NOVA NOTES

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THE NEWSLETTER OF THE HALIFAX CENTRE OF THE RASC
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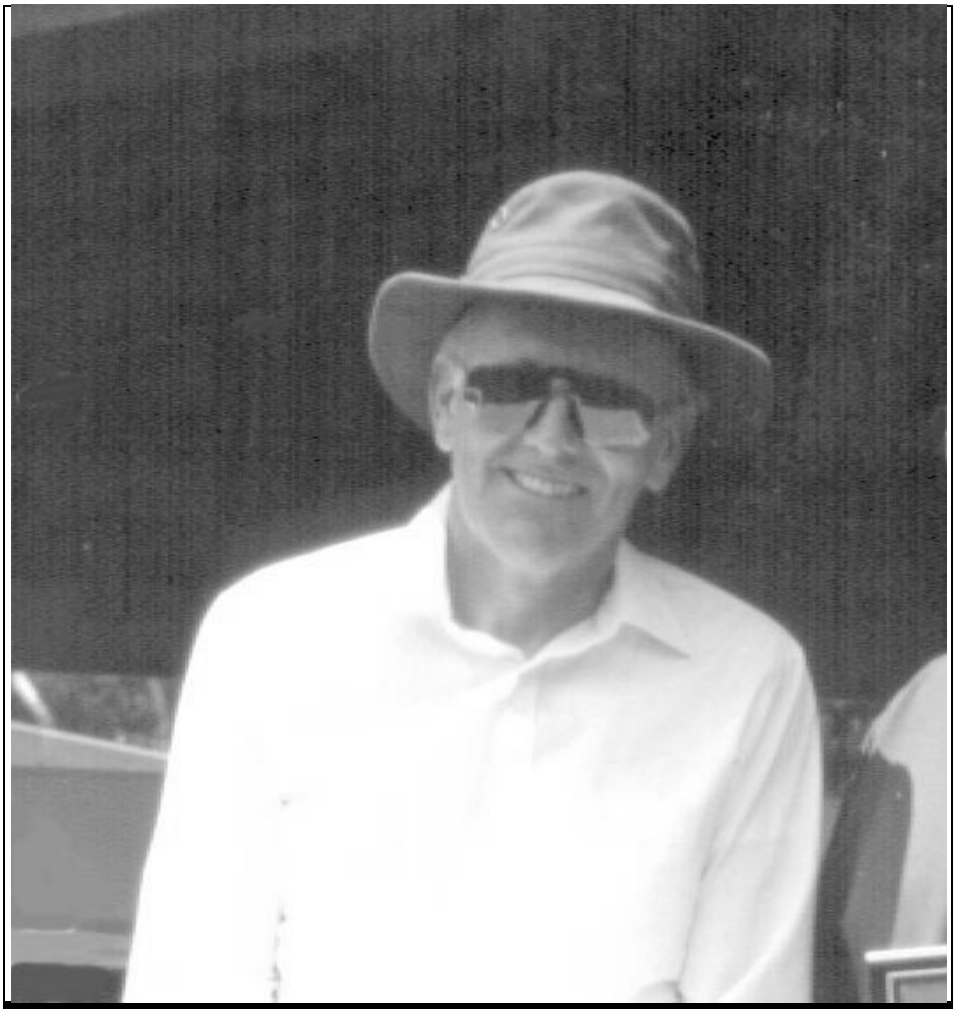
EDITOR'S REPORT: BY SHAWN MITCHELL

Well I really don't have much to say, other than I need material for the next issue of Nova Notes. This is an on going request that is made by every editor, so I'll just have to keep the long tradition of nagging for material alive... Material needed HELP ! Ω

PRESIDENT'S REPORT: BY CLINT SHANNON

We have a new Honorary President! It is my great pleasure to announce that Dr. Roy L. Bishop has honored the Halifax Centre of the RASC by accepting our invitation to be the Centre's Honorary President.

Although Roy needs no introduction to the majority of the members of the Centre, I will enumerate some of his pertinent background highlights. He received his MSc. from McMaster University and his Ph.D. from the University of Manitoba, both in nuclear physics. He served as President of the Halifax Centre from 1975 to 76 and was also served as Secretary and National Council Representative. He was elected to the IAU in 1982, and has served as 2nd Vice-President of the National Council of the Society in 1980 and subsequently as 1st Vice-President and then President of the RASC (1984-1986).



