was sent back a new 50mm lens, yet it (the 3rd) isn't as good as the 2nd. I have it in the finder tube and in that service works quite well.

Likely I told you of a finder I had assembled a year ago that at 5x gives a 9°! field (Orion's Belt plus Rigel). Extra wide fields have interested me of late, so I checked the field of my 7 x 35 binoculars and found it does even better, taking in Orion's Belt and Alpha, and the whole Bowl of the Big Dipper, so is about 11°. The widest-field instrument I have ever read about, short of the unaided eye itself was a 6x Unitron satellite scope of 1958 with an advertised 12° field. One day it suddenly came to me to try a curious optical configuration and I came up with 18°! (as measured on a Tirion Atlas) using a 25mm Unitron Ramsden eyepiece. Today I mounted a wider apparent field eyepieces of 28mm on it and expect a field 23-25° across. Even with the "narrow" 18°! I take in all the main stars of Orion's hourglass shape. All of the Big Dipper can be included except the Pointer Stars. For what purpose this? It may give interesting results on wide Milky Way fields and large dim nebulae.

Clear Skies!
Gus Johnson.

Mr. Johnson's second letter refers to the venerable, historic Allegheny Observatory and its amazing old refractor. We envy him his chance to visit that institution so frequently. I think you will be interested in what he has to say about it.

March 15, 1983

Dear Mr. Enright,

I'm glad to hear that my Messier observations were approved. At last Friday's meeting of the Pittsburgh group I received a similar certificate; I was half expecting that a couple of the observations wouldn't pass their requirements. That meeting was at Allegheny Observatory and was very enjoyable. The program was about the history of Allegheny, which dates from 1860. The coming 30-in, red-corrected lens is still in the making, in Arizona, I think, since it is thought that the objects most in need of study need a red-corrected lens, while the marvelous old blue-corrected one by John Brashear is perhaps suffering from the city lights and air pollution of the location. It would seem a scientific loss of really great size if that fine lens ends up in a museum. The precision of the astrometric measurements it has produced are exceeded only by the 61-in. f/10 Naval Observatory in Arizona! Who could afford to build an observatory in a dark sky location for such a "long" lens? But as a horizontal telescope, using a coelestat, the expense would be much reduced. A plane mirror of perhaps 45-in, diameter would be needed, and such are much harder to produce than a parabolic one of that size.

I likely mentioned that I am considering selling my long 2.4-in, and my 5-in. The ad has not appeared in "Astronomy" as yet, and I have a couple of potential buyers for the refractor in Pittsburgh and a friend in Virginia has put

his name in for the 8-in. I think I'll deliver the 5 in April and also get to use his 12½-in, on the galaxies. Perhaps at mid-month I can get away just before the moon gets bright.

I admire your collection of fine eyepieces. I have not replaced the 32mm Konig that I returned. In the 18-in. O.D. format I can hardly find anything to give more field than my 20mm Erfle. The 24mm Konig is close to it in magnification and would have a little larger overall field, assuming an apparent eyepiece field of about 60°. The 26mm TeleVue sounds like an excellent eyepiece, yet its actual field would be less than a 28mm RKE, and so costly! I am tempted. The actual field would be considerably more than the 20mmE. I have observed more with my array of small refractors and find that unless the sky is unusually dark and clear, the background is a bit bright with a 5mm exit pupil. 3½ to 2½mm gives a beautiful background, which equals 7x to 10x per inch of aperture, making dim nebulosity visible. The 20mm Erfle on my 6-in. f/7.8 gives about 10x per in. Even the 2.4-in. f/15 with that 32mm Konig approached "rich-field" performance, 1 3/4° across with pin-point images across the field and probably could show the Merope Nebula and the Veils for sure.

The Lumicon ad about that 3 1/4-in. refractor of about f/4 caught my eye. But could a 2-element f/4 lens really give sharp clear images? And if it did, it would almost certainly be only at low power. The ad gives 30x as its maximum, suggesting that chromatic aberration sets that limit. At low powers my short 2.4-in. Unitron wouldn't show as faint a star, but it can give very tolerable images at 125x, "resolve" below Dawe's limit and showing to mag. 13. I don't expect the Lumicon can go to 13 or come anywhere close to Dawe's limit. I would like to try one. With my 20mm Erfle it would give about 15x with over a 4! field and that sounds interesting. My experience with the Meade 2-in. f/4.8 finders is a bit discouraging; as finders they do very well with a bright rich field, but of the three I have tried even the best does not give Unitron quality images. I had one out last night set up with a 1 1/4-in. O.D. (9x) right angle prism and saw M51, M81 and M82. Close to M35 I detected 2158. The companion of Delta ORI seemed visible, but not clearly as I would prefer or like the 1.6-in. Unitron at 11x.

