REGULUS

JULY-AUGUST 1992

NEWSLETTER OF THE KINGSTON CENTRE
OF THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

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CONTRIBUTIONS WELCOME: Articles, notes on observations, humour, poetry, artwork, anything on astronomy or related topics, are invited. Submitted material may be edited for brevity or clarity. Please send all submissions to the Editor as follows:

Bill Broderick
XXXXXXXX
XXXXXXXXXX, Ontario XXXXXX

DEADLINE FOR MATERIAL IS THE 15th OF THE MONTH PRIOR TO PUBLICATION.

MEETINGS AND EVENTS HORIZON

Regular Meetings of the **Kingston Centre, RASC**, are held on the **second Friday** of each month (unless otherwise noted) at **8 p.m.**, in **Room D-216**, **Macintosh-Corry Hall, Queen's University. Non-members are welcome.** Executive meetings are at 7:30 p.m.

Fri.. July 10 — **REGULAR MEETING. Film followed by public observing from parking lot. Please bring a telescope.**

Tues.. Aug. 4 — **CHARLESTON LAKE STAR PARTY. Details on page 6.**

Fri., Aug. 14 — **REGULAR MEETING. Speaker, Christine Kulyk, "Spheres of Influence, or When Astronomers Ruled The Earth."**

Fri., Sept 11 — **REGULAR MEETING. Members' Night. Please bring your slides and/or summer observing report.**

IN THIS ISSUE...

THE MOON, MYTHS AND MANKIND

By David Stokes

PART 3 OF 5

If we suppose the "gods" were projections of unrealized forces within the unconcious mind of mankind, the Jungian model, then we can view the history of these people from the late Bronze Age to the end of Greek civilization as playing out psychological forces in the unconcious and reaching slowly toward a true understanding of life and the need for self-determination. This story is fascinating but beyond our scope which is the story of the moon. In Greece is the beginning of thinking in terms of a model of the cosmos: a model to account for what is observable. Clear for all to see, who cared to view the heavens regularly, was a glittering universe of stars fixed to the inside of a sphere that rotated about the immovable Earth in a day. Across this backdrop fiery planets moved each in its own orbit From the Earth outward were seven such worlds, the Moon, the Sun, then Venus, Mercury, Mars, Jupiter and slow-moving Saturn. Below the orbit of the Moon all was change-able and subject to corruption; it was transitory and ephemeral typified by meteors and comets. Above the Moon was nearer perfection and the highest quality was fire, whereas on Earth fire was mixed with air, water and earth in proportions that gave to everything its intrinsic quality. This model was to fix thinking for nearly 2000 years, being accepted doctrine in Christianity and considered divine in origin and therefore immutable.

Aristotle should have known better but the Greeks were primarily thinkers and not scientific observers. When Greek thought and Egyptian practicality eventually combined the outcome was a rudimentary science and alchemy. Aristarchus estimated the distance of the Sun beyond the Moon and postulated that Earth and planets (Gk. wanderers) moved around the sun, a revolutionary idea (no pun intended) that was not seriously contemplated again for another 1600 years! Hipparchus measured the motion of the Moon against the background of the fixed stars and drew up the first star charts. Much later Ptolemy (150 CE) took up the work of Hipparchus and measured star positions with instruments of his own devising. The accumulated learning of his day was taught at Alexandria (Ishkandaria), the first university complete with library. Part of this precious collection was destroyed by the Christians and the Greeks fled (389 CE) to Constantinople. The remainder was utterly destroyed by the Muslims 300 years later.

Before we follow the moon myths that entered the Christian world through their Roman overlords we should note parallel civilizations in antiquity that flourished in the western hemisphere. The Aztecs of Mesoamerica and their southern counterpart the Incas developed very elaborate calendars that exceed in complexity anything we know in the eastern cultures. They were in fact specialists in the science of synchronicity, balancing the disparate cycles of the Sun and Moon and weaving from them a calendar that encompassed time in periods of 52 years. They are the only people to have been aware of and to have incorporated into their calendars the synodic month of 28 or 29 days and the sidereal month of 27 and 1/3 days. This latter month was arrived at by careful observation over a long time-period. It is the average time required for the Moon to complete one orbit around the Earth, measured against the background of the fixed stars, and not relative to the Sun.