DR. ROY BISHOP
NEW HONORARY PRESIDENT OF THE HALIFAX CENTRE

Clint Shannon our President announced that Dr. Roy Bishop had accepted an invitation from the Centre executive to become our new Honorary President at the October meeting. The photo of Dr. Bishop, was taken by David Lane at the Opening Ceremonies of the St. Croix Observatory.

In 1988 he was the recipient of the RASC Service Award, which is a major award of the Society given to a member in recognition of outstanding service, rendered over an

NOVA NOTES, the newsletter of the ***Halifax Centre of the Royal Astronomical Society of Canada***, is published bi-monthly in February, April, June, August, October, and December. The opinions expressed herein are not necessarily those of the *Halifax Centre*. Material for the next issue should reach the editor by **April 17th, 1998**. Articles on any aspect of astronomy will be considered for publication. "Letters to the Editor" or to our resident expert: GAZER are also most welcome. Contact the editor at:

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Extended period of time, where such service has had a major impact on the work of the Society and/or of a Centre of the Society.

Prior to his retirement as a professor of Physics at Acadia University, he was chair of the Physics Department. He is and has been the Editor of the RASC Observer's Handbook since 1981.

Last summer he was recognized for his work by the International Astronomical Union when the asteroid formerly called 1989PA was officially named (6901) Roybishop. Eugene and Caroline Shoemaker discovered the asteroid and proposed naming the asteroid in honor of Roy Bishop.

It was also through Roy's good office that the Centre was able to obtain the very favorable land lease of the property for our St. Croix Observatory. He is an avid supporter of astronomy, the RASC, and the Halifax Centre. He can always be counted on to give an interesting and informative talk at our meetings when called upon.

A reminder to all that November 20th meeting will be our Annual Meeting and Election of next year's Executive. Ω

MEETING REPORT FOR SEPTEMBER 1998

BY MARY LOU WHITEHORNE

This first meeting of the new season was opened by President Shannon as he welcomed the crowd of 37 astronomy enthusiasts to the September meeting. He moved immediately Ferengi Moment #1 by plugging the Society publications, in particular the 1999 Observer's Calendar. He then called for nominations of officers from the floor. This motivated Dave Chapman to nominate Clinton
Shannon as President for a second 1 year term. The motion was seconded by Ralph Fraser. Stunned into silence by this bold action, there were no more nominations.

Dave Lane then jumped to his feet to report on the success of Nova East '98 - Ferengi Moment #2 - the Centre realized a profit of about $800 on this year's venture. To quote Treasurer Dave, "Ferengi Rule of Acquisition #37 says that if you can't make any money from your friends, who can you make money from?" He then briefed us on plans for Nova East '99 and on the up coming August 11 Solar eclipse.

Clinton then proceeded to announce to all present that the Centre needed to amend the by-laws because, much to our embarrassment, we have found ourselves to be in conflict with the by-laws of our own creation. Imagine that! Trust me - it's easy. Following some general discussion, Article 8.03(2) was moved amended by John Connelly, seconded by Mike Boschat, to read as follows: "No person who is an elected officer of the Society may simultaneously be President, Secretary or Treasurer of the Centre." (Dave Lane, our Treasurer, is an elected officer of the Society since he is also our National Rep. the vote resulted in 25 yeas, 0 nays and 2 abstentions. Motion carried by an overwhelming majority. Whew! We've been rescued from a vat of yak dung just in the nick of time!

The meeting then turned its focus to Mike Boschat who gave his regular "What's Up" report. He mentioned that the Zodiacal Light may be visible in the morning skies at this time of year, that Autumn begins on September 23rd., and to be on the lookout for Draconid meteors, visible planets, lots of sunspots, etc. Dave Chapman showed us a few brag pictures from the April 23rd conjunction and from Nova East.

Having digested these interesting tidbits, we were by now ravenous for the main meal, which was served up to us in the form of Dr. Dave Turner (yes, yes, yes - yet ANOTHER member of the RASD, the Royal Astronomical Society of Daves) who was about to satisfy our appetites for some serious astronomy with his presentation about his favourite research topic, "A Lifetime of Star Clusters."

