Hamilton Amateur Astronomers

Event Horizon

December 1996 Volume 4 Issue 2

Catch a "Falling" Star in Your Binoculars!

A fellow member of the American Association of Variable Star Observers (A. A.V.S.O.) posted a list on the AAVSO discussion group recently of variable stars visible in binoculars . I was surprised to count 139 visible to northern hemisphere observers!

"I was shocked to learn that so many were bright enough to follow with only the aid of a pair of binoculars"

Most people are unaware of how many variable stars there are, but I was shocked to learn that so many were bright enough to follow with only the aid of a pair of binoculars. The list posted on the Internet discussion group was prompted by complaints from many observers that they lacked the time and energy needed to set up telescopes and do variable star estimates on a regular basis. (A problem many of us have!) Someone pointed out how quickly and easily brightness estimates could be done with binoculars and a list of suitable stars was then compiled and posted. I've reviewed the list and narrowed it down to just the brightest stars - those that would be visible (at this time of year) throughout their change in brightness from the light polluted skies of Southern Ontario. I have listed them in order of right ascension:

Designation: The first four digits are right ascension (hours/minutes), second two digits preceded by +\- show declination.

Name: Where possible, I have shown the star's popular name. Otherwise, standard Bayer nomenclature or variable star designation is shown. (If you're new to this, the second part of the name is an abbreviation of the constellation in which the star is found.

Most good star atlases (including Star Atlas 2000) label the stars with their Bayer (Greek alphabet), Flamsteed (numbers) and variable star (one or two capital letters) designations.) The star called NSV650 Cas is a suspected variable star, it awaits enough data to confirm its type, period and light curve.

(Continued on page 3)

Designation	Name	Type	Brightness Range
0022+17	TV Psc	Semi-regular	4.7 - 5.4
0050+60	gamma Cas	GCas	1.6 - 3.0
0146+67	NSV650 Cas	L	6.9 - 7.7
0214-03	Mira (o Cet)	Mira	2.0 - 10.1
0258+38	rho Per	Semi-regular	3.3 - 4.0
0343+23	BU Tau	GCas	4.8 - 5.5
0349+30	X Per	GCas	6.0 - 7.0
0506-11	RX Lep	Semi-regular	5.0 - 7.4
0549+07	Betelgeuse	Semi-regular	0.0 - 1.3
0608+22	eta Gem	Semi-regular	3.2 - 3.9
0617+49	psi Aur	L	4.8 - 5.7
0619+07	T Mon	Delta Cephei	5.6 - 6.6
2139+09	epsilon Peg	L	0.7 - 3.5
2140+58	mu Cep	Semi-regular	3.4 - 5.1
2225+57	delta Cep	Delta Cephei	3.5 - 4.4
2349+56	rho Cas	Semi-regular	4.1 - 6.2

inside...

Editorial

Ann Tekatch is doing her best to convert everyone to variable star observing again this month with her article on page 1. Binocular observing greatly improves the number of opportunities to pursue this interest. I have lost track of the number of times that I have not gone observing because there wasn't enough time to pack my scope into the car, set up, take it apart, repack the car, etc. With binoculars, you grab them, hop into the car and go.

That was terrible news about the failure of the latest Russian effort to send a mission to Mars. Some reports have gone as far as saying that this failure puts an end to Russian planetary exploration for a long time to come.

I'm not sure where I heard it but I had the impression that the majority of missions to Mars were failures. Some of the tabloids were coming to all sorts of wild conclusions about why this was happening. Checking out the list on page 5 shows that in fact there have been lots of successful missions (American that is). One notable and very expensive exception was the Mars Observer that was launched September 25, 1992

Next year, two more American missions will reach Mars. The most interesting one, known as Pathfinder, will land a microrover on the surface of Mars. The will be the first time that a machine will be able to Navigate the Martian surface.

One more thing... you only need to write 9 more articles for Event Horizon this year Ann.

Stewart Attlesey

Chair's Report ...