The Egyptians observed the heliacal rising of the bright star Sothis (Sirius) to herald the time for the Nile to flood and cross-checked this with the phase of the Moon. The Incas observed the day on which the Pleiades were first visible in the sky at dawn and then used the time of the Full Moon to mark the month in which the June solstice occurs. In this way their solar calendar for agricultural work was synchronized with their lunar, religious calendar. The Sun was the more important to the Incas and they measured with care the days on which it transited overhead twice a year to fix their times for growing and harvesting.

The heliacal rising of the Pleiades, called "collca" or "storehouse" marked the beginning of the year. From then, about June 9 until the following May, marked the length of the agricultural year. Then, when the Pleiades were last seen in the sky at sunset, the heliacal setting of the Pleiades, in early May, a period of 37 days elapses until the heliacal sighting of the Pleiades again at dawn. This 37-day period was not counted in the calendar year! Now 365 minus 37 days is equal to 328 days. This period is exactly 12 months of average duration 27 and 1/3 days, the sidereal period of the moon.

By relating these cycles of solar years and two sets of lunar months over long periods of time, and given excellent record-keeping, the length of the tropical year was averaged out to slightly less than 365 and 1/4 days. This is in error by only 19 minutes in modern reckoning, an astonishingly accurate and complete calendar unequalled in any other civilization, except perhaps the Chinese who were likewise careful observers and meticulous record keepers. Before leaving Mesoamerican civilizations we should note the Mayan calendar keepers who based their counting system on 20 and not on 10. Their year was composed of 18 "months" of 20 days each plus five extra to make a 365-day year. But a 360-day year was kept for reckoning because it has so many divisors. They did not use any formal lunar calendar but they did record an event by day number in the current lunation. And lunations were bundled into fives or sixes to keep track of eclipses which they forecasted for religious purposes. To the Mesoamerican calendar keeper congruence was of primary interest. Synchronizing sun and moon clocks gave their civilization stability and regulated the activities of the king, priest and common labourer.

(To be continued)

Canada

As we celebrate this 125th anniversary of the founding of our country, let us reflect on those qualities and things that make Canada such a great country to live in and to be a citizen of: among them Freedom, Human Rights, the Rule of Law, and Respect for the differences between Peoples. Together we can overcome the forces of intolerance and division and keep our country one and united--from sea to shining sea. Let it be so! May we continue to sing with one voice the words of our National Anthem:

God keep our land glorious and free.
O Canada, we stand on guard for thee!
O Canada, we stand on guard for thee!

OBSERVING NOTES
March/April 1992

By Walter MacDonald

The spring months (March, April and May) are fantastic for observing, so I always make an extra special effort to get lots in during this time. After all, the winter constellations are moving on rapidly, and the annual mosquito invasion is not far off. Too soon the summer solstice will arrive, and we'll only have four-hour nights (assuming you can stay up late enough for it to get dark). During the March/April observing window (roughly last quarter to first quarter) I spent three luxurious nights at LCOS (with my omnipresent observing buddy, Doug Clapp) drinking in the fantastic skies. Both my C8 and 17½" scopes got a good workout each night. The following are some of the highlights of these observing sessions...

Messier Marathon

One of my observing goals for this window was to do a Messier marathon. Well this year I finally did it! On the night of Sat/Sun, March 28/29, using a Messier marathon list from an old AstroTent magazine, I worked my way through most of the list. For almost all of the objects, I observed with the 17 since I have already observed the entire M catalog with my C8. Despite poor transparency near the horizon, and a crescent moon rising just before morning twilight (the next weekend would actually be the optimum marathon time), I managed to find a number of objects that were close to the horizon (such as M83, 54, 69, 70). The 17's light gathering power was definitely a help for these objects. Unfortunately, I spent too much time in the Virgo cluster with the 17 (more about this later) and looking at variable stars along the way to finish off all of the easy-to-find Messiers. Nevertheless, by night's end I had bagged 77 M objects, a respectable total. The easy ones I missed were mostly in Ursa Major, Canes Venatici, and Ophiuchus.