Star clusters are not boring - quite the contrary, in fact. Star clusters hold many secrets of the

galaxy and in the right astronomer's hands, they can be made to give up their secrets so that we can begin to understand stellar evolution. Dr. Turner confessed to studying mathematics and not being lured into the realm of the stars until he took an astronomy course as one of his physics electives. Occasionally, one does fall into the right line of work, even if by accident, as was the case this time.

Dave, with his characteristic humor and enthusiasm for this fascinating field of study, gave us an introduction to open clusters. He started with images of open clusters that were a bit of a challenge to the uninitiated, in that it was sometimes difficult to even find the cluster among the field stars. So how can you tell if there's a cluster in that mess of stars, anyway? Simple. Using a grid overlay, you start counting stars per unit area, looking for an increase in the count and a center of symmetry. In no time at all, you've got a bona fide star cluster!

So we danced among the H-R, Colour-Colour, Colour-Magnitude, and a host of other Diagrams, looked at Main Sequence Fitting, and other equally interesting astronomical pastimes. All of this led to one of Dr. Dave's real passions - interstellar reddening and the Reddening Laws. To some this stuff may seem obscure and not really related to the price of bread. For this reporter it brought back warm, fuzzy memories of studying astronomy at Saint Mary's and actually trying to figure out the reddening of stars in clusters; trying to determine which stars were cluster member and which were not, and other important life skills for an astronomer.

One message that Dr. Turner delivered, maybe without knowing that he did so, was that astronomy is a very human endeavor. Research is not pointless and boring stuff; it is real, vibrant and vital. It is relevant and rewarding. In telling his story of research into star clusters, he also shared with us the joys and frustrations of being involved in astronomical research. This message is just as important as the data that comes from the research itself.

He concluded his presentation with a modern day fable written by an astronomer by the name of Heard. The fable compares the methods of a Hypothetical group of philosophers studying the life cycle of trees with the way we study the heavens today. It was a most compelling analogy and a wonderful illustration of the detective work that we all recognize as astronomical research.

Many thanks to Dave Turner for putting together such an entertaining and enlightening presentation. I thoroughly enjoyed it!

The star clusters were followed by adjournment of the formal part of the meeting, and a clustering of astronomers around the cookie jar. Interesting, isn't it, how good things happen in groups? Ω

MEETING REPORT FOR OCTOBER 1998

BY DAVE CHAPMAN

President Clint Shannon kicked off the October meeting right on time and got right down to business. He always does such a wonderful job of enumerating the multifold benefits of membership in the RASC, and we never tire of hearing it. Such a good deal! What many don't realize, however, is that the revenue from the most excellent Observer's Handbook actually keeps the membership fee below "market price", thanks to the efforts of a team of 30-odd volunteer contributors---not to mention the Editor---who produce the document every year without financial compensation. But I digress...this was not part of the meeting, but it did come up at the Executive Meeting just prior.

Speaking of Roy Bishop (the Editor of the Observer's Handbook), Clint made the welcome announcement that Roy has agreed to honor the Halifax Centre by becoming our Honorary President. (I believe there may be a citation elsewhere in this issue). Roy took the podium for what passed as an acceptance speech: he understands that the post has absolutely no duties, and that it will go on forever. Roy knew his predecessors well: Fr. Burke-Gaffney, Dr. William Holden, and Dr. Murray Cunningham, and he feels that he has large shoes to fill. His parting shot was that he feels OK and we may be stuck with him for a long time. Amen to that! Gosh, Roy, you make it sound like a job to aspire to.

Mike Boschat, the Observing Chair, gave us a "What's Up", which this month turns out to be meteor showers, meteor showers, and more meteor showers. The Orionids, associated with Halley's Comet, will have come and gone by the time you read this. The second shower is the Taurids, associated with Comet Encke. They peak around November 3, but I think I am correct in saying they are a minor shower. Which brings us to the much anticipated Leonids, associated with Comet P/Tempel-Tuttle. These have a 33-year cycle of providing immense storms of meteors, and we are due for one this year or next...or maybe not. Anyway, November 17-18 are the days to look, and just before dawn is the best time. Before you get too excited, be aware that Canada's leading meteor experts have flown the coop and have headed to Asia for the event, as the storm is expected to be of short duration and unfortunately will occur during daylight hours in North America.

