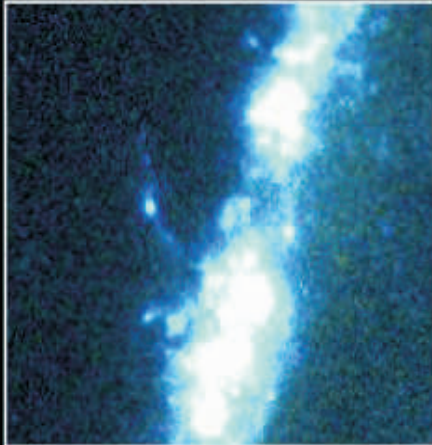




Regulus

January - February 1995

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



Cartwheel Galaxy

HST · WFPC2

PR95-02 · ST ScI OPO · January 1995 · K. Borne (ST ScI), NASA

12/23/94 zgl

HUBBLE VIEWS A STARRY RING WORLD BORN IN A HEAD-ON COLLISION

(see story page 5)

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The Centre

Officers and Executive Council

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Treasurer	Kim Hay
Regulus Editor	Peter Kirk
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Astronomy Day	Cathy Hall
Education	Denise Sabatini
Publicity	Bill Broderick
Observing	Steven Manders
Light Pollution	Bill Broderick
GA Bid	Peggy Torney

Centre Address

RASC - Kingston Centre
P.O. Box 1793
Kingston, Ontario
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Meetings and Events

Fri. Jan. 13	Regular Meeting - Speaker, Dr. Martin Duncan, Queen's University - "Origin of Comets"
Sat. Jan. 14	G.A. Committee meeting
Fri. Feb. 10	Regular Meeting - Speakers, Leo Enright, Cathy Hall - "All about meteor showers and how to observe them"
Fri. Mar. 10	Regular Meeting - Speaker, (Tentative) Dr. Dave Hanes, Queens University - TBA
Fri. April 7	Regular Meeting - Work shops.
Fri. May 12	Regular Meeting - Speaker, Paul Boltwood, Ottawa Centre - TBA

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.

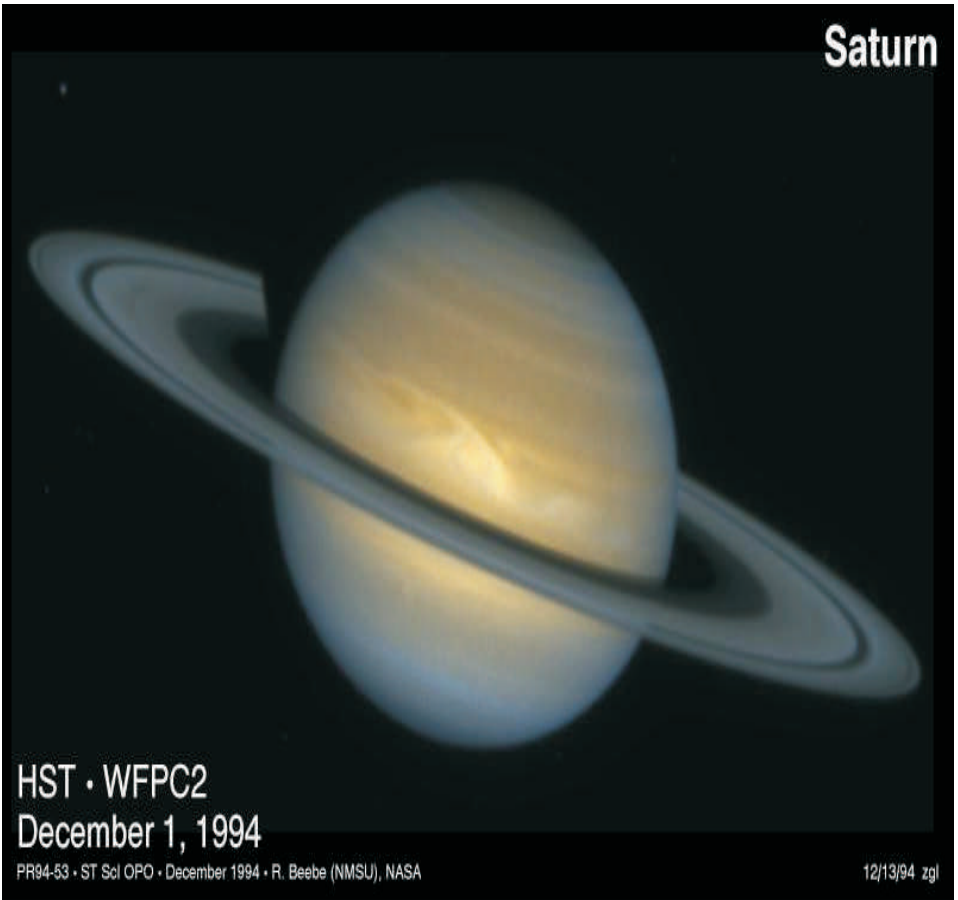
Deadline for receipt of material is the 15th of the month prior to Publication.