There were so many positive comments about our last meeting that I am wondering if I should have work-related travel every month for the benefit of the group! Congratulations to de facto sometimes Chair Grant on running such an excellent meeting. We will do our best to have clear skies for the 13th so that we can check out Saturn once again.

As most of you may know, Grant Dixon has been donated a near-infinite amount of time to promoting the HAA and astronomy in general. He has given about a billion planetarium shows and is also the groups World-Wise Webmaster. Our group was the second amateur group in North America to have a Web site and Grant has recently redone the whole site, top-to-bottom, to make it even more attractive and functional. This is no small undertaking since out site now has literally hundreds of links and documents. Please check it at:

http://www.science.mcmaster.ca/HAA/

The poor autumn weather has had some unanticipated side-effects. It seems that we have an unusual number of proto-junior members in the making at this time. No names, to protect the less than innocent! However, I am sure we all wish these members a special holiday season and New Year.

Finally, I hope that the season brings you fond memories and that all your holiday wishes all come true. Please bear in mind that Santa has only eight reindeer and can't bring *everyone* Naglers!

Doug Welch
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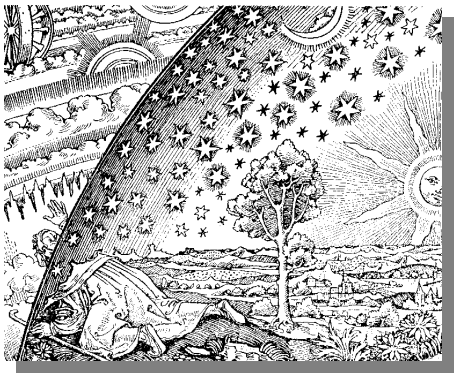
HAMILTON AMATEUR ASTRONOMERS

Event Horizon is a publication of the Hamilton Amateur Astronomers (HAA).

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.



Rob'serving Report

The Event Horizon sports a new feature for the HAA this month, a 1997 Calendar of Events. Marked on it are the dates of HAA meetings and subsequent Council meetings. You will also find new Moon dates and proposed Binbrook observing nights. It has been printed on the inside of the last page so you can easily remove it, if you wish, and place it in a convenient location for future referral.

"The Event Horizon sports a new feature for the HAA this month, a 1997 Calendar of Events"

As mentioned in the January, 1996 Event Horizon, this month hosts a nearby grazing occultation of Aldebaran by the Moon, on December 22. Aldebaran is the brightest star (mag 0.8) which is ever occulted by the Moon. Aldebaran has not been occulted by the Moon for 14 years.

The chances of your observing site being right on the line of visibility of a grazing occultation is very slim. In general the path is only about 2 Km wide. For this one, however, we are very close to the line, which is about 25 Km to the North.

Stationed on that narrow path you would see the Moon moving eastward across the starfield background and Aldebaran winking in and out of view as it alternatively passes by lunar valleys and mountains. Unfortunately the Moon is near full and 96% sunlit, which makes the grazing occultation less spectacular than it would be against a dark limb.

The portion of the graze occultation observing line closest to us, here in Hamilton, is a line joining 80deg-0.00min/43deg-29.90min and 81deg-0.00min/43deg-06.19min. This line passes roughly 2 Km south of Embro and 1 Km north of Morriston. The carpool parking lot between Morriston and Hwy 401 on Hwy 6 would be a perfect spot, I imagine. If it's a beautiful, clear Sunday afternoon.....

If you are north of this path, such as Mount Forest (Starfest) or Arthur (HAASP), Aldebaran would be totally eclipsed by the Moon. Southwards, as we are, Aldebaran will appear to skim close to the Moon's southern limb.

This occultation will occur on or about 17:27 EST. Having risen at 15:30, the Moon should be about 30 deg above the horizon to the east about 1 hour after sunset. An excellent photo opportunity should occur. Using a medium telephoto lens of 135mm to 350mm on a tripod and ASA 400 film, try a range of 1 to 20 second exposures.

September 22, 1997 promises a much better grazing occultation of Aldebaran for two reasons: the occultation is by a dark limb and initial predictions place Hamilton right on the path of visibility.