I expect Clint will give you the lineup for next year's executive in his

President's Report, so I will simply say that nominations closed during the October Meeting, after a brief plea for new blood.

Dave Chapman presented a brief explanation of why October mornings seem as dark as winter mornings, when one considers the effect of Daylight Savings Time. His column in the December issue of the Journal of the RASC will cover this in some detail.

The main speaker was the reliable Pat Kelly, who dipped into his store of astronomical facts to present "The Lost Oceans of Venus". Pat is amazing, so amazing in fact that I plumb forgot to take notes. Actually, I couldn't see in the dark, a hazard which Pat later explained could be overcome by sitting at the side next to the aisle lights. Anyway, I remember a few things: we can't see anything on Venus because of the clouds, therefore there are dinosaurs on Venus. (Hey, I don't make this stuff up, I am just the reporter...ask Pat)!

Here are some of my deciphered notes, somewhat scrambled: Venus atmospheric pressure is 90x Earth's, and is mostly carbon dioxide...if Earth's oceans were boiled away, the pressure would be 150 Atmospheres, mostly water vapour...Why is there so little water on Venus?...(after this it gets fuzzy)...deuterium...ozone ...argon...wet greenhouse effect... volcanic activity may have destroyed evidence for Venusian oceans...and so on. Sorry, Pat, but I just couldn't keep up! The discussion at the end was lively, and in summary I will just say that by all accounts Venus is a very unusual planet indeed. Pat, I think you have material for a great article for Nova Notes.

The evening ended with the usual activities cookies and refreshments courtesy of Ralph Fraser:

see you next month! Ω

Deep Sky Observing From the City
By Michael Boschat

Deep sky observing from the city? - Nah...can't be done. Too much light pollution and just impossible. So I thought years ago, but I have been observing some deep sky objects long before I used a 20cm SCT. When I used my 8cm refractor at low power I was able to detect M1 and NGC 253, not bad I thought. Later on I got the C8 and moved to an apartment with a wrong view I face west but wanted a south view. Alas I am on a waiting list for someone to move out on the south side.

Once out on the balcony, I move the scope to the position - no RA and Dec settings for me! just memory. I use low power 62x with my C8 and slowly scan, then POP- M97 is there, yeah it's faint but I can just see the grayish circle area, moving the telescope slowly there's M108 in the same field. After that is done I go for M104 which is just clearing the roof, boom - a slight elongation and a faint bulge - that's it as I jump up and down on the balcony. Next I go for the Virgo Cluster, I have NEVER seen any at all, till the summer, I came across M60, M61, M49 and M87. Moving into Coma Berenices I saw M53 and NGC 5053.

When I observed Delphinus a few weeks back I came across NGC 6934 and NGC 7006 at 11.5 magnitude and 1 minute arc diameter. A few other objects I have seen was the galaxy NGC 6207 in the same field as M13, it is listed at 12.3 magnitude also NGC 6229 a globular cluster in Hercules at 8.7 magnitude. And I followed that supernova in M96 for awhile with the C8 from the balcony even on a slightly hazy night!

So, the basics are warm clothing in winter, low power, know before hand what you want to look for, where the object is located and then go out and look for them, make notes as to what you saw and how they appeared, if necessary make a drawing also. Have a red covered flashlight and a set of star maps in case you get stuck, I use them to locate the fainter objects when I'm not sure of the exact position. When you get older the mind slips a bit. Get your eyes as dark-adapted as much as possible. Look for the faintest star in Ursa Minor, usually 5.2 on a good night clear moonless night for me.