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From the Desk...

Peter Kirk - Editor

The new year is upon us and with it brings the first issue of Regulus that I have done since taking over as the editor. I would like to take the time now to thank Bill Broderick for the excellent job he did in producing the newsletter for the last five years. I only hope that I can keep the newsletter at the same high level that we have enjoyed. It has been a hectic three months since becoming the editor, with deciding on whether or not to do changes, figuring out what format to use and with that, what software, whether or not an electronic version should be done. Well, after all that, I have decided to try and put out an electronic version to be put on the local RASCnet BBS's, so those with modems can download the file and view it on their home computers and print it out if they so choose. At this point, I'm not too sure what software to use so that everyone can read it, no matter what they are using. Although, I'll be sticking to the IBM platform. There are a few items that I would like to add to the newsletter. With the computer becoming more prevalent in the home; I would like to add a column with computer news outlining available astronomical software, the availability of pictures from Hubble and other sources. Such as the pictures that grace this issue of Regulus. Maybe something along the line of Kevin Kells RASC-Net-News.(hint,hint) Another thing I would like to see are pictures in the newsletter taken by the members of the centre. I have an abundance of ideas for the newsletter, but if you have anything you would like to see in Regulus, please don't be shy to ask. I would like to congratulate Terence Dickenson on being awarded the Order of Canada. This is an honour that was announced last week and is to be officially presented in April at Rideau Hall. Well this issue is finally done, now on to the next.



HUBBLE OBSERVES A NEW SATURN STORM

This NASA Hubble Space Telescope image of the ringed planet Saturn shows a rare storm that appears as a white arrowhead-shaped feature near the planet's equator. The storm is generated by an upwelling of warmer air, similar to a terrestrial thunderhead. The east-west extent of this storm is equal to the diameter of the Earth (about 7,900 miles). Hubble provides new details about the effects of Saturn's prevailing winds on the storm. The new image shows that the storm's motion and size have changed little since its discovery in September, 1994. The storm was imaged with Hubble's Wide Field and of Death (WFPC2) in the wide field mode on December 1, 1994, when Saturn was 904 million miles from the Earth. The

picture is a composite of images taken through different color filters within a 6 minute interval to create a "true-color" rendition of the planet. The blue fringe on the right limb of the planet is an artifact of image processing used to compensate for the rotation of the planet between exposures. The Hubble images are sharp enough to reveal that Saturn's prevailing winds shape a dark "wedge" that eats into the western (left) side of the bright central cloud. The planet's strongest eastward winds (clocked at 1,000 miles per hour from analysis of Voyager spacecraft images taken in 1980-81) are at the latitude of the wedge. To the north of this arrowhead-shaped feature, the winds decrease and the storm center is moving eastward relative to the local flow. The clouds expanding north of the storm are swept westward by the winds at higher latitudes. The strong winds near the latitude of the dark wedge blow over the northern part

(continued on page 5...)

Presidents Report Walter MacDonald

1 1994 has been an eventful year, both for the Kingston Centre and for Astronomy generally. In this report, I will try to touch on as many of these events as I can. I apologize in advance for missing anything (or anyone), or for any bias in reporting!!

The year started out with the first of two financial windfalls for the Centre: \$50 was received from the sale of the Centre's mirror grinding machine to the North York Astronomical Association. The grinder had been gathering dust at Queen's University for many years, but I am happy to report that it has been in active service for much of this year since being moved to its new home.

Asteroids made a big impact this year (if you'll pardon the expression!): both Terry Dickinson and Art Covington received perhaps the highest of honours with the naming of an asteroid for each of them. I'm sure it was several months before their feet touched the ground again! The Centre held another successful Astronomy Day on Saturday, April 16. Many thanks to Ian Levstein (our Astronomy Day coordinator), Bill Broderick, and everyone else who helped out.