Based on this experience, finding 100 Messier objects should be easy as long as you allow yourself sufficient time. The difficult objects include those in Andromeda, Triangulum, Capricornus, and Aquarius. These objects are low on the horizon and in twilight, either in the evening and/or morning sky. In a typical M marathon, there is a flurry of activity early in the evening for objects like M74, 77, 33, 31/2, 110, 34, 76, and 79. Once the evening objects are done, you have arrived on the "main sequence" of the marathon. Most of the rest of the night can be spent at a leisurely pace (if the marathon is all you're doing) working in any order you want. Early in the morning, during twilight, another flurry of activity is necessary to sweep up the low morning Messiers, such as M72/3, 30, 15, and 2. It is success in the early evening and late morning with the difficult objects that ultimately determines how close you get to the magic 110 mark.

During the evening, as I was running back to the 17 from the trailer, Doug remarked, "So that's why call it a Messier marathon!" With so much to look at in the two scopes, I was kept hopping all night. Of course, by the time you read this it will be too late to do a Messier marathon. However, it's never too late to start planning for next year. The main thing you need, other than a star atlas and telescope, is a special marathon list of the M objects. Such a list tells you the best order in which to hunt down the objects. This is crucial in the evening and morning since time is limited.

During my marathon, I noted three omissions in Uranometria 2000. On Chart 238, NGC 4303 is not also labelled as M61 (this threw me briefly into a panic until I figured it out). On Chart 194, NGC 4649 is not also labelled as M60. Finally, on Chart 47, the double star to the left of NGC 4290 should be labelled as M40.

The Virgo Cluster

This is, of course, the mother of all galaxy clusters. As I mentioned earlier, I wound up spending far too much time in this area of the sky. My 17 is to blame for this--it shows 'way too many objects! Everywhere I looked there were galaxies--gobs of them. In fact, finding galaxies in Virgo with the 17 is like shooting fish in a barrel--with an Uzi! As an example, I saw seven NGC galaxies just hopping from M87 to M88! The galaxies came in all shapes and sizes. I looked at approximately 50 non-Messier objects in Virgo (plus a bunch of others I didn't have time to identify). Half of these I'd never seen before. Looking at the Virgo charts in Uranometria 2000 will give you an idea of the galaxy congestion in this area.

Quite apart from the sheer fun of tracking down and viewing all of these deep sky objects, my vigorous session with the 17 for the first time gave me a good idea of its capabilities. I saw galaxies listed in the RNGC as faint as magnitude 14½ without breaking a sweat. Some 14½ galaxies were missed though, suggesting that 14 is probably a better "no-sweat" limit. 13th magnitude galaxies, barely visible in a C8, were obvious with the 17. Once I put it in an observatory, I hope to gain an extra magnitude. All of my observing was done without filters.

Globulars Galore!

My favourite type of deep sky object is the globular cluster. I just can't get enough of them. Did you know that the winter sky is almost devoid of globulars? This is because they tend to crowd around the centre of our galaxy, which is located in the summer sky in Sagittarius. If we think of Saggitarius as the "globular zenith" of the sky, then the "globular nadir" would be 180° away. In fact the globular cluster NGC 2419 in Lynx can be considered to be occupying this nadir. According to Burnham's Celestial Handbook, there is no other globular within 60° of 2419! Perhaps it should be called the "Black Sheep" globular!

Fortunately, with the onslaught of spring and summer, the winter globular drought has abated. On my third night out, Sun./Mon. April 5/6, I found two globulars I'd never seen before. The first, NGC 4147 in southwestern Coma (mag. 11) was easily found using my C8. The second, which instantly became my favourite NGC globular, is NGC 5634, midway between iota and mu Virginis (eastern Virgo). NGC 5634 is a small but bright (mag. 10) globular surrounded in the field by bright stars. Doug was so taken with it, be immediately photographed it at f/5 and f/10 with his Meade 8!

