

# NOVA NOTES

VOLUME 25 NUMBER 2 APRIL 1994

THE NEWSLETTER OF THE HALIFAX CENTRE OF THE RASC  
c/o 1747 SUMMER STREET, HALIFAX, N.S., CANADA B3H 3A6



**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 **May 20, 1994**. 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:

**David Lane**  
4-26 Randall Avenue  
Halifax, Nova Scotia  
B3M 1E2

E-mail: [dlane@hercules.stmarys.ca](mailto:dlane@hercules.stmarys.ca)  
Compuserve: 71601,247  
Phone: (902) 443-5989 (home)  
(902) 420-5633 (work)

Observatory Site Selection Committee Report	
- Shawn Mitchell	8
Heard in the Dark	8
Ask <b>GAZER</b>	8
Notice of Meetings	10
Halifax Planetarium Shows	10
1994 Halifax Centre Executive	10

## EDITOR/PRESIDENT'S REPORT

I don't have very much space this month, so I'll have to be brief.

Our annual banquet this year will be held on June 17th. We are going to try a different format than is usual by having a "pot-luck" affair at the Astronomy and Physics Department at *Saint Mary's University*. This will include a tour of the department's facilities and observatory. We hope this format will be more affordable than in the past and will bring out more of our members than is usual. The speaker is yet to be determined. More details will be provided in the next issue of *Nova Notes*.

Shawn Mitchell, our Librarian, has revamped the system used to keep track of books in our Centre Library. I hope he'll write a note about it for the next issue. He has also ordered a few new books from Sky Publishing. If you have any ideas for good books to purchase, please call him.

We will again be providing a few public observing sessions this summer as part of the "Parks are for People" program at Dollar Lake Provincial Park. The dates are July 15, August 5, and August 12.

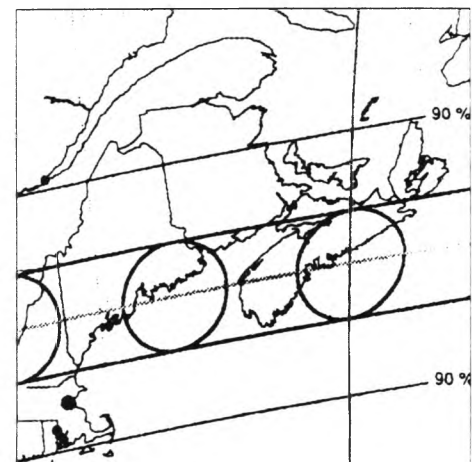
Also, for your vacation planning, this year's *Nova East* will be held later than usual (October 7-10).  $\Omega$

## THE MAY 10TH ANNULAR SOLAR ECLIPSE: by David Lane

On May 10th, an annular solar eclipse will be visible over the southern half of Nova Scotia as shown on the figure below. The partial phases will be visible throughout most of North America.

Being an annular eclipse, the photosphere of the Sun will not be completely covered by the Moon. At maximum eclipse, the Sun will appear as a "ring of fire". Since the Sun will be only 94.2% covered, none of the regular features of total solar eclipses will be visible (the Sun's corona, bailey's beads, etc.).

At all times during the eclipse, **DO NOT LOOK DIRECTLY AT THE SUN** without proper SAFE eye protection. See page 110 of the *Observer's Handbook* for proper safe viewing techniques.



This eclipse is well covered in the *1994 Handbook*, so I will not go into great detail here. However, the times of the beginning, maximum, and ending of the eclipse (rounded to the

## INSIDE THIS ISSUE...

Editor/President's Report	1
The May 10th Annular Solar Eclipse	
- David Lane	1
Meeting Report: January 1994	
- David Turner	2
Meeting Report: February 1994	
- Mary Lou Whitehome	2
Meeting Report: March 1994	
- David Turner	4
Images of Asteroid IDA and its Satellite!	4
The 1994 Messier Marathon	
- Bill Lucas, NCAC	5
75 Years Ago: Confirmation of Einstein's General Theory of Relativity	
- David Chapman	6
Constellation of the Month: Boötes	
- Joe Yurchesyn	7
The Halifax Planetarium Needs Your Help!	7

nearest minute) for various locations in Nova Scotia are shown below:

Place	Begin	Max	End
Halifax	1:16pm	2:59pm	4:32pm
Yarmouth	1:10pm	2:54pm	4:31pm
Bridgewater	1:14pm	2:57pm	4:32pm
Kentville	1:14pm	2:57pm	4:32pm
Truro	1:17pm	2:59pm	4:33pm
New Glasgow	1:19pm	3:00pm	4:33pm
Sydney	1:24pm	3:04pm	4:35pm

The Centre and the Department of Astronomy and Physics at Saint Mary's University are co-sponsoring a public viewing session. It will be held beginning at about 1pm on the lawn in front of Saint Mary's on Robie Street

The Centre and the Department have shared to cost of purchasing 1000 mylar eclipse viewing glasses which will be given out to the public free-of-charge.

---

... we could really use your help in making this event successful.

---

They will also be available at the April meeting for purchase by Centre members for \$2 each (maximum 2 per member). If you attend the public session, they will of course be free.

Because this event will be heavily advertised in the media, we could really use your help in making this event successful. If you are willing to help out, please give me a call.

In the event of bad weather, it will be postponed until the 11th at the same time (just kidding!).  $\Omega$



**MEETING REPORT:**  
**JANUARY '94**  
 by David Turner  
 Meeting Reporter  
 (For-Life)

The January 21st meeting of the Centre was one of particular note owing to the presence of both Walter Zukauskas and Doug Pitcairn in the crowd of 35 in attendance. This had a few of us

searching for our nitro tablets "just in case". This meeting also marked Dave Lane's first official meeting as Centre President (for Life).

