

Event Horizon

November 1996

Volume 4 Issue 1

One of the Usual Suspects

In the spring of 1995, I participated in an observing programme through the AAVSO for NASA's Astro-2 mission. During this mission, NASA hoped to study a number of cataclysmic variable stars. They asked the AAVSO to help by monitoring the stars and notifying NASA as soon as any of them went into outburst.

One of the stars under study was RX Andromedae, a cataclysmic

variable in the constellation of Andromeda. (RX Andromedae is about 3 degrees west of M31, the Andromeda Galaxy.) I made several observations of this star during February and March 1995 and forwarded my estimates to the AAVSO.

Recently, Doug Welch and I were out at the Binbrook Conservation Area and we decided to do some variable star estimates. I remembered RX Andromedae and we decided to

check on it. When we compared our results, our estimates were wildly different. It was obvious that one of us was looking at the wrong star. After carefully comparing the star field to the AAVSO chart, I had to admit the fault was mine. (And Doug will never let me forget it! Especially since he's on the council for the AAVSO!!)

“Recently, Doug Welch and I were out at the Binbrook Conservation Area and we decided to do some variable star estimates.”

The Sun and the Moon

The following is a Folk Tale from Korea, adapted by a book of the same name written by Zog In Seob. You'll probably recognize quite a few elements from our own fairy tales. - Denise Kaisler

Long ago, there lived an old woman who had two children, a son and a daughter. One day the woman went to a neighboring village to work in a rich man's house. When she left, she was given a big wooden box containing buckwheat puddings. She carried it on her head and hastened home to her waiting children. But on the way, she encountered a tiger who not only ate all her puddings, but the woman herself. The cunning tiger dressed in the old woman's clothes and put a white handkerchief on its head. Then, standing erect on its hind legs, it walked to the old woman's house and knocked

at the door. It called the two children. "My dears, you must be very hungry. Open the door. I have brought you some buckwheat puddings." But the children remembered the advice their mother had given them: "There are tigers about, be very careful." They noted that the voice sounded rather strange and so they said "Mother, your voice sounds so hoarse. What has happened to you?"

The tiger said "I have spent the day spreading barley to dry on mats and the sparrows kept flying down to eat it, so I had to shout at them all day long to drive them away." But the children were not convinced, so they said "Mother, please put your arm through a hole in the door and let us see it." The children touched it and said, "Mother, why is your arm so rough and

It turns out that the star I was observing (and had been observing since February 1995) was actually NSV389 - a suspected variable star. The NSV catalogue is a listing of stars that are suspected to be variable but for which not enough data has been collected to confirm their variability.

I went home and dug out all my old observations for "RX Andromedae" and discovered that during the period of February and March 1995, the star had gone from magnitude 10.5 to 11.9. Certainly that would make my "suspected variable" a confirmed variable!

I swiftly turned to the newly formed AAVSO discussion group on the Internet and asked if anyone else

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Editorial

Volume four issue one. Yes, we really are starting the fourth year of the HAA - Happy Birthday! If you haven't renewed your membership yet, now is the time to do it. Our price is still a bargain at \$15 for an individual and \$20 for a family membership.

It was one year ago that I put together Event Horizon in Korea using the Internet to gather the articles and to send the finished newsletter to Ann Tekatch for printing. Now we have Denise Kaisler writing articles in Korea and e-mailing them over here for EH. I much prefer doing the newsletter this way around.

As promised, part two of the article on Nagler eyepieces can be found in this issue on page 5.

I would like to apologize to Bill Tekatch for the error last month in the date of the next Cosmology Group

Chair's report

Like a bad dream, I'm back! It is with some trepidation that I attempt to follow in the footsteps of Ann Tekatch. She has been an especially effective leader. During the past year, our ranks have swelled to over 150 members! A good chunk of the credit for the attraction of the club must go to Ann, who has been an untiring advocate for both astronomy and the HAA. Thanks Ann! The only complaint I have is that she refused to run again!

This is likely to be a banner year astronomically. We have the long-anticipated encounter with Comet Hale-Bopp (don't forget your sunglasses!) Furthermore, there will be several favorable meteor showers (including the Leonids a couple of days after the meeting).

meeting. The date shown in the calendar this time is correct. It really will be on Saturday November 23. (No, there won't be a prize for finding errors in this month's issue.)