In April, the Centre experienced another "first": an Astronomy Workshop. This event was the brainchild of our Past President, Christine Kulyk. It was quite successful and well received by the members who attended it, and I expect there will be a second Workshop in 1995 (right Christine?!).

May 10th brought us an annular solar eclipse and the Centre's second financial windfall: \$600 was realized from sale of eclipse viewers. Oh, and of course many Centre members saw the eclipse too!

"Looking Up", A History of the RASC was finally published after several delays. This is a fine book and a definite must-

have for any RASC member.

The annual RASC General Assembly was held in St. John's, Newfoundland over the Canada Day Weekend this year. The Kingston Centre was well represented, as usual. I should point out that Kingston Centre is a significant player on the national scene: Terry Hicks has just completed 2 years as National Treasurer, Kim Hay has taken over the RASC promotional items, Leo Enright is the Beginner's Observing Guide Editor, and I have just been appointed National Librarian. One practical upshot of all this is that Kingston Centre has had 3 votes on National Council during the last two years!

It goes without saying that our Honorary President, David Levy, had an incredibly busy year! Comet Shoemaker-Levy 9 put on a big show in July when it collided with Jupiter. Many Centre members had their 'scopes in overdrive during impact week as the impact scars paraded across Jupiter's southern hemisphere. Thanks to the efforts of several members, this spectacle was shared with members of the public at several provincial parks: on July 9 at Bon Echo, on July 11 at Presqu'ile, and on July 13 at Sandbanks.

August brings with it the annual Perseid meteor shower. The 1993 Perseids put on a good show, but the 1995 Perseids will be marred by a full moon. This provided added incentive to get out and watch the 1994 Perseids. Despite mixed weather, some Centre members were able to watch this year's shower. As in July, members volunteered their time and effort to share the event with the public at local provincial parks: on Aug 8 at Presqu'ile, and on Aug 10 at Charleston Lake (Terry Dickinson's annual public star night) and at Sandbanks.

Several Kingston members attended the Syracuse Summer Seminar on the Persied weekend in August. Jupiter's impact scars and the Perseid meteor shower were observed, and many excellent talks were heard over the weekend. Hopefully more Centre members will attend Syracuse in

future years.

The RASCNet continues to gather momentum. Centre member Mark Kaye has been the driving force behind this network. And Kingston is connected to the max — by 4 local nodes! This is a great way to correspond with other amateur astronomers across Canada, and I encourage everyone to get involved in this!

The Centre's GA Committee is rolling along towards its date with destiny in 1997. This is a very exciting project since Kingston Centre has never before hosted a General Assembly. For those of you who have never been to a GA, mark 1997 on your calendars —there's no excuse for missing it when it's right here in town!

On a sad note, I must report that Stan Hanna and Mark Kaye have moved out west. Of course this is good news for the Centres that they'll be joining out there... Good luck guys!

In December I had the pleasure of awarding the A. Vibert Douglas Award for 1994 to our Treasurer, Kim Hay. Kim has been a very important part of the Kingston Centre for several years now. Congratulations Kim!

I would like to thank several people for helping me through my first year as president: Christine Kulyk, Leo Enright, Kim Hay, Ruth Hicks, Gord Taylor, Bill Broderick, and Cathy Hall. I would also like to thank Ian Levstein and Peggy Torney for going "through the window" so that we could enjoy the use of the slide projectors at a couple of our meetings! Last, but not least, I would like to give special thanks to all those who gave talks at meetings, whether it was a full-blown 2 hour presentation or just a few slides.

In closing, I hope that 1995 will prove to be every bit as eventful as 1994 has been! Clear Skies!

A. Vibert Douglas Citation

About the Winner of the A. Vibert Douglas Award for 1994 This year's winner of the A. Vibert Douglas award has, true to the spirit of the award, made very substantial contributions to the operation and well-being of the RASC Kingston Centre. For the past several years, she has spent many hours keeping the centre's finances and correspondence in order, writing beautifully worded annual reports summarizing the centre's activities each year, booking the meetings with Queen's University, handling Observer's Handbook distribution and membership renewals, and much, much more.