Following a few brief announcements, Paul Gray described the discouraging prospects for observational activities, with the exception of those willing to stay up to see Jupiter in the morning sky. The possibility of a "grand tour" of the planets during the second week of July was noted, and he also summarized recent efforts to observe the Ursid and Quadrantid meteor showers.

Mary Lou then introduced Murray Forbes from Environment Canada to talk about "Predicting Nova Scotia Weather" — which sounds very much like an oxymoron. Murray described the use of radiosondes to collect data for weather forecasts. These non-returnable probes carry balloon-borne weather instruments and rise to about 100,000 feet (20 miles) before parachuting (we hope!) back to Earth. They measure the temperature, humidity, and air pressure in the atmosphere continuously during their ascent, and are tracked by radar to determine wind speed and direction. All data acquired are computer analyzed to provide weather predictions according to the most trustworthy (?) software available. It was noted that different programs generate different weather predictions, with greater divergence for the long-range forecasts (which are "not worth a cent"). He noted how recent developments had improved the situation over earlier eras, an example being the new ability to forecast those high winds on Cape Breton Island which have been known to exist for several centuries.

The forecasting is usually done using a Cray computer in Montreal, although this is still not powerful enough to generate sufficient time resolution for the local picture. Murray described the principal causes for the local weather — cold fronts and warm fronts moving into regions of warm and cold air mass, respectively — and discussed the various cloud types associated with

each. He also noted how different weather charts could be generated for different purposes, with predictions for observational astronomers differing from those for the general public. He also discussed the importance of the jet stream to weather systems at the latitude of Nova Scotia. This was followed by a barrage of questions from those in attendance.

Dave Lane then took the floor to coordinate a short slide presentation which included new images from the repaired Hubble telescope which he pulled off the Internet, planet photographs from Roy Bishop, and Terry Dickinson's lunar eclipse photograph. This was followed by this month's Handbook Study, which was a summary by Dave Tindall of The Brightest Stars section of the Handbook. Discussed were the types of data catalogued in this section, and their potential use for finding stars, constructing H-R diagrams, noting star colours and velocities, and knowing when to go out to see them (amid many other possibilities). Among the juicier tidbits noted by Dave was the discovery by Walter Zukauskas that the number of stars brighter than visual magnitude 3.55 has increased from 286 in 1985 to 314 at present!

The meeting ended with a short presentation by Shawn Mitchell on the new organization of the Centre Library.  $\Omega$



**MEETING REPORT:**  
**FEBRUARY '94**  
 by Mary Lou Whitehorne

If you weren't there, this is what you missed. President-For-Life-Lane opened the meeting by welcoming everyone and introducing our newly self-appointed NWC - Newcomer's Welcoming Co-chairman, Doug Pitcairn, who wasn't in attendance to welcome anybody anyway. But that's OK since the Blair MacDonald (the other co-chair) acted in Doug's place. We were honoured to have in attendance at this meeting

the TFT: Trio From Truro. El Prezidente invited everyone to join the Junta in a visit to Hogie's after the meeting. There were a number of interested takers...

Next, Mr. I.O.C. (Intrepid Observing Chairman) Gray rose to address the 29 strong throng of attendees. What's up, you ask? Not much, according to our I.O.C. Venus, Mercury and Saturn are all in conjunction with Sol. If you weren't paying attention two weeks ago, you missed a great apparition of Mercury. (I was paying attention and I saw it!) There is presently a rather nice naked eye sunspot marching across the Solar disk; and by all accounts Jupiter, should you either stay up late or rise very early, is all fuzzed up with a disturbance in it's southern hemisphere.

Before introducing this night's Guest of Honour, Dave Lane announced some details concerning the joint RASC-SMU Solar Eclipse Event scheduled for the afternoon of May 10, 1994.

### THE MAIN EVENT

Finally, at long last, it was the Speaker's turn! Dr. Dave Turner, our highly respected but perpetually mumbling and grumbling Chairman of the SMU Department of Astronomy & Physics, took the floor to deliver what was to be an excellent talk about the origins of the constellations, entitled "Predecessors to the Age of Aquarius." The introduction was an overhead transparency of "The Big G" (Good Grief!) in the winter sky. At any rate, we were treated to a delightful tour of the genesis of the constellations - how, where, and why they originated. This involved some discussion of precession and a mention of proper motion, and - oh no! - the dreaded diagram of the Celestial Sphere! Dr. Turner also made good use of a beautiful Celestial globe to illustrate the principles involved in sorting out diurnal and yearly sky motions, plus a gyroscope to illustrate precession.

Recognition of the precession of the equinoxes, coupled with a careful

examination of the arrangement of the more prominent constellation figures and their location in the sky, plus their mythological significance, has led to a consensus on their origins. Some of the earliest, biggest and most prominent were named about 6000 years ago, with many more originating 4500 - 5000 years ago from the ancient Minoans, at a location of about 36.5 degrees North and 26.3 degrees East, for the primary purpose of navigation at sea.

It was a wonderful account of some very interesting detective work on the part of a number of scholars, to determine the origins of, and reasons for, the constellations that we know and love so well today. It was also an acknowledgment of the intelligence, creativity and sophistication of our ancestors who watched the skies with sharp eyes and keen minds. Dave Turner gave eloquent testimony to the very human element that drives all scientific endeavor, but in particular, the science of astronomy with its most ancient of roots. Kudos, Dave!

### THE HANDBOOK RISES YET AGAIN

Walter Zukauskas followed Dave Turner's tough act with "Mr. Batten's Neighbourhood"; a tongue-in-cheek tour of the Observer's Handbook section on the nearest stars, written of course, by Dr. Alan Batten (hence the title). Apparently, our stellar neighbours are all rather different individuals and so resemble a motley neighbourhood rather than a cohesive family. The only thing they all share in common is trigonometric parallax. Having settled that business, Walter moved on to illustrate some activities that could be undertaken during those nasty commercials that interrupt television coverage of the Olympic games.