In Ann's article on page one she talks about observing the variable star NSV389 instead of the intended RX Andromedae. Doug pointed out to Ann the correct location for RX Andromedae after which Ann said that Doug would probably never let her forget. Well... that is not the end of the story. It seems that the star that Doug picked wasn't RX Andromedae either! Doug realized his mistake later all by himself so you don't quite get the last laugh Ann, but I'm sure he won't be reminding you of your mistake too often.

Stewart Attlesey
stewart@io.org

Christmas-time is almost upon us, and, like every year, most of us will be asked to recommend telescopes or binoculars to friends and relatives. I would like to remind everyone of the superb pamphlet that Stewart (our near-silent, but devastatingly effective editor) put together a year or so ago. It covers all of the most frequently asked questions. I also have something good to say about the Sear "Wish Book" this year. For the first time in memory, they have dropped the claims of insanely high magnifying powers! Well done.

Also, I would like to welcome all the new members of our unusually large Council. We had a number of people leave the Council and the country (complete coincidence, I assure you!) last year and I am pleased to say that several people came forward to take their places. The hard work and many ideas which come from our Council

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The HAA is an amateur astronomy club dedicated to the promotion and enjoyment of astronomy for people of all ages and experience levels

The cost of the subscription is included in the \$15 individual or \$20 family membership fee for the year. Event Horizon is published 10 times a year.

HAA Council

Chair	Doug Welch
Second Chair	Grant Dixon
Honorary Chair	Jim Winger
Secretary	Patricia Baetsen
Treasurer	Barbara Wight
Education Dir.	Grant Dixon
Obs. Dir	Rob Roy
Editor	Stewart Attlesey
Recorder	??
Membership Dir	Ann Tekatch
HAAJ Coord	Rosa Assalone

Councillors

Patricia Gassmann
Alan Shinn
Bill Tekatch
Tracey Webb



Rob'serving Report

This is the first of ten monthly Observing Director's reports. Each month I hope to find astroobjects and astroevents on which you can focus your attention. December's issue will carry a pull-out 1997 calendar showing the dates for HAA meetings, new Moons, proposed Council meetings and evenings suitable for observing at the Binbrook Conservation Area.

We would like to see many more newcomers participating in these observing sessions. This is where you get to try out different scopes so you can make a wiser decision as to what you might like to purchase (refractor/reflector-big/small-make?) You can also learn more about the skies from the experts. That's what "clubing" is, getting together and sharing. So, don't be shy!

Thanks to Ann Tekatch and

Chair's Report ...

(Continued from page 2)

members make this a dream organization for a Chair.

Finally, I encourage any of you to give me feedback on how the group is measuring up to your expectations. As always, we hope to keep moving forward and to grow and change in a positive way. Please feel free to talk to me at a meeting (if I ever manage to show up at one!), phone me, or e-mail me if you have comments or suggestions. I look forward to another exciting year with Canada's largest and most active group of amateur astronomers!

Doug Welch
welch@physics.mcmaster.ca

Barb Wight for the catchy first and last titles.

Winter's Meteors

This month I would like to target the three major winter meteor showers. The first, the Leonids, is called that because the meteors appear to emanate from the constellation Leo the Lion, near the head. The number of meteors/hour is expected to increase over the next few years, possibly peaking in a meteor storm in 1998 or 1999. Maybe it will be early. The shower should run from November 15 to 20, peaking around 2 am on the Sunday, the 17th.

The first quarter Moon will

"We would like to see many more newcomers participating in these observing sessions."

have set by then. It is an excellent chance to go out to our "dark site" Saturday night and do some photography, gather some data, or just sit back and enjoy the spectacle.

The Geminids are next, radiating from the heads of the Twins. The shower builds for a week, peaking on the morning of Friday, December 13, then disappearing on December 16. Again, the Moon favours us with its absence. It is only 3 days old, setting a few hours after sunset.

Two out of three ain't bad, as they say, because the waning last quarter Moon will interfere a little with the Quadrantids. It could, nevertheless, be a good show. The shower runs from January 1 to 6, with a maximum on the night of the 3-4th. The meteors radiate from the ancient constellation of Quadrans Muralis. This position is now near the junction of Draco, Hercules and Böotes.

Observing Meteors



Dress warmly! It's one thing to go for a winter's afternoon hike with the family, but here it's night and much colder and you are mostly standing or sitting still. Loose fitting, wind proof, bulky clothes that can be sealed at the neck, waist, hand and foot joints are best. Your head loses more heat than any other area- protect it. The little reusable or disposable heat pads are handy to have for slipping in your pocket or even in your boots, if necessary.