I did have a problem with a neighbor and his halogen light but after a friendly talk and a mention of our Society and light pollution, he moved his light- a big win! The only time I use a hood is when the neighbor in the next apartment turn on their lights full, but let me say I still have seen faint objects when the neighbors just have a normal light on

Submitting Articles and Images for Nova Notes

The Editor is always looking for articles and images to publish in Nova Notes. Let the rest of the members of the Centre see what you have been doing. Your new observing techniques and tricks, photographs, drawings, graphs, cartoons, and humor are all welcome. Articles and images can be submitted either on an IBM formatted disk or via e-mail to smitchell@ap.stmarys.ca, please specify “Nova Notes Submission” in the message header. Almost any word processor format can be handled, but please submit articles in plain ASCII text files if possible. Alternatively, articles, photographs, sketches, etc. can be mailed to the Halifax Centre’s mailing address, Attention: The Editor.

and it does lightly illuminate the telescope! I would really be surprised to see any objects from downtown Halifax, I'm about 3 miles from the core and even to my northwest I have the air Fairview Container pier not as bad as I though. So, go out some clear night, look and see how far into the reaches of space you can see from your little patch of Earth. Ω

WHAT'S UP
BY MICHAEL BOSCHAT

November

Tue.3 - South Taurid Meteor Shower peaks at 0800 UT (4 am). About 15-20 per hour.

Fri.6 - Albebaran (Alpha Tauri) 0.6 degrees South of Moon. Occultation for North America. Moon 2 days past Full. Disappears behind bright limb: 0025 UT (8:25 pm) Reappears from behind the dark limb: 0106 UT (9:06pm)

Wed.11 - Regulus (Alpha Leo) 0.3 degrees North of Moon at 2200 UT (6 pm).

Fri.13 - North Taurid Meteor Shower peaks at 0700 UT (3 am). About 15-20 per hour.

Mars 0.5degrees south of Moon at 1800 UT (2 pm).

Tue.17 - Leonid Meteor Shower peaks at 1700 UT (1 pm). Irregular Storms every 33 years, this year? Have lots of film in case!!
(If clear, a meteor watch is planned for St. Croix).

Sat.28 - Jupiter 0.6 degrees north of Moon at 0100 UT (9 pm).

December

Tue.3 - Albebaran (Alpha Tauri) 0.6 degrees South of Moon.

Wed.9 - Regulus (Alpha Leo) 0.01 degrees North of Moon. Occultation for Central America.

Mon.14 - Geminid Meteor Shower peaks at 1200 UT (8am). Rates 60-90 per hour, many bright meteors. Moon a few days past Last Quarter. Shower goes from 10th to 15th.

Sun.20 - Mercury at greatest elongation west (22 degrees).

Tue.22 - Solstice at 0156 UT (9:56 pm) -Winter begins BRRRR!!!

Ursid Meteor Shower Peaks at 1800 UT (2 pm). About 5-10 per hour, possible dying stream?

Fri.25 - Jupiter 1.2 degrees North of Moon at 1100 UT (7 am).

Wed.30 - Aldebaran (Alpha Tauri) 0.6 degrees South of Moon. Occultation occures for Eastern North America. Disappears behind the dark limb: 2158 UT (5:58 pm) and reappears from behind the bright limb: 2256 UT (6:56 pm)

Planet Roundup

Mercury: Becomes visible low in southeast before sunrise 2nd week of Dec.

Venus: Too close to Sun until Jan.1999

Mars: Rises after midnight.

Jupiter: Near meridian after evening twilight then sets in west about midnight in December.