Following a short dissertation on proper motion, radial motion, and the Pythagorean Theorem, Walter suggested using the data contained in the Nearest Stars table to ascertain where Altair is going to be when it makes its closest approach to the Sun.

This admittedly involves the use of a hand held calculator and a few simple mathematical formulae with relatively uncomplicated terms. For example:  $(\$2x\%^{+4+7/8*9\%}) \times *1\&^{\wedge}/5$ . Then divide all that by 1 apple pie and Bob's your uncle!

We learned that Altair is now 5 parsecs away but that at closest approach it will be only 2.5 parsecs distant and will be one full magnitude brighter! At the time it will have relocated against the starry background to a point somewhere on the Cygnus/Lacerta/Cepheus border. This disregards the possibility that Cygnus, Cepheus and Lacertae might be somewhat rearranged themselves by this time! However, to everyone's disappointment, he neglected to calculate at what date in the future this momentous event would transpire! His excuse for this poor showing was that such a calculation would require more time than was normally taken up by TV commercials! Really, Walter!!! He concluded by fingering Blair MacDonald, who graciously agreed to put his reputation on the line, and deliver next month's Handbook talk.

### THE WRAP UP

President For Life Lane concluded the formal portion of the meeting by briefly announcing upcoming meeting topics (including the May meeting to be held in the Planetarium, and the June meeting which will be a Pot-Luck Party-Star-Feast at SMU). Those present acknowledged the continued efforts of Ralph Fraser and Alec Norman as Cookie Co-ordinators, by greedily gobbling up all the French Pastry goodies in a record breaking 10 nanoseconds. In closing, I would like to personally thank all those generous souls who bought Easter Basket raffle tickets from me in support of my kid's week-long French Immersion trip to Universite Ste-Anne in April. I'm going along as a chaperone, so after a week of teen babble en francaise, I shall no doubt be needing a vacation in a nice comfy padded cell.  $\Omega$



**MEETING REPORT:**  
**MARCH '94**  
 by David Turner  
 Meeting Reporter  
 (For-Life)

The March 18th meeting of the Centre witnessed the usual number in attendance, about 35. Dave Lane began the meeting by flogging Centre souvenirs, namely decorative pins, glow-in-the-dark T-shirts (potential radiation hazards!), and bargain basement 1994 RASC calendars. Get them while they're hot (literally!).

The guest speaker for the evening was then introduced. This was Dr. David Clarke from the Department of Astronomy and Physics at Saint Mary's University speaking on "Supercomputing in Astronomy". David described, with the aid of colourful images of radio galaxies, those enigmatic entities referred to as extragalactic radio sources (ERS) — some of the most powerful sources in the universe. The origin of the synchrotron radiation from the high speed electrons in the jets and clouds associated with these sources was discussed, with particular attention on his attempts to model the brightness and polarization features of these jets using magnetohydrodynamical (MHD) computations with a Cray computer. The problem of "bent" jets was given special attention, but without satisfactory resolution. David managed to complete his presentation despite having to answer a small ton of questions from the audience, which continued well into the coffee break.

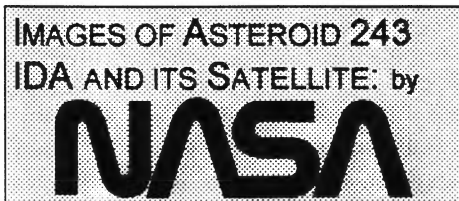
---

... extragalactic radio sources (ERS) — some of the most powerful sources in the universe.

---

In the absence of Paul Gray, Joe Yurchesyn gave the Observing Chairman's report based upon his recent experiences with the planetarium sky and various news notes gathered from the Internet. Included were recent forecasts for the Jupiter comet hit and the discovery of

a satellite to the asteroid Ida. This was followed by Blair MacDonald's Handbook study, which involved a discussion of the Optics and Observing section. Blair went into some detail about the measurement of exit pupils and their use for eyepiece selection, going into detail about how telescope focal lengths and the effects of diffraction set useful limits on eyepiece magnification. Dave Lane ended the meeting with a summary of upcoming meetings, the May 10th eclipse, and the ongoing search for a Centre observing site. Ω



**Public Information Office (JPL)**  
 (March 23, 1994)

(edited for size)

**T**he first-ever photograph of a moon of an asteroid, sent to Earth by NASA's Galileo spacecraft, was released by the space agency today.

The photo, of asteroid 243 Ida and its newly discovered natural satellite, was taken by Galileo as the spacecraft flew past Ida last August 28. It was not transmitted to Earth until recently because the spacecraft is sending back data at a very slowly.

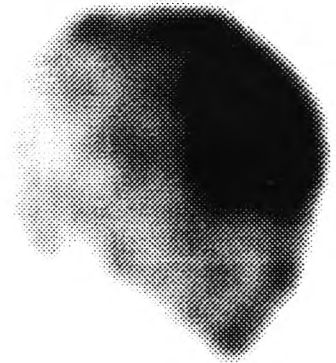
The image together with data from Galileo's near-infrared mapping spectrometer are the first conclusive evidence that natural satellites of asteroids exist.

The discovery gives scientists an intriguing new clue in deciphering the origins and evolution of these ancient, rocky bodies, most of which orbit the sun in the main asteroid belt between Mars and Jupiter.

Even so, many pieces of information on the newly found moon -- where it came from, how it came to be orbiting Ida and the details of that orbit -- are still unclear.