If you plan on sticking it out for a while, get comfortable in a reclining lawn chair and cover up with a sleeping bag. A snack (sandwich > cookies > candy) will provide internal energy to help keep you warm. Candy gives a sudden lift, but that is quickly followed by an abrupt crash in blood sugar. A thermos of your favourite hot beverage (cider>chocolate>coffee) will keep your fluid levels up, after

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Did You Know That ...

The Chinese mark the beginning of their calendar on the new Moon of March 5, BC1953 when all five visible planets were within 3 degrees of each other. Just days before, the dawn's waning crescent Moon combined with them to make a spectacular sight not witnessed since.

Rob Roy

Rob'serving ...

(Continued from page 3)

breathing out your moisture to winter's dry air. Caffeine, as does tobacco, restricts the circulation to your extremities. Alcohol is a definite no. It not only reduces your night vision but makes you lose heat by dilating the capillaries in the skin. At the slightest hint of chilling, get up and move around briskly to produce some heat and to move it around the body.

Now you are ready. If it is your first shower, you may want, as a minimum, to count the number of meteors that you see in a given period of time. You should be looking about 45 degrees away from the apparent source of the meteors, well above the horizon. Once your appetite has been whetted, there are many things you can do, drawing each meteor on a star chart, estimating its magnitude, recording its time and/or noting unusual colours and features. Veterans have learned to use a time-set tape recorder and to work in groups of two or more. Don't forget to take a break, sooner than later, if you're a novice. Your eyes will play tricks on you after a while. There's a ton of information available out there, if you crave more detail.

Monthly In-sights

- Nov. 17th- pre-dawn Leonids.
- Jupiter in the SW in Sagittarius.

Slides Wanted

If anyone has any duplicate or unwanted slides I could make good use of them for slide presentations I do at public schools. See me at the next meeting, or phone 383-4528 or E-MAIL at ai337 @freenet.hamilton.on.ca. Thanx,
Allan Shinn

- Saturn is S, high in the sky just below western circlet of Pisces.
- Mars rises after midnight.
- Venus is a brilliant sight a few hours before dawn.
- Hale-Bopp will get harder to see through Dec/Jan. It is travelling between Ophiuchus and Serpens. Have a look at it now.

Dec. 6th/7th/14th BCA observing.

- 13th-am Geminids.
- 15th-am Mercury's greatest elongation- 20 deg. East.
- 17th Moon close to Saturn.
- 22nd Ursids Meteor Shower.
- Moon close to Aldebaran.
- 25th Merry Christmas!
- Jupiter too low in SW for meaningful observation.
- Saturn is visible high, for many hours.
- Mars good in the early morning-growing in apparent diam.
- Venus getting closer to morning Sun.
- Hale-Bopp is not very visible for end of Dec./early Jan.

Although Jupiter is not well placed for observing surface details now, tracking its moons' shadows across the face of the planet is interesting and still possible. Eastern standard times between local twilight and the planet's setting are given below for the start and the end of a shadow's transit. Jupiter's moons are I- Io, II- Europa, III- Ganymede and IV- Callisto.

Date	Moon	Start	End
Nov. 23	I	5:40pm	set
Nov. 24	III	5:55pm	set
Dec. 7	II	4:21pm	set
Dec. 9	I	daytime	6:15pm

Jupiter is too close to the Sun in January, so get out early while you still can and have a look. For the next set of times, you'll have to get up before dawn when Jupiter next becomes a

morning planet.

Rob Roy
692-3245
royrg@mcmaster.ca

Membership Renewals

Don't forget to renew your membership. The due date was November 1 and the fees are \$15 for an individual membership or \$20 for a family. A tax receipt will be issued for voluntary donations.

Please make your cheque payable to:

Hamilton Amateur Astronomers
P.O. Box 65578
Dundas, Ontario

Mars Global Surveyor Launch

The Mars Global Surveyor spacecraft was successfully launched today (November 7, 1996) and is on its way to Mars. The Delta 2 first stage rocket with its nine strap-on solid rockets all ignited at 9:00:49.99 PST.

Mars Global Surveyor will go into orbit around Mars on September 12, 1997. The spacecraft will then map the red planet for one full Martian year.

Ron Baalke
baalke@kelvin.jpl.nasa.gov

Nagler Eyepieces

This is a continuation of last month's article.