Saturn: Sets about 5 hours before sunrise. Ω

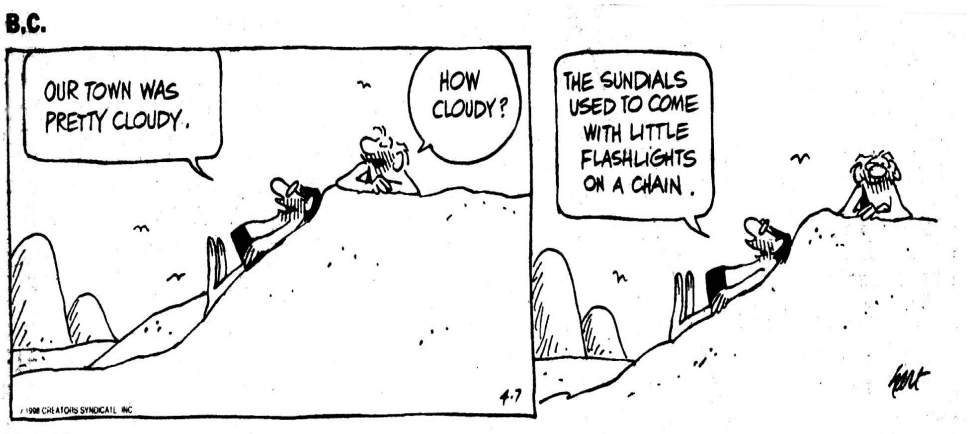
RADIO METEORS
BY MICHAEL BOSCHAT

Here are some frequencies that you could try to detect meteors by radio:

Station	Frequency (MHz)
CKWM - Kentville	97.7
CKPE - Sydney	94.9
CKTO - Truro	100.1
? - Yarmouth	92.1
WGBH - Boston US	89.7 *
WERS - Boston, US	88.9 *
WBGO - New York, US	88.3 *
WHCF - Bangor, US	88.5 *
CJYC - Moncton	98.9

The * denote the best frequency to try, the lower you can go the better. But listen around and if there is over-spill from local FM stations near you try another frequency.

If you have any questions call me at 455-6831 and pass the list around to others... Ω



WHAT'S A GOOD BEGINNER TELESCOPE?
BY MARY LOU WHITEHORNE

Many people ask this question and the answer is surprisingly simple. The best telescope for a novice stargazer is a good pair of binoculars. Binoculars? Yes, binoculars!

Why Binoculars? Binoculars are easy to use. They give a wide field of view and a bright, right-side-up image. They may not offer a lot of magnification but there are many, many interesting celestial objects that can be viewed with a simple pair of binoculars. Another advantage is that binoculars are relatively inexpensive and if the person decides not to pursue astronomy as a hobby then the binoculars have lots of other applications. A pair of binoculars accompanied by a good astronomy guide book (like Terrence Dickinson's "Nightwatch") is all you need to begin a friendship with the night sky.

A Note on Binocular Sizes: Binoculars all have numbers on them that look something like this: 7x35 or 10x50. The first number is the binocular magnification factor and the second number is the diameter of the objective (big end) lens in millimeters. The larger the size of the objective lens, the more light gathering power that the binoculars will have and therefore, the better they will be at detecting fainter stars. So a pair of 7x50 binoculars have 7x magnification and 50mm objective lenses. Recommended sizes would be in the range of 7x50 or 10x50. Binoculars with objective lenses bigger than 50mm tend to be large and too heavy to hold comfortably.

Inexpensive "Department Store" Telescopes may look attractive at first glance but they are usually more of a deterrent to an astronomy hobby than a help. First, they are inexpensive. This means that their optical components are cheap and of very poor quality. Mechanically, they are also very poor with unstable mountings that wiggle all over the place, making it impossible to keep a steady view. They offer too much magnification and a very narrow field of view. This makes it nearly impossible to find your target. The cheap lenses give very fuzzy, poor quality images. All together, they are disappointing and frustrating to use. There is no such thing as a good, inexpensive telescope. Often, these cheap telescopes turn people away from astronomy, making them feel as though astronomy is "too hard" for ordinary people to enjoy.

Nothing could be further from the truth! Astronomy is not too hard - it is a very enjoyable hobby that can lead to a lifetime of exploration, learning and fun. Start with a good pair of binoculars and a good guidebook. When you have learned some constellations and learned how to navigate around the sky, then you will be ready for, and very confident in your ability to use, a good astronomical telescope.

Two Good Places to Start are your local library and your local astronomy club. Your library should have a list of clubs and organizations to help you locate the nearest astronomy club. In Canada there is The Royal Astronomical Society of Canada (RASC) with branches in many Canadian cities. In Halifax the RASC can be contacted at:

RASC Halifax Centre
P.O. Box 31011
Halifax, NS B3K 5T9

or visit them on the Web at http://halifax.rasc.ca

When you are ready for the big step of buying a good starter telescope (expect prices to begin between $500 to $1000), contact a reputable dealer such as:

Perceptor Telescopes Trans Canada
Brownsville Junction Plaza
Box 38, Suite 201
Schomberg, Ontario L0G 1T0
phone 905 939-2313
fax 905 939-8274

This information is provided for you by:

Canadian Space Resource Centre-Atlantic, located at Discovery Centre 1593 Barrington Street, Halifax, NS B3J 1Z7 phone (902) 492-4422 The Resource Centre can be reached by calling 1 800 511-3500
e-mail: Space@hercules.stmarys.ca
http://apwww.stmarys.ca/space

"We are all in the gutter, but some of us are looking at the stars."
- Oscar Wilde Ω

SPACE NEWS
A NEW TYPE OF STAR?