"It was previously thought that natural satellites of asteroids could

form but they probably weren't common," said Dr. Torrence Johnson, Galileo project scientist. "Having found one fairly quickly, we can say that they're probably more common than previously thought."

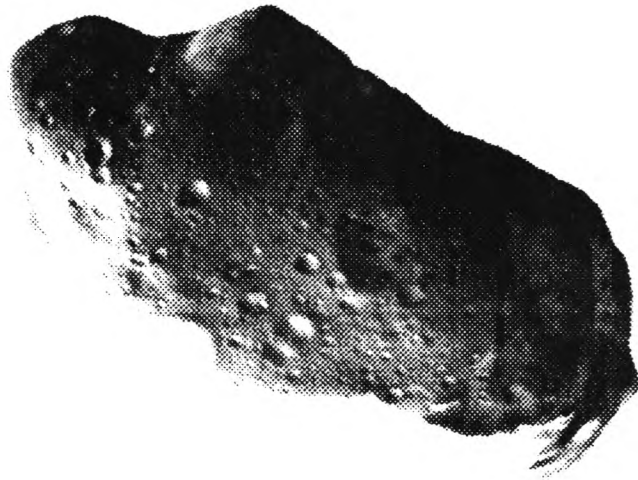
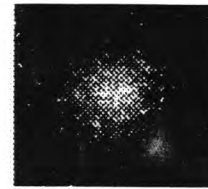


From the photo and spectrometer data, team scientists estimate that the natural satellite is about 1.5 kilometer (1 mile) across in this view, and appears to be at a distance of about 100 kilometers (60 miles), plus or minus 50 kilometers (30 miles), from Ida's center. The position will be more accurately determined as new data are analyzed. Ida itself is about 56 by 24 by 21 kilometers (35 by 15 by 13 miles) in size.

The data from Galileo's near-infrared mapping spectrometer -- which scans space objects at a variety of wavelengths to reveal their chemical composition -- suggest that Ida's moon is made more or less from the same kind of material as Ida. As an S-type asteroid, Ida is composed mostly of silicate rocks.

Galileo scientists believe the moon may have been created at the same time as Ida -- when an older, larger asteroid was shattered in a collision with another asteroid, giving birth to dozens of smaller asteroids.

Ida is a member of the Koronis family of asteroids, which scientists believe was created when a larger body perhaps 200 to 300 kilometers (120 to 180 miles) in diameter was smashed relatively recently -- at least considerably after the solar system formed some 4.5 billion years ago. (The family was named for Koronis, one of the asteroids that belongs to it.)



Alternatively, it is possible that Ida was hit by a smaller object even more recently, leaving a crater on the asteroid and throwing off the material that became the small moon.

"Ida's age is baffling, because the craters visible on its surface suggest that it is old, but being a part of the Koronis family suggests it is younger," said Johnson.

"In any event, we don't believe that Ida and its moon could go back to the formation of the solar system," he added. "It's generally thought that a small object like that moon could not survive this long; sooner or later it would itself be broken up in a high-speed collision with an even smaller object."

Because Galileo is sending data back to Earth through its low-gain radio antenna, it must transmit at slow rates. One portrait of Ida -- a mosaic of five separate frames -- was received shortly after the flyby, but later pictures had to wait because telecommunications conditions became unfavorable as Galileo's distance from Earth increased. In the meantime they were stored on Galileo's onboard tape recorder, awaiting playback this spring.

Scientists say that the newly found moon was outside the boundaries of the picture of Ida released last September.

In preparation for complete playback, they commanded the spacecraft to transmit strips of each

image -- called "jail bars" by the project's engineers and scientists -- so that they could locate Ida accurately in images stored on Galileo's recorder. Later, portions of an image containing Ida could be selected for playback in their entirety.

On February 17 -- a day after the first of these "jail bars" was sent back from Galileo -- evidence of the natural satellite was noticed in one set of image strips by Ann Harch, a Galileo imaging team associate at JPL. It took several days to verify that what appeared to be a moon was not, in fact, an artificial effect of some kind.

On February 23, scientists examining similar preliminary data from a chemical map obtained by the near-infrared mapping spectrometer discovered an unusual object in their data. By February 28, scientists from both the camera and spectrometer teams concluded that they had a confirmation.

The newly found moon has been provisionally designated "1993 (243) 1" -- meaning that it is the first natural satellite discovered in 1993 at Ida, which was the 243rd asteroid discovered over the past two centuries. The moon will be formally named later by the International Astronomical Union.

JPL manages the Galileo Project for NASA's Office of Space Science.Ω

The observing chairman calls a dedicated member who replies: "You want to do what!" Answer: "Yes, yes it can be done". Reply: "But you're talking about 110 deep sky objects!" Answer: "Well yes, well no, well maybe?"

Most amateur astronomers will fall prey to this befuddled conversation at some point in time in their seasoned career, and many will fall short of committing themselves. They are being asked to take part in one of amateur astronomy's more celebrated events, the Messier Marathon. It is a challenge, a ritual, and for some, a true test of their observing skills. The window occurs in and around the month of March, and if your dearest and best friend; you know who I mean, the one who owns "COLOSUscope" isn't going to the site on that particular evening, you will have difficulty seeing the first or last few objects contained on the list. Enough negativity, the marathon is an experience you won't forget. When the constellations of both winter and spring appear in the night sky, it is time again to prepare; and prepare we did.