The International Occultation Timing Association, IOTA, collects and compiles data on lunar, planetary and asteroidal occultations of stars. If you wish to get involved and contribute, you can join IOTA (http://www.sky.net/~robinson/iotandx.htm or e-mail: 570-0611@mcimail.com) for $30US. Membership includes free graze predictions for your area, descriptive materials and a subscription to "Occultation Newsletter".

For details of occultations close to you send your accurate latitude and longitude and a SASE to:

Kent Okasaki
5255 Stevens Creek Blvd., Apt. 236,

(Continued on page 4)

Catch a "Falling" Star ...

(Continued from page 1)

Type: The class of variable star: Mira stars are long period variables, taking a year or so to go through a complete period of brightness change; semi-regular stars show some predictability in their light curves, but occasionally display an unexpected change in brightness; Delta Cep (or Cepheids) stars change brightness over a relatively short period of time (days); L stars (RR Lyrae stars) are slow irregular stars; GCas (gamma Cas) stars change little in brightness and take generally 50 to "several hundred" days to go through their period.

Range: this is the usual range in brightness for the star, from brightest to dimmest. The less the difference between brightest and dimmest, the more difficult it is to detect a change.

To follow the brightness of a variable star, you need to compare that star to nearby ones of known (and unchanging) brightness. I can print comparison charts for any of the stars listed here for anyone interested. If you'd like a chart, give me a call.

I would like to point out that the famous long period variable, Mira, will be reaching its maximum brightness on February 10/97. Now would be a good time to start following it in binoculars.

Ann Tekatch
575-5433

Rob'serving ...

(Continued from page 3)
Santa Clara, CA
95051
(e-mail - 73112.3157@compuserve.com)

Forms and instructions can be obtained from Okasaki or:
David W. Dunham
2760 SW Jewell Ave.,
Topeka, KS
66611.
(e-mail: david.dunham@jhuapl.edu)

You can do your own predictions, if you wish, using David Herald's "Occult" program, which is on four IBM-PC disks, and is obtainable from Okasaki for $12US ($6US for IOTA members.)

Monthly In-sights

December
- 14- BCA observing/Geminid Meteors peak.
- 15-PM Mercury's greatest eastern elongation.
- 22- Ursid Meteors peak/Lunar occultation of Aldebaran.
- 29- possible Jupiter occultation of a 7.5 magnitude star.

January
- 1- Earth closest to the Sun (could have fooled me - brrr!)
- 3- Quadrantid Meteors peak.
- 3,4,11- BCA observing.
- 7- Crescent Moon, Mercury & Venus close just before dawn.
- 23-am Mercury's greatest western elongation.
- 28- possible Mars occultation of a 7.2 magnitude star.
- Saturn, at magnitude 1.0, is high in the southern sky in Aquarius at dusk. Ring tilt is 4 degrees and increasing.
- Mars rises about 11 PM on Jan. 1, just east of Leo's tail. Apparent diameter increasing as we approach each other.
- Jupiter is too close to the Sun and is not visible in January.
- Comet Hale-Bopp is low in the eastern dawn sky in January, moving eastward from Serpens Cauda through the north end of Aquila.

Rob Roy
Observing Director
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Cloudy Night Observing Tip

On the next observing night that it is cloudy and you want to some astronomy, rearrange your issues of "Sky and Telescope" or "Astronomy" by the month. Last year, I bought copies of S&T back to 1979. As I read through them, I kept a log of observing tips, DIY accessories, astrophoto hints, etc.

When I was finished, I got the idea to file the copies in boxes by the month. That way, anything of interest for spring observing, for example, could be found in the March box, or April's or May's. You can still easily find a specific article such as the May, 1988's 'Hula Hoop Dome' on page 544.

In planning ahead for March, for instance, I looked through one box, not seventeen. I found articles on Variable Stars in Leo, Double Stars in Cancer, Springtime Galaxies, a Gemini Star-Hop and a Tour of the Winter's Milky Way, just to name a few. The monthly columns, "Observer's Page" and "Celestial Calendar" provide a wealth of gems to observe.