Two other lesser known globulars are NGC 5053 in Coma and 5466 in Bootes. NGC 5053 is large and faint. Even with a C8 it can be a challenge. Good sky transparency is important when looking for 5053. It is located about 1° from M53. NGC 5466 is located about 4° east of M3 and is readily found with an 6-inch telescope. Just 1° WNW of 5466 is the variable RZ Boo.

Time Warps

The switchover from standard to daylight saving time came in the middle of my second night (Sat./Sun. April 4/5). To avoid confusion I didn't switch to EDT until after I'd left the observing site for home, on Monday afternoon. Using UT helps avoid this confusion, so all of my variable star estimates were recorded in this way. But for a couple of days, Doug and I were behind the times!

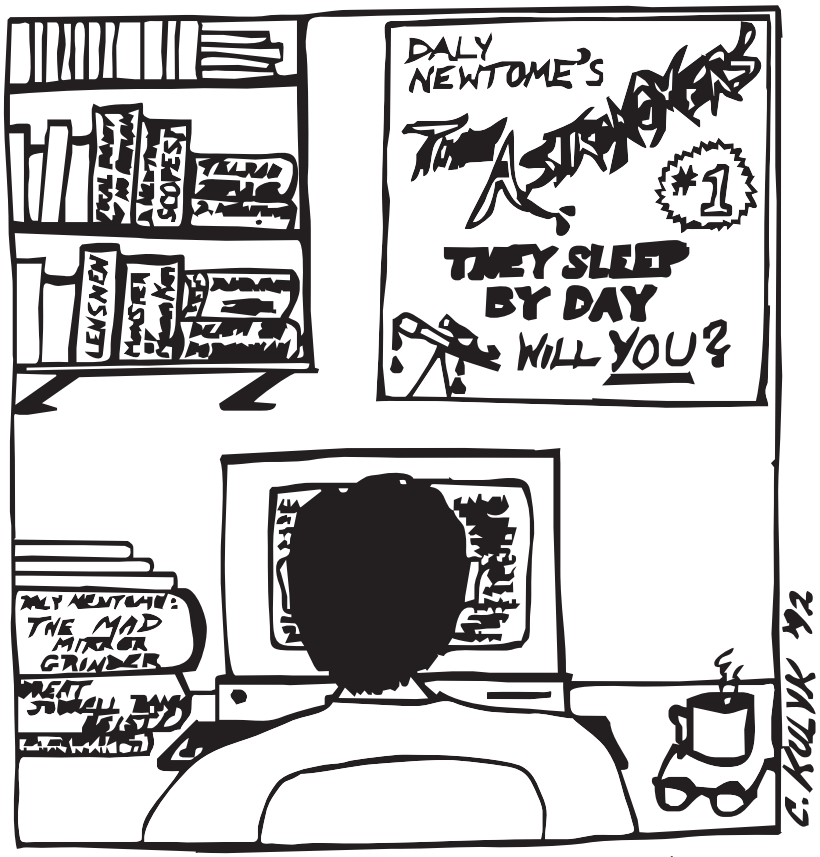
Well, that's the scoop on my March/April 1992 observing window. The April/May window is now upon me, so once again it's off to the starfields!

NEWS AND NOTES

NEW MEMBERS
A warm welcome to **RICHARD CROCKETT, JUDITH IRWIN,** and associate member **DIETER BRUCKNER,** all of whom joined the **Kingston Centre, RASC,** as a result of our **ASTRONOMY DAY** activities. Great to have you with us!

ONTARIO HYDRO AND LIGHT POLLUTION
Ontario Hydro is making a start at educating municipalities and local public utility commissions about light pollution. In late May your editor was privileged to preview a draft copy of a "fact sheet" about light pollution that they are preparing, and to submit his comments and suggestions. Hopefully, we will be able to include a copy of the finished product with a future Issue of this newsletter.