I am speaking of none other than Kim Hay, of course. Kim has served the centre for three years as Secretary and is embarking on her third year as treasurer. In fact, Kim actually held both the positions of Secretary and Treasurer simultaneously during 1993! There are few people indeed that could handle such a tremendous responsibility as this, but Kim not only handled it, she excelled at it. More recently, Kim has taken on the task of managing the Society's promotional items, and in doing so, has raised the profile of the Kingston Centre at the National level of our Society.

As you can see, Kim's influence has been greatly felt throughout the Kingston Centre over the past few years. But I should mention also, that her influence is felt not just in "normal" space. Through her operation of the "Moonlight Cascade BBS" (a member of the RASCNet), Kingston Centre members have yet another venue in which to pursue their hobby: in "cyberspace"!

In summary, Kim Hay's enthusiasm, hard work, and good humour have enriched the centre tremendously, and it is with great pleasure that I present the 1994 A. Vibert Douglas Award to her.

(continued from page 3..)

of the storm, creating a secondary disturbance that generates the faint white clouds to the east (right) of the storm center. The storm's white clouds are ammonia ice crystals that form when an upward flow of warmer gases shoves its way through Saturn's frigid cloud tops. This current storm is larger than the white clouds associated with minor storms that have been reported more frequently as bright cloud features.

Hubble observed a similar, though larger, storm in September 1990, which was one of three major Saturn storms seen over the past two centuries. Although these events were separated by about 57 years (approximately 2 Saturnian years) there is yet no explanation why they apparently follow a cycle — occurring when it is summer in Saturn's northern hemisphere. Credit: Reta Beebe (New Mexico State University), D. Gilmore, L. Bergeron (STScI), and NASA.

Hubble views Starry ring World

A rare and spectacular head-on collision between two galaxies appears in this NASA Hubble Space Telescope true-color image of the Cartwheel Galaxy, located 500 million light-years away in the constellation Sculptor. The new details of star birth resolved by Hubble provide an opportunity to study how extremely massive stars are born in large fragmented gas clouds. The striking ring-like feature is a direct result of a smaller intruder galaxy - possibly one of two objects to the right of the ring that careened through the core of the host galaxy. Like a rock tossed in to a lake, the collision sent a ripple of energy into space, plowing gas and dust in front of it. Expanding at 200,000 miles per hour, this cosmic tsunami leaves in

its wake a firestorm of new star creation. Hubble resolves bright blue knots that are gigantic clusters of newborn stars and immense loops and bubbles blown into space by exploding stars (supernovae) going off like a string of firecrackers. The Cartwheel Galaxy presumably was a normal spiral galaxy like our Milky Way before the collision. This spiral structure is beginning to re-emerge, as seen in the faint arms or spokes between the outer ring and bulls-eye shaped nucleus. The ring contains at least several billion new stars that would not normally have been created in such a short time span and is so large (150,000 light-years across) our entire Milky Way Galaxy would fit inside. Hubble's new view does not solve the mystery as to which of the two small galaxies might have been the intruder. The blue galaxy is disrupted and has new star formation which strongly suggests it is the interloper. However, the smoother-looking companion has no gas, which is consistent with the idea that gas was stripped out of it during passage through the Cartwheel Galaxy. [Top Left] Hubble's detailed view shows the knot-like structure of the ring, produced by large clusters of new star formation. Hubble also resolves the effects of thousands of supernovae on the ring structure. One flurry of explosions blew a hole in the ring and formed a giant bubble of hot gas. Secondary star formation on the edge of this bubble appears as an arc extending beyond the ring. [Bottom Left] - Hubble resolves remarkable new detail in the galaxy's core. The reddish color of this region indicates that it contains a tremendous amount of dust and embedded star formation. Bright pinpoints of light are gigantic young star clusters. The picture was taken with the Wide Field Planetary Camera-2 on October 16, 1994. It is a combination of two images, taken in blue and near-infrared light. Credit: Kirk Borne (ST ScI), and NASA

RASC - Kingston Centre
Annual Treasurer's Report
Oct 1, 1993 to September 30, 1994

<u>Revenue</u>	1994	1993
Membership Fees	2553.75	2480.00
Life Members Grants	115.20	102.40
Donations & Auctions	216.95	329.59
Educational Activities	—	—
Interest & Dividends	30.15	6.47
Sales of Observer Handbook	102.00	160.00
Sales of Jr. Observer Guide	85.00	168.85
Sales of Calendars	127.45	192.50
Sky & Telescope Program	83.58	278.57
Advertising	—	—
General Assembly(Travel Grants)	—	492.50
Miscellaneous (Solar Filters)	802.75	335.89
 Total Revenue	 4116.83	 4546.77