On Saturday, the 12th day of March 1994, members from both the RASC Halifax, and NCAC Truro club converged at the Camden observing site. The observing session ran from 6:45pm until 5:26am Sunday morning. Transparency was fair to good averaging a 6/10 sky for most part and at times a visual stellar magnitude of 5.5. Present at the site were: Mary-Lou Whitehorne and Dave Lane from the Halifax Centre, Daryl Dewolfe, Reg Henderson, Ralph Hudgins, Brad Kennedy, Roger Langille and Bill Lucas from the Truro club. In all, 106 of Messier's nebulae and star clusters were observed. The temperature did plummet, however, to -21° C and was cause for concern when nearing the final hour. Dave Lane was able to penetrate the light



of dawn to find M72 only minutes before the globular along with M73, M55 and M75 were engulfed. We knew in advance M30 was out of the question. As little as one week later in the month may have allowed us to view 109 of the objects. Nonetheless everyone was pleased with the results and to have had twelve straight hours of unhindered skies.

---

The temperature did plummet, however, to  $-21^{\circ}\text{C}$  and was cause for concern when nearing the final hour.

---

What makes the Messier Marathon so significant? Could it be its timing? Most novices today are encouraged to begin their deep sky search using the Messier catalogue. Once the catalogue is completed, the observer usually discovers he/she has the infection NGC, a disease which results from occasionally glancing a faint smudge that turns out to be something other than what you originally set out to observe. If let run amuck, the amateur observers "rapid eye movement" will begin logging numbers at a staggering rate! The splendor that came with each new discovery will fall to the wayside and "hunters syndrome" will overtake the observers mind. Not a pretty picture, but alas! there is a cure. Once each year, take in a Messier Marathon. Under these conditions "rapid eye movement" brings back a lot of wonderful memories. M13, the first time you looked at it. M65 and M66, no one had to tell you they were galaxies. M11, what a jewel it is! M42, and why you purchased your first book about stellar evolution. Messier's list has a special place inside all amateurs, and when you return to the NGC or other list, you may find a nights observing has a more settling effect, and your log book is in need of more space for your descriptions.

Oh, there is one more thing I'd like to mention. Do not rush through the marathon. We discovered by midnight we had as much as three hours to wait for the next batch of

Messiers. So take your time, relax and remember, you've got all night!  $\Omega$

**75 YEARS AGO:  
CONFIRMATION OF  
EINSTEIN'S GENERAL  
THEORY OF RELATIVITY  
by David Chapman**

**M**ay 29 is the 75th anniversary of an important date in the history of physics and astronomy: Sir Arthur Eddington's experimental confirmation of the General Theory of Relativity during a total solar eclipse observed from an island off the west coast of Africa. The story of Eddington's expedition is well-known, but there was an earlier (unsuccessful) attempt by the German scientist Erwin Freundlich whose exploits make an equally interesting story. [The material for this article is drawn largely from the book *Totality: Eclipses of the Sun* by Mark Littman and Ken Willcox (University of Hawaii Press, Honolulu, 1991).]

Even before he had worked out all the details of his General Theory, Einstein realized that the theory required light rays to deflect as they passed a gravitational mass. The well-established Newtonian theory of gravitation, which had unlocked the secrets of planetary motion, also predicted such a deflection, but to a smaller extent. Which theory was correct would have to be confirmed by experiment. The snag was that the only convenient body that could produce a measurable deflection was the Sun, yet the Sun's glare would mask the light from even the brightest star in the daytime sky. The solution to this dilemma was to photograph a star field near the Sun during a total eclipse, when the sky would be dark enough to allow the stars to be seen.

The British astronomer Sir Arthur Eddington led one of two solar eclipse expeditions to observe the total eclipse of 29 May 1919. He and Edwin Cottingham sailed to the Portuguese island of Principe, 200 km west of the west coast of Africa; Andrew Crommelin and Charles

Davidson traveled to Sobral in northeastern Brazil. Both teams were plagued by bad weather and narrowly avoided being clouded out, but they both returned with measured star positions supporting Einstein's prediction.

---

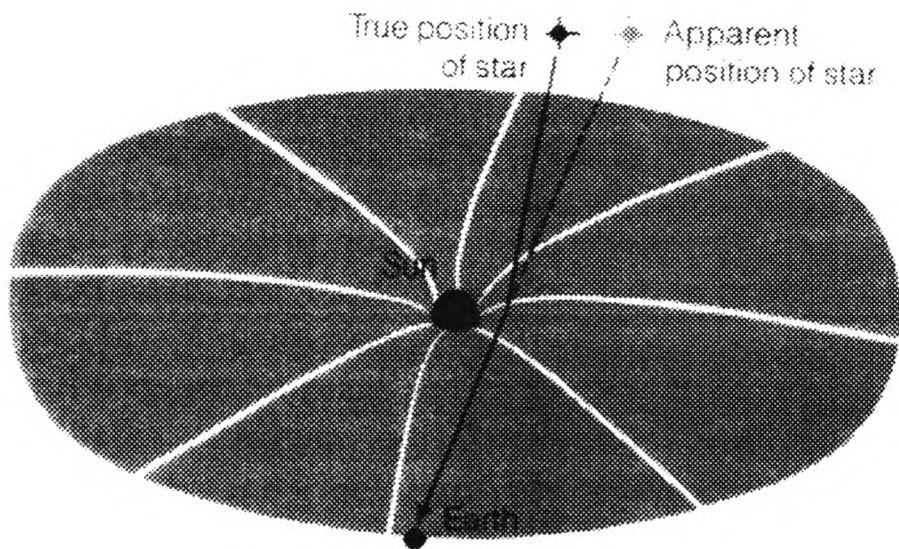
The solution ... was to photograph a star field near the Sun during a total eclipse...

---

Although Eddington's expedition was the first successful one, it was not the first attempt. Five years earlier, a young assistant at the Royal Observatory in Berlin named Erwin Freundlich had proposed an expedition to Russia to test Einstein's theory during a solar eclipse in the Crimea. His superiors were not interested, but gave Freundlich unpaid leave to carry out the work. He even had to raise his own funds for the trip! In the summer of 1914 the team set out for the Crimea with their equipment, only to find themselves behind enemy lines after Germany declared war on Russia on the first day of August. The eclipse team was arrested and held in jail for a month while Germany and Russia negotiated a prisoner exchange. By the time they were released, the eclipse had come and gone.