No matter how you organize your past issues, you will always need the current ones for unique events such as occultations, eclipses, or comet visitations, but monthly boxes or binders will make planning your observing sessions much easier- give it a try.

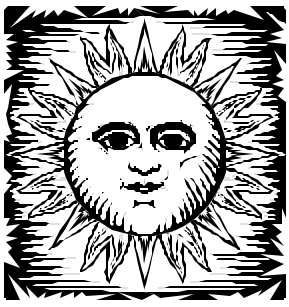
Rob Roy,
Observing Director
royrg@mcmaster.ca

Store Opening

Steve Barnes is opening a home-based astronomy store called "Sky Optics" on Saturday, December 14 at 2460 Newport Street, Burlington. His phone number is 905-336-2211. He will be selling telescopes, eyepieces, accessories, books, CCD cameras, computer software, calendars, magazines, posters, and photographs. Newport Street is south of Highway 5 and west of Walkers Line. Take South Hampton west off Walker's Line and turn north onto Headon Forest. Newport will be a turn to the south off of Headon Forest.

Let's help out this new business!

Doug Welch welch@physics.mcmaster.ca



Notable U.S. Planetary Science Missions

Spacecraft	Launch date	Mission	Remarks
Mariner 2	Aug. 27, 1962	Venus	Passed within 22,000 mi from Venus 12/14/62; contact lost 1/3/63 at 54 million miles.
Ranger 7	July 28, 1964	Moon	Yielded over 4,000 photos of lunar surface
Mariner 4	Nov. 28, 1964	Mars	Passed behind Mars 7/14/65; took 22 photos from 6,000 miles
Ranger 8	Feb. 17, 1965	Moon	Yielded over 7,000 photos of lunar surface
Surveyor 3	Apr. 17, 1967	Moon	Scooped and tested lunar soil
Mariner 5	June 14, 1967	Venus	In solar orbit; closest Venus fly-by 10/19/67
Mariner 6	Feb. 24, 1969	Mars	Came within 2,000 mi of Mars 7/31/69; sent back data, photos.
Mariner 7	Mar. 27, 1969	Mars	Came within 2,000 mi of Mars 8/5/69
Mariner 9	May 30, 1971	Mars	First craft to orbit Mars 11/13/71; sent back more than 7,000 photos
Pioneer 10	Mar. 2, 1972	Jupiter	Passed Jupiter 12/3/73; exited the planetary system 6/13/83; still operating in outer solar system.
Mariner 10	Nov. 3, 1973	Venus, Mercury	Passed Venus 2/5/74; arrived 3/29/74. First time gravity of one planet (Venus) used to whip spacecraft toward another (Mercury).
Viking 1	Aug. 20, 1975	Mars	Landed on Mars 7/20/76; did scientific research, sent photos; functioned 6 ½ years.
Viking 2	Sept. 9, 1975	Mars	Landed on Mars 9/3/76; functioned 3 ½ years.
Voyager 1	Sept. 5, 1977	Jupiter, Saturn	Encountered Jupiter 3/5/79, provided evidence of Jupiter ring; passed near Saturn 11/12/80
Voyager 2	Aug. 20, 1977	Jupiter, Saturn, Uranus, Neptune	Encountered Jupiter 7/9/79; Saturn 8/25/81; Uranus 1/24/86; Neptune 8/25/8
Pioneer Venus 1	May 20, 1978	Venus	Entered Venus orbit 12/4/78; spent 14 years studying planet; ceased operating 10/19/92 .
Pioneer Venus 2	Aug. 8, 1978	Venus	Encountered Venus 12/9/78; probes impacted on surface.
Magellan	May 4, 1989	Venus	Orbit and map Venus; monitoring geological activity on surface; first planetary spacecraft to lower its orbit by using planet's atmosphere (aerobraking) 5/25/93-8/3/93; ceased operating 10/12/94
Titan IV	June 14, 1989	Orbit earth	First of 41 such rockets whose primary purpose is defense.
Galileo	Oct. 18, 1989	Jupiter	Used earth's gravity to propel it toward Jupiter; encountered Venus Feb. 1991; launched robot to Jupiter 7/13/95
Mars Observer	Sept. 25, 1992	Mars	Communication was lost 8/21/93

Source: National Aeronautics and Space Administration
Submitted by: Grant Dixon

NOTE: This list does not include the last two missions scheduled to reach Mars next year.