My experience with an optical window shows that if uncoated will lose very nearly a half magnitude. All of my 1 1/4-in. O.D. prisms are uncoated, so I suspect that by using a coated prism I could raise the light level of my 2.4-in to that of a 3-in. I hope to experiment with this notion soon. Is mag. 13.5 reachable with the 2.4-in? A jolly thought! My Meade prism of 0.965-in. is coated so only a clear night is needed and no moon. Of my 5 prisms it gives the sharpest images.

How clearly did your photographs come out with those 30 to 45 thousand mm. focal lengths come out. On my long 2.4-in. I experimented with up to around 8000mm. on the moon. The results weren't too bad. My coarse focussing screen hinders getting the sharpest focus and guessing the correct exposure prevented the best results, but my few attempts were promising. CORRECTION: I just checked those slides. They were made with the short 2.4-in, so the effective f.l. was about 4,550mm, not 8000.

I don't do much solar observing, but a month or so back I noticed a time when the disk was almost devoid of spots, except for one or two very small marks, almost missed. Also some large spots have been seen, some "aimed" at Earth, and television reception showed that flares had also occurred.

Clear Skies,
Gus.

Since our past president, Angelika Hackett, moved to Edmonton we have received several postcards and a warm and wonderful letter telling what she and Bob are thing in Alberta's capital. Part of her letter is reprinted here.

March 15, 1983

Dear Leo and friends at the Kingston Centre!

Thank you very much for your letter which was already waiting for us here, when we returned from Hawaii. It was good to hear from you and we hope that all is well in the Kingston Centre. From the signatures I see that David Stokes is back; we hope that he had a most enjoyable trip and are sad to

have missed him upon his return. Every meeting night I think of you and wonder what you might be doing and who might be giving a talk, and I miss your excellent slide shows!

Yesterday I was able to attend my first meeting of the Edmonton Centre, since I had previously talked to Franklin Loehde on the phone. It turned out that we were the very first public group to tour the new Space Sciences Centre, due to open in July 1984! What an impressive structure; the out-side is completed and it looks as if the inside will soon be done, and then all they need is the displays, projectors, and hundreds of other pieces of equipment. Can you imagine: an anonymous donor has given \$1 million towards the project! His name will be announced at opening time, and I think that the planetarium dome will be named after him. Around the building it is still very muddy, but eventually there will be an artificial lake, with numerous black swans, to contrast with the white building. A science shop and fancy restaurant will help raise funds, and little kids can play in a space-age play-ground while the older ones look at the exhibits. It sounds as if the Edmonton Centre has quite a bit of input; Franklin knows the place inside out! Some sections will even open later this year, and in a few months the Edmonton Centre will be able to hold its regular meetings in one of the classrooms there! Everyone is extremely proud of the whole structure, especially since it is still under budget. Now I understand why, at one of the shows in the old (and tiny) planetarium, the announcer went on and on about how great this new centre will be.

Bob's work is going very well; he has presented a paper and written an article for publication, and shall begin work on his book shortly. He sends many greetings to all of you!

Hope you have many clear spring skies!
Best wishes, from Angelika.

POEMS FROM AN ASTRONOMER

I am very pleased to have received several poems from Jeff Frett. His fine "astronomical poetry has appeared here before and we hope he continues to share with us these fine works of art.

PERSONAL CLEAR NIGHTS

December gave the warmest night,	Like the night David's pier
June, the same,	I raised my eyes
Every year,	To all the stars
Days so right.	That could appear.
There were times I could not listen;	And when these future days arrive
Silenced cities	From cosmic shore
Then I saw	I will as always
With total vision.	Wade in starry tides.

NIGHT FLIGHT

Take me up
From summer sunset;
Let me drop
This fading light,
Glide through tones
Of Earthly evening,
Bask in brilliance
Of the night,

Carried high
On fluttering passions
Above the sky
So boundless free.
I threw my heart
In all directions
Became a part
Of the cosmic sea.

TIME TRAVELLER

The planet beneath my feet
Ripples with ancient memories:
'I have been for many;'
'And many more shall come'

Traces of yesterages
Lay dormant for curious visitors-
Posterity unintended,
unlikely buried treasures.

Times will come again-
Wanderers captured by the gravity;
The migratory urge sufficed,
Ships will settle down

For now, however,
I come a time traveller
On fabled sands
To sift through the ages.

FOR YOUR COMPENDIUM OF ESOTERIC FACTS

We know that there are many double and triple stars that can be easily resolved in our small and medium telescopes, and you know that there is a bright naked-eye star in a prominent summer constellation that can be resolved into a "quadruple star"; in fact, a famous observer has called it the most beautiful quadruple group in the heavens."? Binoculars can split the star into two, and then as in the case of the "double-double, each one can be further split into two more.