Fortunately, The collaboration between Freundlich and Einstein had its lighter moments: One time, when Einstein was dining at the Freundlich household, he pushed his dinner plate away, produced a pen, and proceeded to cover their best tablecloth with scientific equations. Kate Freundlich later remarked "Had I kept it unwashed as my husband told me, it would be worth a fortune."

Returning to Eddington's successful expedition, although the good news was immediately apparent to Eddington on the day of the eclipse, Einstein did not learn of the results until September of that year. Einstein and his theories were known in the world of physics, but unknown to the world at large. When the confirmation of his theory was



announced on 6 November 1919 at a special joint meeting of the Royal Society and the Royal Astronomical Society, Einstein instantly became a world-wide celebrity.  $\Omega$

**CONSTELLATION OF THE MONTH: BOÖTES**  
by Joe Yurchesyn

**A**round the time of the Spring Equinox, the constellation Boötes, the Herdsman, rises an hour or so after sunset for northern hemisphere observers. It is located adjacent to the handle of the Big Dipper and between the constellations Hercules and Leo. It is primarily a kite shaped asterism of 2<sup>nd</sup> and 3<sup>rd</sup> magnitude stars, with the 1<sup>st</sup> magnitude star Arcturus located where the tail of the kite would be attached.

The name Arcturus means *The Guardian of the Bear* and in ancient times it was known as the *Watcher* or the *Guardian*. To the Arabs, it was the *Lance-Bearer* or the *Keeper of the Heavens*. Arcturus was the first star to be seen through a telescope in the daytime (by Morin in 1635) and at the 1933 Chicago *Century of Progress* Exposition, starlight from Arcturus was focused by telescopes onto photocells which operated the switch that started the fairground lights. Arcturus was chosen because the light was believed to be have begun its journey toward the Earth 40 years

before, the year another that Chicago fair had taken place.

At a distance of 37 ly's, Arcturus has an annual proper motion of 2.29", the second largest for a first magnitude star. Its motion, first noticed by Halley in 1718, is also bringing Arcturus closer by 3 mi/s (decreasing). In a few thousand years, it will pass us and then begin to recede. Arcturus is actually a *Population II* star, a member of the spherical halo. It is moving in a highly inclined orbit and is presently cutting through the galactic plane.

Boötes is located far from the Milky Way and is also somewhat devoid of bright extra-galactic deep sky objects. However, for the double star observer there are three good pairings. Epsilon is orange and blue (2.5,4.9, 2.8"), Xi is yellow and reddish purple (4.7,7.0, 8.0") and i (also 44) is a challenging yellow-blue pair at 1.6" (5.3,6.2). The brighter component of i very similar to our Sun in luminosity and type and at a 40 ly's distance, the actual separation of the two stars is 45 AU. Astrometric studies of Xi have revealed a third faint component of 0.1 solar mass. However, even at a distance of 22 ly's, a star of such low mass is probably too faint to be seen in the glare of the two bright primary components.

The only bright deep sky object in Boötes belonging to our galaxy is the globular cluster NGC-5466. It is 5' in diameter, at magnitude 9.1, and the

individual stars are very faint, giving it a very low surface brightness. It is difficult to spot with anything less than a 3" telescope and a 10" telescope is needed to reveal the brighter stars against the cluster's background glow.

Numerous galaxies are present, but most are relatively small and faint. About 3° SE of NGC-5466 is the 4.5' by 1.4' galaxy NGC-5523, which is also 1° NE of the star 12 Boötes. Somewhat faint at magnitude 12.9, it is interesting in a large telescope because it is nearly edge-on, similar to NGC-4565 in Coma Berenices. About 2° SSE of  $\theta$  Boötis (and 30' SE of  $g$  Boötis), three galaxies lie in a row, spaced 1° apart toward the SSE. These include NGC-5660, an Sc spiral (2.8',2.6', 11.8), NGC-5676, an Sc spiral (3.9',2.0', 10.9) and NGC-5689, an edge-on barred spiral (3.7',1.2', 11.2).

Just a little something to ponder, when you next gaze in the direction of Boötis. Now, if Arcturus has the second largest annual proper motion for 1<sup>st</sup> magnitude stars, I wonder which one has the largest?...  $\Omega$



**THE HALIFAX PLANETARIUM NEEDS YOUR HELP!**

**T**he small planetarium located in the Dunn Building at Dal, is in desperate need of a few volunteers to provide group and school programs. It's not hard to do and it's fun, too!

Here's your chance to share your knowledge of the night sky with lots and lots of people. School shows take place during the day, usually in the mornings; while other community groups are booked in the evenings. If you would like to try your hand at being a planetarium operator, please call Bonnie Julien at the Nova Scotia Museum, 424-6512.

If you want to find out what it's like to be an operator before you "commit yourself," call Mary Lou Whitehorne 865-0235.  $\Omega$



**OBSERVATORY  
SITE SELECTION  
COMMITTEE  
REPORT:  
by Shawn Mitchell**

For the past year the committee has been looking for an observing site that the *Halifax Centre* could use in near perpetuity. To date we have found one site that we think would make a good observing site and future observatory. The site is located on Highway 14, about 5 miles from Highway 103 - Exit 7. The site is located at the top of a 600 ft hill that has been logged out, thus providing very good horizons.

The one possible drawback to this site is a 250 ft microwave repeater tower located at the very top of the hill. The tower subtends only a small part of the sky but MT&T have placed a spotlight on the building at the base of the tower that floods the surrounding field with light. We also don't know if MT&T have bought/leased the whole hill or only the area around the base of the tower, we are presently looking into the ownership of the land.