January Meeting

Our January meeting will **NOT** be at the Spectator Building. It will be held in Room 1A4, McMaster Medical Centre (Ewart Angus centre).

Did you know that...

If galaxies were as far apart, relative to their size, as stars are, then the nearest galaxy would be a hundred times further away than our telescopes have ever seen? (If our Milky Way Galaxy were the size of an aspirin, the nearest galaxy would only be 13cm away, but if our Sun were the size of an aspirin, the nearest star would be 140Km away!)

Rob Roy

Gustav Holst

Gustav Holst, (1874-1934), wrote "Mars, The Bringer of War" in 1914. Over the next few years he wrote:
“Venus, The Bringer of Peace”,
“Mercury, The Winged Messenger”,
“Jupiter, the Bringer of Jollity”,
“Saturn, The Bringer of Old Age”,
“Uranus, The Magician” and
“Neptune, The Mystic”.

Each is a self-contained tone poem and together comprise his most famous collection entitled, "The Planets".

Interested in eternity, Holst studied astrology and learned to cast charts. He is also reputed to have studied astronomy in an effort to understand the Space-Time continuum.

Interestingly enough, Holst never intended "The Planets" to be about celestial bodies, but, rather, the gods for whom they were named. The association of the titles with the celestial planets, combined with the powerful orchestration guaranteed that at least some part of the score would be included in almost every sci-fi movie of the 1950's.

Science documentaries also included the works of Holst. Indeed I have more vivid recollections of the score of "Mars, The Bringer of War" as overpowering and terrifying, than I do of the contents of the astronomy films we were supposed to be studying. That was way back in the mid-sixties.

"The Planets" remain a favourite background score for documentaries, television programs and such even today.

BOB BOTTS
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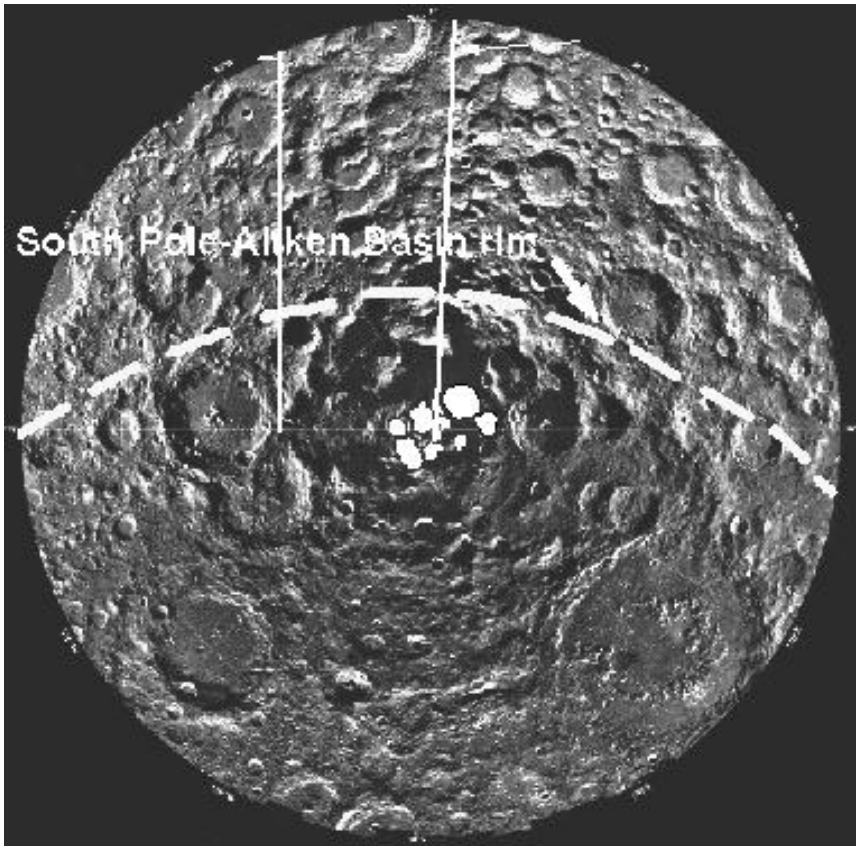

Lunar Gold?