Total Revenue down \$429.94 from 1993

Expenditures

Fees Remitted to National Office	1188.00	969.40
Library	340.44	150.00
Meetings and Newsletters	413.43	618.34
Mailing & Postage	138.81	166.18
Publicity(flyers)	233.86	246.79
Travel Grants	—	450.00
Equipment and Supplies	212.92	27.58
Office Expenses	306.37	179.70
Educational Activities	178.92	—
Insurance	—	—
Awards & Donations	118.94	103.94
Sky & Telescope Offer	68.05	278.57
Purchase of Ob. Handbook	60.99	158.25
Purchase of Calendars	104.35	133.75
Bank Charges(Service Charges)	15.00	14.50
Miscellaneous(Promo Items)	—	581.27
 Total Yearly Expenditures	 3380.08	 4078.27
 Surplus or (Deficit) on Operations	 736.75	 468.50

Surplus of \$268.25 more than 1993

Centre Treasurer _____

Date__ Sept 30, 1994__

A Day with the Shoemakers

Peggy Torney

Friday the 28th day of October, 1994 is a day marked prominently in my Observing Log. This was the day that David H. Levy received an Honourary DSc from Queen's University and Leo Enright, Denise Sabatini and myself escorted Carolyn and Gene Shoemaker through Holleford Crater.

Holleford Crater is an old structure, perhaps as old as 100 million years. It is not as obvious a crater as the caldera of Diamond Head or Meteor Crater, Arizona. This is a gentle, saucer shaped hollow with a raised lip. It is about 2.5 kilometers across and its rim is no longer continuous, cut through by river and road. The crater is located a short distance northeast of highway 38 along the Holleford road. (Don't look for Holleford - the town no longer exists)

Shortly after 9:00 am that morning we met the Shoemakers, accompanied by Dr. Edith Levy, at the small store in Hartington and led the way to the crater. Our first stop was the rim.

Both Eugene and Carolyn were full of questions, mostly concerning the study that had been made of the crater. Gene wanted to know if any of the original space debris had ever been recovered. The answer to that was, so far, no. The original work was begun on the crater in 1955 and the analysis of the time showed no sign of the object. However, Gene suggested, a re-examination of the core samples might turn up fused glass beads or other bits of the original piece. It was fused glass found at Meteor Crater that helped Gene prove that crater was impact formed and not a collapsed salt dome or volcanic crater. Although he first began to work on this theory in 1954 he did not prove it until after 1956. It is probable that the Canadian survey would not have been looking for fused glass in the breccia.

That was our introduction to Gene.

He obviously appreciated the information Leo could provide him with but, as a geologist, he looked at the crater in a slightly different manner.

Carolyn was taking photographs by this time. She also seemed very used to craters shooting at angles that gave a good view of both rim and hollow. She also takes people pictures and we all posed in the middle of the road just below the rim. (Good thing it's not a high traffic road)

We moved from the rim to the crater bottom, well, not really the bottom, that has been silted up. Our aim was to view the fiat drill site and get close to the point of impact. To do this we had to first maneuver our way over a farm rail fence and then through the cow pasture. Denise found a relatively low spot in the fence and went over first. Carolyn then followed. Dr. Levy stated that she had been a hurdler in her youth and should be able to handle the fence and proved that she could, even without hurdling it. I had little trouble with the fence but nearly put my foot directly in a meadow muffin once over.

...reasonable to assume that the impact had been marine

There is quite a story about the first drill site. There was an explosion and a fire when the drill broke through a pocket of methane gas. The blast was powerful enough to shift the water table and ruin farmer Babcock's well. The Federal government paid to have water trucked in for the cattle and for a new well to be drilled. Drill site one was abandoned with the diamond bit still in place. It is marked today by rusting steel piping protruding about a foot from the ground.

Here Gene pointed out a rock outcropping slightly angled toward the centre of the crater. This was very smooth and, at first, I thought he was pointing at frozen mud. (I should have known better. It was cold, but not that cold.) There were some fossils imbedded in this rock

and for some reason Gene seemed to think this was important.

Next we moved toward the centre. You can't go right to mid point without plodding your way through swamp so we stopped as close as we could. A discussion took place here concerning the age of the crater and what had happened to it. The plaque put up by the Ministry of Culture states that following the impact, the seas rushed in and the crater was filled with water. Dr. Shoemaker did not seem to agree with this. He looked around the crater and stated that the impact must have been marine.