6. The 13mm Nagler:

The last in the series 1 Naglers, the 13mm is perhaps one of the finest, and yet it has an infamous problem : The Kidney Bean effect. Essentially, these kidney shaped, blackout areas become prominent as you shift your view around to take in the whole view. (similar to a blackout when you get too close to a 40mm eyepiece) I have seen it claimed that if you naturally hold your eye steady, then you will not have a problem. Well, that is true, but you will also only be taking in 70 degrees and not 82 degrees, or thereabouts, and that is what you are paying for. However, this eyepiece, also quite large, exhibits a very comfortable view, and good eye relief compared to the 12mm. I believe it is rated at about 19mm relief, but I found it shorter, especially when trying to view the edge of field. This eyepiece is fantastic on deep sky, giving a real Oh-wow feeling. On Jupiter, I believe the sharpness on the bands was not quite as good as on other eyepieces, but I discovered that in a pretty quick and dirty test session, so I could be wrong. In a side by side test against the 12mm Nagler, I thought I detected a bit more "life" and brightness to the image through the 13, but it could be because of the additional 1mm focal length. Note, that on this Nagler, as in many others, there is already a "built-in" barlow! This can be unscrewed, to gain a 30mm eyepiece or thereabouts, but I wouldn't recommend it. Firstly, the stars at the edge of field suffer greatly, and secondly, you risk ruining your eyepiece, especially since it isn't easy to screw and unscrew the built-in magnifier.

7. The 16mm Nagler 2:

Almost identical in design, size, weight, and viewing characteristics (indeed the 16 is slightly SMALLER than the 12, go figure) the 16mm Nagler 2 is an awesome deep

sky and planetary eyepiece. The space-walk, eye relief, and just about everything is identical to the 12.

8. The 20mm Nagler 2:

This is a huge, heavy eyepiece, up there with the 35mm Panoptic in size, and weighing in in pounds, and not ounces. Some telescope owners can't afford that extra weight. Also, it is a 2" eyepiece, there is no provision at all for a 1.25" focuser/diagonal unlike the other Naglers. The wide top lens makes for a very comfortable viewing experience. However, like the 12 and 16, you shouldn't use this eyepiece with glasses, unless you are willing to sacrifice a chunk of field. Again, a similar, approximately 10mm of eye relief. The space-walk feeling is at it's maximum with this eyepiece as you have to shuttle around a lot to take in the whole picture.

However, this is one of the most important eyepieces around (and expensive), as it will give you as much field size as a 32+ mm Plossl, and yet give you a substantially more magnified, intensive view (although potentially dimmer as the exit pupil is smaller, but the contrast factor often makes up for that). If you buy this eyepiece for instance, and replace your 26mm that comes with your telescope, you will gain BOTH substantial field size AND magnification all in just one eyepiece. Indeed with a fairly high powered telescope, such as an 8" f/10, I probably would choose this eyepiece if I could choose only one (and no barlowing allowed, with a barlow I would probably choose the 27mm panoptic if I was allowed just one!)

The Panoptics from Televue, in my opinion, are even sharper in view than the Naglers! Their focal lengths are generally longer, the eye relief thus is longer, and the field size is somewhat smaller. They start at 15mm and run on up to 35mm focal length.

Thanks!

-Todd

Todd Gross, Ch. 7 Meteorologist,
Boston

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RASC Handbooks and Calendars

The 1997 RASC Observer Handbooks are in. The price is \$13.00 each.

A very limited supply of 1997 RASC Astronomical Calendars will be available shortly at \$9:00 each.

If you are interested in these items see Ann Tekatch (575-5433).

HAMILTON AMATEUR ASTRONOMERS INCOME STATEMENT

HAMILTON AMATEUR ASTRONOMERS
INCOME STATEMENT
YEAR ENDED
OCTOBER 31, 1996

INCOME	YEAR 1996	YEAR 1995
MEMBERSHIP FEES	1845.00	1330.00
DONATION INCOME	257.72	235.20
PUBLIC EDUCATION	1826.00	1235.65
SWEATSHIRT/T-SHIRT SALES	568.80	310.00
OBSERVERS HANDBOOK SALES	313.12	417.50
SKY & TELESCOPE SALES	0.00	4.00
BOOK SALES	263.75	0.00
TOTAL INCOME	5074.39	3532.35
EXPENSES		
NEWSLETTER PRINTING	459.37	657.40
NEWSLETTER POSTAGE	508.08	425.03
JUNIOR GROUP (HAJA)	36.87	0.00
SPEAKERS EXPENSE	258.38	128.98
PUBLIC EDUCATION EXPENSE	74.50	22.50
PROMOTION EXPENSE	179.43	119.61
ATM EXPENSE	18.72	0.00
SWEATSHIRT/T-SHIRT COST OF SALES	588.80	318.81
OBSERVERS HANDBOOK COST OF SALES	337.20	427.12
INSURANCE EXPENSE	550.80	432.00
GENERAL ADMINISTRATION	135.52	270.87
POST OFFICE BOX RENTAL	63.13	57.78
MISCELLANEOUS EXPENSE	0.00	0.00
DONATION EXPENSE	100.00	300.00
TOTAL EXPENSES	3310.80	3160.10
SURPLUS	1763.59	372.25
	=====	=====