Marshall Space Flight Center, Huntsville, AL
PRESS RELEASE: 98-172
TREMENDOUS GAMMA-RAY FLARE BLASTS EARTH

An intense wave of gamma rays, emanating from a catastrophic magnetic flare on a mysterious star 20,000 light years away, struck the Earth's atmosphere on August 27, 1998, providing important clues about some of the most unusual stars in the Universe. Scientists said the gamma radiation posed no health risk to humans. The wave hit the night side of the Earth and ionized (or knocked electrons out of) the atoms in the upper atmosphere to a level usually seen only during daytime. This astonishing blast of ionization was detected by Prof. Umran Inan of Stanford University. "It is extremely rare for an event occurring outside the solar system to have any measurable effect on the

Earth," Inan said. It was so powerful that it blasted sensitive detectors to maximum or off-scale on at least seven scientific spacecraft in Earth orbit and around the solar system.

The wave of radiation emanated from a newly discovered type of star called a magnetar. Magnetars are dense balls of super-heavy matter, no larger than a city but weighing more than the Sun. They have the greatest magnetic field known in the Universe, so intense that it powers a steady glow of X-rays from the star's surface, often punctuated by brief, intense gamma-ray flashes, and occasionally by cataclysmic flares like the one observed on August 27. Astronomers think that all these effects are caused by an out-of-control magnetic field—a field capable of heating, mixing, and sometimes cracking the star's rigid surface to bits. In June a team of scientists led by Dr. Chryssa Kouveliotou of NASA's Marshall Space Flight Center in Huntsville, AL, used NASA's Compton Gamma Ray Observatory to detect a series of about 50 flashes from the star, a type called a Soft Gamma Repeater (SGR), known as "SGR1900+14" in the constellation Aquila. During the flashing episode, Kouveliotou's team, in collaboration with Dr. Tod Strohmayer and his colleagues at NASA's Goddard Space Flight Center, Greenbelt, MD, pointed sensitive X-ray detectors aboard NASA's Rossi X-ray Timing Explorer satellite toward the star. They found faint X-rays coming from the star, which pulsed regularly in intensity every 5.16 seconds.

These 5.16-second pulses already had been detected in April, when Dr. Kevin Hurley, University of California, Berkeley, aimed the Japanese/NASA Advanced Satellite for Cosmology and Astrophysics (ASCA) at the star. Comparisons of the ASCA and RXTE data showed that the X-ray pulses were gradually slowing down.

The finding implies that the Soft Gamma Repeater has a magnetic field about 800 trillion times stronger than Earth's magnetic field, and about 100 times stronger than any found anywhere in the Universe. Kouveliotou and her team had earlier found that another SGR was also a magnetar. This was exactly what Dr. Robert Duncan, University of Texas, Austin, and Dr. Christopher Thompson, University of North Carolina, Chapel Hill, predicted in 1992 when they originated the "magnetar" theory. Before the NASA team could announce these conclusions, SGR1900+14 emitted the tremendous flare of August 27, which was observed by almost every spacecraft with a high-energy radiation detector in space. "Magnetars seem to answer several mysteries about the structure and evolution of stars," said Kouveliotou. "We think magnetars spend their first 10,000 years as Soft Gamma Repeaters. As they weaken with age and slow their rotation, they become Anomalous X-ray Pulsars—stars that do not have enough 'juice' to flash anymore, but which emit a steady flow of X-rays for perhaps another 30,000 years. After that, they fade to black and drift for eternity through the heavens. The absence of observable pulsars in some supernova remnants just means that the pulsar's lights have gone out sooner than we expected."