... would like members of the Centre who know of land for sale, or who own a vacant field ...

However as bad as the tower may seem it does provide several advantages. The road up the hill is well maintained and kept clear during the winter and electrical power is also available along the road to the tower.

The committee is continuing to look for other more suitable sites, and would like members of the Centre who know of land for sale, or who own a vacant field that they would be willing to let us use as an observing site to let the committee know. The criteria that the committee are using to select a site include:

- Site less than 50 min from Halifax
- Cleared land preferably a hill top
- Reasonable horizons
- Near year round access
- Limited nearby lights

- Electrical power located nearby.
- Most of the large well established RASC Centres have permanent observing sites and observatories set up for the their members to use. The Halifax Centre lacks this essential service and will need the assistance of members to help get a permanent observatory built that we all can enjoy and take pride in.  $\Omega$

**HEARD IN THE DARK:  
by GAZER**

Finally the editor has given me a little space for my gossip column, which has not seen the pages of *Nova Notes* for some time. Thanks for those who sent me some tidbits. OK, here we go...

Dave Lane and Bill Lucas nearly completed a Messier Marathon recently. They got all but 4 objects. Do you suppose they'll ever get it right?

Greg Palman, a member from Maine, remembered to bring "all" of his telescope back from the Winter Star Party this year. Word has it that Dave Lane was unable to get any sympathy at all from club members regarding his sunburn obtained at the Winter Star Party!

Dart wielding Pat Kelly is sorry he did.

It seems that the famous *Maktomkus Observatory* owned by none other than the editor of our *Observer's Handbook* does not have a copy located therein!

Mary Lou has something else to hold other than the RASC Scepter of Power. It's got a core of iron, just like her, and it's out of this world ... or used to be. Ask her about it.

Joe, our Centre dynamo, is still churning out "Constellation of the Month" articles. 13.333 years to go, and then what Joe?

Got to go Gang. Remember to send me your gossip or letters, by regular mail through the editor .... or on the "Information Super Highway" (gee, I hate those words!) at "gazer@hercules.stmarys.ca".

*Gazer*

**ASK GAZER: by GAZER**

*Dear Gazer,*

*You've got to help me. A year ago I made the mistake of suggesting to the Halifax Centre executive that we should include meeting reports in Nova Notes, and then compounded my error by actually volunteering to do a couple. You can probably guess my problem. The newsletter editor seems to like the drivel I write and claims that there are readers of Nova Notes who actually look forward to these reports in each issue. Let's get real, eh? Next he will be claiming that Joe's Constellation of the Month articles are the highlight of each issue!*

*Of course, any moron could write these meeting reports. All you have to do is remember to start off each one by saying something nasty about the Nova Scotia weather (a sure thing according to Murray Forbes), always refer to the Centre executive as the "ruling junta" and the Centre President as "President-for-Life Lane", make some disparaging remark about an innocent Centre member in each report (it doesn't matter who), and always include at least one sentence which contains the oxymoron "Dave Lane" and "the planet Venus". Even my daughter could write this stuff. Why am I in such high demand? Short of booby-trapping my body with sticks of dynamite at the next meeting, what would you suggest I do about my problem?*

*A Wished-I-Were Anonymous  
Meeting Report Writer*

*Dear Wished-I-Were ... ,*

Oh heavy lightness, serious vanity! I think your drivel is just delightful! Full of facts and aimed to the heart of the matter. I would counsel you to regale in your ability. Any old fool can storm on for hours saying much about nothing, but you...you have the magnificent gift of writer clarity and brevity, and with a sabre's sharpness.

You're in such high demand because you said the magic words..."I



WILL!" So don't strap dynamite to yourself. Get hold of your faculties and don't come apart on us. We're so lucky to have you! Excuse me while I dry my eyes.....there. Now...

By my count we've seen 8 Constellations of the Month's, leaving 80 to go. At six issues of Nova Notes a year that's 13.3333 more years of lively reading. 13.333...Ooooo... how do you suppose FPU Joe is going to handle this one?

President-for-Life. Not on yours, but at least every five to seven years in the Centre's musical chair executive. With only 130 odd members, what do you expect, no one having to recycle themselves? As far as your calling our illustrious leader an ox and a moron (*Editor's Note: WATCH IT (!), remember, only I know where you live!*), certainly not! Routinely naive and perhaps a bit pig headed too. Your reference is a tad too harsh! And besides, that's my territory you're infringing on. Lancing our leaders is my domaine.

G.AZER

Dear Gazer;

Hey, Dude, I'm lookin' t' buy a new scope. I had a Trash-scope once but it weren't worth the time of day so now I jist use it to chase stray cats outta my bean patch with, y'know? Works great! But I want a really good scope, y'know? One I can SEE things with.

Like yer monetary nebulas and binary 010101 stars and such like. I want to be able to count craters on the Moon and spots on the Sun and have a starin' contest with the Eye of Mars (you know Solis Lacus, don't cha?) and mebbe track down some of them spirallin' nebulas in the Virgo!

So I been doin' my homework, readin' Sky & Telescope. Which is why I'm writin' t'ya, hopin' the expert can trace a nice straight set of rays through my diagram, like. I come across this advert from JMI tootin' up a thingy called a "Drive Corrector." Now I know it's nothin' to do with gettin' me and the local constabulary agreein' on my drivin' habits so I figured it's to do with running one of

them fan-dancy motorized telescopes. I looked at all the buttons in the picture and I figured I got it all figured out. Like this: ye poke the star button and it goes and points to a star. I s'ppose it'd point to a nice, inerestin' one? Ye poke the Moon button and it goes and points t' the Moon. Ye poke the Sun button and it goes and points t' the Sun. (D'ye s'ppose it needs a filter here? Must be kinda bright without one!)