TERRY DICKINSON AWARDED SANFORD FLEMING MEDAL
Congratulations to **TERRY DICKINSON** who was recently presented with the **SANFORD FLEMING MEDAL** of the **ROYAL CANADIAN INSTITUTE** for his popular science writing. We are extremely pleased that TERRY has received this well-deserved recognition. He joins such other recipients of this medal as **DAVID SUZUKI, LESTER SINCLAIR, HELEN HOGG,** and **JAY INGRAM.**



DALY NEWTOME: BY NIGHT, A MILD-MANNERED ASTROPHYSICIST. BY DAY, A WRITER OF BEST-SELLING THRILLERS.

CHARLESTON LAKE STAR PARTY
TERRY DICKINSON'S "Charleston Lake Star Party" is this year being held on **Tuesday, August 4th**. As in the past, **TERRY** would appreciate all the help we can give him with telescopes. If you would like to come and bring a telescope, there is no need to notify Terry or the Park. Upon arrival at the Park, just tell the gate attendant that you are there as a **telescope operator** for the Star Party and you will be admitted free and directed to the observing site. Charleston Lake Provincial Park is about 10 km north of Lansdowne (about midway between Kingston and Brockville). Please allow sufficient time prior to darkness for set up and preparation. **TERRY** will be giving a half-hour talk and slide show in the Park amphitheatre, which we are all welcome to attend, then everyone walks the few hundred meters to the observing site for viewing of Saturn, the Moon, and anything else the telescope operators wish to show. The crowds are usually gone by about 11 p.m. or so and we turn from being telescope operators to telescope users. (Note that there is a small honorarium for this service. Last year this amounted to over $100, which the participants voted to donate to the Centre.)

IN SYMPATHY

The **Kingston Centre, RASC,** extends to **LEO ENRIGHT** and the ENRIGHT family our kindest expressions of sympathy on the passing of their mother **MRS. RITA ENRIGHT,** which occured on Tuesday, May 26, 1992. Funeral services were held at St. Charles Borromeo Church, Read, on Saturday, May 30th.

ASTRONOMY DAY MALL DISPLAY A SUCCESS

Thanks to everyone who helped in any way at the **Frontenac Mall** on **ASTRONOMY DAY,** May 9th. We gained three new members and also raised public awareness of the light pollution problem. Although we were "rained out" of our observing session in the evening. we were invited to give a presentation and observing session at **H.H. Langford Public School** near Napanee, as a result of our **Mall Display.** By the way, another **Mall Display** has been scheduled at the **Kingston Centre Mall** for September 26th.

NEWSLETTER IN MAIL--THIS TIME ONLY

Because I will be away for the July meeting--on a trip to the Yukon and Northwest Territories--all copies of this issue of **Regulus** are being mailed out. Resuming in September, the newsletter will again be distributed at the meeting.

HAVE A GREAT SUMMER! SEE YOU IN THE FALL

R.A.S.C. KINGSTON CENTRE

AURORA TELEPHONE LINE

JUNE 1992 - DECEMBER 1992

	NAME	NUMBER	HOW LATE?
1.	Denise Sabatini & Leo Enright	(000) 000-0000	ANYTIME
2.	Ian Levstein	(000) 000-0000	12:00
3.	Murray Anderson	(000) 000-0000	11:30
4.	Stanley Hanna	(000) 000-0000	1:00
5.	Frank Cervenko	(000) 000-0000	ANYTIME
6.	Kim Hay	(000) 000-0000	1:00
7.	Trish Blasko	(000) 000-0000	11:00
8.	Kevin Kell	(000) 000-0000	11:00
9.	Chris Collin	(000) 000-0000	12:00
10.	Peter Kirk	(000) 000-0000	12:00
11.	Christine Kulyk	(000) 000-0000	1:00
12.	Walter MacDonald	(416) 000-0000	ANYTIME
13.	Bill Broderick	(000) 000-0000	12:00
14.	Jim Towgood	(000) 000-0000	ANYTIME
15.	Joanne Burns	(000) 000-0000	1:00
16.	Peggy Torney	(000) 000-0000	2:00