Not sure that I had heard what I had thought, I asked Carolyn. She said that the crater would have had steeper walls if the impact had been on land. Since this had a gentle slope something must have absorbed a great deal of the energy. As there was a great deal of water on the Earth during the time in question, it would be reasonable to assume that the impact had been marine. Therefore the water did not rush in following impact, it was already there.

Then Gene reminded us of the fossils we had seen in the outcropping. These had been marine fossils. Definitely, the core samples from this crater need to be re-examined.

Drill site number two was somewhat anti-climatic following Gene's statements concerning our crater. This site is partway up the side and almost hidden in scrub brush. Drill site three is unmarked.

Before we left the crater, Gene and Carolyn had the opportunity to talk to one of the farmers who had assisted the government to move the drilling equipment following the fire. The day was clear in Mr. Orser's mind. It had been the coldest one that winter.

So far this had been a very full day and it was not yet noon. We joined the Shoemakers, Dr. Levy and Richard Levy for lunch and introduced Carolyn and Gene to Bob Rae. Denise then explained what a Premier was.

By 2:00pm we were joined by the rest of the Levy's, Peter and Dianne Jedicke

News & Notes

and Terrence Dickinson at Jock Harty Arena, there to await the conferring of degrees, seated on plywood covered ice. (I haven't been so cold since Starfest.) The recipients were piped in, we stood for the singing of "God Save the Queen" and the opening remarks were made.

David was the first Graduant to receive his Doctorate of Science. It was stated that he had received his Master's degree from Queen's, in English Literature, and it was his advisor, Dr. Norman MacKenzie, who hooded him on this occasion. Much to our surprise David was then asked to present Carolyn and Gene to the Convocation. A rousing applause was given.

It was a great day for astronomy. Seated behind the Shoemakers was a highschool physics teacher who asked if he could take their photograph, to prove to his students that discoverers are real people and not just names in books. Outside the Arena, I heard one of the other graduates comment as we passed through their photograph, that was Carolyn Shoemaker, you know, the comet discoverer."

Yes, Friday, October 28th, 1994, was a great day for Astronomy in the Limestone city.

Want Ads

Wanted - A camera adapter for a 1.25 eyepiece to a T-mount.
Contact Kevin Kell (000- 0000)

Wanted - Articles, photos, notes, or any other submission for the newsletter.
Contact Peter Kirk (000-0000)

Terence Dickenson local astronomy writer has been awarded the Order of Canada. He will be officially presented with the honour in April at a ceremony at Rideau Hall

In Tucson this week at the 185th meeting of the American Astronomical Society Russian astronomers announce the finding of a planet orbiting a neutron star. Watch for more information to come out in the next little while.

Recently in the RASC net there has been a discussion on qualifications for receiving your Messier certificate as set down at the GA. Below is a copy of a message from Dr. Hube on the subject asking for an informal poll on the subject. So let your feelings be known to your council representative.

Subject: Messier and NGC Certificates

To: Various people at various RASC Centres From: Doug Hube

I am being subjected to verbal abuse by many members of the Edmonton Centre! Some people are VERY unhappy with the current criteria for the 'Messier' and 'Finest NGC Objects' certificates.

I am very interested in knowing how people in other RASC Centres feel about this matter.

The unhappiness is with the requirement that the Messier and NGC target objects be found (and observed) without the use of computer-controlled telescopes. This requirement was included in the criteria approved most recently at the St.Johns GA and at the meeting of National Council in October of this year.

At the meetings at which the criteria for these certificates were discussed I do not recall any strong objections. However, objections there are now.

The argument I am hearing — very loudly and very clearly, and as printed in the latest issue of the Edmonton Centre's news-letter — is that people ought not to be denied a certificate simply because they are using the high-tech equipment which is so readily available. They argue that the observations and the record one makes of one's observations are the important things.

Consider this to be an informal poll. What do you and the members of your Centre think about this? Should people be required to star-hop to the Messier and NGC objects before being awarded a certificate, or should we allow (= encourage) the use of the best equipment available, and give credit primarily to the observing record?

(Some Edmonton Centre members intend to make a motion at a future meeting of NC to change the criteria. Hence, the subject will be discussed, and it would be useful to know how most people feel beforehand.)

Thanks for your consideration of this matter.