But I'll be gosh-dummed if'n I can figure out the Crown button! If'n ye pokes that one does the telescope go pointin' off towards Her Royal Highness Queen Lizzie?!?!?! (Or worse yet, Prince Charlie?) Now, how in tarnation would a telescope be able t' figure out where in blue blazes she is?!?!?!)

This can't be right! EnLIGHTen me, GAZER!

Confused in the bean patch,  
Sidere Al Rate

ps: And what is the meanin' of "PEC" - some sorta peckin' order in how ye poke the buttons?

Dear Al,

I didn't know we had a member born and raised amidst the Beverly Hillbillies! What a surprise and, uh, challenge your communique is. Tis a good thing I recharged the NiCads in my universal translator last night. Before you buy a new scope, sign up for some diction lessons ... better to express your thoughts when you buy. But, if your thoughts are as convoluted as your speech? Wait here, I've got to plug the translator into the house current. These batteries (where is that Energizer Bunny when you need him!) just won't stand up to this assault. OK.

Pardner, you got a problem. Actually several, but lets cogitate on your tele question. Being without one is the pits. Yep, I'd sure recommend one of them fancy ones, like a JMI or somethin' like a Meade LX-200. All them buttons are the greatest. Why, I had one of them little beauties doin' back flips recently. You shoulda seen

it...just like it was doin' the Twist. Only thing missin' was Fats Domino music playin' from the wedge. I've been just a chompin' for Meade to add a CD-ROM to their riggin', but they ain't got cheap enough for 'em I'm guessin'.

Yep, press the star button and it'll take you to some little jewel stored in those rambo chips tucked into the base. Push the Moon button and that'll be where ya be in the blink of an eye. Sun will git ya to Ol' Sol. But, you gotta remember to push that reversin' polarity switch when the Moons new, cause if ya's don't you'll get the Sun when ya's presses the Moon button, and the Moon when ya punch the Sun. As far as the "Crown" button goes, yep, it does point ta Lizzie. It's so's ya can do an artificial star test on yer optics. But, only when she's awearin' that fancy tiara so's you can shine a light off'em those bulls-eye sized diamonds and do a star test. PEC? Nope. No peckin' order here. Just stands for "Peculiarly Eccentric Club-member"! Hope I helped ya chummy!

G.AZER

Gracious, that was a tough one. Let me get back on battery. The AC is beginning to overload my neural net.

## ASTRO-ADS

**15mm TeleVue Wide Field**

**Eyepiece: Asking \$110**

**4.8mm TeleVue Nagler Eyepiece:**  
Asking \$125. Both prices are about  
65% of replacement cost

"Used but never abused"

Contact Daryl Dewolfe (542-2357)

## Eyepiece Sale!

I am liquidating some of my older eyepieces of various brands including: 6 and 25mm Ortho, 8 and 21.5mm RKE, 7.5, 12.5, 22mm Plossl, Meade 2X Barlow. No reasonable price refused.  
Contact David Lane (443-5989)



NOVA NOTES EDITOR, HALIFAX CENTRE  
 ROYAL ASTRONOMICAL SOCIETY OF CANADA  
 C/O 4-26 RANDALL AVENUE  
 HALIFAX, NOVA SCOTIA  
 B3M 1E2



Peter Broughton  
 31 Killdeer Crescent  
 Toronto, Ontario  
 Canada  
 M4G 2W7

**NOTICE OF MEETINGS AND EVENTS**

**Date:** **Regular Meeting - Friday, April 15th: 8:00pm**, 7:00pm for the executive council meeting (all welcome).

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

**Topic:** **Dr. Bob Hawkes** from Mount Allison University, Physics Department will present a talk entitled: **"The Peekskill Meteorite"**.

**Event:** **Solar Eclipse Public Observing Session** at SMU (see article for details) on May 10th beginning at 1pm.

**Date:** **Regular Meeting - Friday, May 13th: 8:00pm**. Please note that this is the **second Friday**. No executive council meeting will be held that evening.

**Place:** **The Halifax Planetarium** on the main floor of the Sir James Dunn Building at Dalhousie University. Access via Cobourg Road. If you need further directions, please call me.

**Topic:** **BEGINNER'S NIGHT IN THE PLANETARIUM**. Short talks will be presented related to beginning amateur astronomy.

**Event:** **Annual Banquet** (Pot-Luck this year) is to be held at SMU Astronomy and Physics Department on June 17th. More details will be in the next issue.

**HALIFAX PLANETARIUM SHOWS**

The Halifax Planetarium, located in the Dunn Building at Dalhousie University, provides shows each week on Thursday evenings at 7pm. Contact the *Nova Scotia Museum of Natural History* at 424-7353 for show information.

**1994 HALIFAX CENTRE EXECUTIVE**

Honorary President	Dr. Murray Cunningham	
President	David Lane	443-5989
1st Vice-President	Patrick Kelly	798-3329
2nd Vice-President	Mary Lou Whitehorne	865-0235
Secretary	Patrick Kelly	798-3329
Treasurer	Ian Anderson	678-8009
Nova Notes Editor	David Lane	443-5989
National Representative	Joe Yurchesyn	422-8030
Librarian	Shawn Mitchell	865-7026
Observing Chairman	Paul Gray	864-2145
Councilors	Dr. David Turner	435-2733
	Doug Pitcairn	463-7196
	Blair MacDonald	445-5672

**REMAINING 1994 OBSERVER'S CALENDARS**  
 ARE BEING LIQUIDATED AT ONLY \$2 EACH. CONTACT  
**PAT KELLY** TO GET YOURS BEFORE THEY ARE ALL GONE!