RULES

1. The person who sees the Aurora should call the person named **next** on the list.
2. That person should call the person named next on the list, and so on.
3. The **last** person named should call the first person named.
4. **The person who starts the phoning and all others who participate should remind the next person of the came of the person who started the procedure. The one who started it does not want to receive a call from someone else.**
5. If it is **past the time** when the **next person** wants to be called go to the **next person** named on the list.
6. If there is **no answer,** the caller should go to the **next name** on the list.

ASTRO JUMBLE

Our "puzzle editor" is "on vacation" this month. Hopefully, he'll be back on the job by the next issue. In the meantime, here is the answer to last issue's puzzle: **VEGA, DENEB, ALTAIR, ANTARES, ARCTURUS. Three of these make up a geometric figure that dominates the summer sky, called (of course!) The Summer TRIANGLE.**
(P.S.: Anyone who has an idea for this feature of our newsletter, please don't feel shy about sending it in. We'll give you full credit, if you want it, or keep it strictly anonymous, whichever you prefer.

THE TRADING POST

FOR SALE

IMPORTANT SALE: Bushnell - BAUSCH & LOMB CRITERION 8000 mm (8-inch) telescope with case, tripod with case, and accessories which include:
30 mm B & L CRITERION Eye-Piece,
18 mm B & L CRITERION Eye-Piece,
Star Diagonal Eye-Piece Adapter, three wing nuts. Hardly used. Excellent Condition. $1750.

Contact
Margaret FitzPatrick
000 XXXXXXXXXXXXXXX
XXXXXXXX, Ontario XXXXXX
Telephone (000) 000-0000

FOR SALE

CLAPP TRAPP Portable Observatory (see Sky & Telescope for July 1987, pp 87-89). Suitable for an 8" or smaller scope. $100. Phone Walter MacDonald at (000) 000-0000.

FOR SALE

MEADE 10"
SCHMIDT-CASSEGRAIN TELESCOPE
MODEL 2120

Complete with:

*** LX DRIVE**
*** HAND CONTROLLER**
*** AC ADAPTER**
*** BATTERY PACK**
*** 8X60 FINDER**
*** WEDGE AND TRIPOD**
*** 2" STAR DIAGONAL & 1¼" ADAPTER**
*** THOUSAND OAKS SOLAR FILTER**
*** PIGGY-BACK CAMERA MOUNT**
*** DEW CAP**
*** CARRYING CASE**
*** OWNER'S MANUAL**