NASA and Defense Department scientists believe they have detected the presence of water ice at the Moon's south pole. This astounding result is the most likely outcome of an experiment conducted in 1994, when the radio beam of the Clementine spacecraft was aimed at both poles and the resulting reflections received on Earth. Nothing unusual was seen in the radar return from the north pole. However, the strength and polarization of the signal from the south pole was unlike what would be expected for bare rock; instead, it strongly suggested the presence of ice. Ice at the Moon's poles has been considered possible in theory for 35 years. The lunar equator points almost directly at the Sun, and Clementine images show that an area of up to 15,000 square kilometers at its south pole has not been exposed to sunlight for billions of years. It's thought that water vapor from impacting comets can migrate to the pole, trapping out as ice in the shadowed interiors of deep craters.

The solid white areas in the exact centre on this map of the Moon's south pole indicate permanently shadowed crater floors. The two vertical lines are ground tracks of the Clementine spacecraft's radar experiment on April 9, 1994. During the pass that cut across the white areas, radar signals bounced off the surface appeared to reflect back from ice, not rock. Courtesy Paul Spudis and the Ballistic Missile Defense Organization.

The Fire Dogs

Here is another folk tale from Zong In Sob's book. It relates to the first one, but is kind of interesting in that the sun and moon seem personified in the first and objectified in the second. - Denise Kaisler

There are many countries in Heaven, just as there are in the world below. One of them is galled Gamag Nara, the Land of Darkness, and its inhabitants keep many horrible dogs. They are known as Fire Dogs. The King of that land is greatly concerned before all else that his realm is so dark, so from time to time he sends his dogs to the world of men to try to steal the Sun or the Moon.

Once upon a time the King summoned the fiercest of his Fire Dogs and ordered to to go and steal the Sun and bring it to him. So the Fire Dog went off and tried to seize the Sun in its mouth, but it was too hot. It snapped at it again and again, but in the end it had to give up, and returned without its prey. The King was very angry, and reprimanded the dog severely of it's failure. Then he turned to the next fiercest dog, and sent it to try to steal the Moon, for he thought it might not be as hot as the Sun. The Moon would not give him as much light as the Sun of course, but he thought it would be better than nothing. But when the dog tried to bite the Moon, it was so cold that it froze the dog's mouth. It tried repeatedly to grasp the Moon with its teeth, but in the end it was obliged to spit it out. And so the second Fire Dog too had to return without the prize.

Despite these failures the King of the Land of Darkness never gave up hope and to this day he sends out his Fire Dogs, but they always fail in the end.

It is said that eclipses of the Sun and Moon are caused in this way. It is the parts of the Sun or Moon that they bite which show dark during an eclipse.

We cannot watch an eclipse of the sun directly because it is so dazzlingly bright, but it can easily be seen in the reflection of the sun in a basin of water in which a little black ink has been dissolved. [*Please don't try this yourself. The only safe ways to view the Sun are through a proper solar filter or by projection. - Ed.*] We can easily see on the inky surface of the water the Fire Dog biting the Sun and then spitting it out again.

Told by Zong Teg Ha, Onyang (1912)

Retyped by Denise Kaisler
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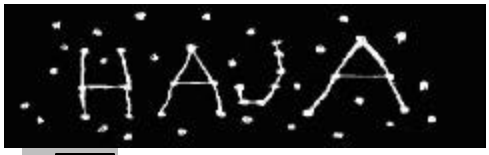

The November HAJA meeting "Imagining Life on Mars" was a lot of fun. Everyone shared what they knew about Mars and a few of the children talked about the recent discovery of evidence that some sort of life once existed on Mars. Then we talked about how we imagine life on Mars. It was a great discussion.