HAMILTON AMATEUR ASTRONOMERS

(Continued on page 7)

HAMILTON AMATEUR ASTRONOMERS INCOME STATEMENT

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BALANCE SHEET AS AT OCTOBER 31, 1996

ASSETS	OCT 31 1996	OCT 31 1995
BANK	2019.08	1394.21
INVESTMENT (OSB)	2000.00	1000.00
ACCOUNTS RECEIVABLE	145.80	0.00
INVENTORY (H/B)	307.75	496.08
PREPAID EXPENSES	63.13	91.88
TOTAL ASSETS	<u>4535.76</u>	<u>2982.17</u>
LIABILITIES		
ACCRUED LIABILITIES (96/97 MF)	455.00	665.00
TOTAL LIABILITIES	455.00	665.00
EQUITY		
OPENING BALANCE	2317.17	1944.92
CURRENT YEAR	1763.59	372.25
CLOSING BALANCE	4080.76	2317.17
TOTAL LIABILITIES AND EQUITY	<u>4535.76</u>	<u>2982.17</u>

Prepared by Barb Wight
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One of the Usual Suspects ...

(Continued from page 1)

had observations of NSV389 they could share with me. Two of my fellow AAVSO'ers were able to offer observations from December 1995 and January 1996. One especially blessed observer (he had a clear sky!) observed it November 10 & 11th and sent me a note. I'm quickly growing very fond of this discussion group! (You can subscribe to it by sending a message to: AAVSO-discussion-request@physics.mcmaster.ca with the word "subscribe" as the first word in the BODY of the message (on a line by itself).)

I have tabulated below all of the observations I have gathered to

date. Judge for yourself whether NSV389 is one of the usual suspects, or a genuine variable star!

I wish all my mistakes were so interesting!

If anyone is interested in following NSV389 and helping to define its range and period of variability, I have star charts available. Please give me a call.

Ann Tekatch
(905)575-5433

Date	Julian Date	Mag.
February 16/95	2449767.5256	10.5
February 18/95	2449767.5111	10.5
February 21/95	2449770.5694	10.8
March 1/95	2449778.5694	<11.3
March 3/95	2449780.5263	11.9
March 9/95	2449786.5354	11.4
March 12/95	2449789.5312	<11.8
December 30/95	2450080.4462	12.8
January 20/96	2450103.4771	12.0
August /96	2450307.2451	12.6
October 5/96	2450362.5520	12.6

The Sun and the Moon ...

(Continued from page 1)

hairy?" So the tiger explained, "I was washing clothes and I starched them with rice paste. That must have made my arm rough." But then the children peeped through a crack in the door and saw a tiger standing there. So they slipped out the back door and hid among the branches of the tree in the garden.

The tiger waited for awhile, but as it got no further reply from inside the house, it broke through the door and searched in vain for the children. But at last it looked down into the well and saw a reflection of the children high up in the tree. So the tiger went and borrowed an axe from the house next door and began to cut footholds in the tree.

In great terror, the children prayed to the God of Heaven. "Dear God, if you are willing, please send down the Heavenly Iron Chain. But if you mean us to die, please send us the Rotten Straw Rope!" At once, a strong Iron Chain came gently down from heaven so that they might climb up without difficulty.

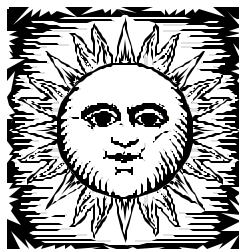
When the tiger reached the top of the tree, the children and Chain were gone, so it too began to pray, but in opposite terms, because it was very afraid that it might be punished for its misdeeds. "Oh God of Heaven, if you would save me send down the Rotten Straw Rope, I beg of you. But if you mean me to die, please send down the Heavenly Iron Chain." By praying in this way, the tiger hoped that the Heavenly Iron Chain would come down, for it expected that as punishment, it would receive the opposite of what it had prayed for. But the gods are straightforward and so the Rotten Straw Rope came down. The tiger seized the rope and because it was night, could not see that it was not the Chain. Once the tiger had climbed a little way, the rope broke and the tiger crashed down in a field of broomcorn where it died, crushed and broken, its body pierced through by the sharp stems of the corn. From that day, it is

said, the leaves of broom corn have been covered with blood red spots.