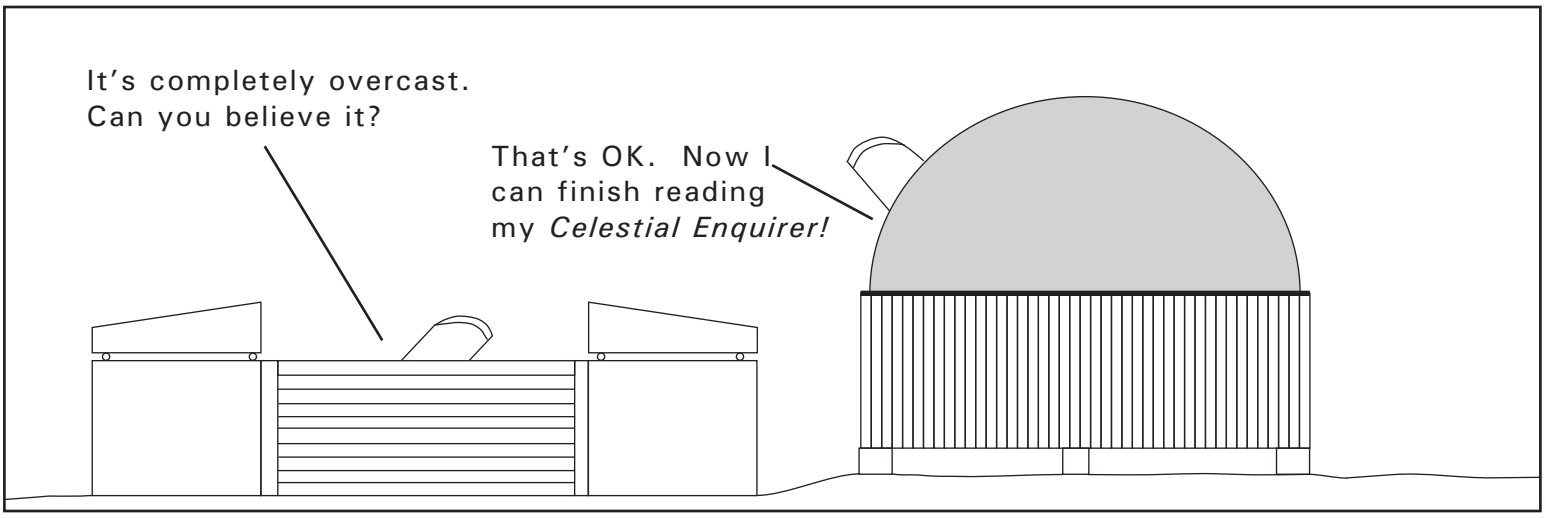
Asking: $1600 (pluss shipping)

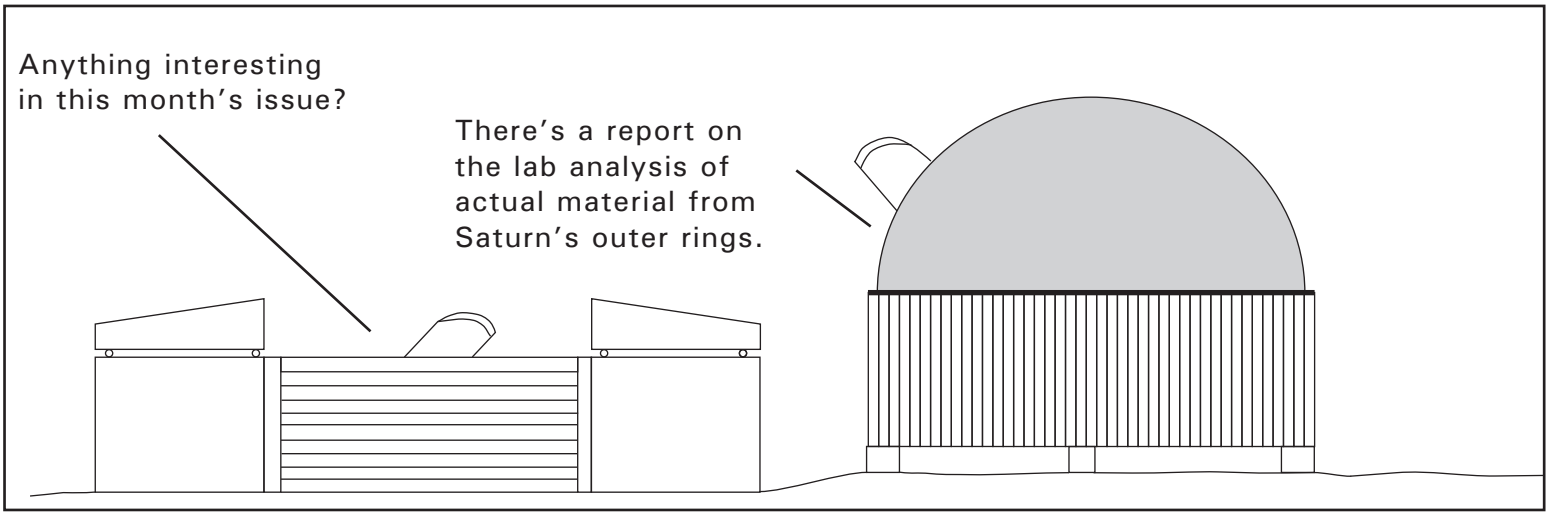
Reason for selling--Upgrade to a larger telescope