This star is the one called Mu Scorpii, located near Beta Scorpii at the upper edge of the Scorpion. Its four components are true members of one group; all four show a common proper motion in the same direction. The two pairs which are 41.4" apart are very unusual in being close both in brightness and separation; the one pair at magnitudes 4.6 and 5.6 are only 1.2" apart, and the second pair at 7.0 and 7.7 magnitude are 2.3" apart. Mu Scorpii, a true quadruple, is certainly worthy of our observation and study this summer. Telescopes of 6" aperture or more should, under good conditions resolve all the members of the group.

REPORTS AND OTHER ITEMS

1. The last two months have brought great numbers of cloudy nights with many days and nights of snow, rain, and generally stormy weather. However, on

a few dates, a number of members of the centre were able to snatch a few minutes or even hours of observation and on rare occasions even take an astrophoto or two.

Faint auroral displays were seen by a few members during both February and March. On several nights Martyn McConnell did some interesting astrophotography of both deep sky objects and lunar craters--the latter using the afocal method of photography. On February 19th and February 21st I photographed lunar craters using eyepiece projection photography and effective focal lengths of up to about 45,000mm. The enormous magnification worked quite well on most of the craters on which I experimented.

Several of us saw Zodiacal Light on a few occasions; I saw it most distinctly in the evening of February 13th. As for solar observing, the few times when it was possible did not lead to many sunspot observations: in fact, when I observed the sun on March 13th, I did not notice any sunspots whatever--one of the very rare occasions on which that has happened. (Is another Maunder Minimum imminent?)

I have also observed the asteroids Melpomene and Astraea which are currently very interesting because they are very close to each other in the constellation Leo.

2. Here is a last call concerning the General Assembly in Quebec City from May 20th to May 23rd. I have a schedule of events and other information about what promises to be an excellent gathering of hundreds of amateur astronomers. Let us hope that we have a good representation at the GA.
3. News from Tucson is that David Levy will be having a very special guest visiting his Jarnac Observatory during the last week in March. It will be none other than Clyde Tombaugh, the discoverer of the planet Pluto.
4. We want to thank Rik Hill for sending us copies of all issues of their new astronomy newsletter since its inception in December. The new publication called Desert Skies looks very promising and should serve the Tucson amateur astronomers very well.
5. A number of events are well worth looking for in the coming months:
 - (1) Many of the planets are starting to be more favorably placed for early night observation. Planetary oppositions are occasions when they appear largest in the telescopes and a number of such events are imminent. Pluto is at opposition on April 18th, Saturn on April 21st, Jupiter on May 27th, and Uranus on May 29th. Venus has been prominent in the evening sky for a couple of months and in late April, Mercury will swing toward a favorable eastern elongation so that it too may be seen very easily in the west-north-west about one hour after sunset. Its greatest elongation from the sun is on April 21st. Throughout the month of May, Jupiter and Uranus form an interesting and close pair near the bright stars of the arm of Scorpius; on the 16th of the month they are less than a single degree apart. Uranus which reaches magnitude 5.8 at the time of its opposition may possibly be visible to the naked eye under good conditions. It is surely a good time for planetary observers.
 - (2) The asteroids Geographos, Melpomene, and Astraea are more than deserving of our attention because they are favorably placed for easy observation.
 - (3) Among the meteor showers, the April Lyrida peaking on the 21st of the month and the Eta Aquarids seen from May 3rd to 5th may be well worth observing. For the first one observation may be best after moonset about midnight, and for the latter one, before the third-quarter moon rises. Best of luck in all your observing. Bring your reports to our regular meetings.

6. Here is a brief schedule of coming meetings with a list of the talks to be presented. Changes may be made and more talks may be added as materials become available.

April 8: John Hansen
April 22: Peter Jedicke, Kingston-London Centres' Speaker Exchange Program
May 13: Mark and Sue Sorensen
May 27: Reports and Slides from GA. '83
June 10: More G.A. Reports
June 24: Summer Plans: Outings, Picnics, and Observing Sessions

Remember that all the meetings are at 8:00 p.m. in Room 222 in Ellis Hall on University Avenue.

7. Your editor would be very happy to receive material for these pages. Our address is:

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CLEAR SKIES!

GOOD OBSERVING!

Leo Enright.

LAST SECOND NEWS FLASH: David Levy's report on his incredible observing session number 6207 on the night of March 15-16th has just arrived. He observed not just 109 Messiers, but also 34 other NGC objects, some of them very faint!! Look for more info on this observing session in our next newsletter.

Leo