A magnetar forms from the explosion, or supernova, of a very large, ordinary star. The star's heavy center collapses under its own gravity into a dense ball of super-compressed matter 12 miles across. This "neutron star" consists mostly of neutrons in a dense fluid, but the outer layers solidify into a rigid crust of atoms about 1 mile deep, with a surface of iron. Even with this solid crust, a magnetar is incredibly unstable. Almost unimaginable magnetic fields, about 800 trillion times that of Earth's, cause the crust to crack and ripple in powerful starquakes. The energy released in these explosive starquakes streams out into space as intense flashes of gamma-rays. In the August 27 flare, pure magnetic energy was also released, as the star's entire crust was broken to bits. "A magnet this strong could erase the magnetic strip on the credit cards in your wallet or pull the keys out of your pocket from a distance halfway to the Moon," said Duncan. Additional information on magnetars or the Aug 27 event is available on the internet at:

www1.msfc.nasa.gov/NEWSROOM/

www.magnetars.com/

NOTICE OF MEETINGS AND EVENTS

REGULAR MEETINGS

Date: **Regular Meeting — Friday, November 20 at 8pm**; 7pm for the council meeting.

Place: Lower Theater, Nova Scotia Museum of Natural History, Summer Street, Halifax. Access is from the parking lot.

Topic: Main Speaker: **Michael Falk**
Topic: **"Astronomical and Numeric Names for the Seven Days of the Week"**

Date: **Regular Meeting — Friday, December 11 at 8pm**; 7pm for the council meeting.

Place: Lower Theater, Nova Scotia Museum of Natural History, Summer Street, Halifax. Access is from the parking lot.

Topic: Main Speaker: **Larry Bogan**
Topic**: "Global Positioning Systems"**

BECOME A ST. CROIX OBSERVATORY KEY HOLDER

For a modest key fee, members in good standing for more than a year who have been briefed on observatory operations can gain access to the centre's new Observatory, which is nearing completion. To become a key holder, contact Observatory Committee Chair, Shawn Mitchell.

JUST WHERE IS THE ST. CROIX OBSERVATORY?

The Centre's Observatory is located in the community of St. Croix, Nova Scotia. To get there from Halifax (Bayers Road Shopping Centre), follow these simple instructions.

1. *Take Hwy 102 (the Bi-Hi) to Exit 4 (Sackville).*
2. *Take Hwy 101 to Exit 4 (St. Croix).*
3. *At the end of the off ramp, turn left.*
4. *Drive about 1.5km until you cross the St. Croix River Bridge. You will see a power dam on your left.*
5. *Drive about 0.2km past the bridge and take the first left (Salmon Hole Dam Road).*
6. *Drive about 1km until the pavement ends.*
7. *Drive another 1km on the dirt road to the site.*
8. *You will recognize the site by the two small white buildings on the left.*

ASTRO ADS

Missing Star Diagonal

Recently I have been unable to locate the 2" star diagonal for my Meade 2120. I have a vague recollection that I loaned it some one. Could that someone please contact me ASAP?

Regards,

Joe Yurchesyn.
Telephone (902) 422-8030

Centre Merchandise for Sale

The New 1999 RASC Calendars are now available from local retailers or can be purchased at a Regular Meeting of the Halifax Centre.

1999 RASC Handbooks, Beginners Observing Guides, Centre T-shirts, and pins are also available. Get them now and avoid the Christmas rush.

OVER DUE LIBRARY BOOKS

If you have had a Centre book out on loan for more than two months please return it to the library at the next Centre meeting, or if you need it longer for a project contact the Librarian.

1998 HALIFAX CENTRE EXECUTIVE

Honorary President	Dr. Roy L. Bishop	
President	Clint Shannon	889-2426
1st vice-president	Pat Kelly	798-3329
2nd vice-president	Darren Talbot	443-9373
Secretary	Mary Fraser	434-3103
Treasurer	David Lane	826-7956
Nova Notes Editor	Shawn Mitchell	865-7026
National Representative	David Lane	826-7956
Librarian	Greg Spearns	868-2626
Observing Chairman	Mike Boschat	455-6831
Councilors	Tony Jones	435-0535
	Steve Carrigan	479-0582
	Dave Chapman	463-9103