Amanda wrote an article about Mars which she mailed to me in time to put into the November issue of HAJA's newsletter. April and Amanda both drew pictures for the newsletter as well. And Nigel made up a crossword puzzle about Mars, so HAJA's newsletter was quite full with lots of fun stuff. Thanks everyone. I hope to get lots of articles for the December issue as well.

If you have children under 12 years of age, HAJA is something they might like to be a part of. The next HAJA we will talk about "The Moon: Our Nearest Neighbour". If the weather is good we will go outside for a bit to look at the sky. The meeting will be on Tuesday, December 17, 1996 at 7 PM. HAJA meets in the room beside the planetarium in the Burke Science Building at McMaster University.

Rosa Assalone
540-8793
assalor@muss.cis.mcmaster.ca

HAA Contest

Announcing Our New Sweatshirt/T-shirt Contest

We're looking for a new design for our sweatshirts & T-shirts and have decided to make a contest of it. Please submit your designs to Ann Tekatch. We don't have a deadline or a prize established yet, so I'll stick my neck out and make them up: How about the winner gets a free sweatshirt/T-shirt and the deadline is January 17/97. The winner will be decided by a vote at our February meeting.

Ann Tekatch

Cosmology Discussion

Saturday, January 25, 8:00 PM, the Cosmology Discussion Group will meet in room B148 (the room next to the Planetarium) in the Burke Science Building, McMaster University. The topic will be "The Limits of Knowledge". For more information contact Bill Tekatch at 575-5433 or tekatcba@mcmail.cis.mcmaster.ca .

Bill Tekatch

HAA Member's e-mail Addresses

The following list is our most up to date collection of HAA member's e-mail addresses. If your address is not shown or is incorrect please send e-mail to me at stewart@io.org

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Stuff fer Sale

This month's special (in time for Hale-Bopp!) Bell and Howell LUMINA 10x50 binoculars $175 (EWA 420 ft at 1000 yds)

Also:

(2) 8" Pyrex blanks $65 each

Metal detector $75

Super 8mm Canon camera $50

300mm f.l. f/4.5 Dimension telephoto $75

6" mirror kit $75

Tele-extender $5

Keychains $7 each

FAX/Phone line-splitter $50

Don't see what you'd like? Ask me!

Doug Welch

(905) 525-9140 x23186 (work)
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CALENDAR OF EVENTS

♦ Sat. December 14, January 3, 4, 11	**BINBROOK OBSERVING SESSION** - Proposed observing nights. For confirmation or directions call Ann Tekatch (575-5433) or Rob Roy (692-3245).
♦ Tue. December 17, 1996, 7:00 PM	**HAMILTON AMATEUR JUNIOR ASTRONOMERS** - Mac Burke Science Building, Rm B148 (beside the planetarium) The topic is "The Moon: Our Nearest Neighbour"For more information contact Rosa Assalone at 540-8793
♦ Fri. December 20, 1996, 7:30 PM	**COUNCIL MEETING** - At the home of Stewart Attlesey. Call Doug at 525-9140 Extension 23186 if you are interested in attending.
♦ Mon. December 30, 7:30 PM	**AMATEUR TELESCOPE MAKERS** - are meeting at the home of Jim Winger in Caledonia. For directions and details please call Jim at 765-4649.
♦ Thu. January 2, 1997, 8:00 PM	**ROYAL ASTRONOMICAL SOCIETY OF CANADA Hamilton Centre** - General Meeting - McMaster University Medical Building Room 1A6
♦ Fri. January 3, 1997, 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. January 10, 1997, 7:30 PM	**HAA GENERAL MEETING** - McMaster University Medical Building Room 1A4 The speaker will be Bill Harris "A new globular cluster"
♦ Sat. January 25, 1997, 8:00 PM	**COSMOLOGY DISCUSSION GROUP** - Room B148 (the room beside the planetarium,) Burke Science Building, McMaster University. The topic will be "The Limits of Knowledge"

January Night Skies