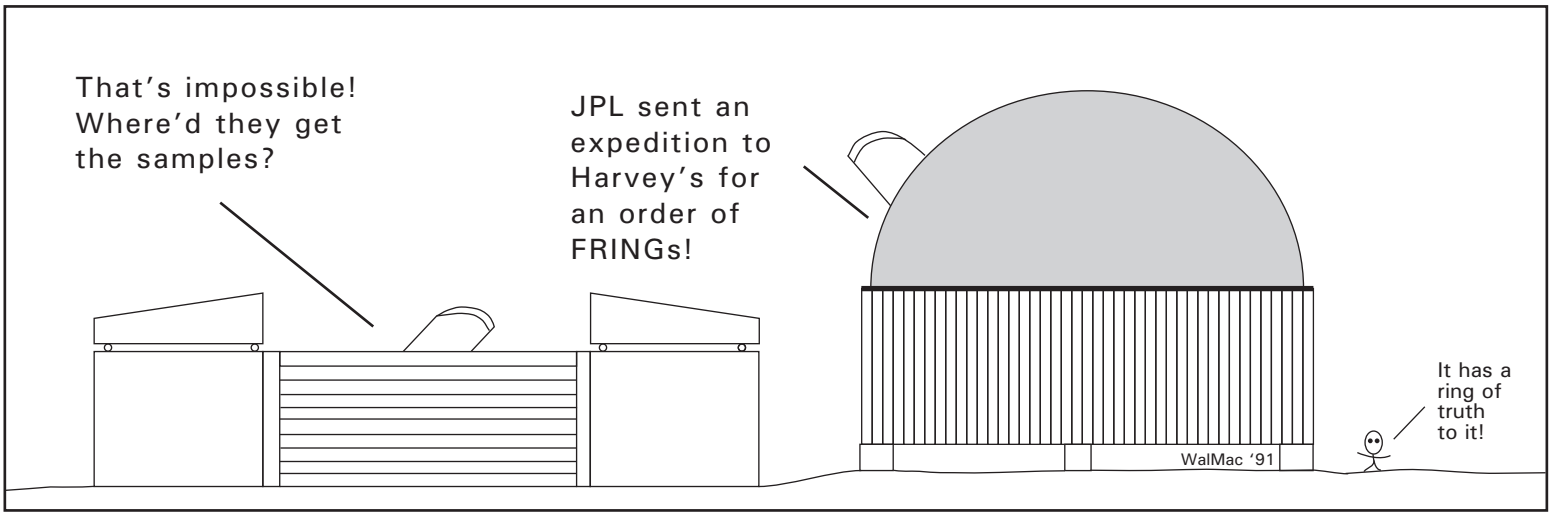
Contact
BILL BRODERICK
XXXXX
XXXXXXXXXX, Ontario
XXX XXX
Phone: (000) 000-0000

FOR SALE

Quantum 6 for sale. Awesome 6-inch f/15 Maksutov-Cassegrain with Questar optics. Two-foot-long tube. Takes 2-inch or 1.25-inch eyepieces. Solid single-arm fork equatorial mount, drive and Meade tripod. Similar deep sky and planetary performance to a refractor—far superior to Schmidt-Cassegrains. If you have ever dreamed about a Questar 7, this is the next best thing but at one quarter the price. Pictured on the last page of the first (red cover) edition of NightWatch. Complete with 2 eyepieces, Barlow, custom mahogany cases, $2900. Terence Dickinson 000-000-0000.


It's completely overcast.
Can you believe it?
That's OK. Now I can finish reading my *Celestial Enquirer!*


Anything interesting in this month's issue?
There's a report on the lab analysis of actual material from Saturn's outer rings.


That's impossible! Where'd they get the samples?
JPL sent an expedition to Harvey's for an order of FRINGs!
It has a ring of truth to it!
WalMac '91