The Heavenly King said to the two children "We do not allow anyone to sit here and idle away the time. So I have decided on duties for you. The boy shall be the Sun, to light the world by day and the girl shall be the moon, to shine by night." Then the girl answered "Oh King, I am not familiar with the night. It would be better for my brother to be the moon."

It is said that when she became the Sun people used to gaze up at her in the sky. But she was a modest girl and greatly embarrassed by this. So she shone brighter and brighter, so that it was impossible to look at her directly. And that is why the sun is so bright, that her womanly modesty might for ever be respected.

Adapted and Retyped by
Denise Kaisler
HAA, South Korea Chapter



December Night Skies

Back in the AAVSO

Every autumn, the American Association of Variable Star Observers (AAVSO) has its annual meeting in Cambridge, Mass., and this year was no exception. Although I attended the Spring meeting in Atlanta last May, this is the first time in many years that I made it down Boston-way. The end of October is always gorgeous in Boston and we were treated to three perfect days.

On Friday, November 1st, there was a special session celebrating the *400th* anniversary of the discovery of the very first semi-permanent variable star: Mira. The discoverer of the variable, Fabricius, was later murdered in an apparently unrelated incident involving a stolen goose. There were many talks given during the afternoon which emphasized that while we may have known about these stars for many centuries, they are still difficult beasts to understand! One of the talks showed images obtained with HST and using interferometric

techniques of Mira itself and the star was decidedly out of round. (To an astronomer, there is nothing worse than breaking that spherical symmetry!) Other talks noted that the size of the star depended on the bandpass used to measure it - in a big way. Different bandpasses give repeatable radii which differ by up to a factor of three!! It was a sobering set of talks!

In the evening, we visited the headquarters of the organization at 25 Birch Street - practically across the street from the Sky and Telescope offices. Just before we arrived, the building (and most others in the vicinity!) had been flooded by torrential rains. However, apart from the occasional stack of boxes of punch cards, you never would have known. One of the great kicks of visiting HQ is to check out lightcurves of your favourite star and to see where your observations actually land!

After the contributed papers on Saturday, we had an excellent banquet

at the John F. Kennedy School of Government. The after-dinner speaker was Dr. Dorritt Hoffleit, best-known for producing the Yale Bright Star Catalogue, but also a long-time Director of Maria Mitchell Observatory on Nantucket Island, which has trained generations of variable star astronomers. She traced the history of Mira and other long-known long-period variables and showed that the Chinese actually recorded a couple of them as 'guest stars'!

It was a great pleasure to visit Cambridge again and to visit with fellow variable-star fans. If anyone is interested, the spring meeting is in Switzerland this year!

Doug Welch
(welch@physics.mcmaster.ca)

CALENDAR OF EVENTS

- | | |
|-----------------------------------|---|
| ◆ Tue. November 19, 1996, 7:00 PM | HAMILTON AMATEUR JUNIOR ASTRONOMERS - Mac Burke Science Building, Rm B148 (beside the planetarium) The topic is "Imagining Life on Mars" For more information contact Rosa Assalone at 540-8793 |
| ◆ Fri. November 22, 1996, 7:30 PM | COUNCIL MEETING - At the home of Rob Roy. Call Doug at 525-9140 Extension 23186 if you're interested in attending. |
| ◆ Sat. November 23, 1996, 8:00 PM | COSMOLOGY DISCUSSION GROUP - Room B148 (the room beside the planetarium,) Burke Science Building, McMaster University. We will finish discussing "The Age of the Universe" and start our new topic "Chaos". |
| ◆ Thu. December 5, 1996, 8:00 PM | ROYAL ASTRONOMICAL SOCIETY OF CANADA Hamilton Centre - General Meeting - McMaster University Medical Building Room 1A6 |
| ◆ Fri. December 6, 1996, 11:59 PM | EVENT HORIZON DEADLINE - Please submit your articles and pictures to Stewart Attlesey, stewart@io.org or modem (905)827-9105 or snail mail to 1317 Mapleridge Cres., Oakville, L6M 2G8 |
| ◆ Fri. December 13, 1996, 7:30 PM | HAA GENERAL MEETING - at the Spectator Building auditorium. The speaker will be Dr. Derek Ford of McMaster University. Topic: A comparison of the surfaces of Venus and Mars. |