

Event Horizon

November 2003

Volume 11 Issue 1

Chair's Report

How time flies when you are having fun! Ten years!! It is hard to believe. Fortunately, they have been ten GOOD years. Being involved with such an interesting group of people has been incredibly satisfying for me. I have been constantly amazed by the energy level of our members and the many, many ways that they contribute to the club and the enjoyment and appreciation of astronomy in general.

Where to start? Perhaps at the beginning. The first meeting of what was to become the first HAA Council took place in a location long ago and far away in a bedroom community near Hamilton. What characterized this meeting, more than anything else, was a desire to actually enjoy astronomy and shed the acrimony and weight of unnecessary politics and paperwork. Having spent time on many different Council's over the years, I can honestly say that the HAA Council spends more time "on task" setting up new activities and making things work better than any other similar group to which I have belonged. It is just plain fun to be there!

In the early years, the HAA had a very active presence in the planetarium at McMaster. The driving force behind that effort was Grant Dixon. He put so many hours into the shows in the evening that everyone else wondered how he managed to remain married! There are literally thousands of children and community groups who benefited from his extremely entertaining shows. Grant has many stories about these shows. Two stand out in my mind. One was how a cub scout ended up with a black eye after complying too vigorously with a suggestion to bring his (fixed-sized) fist from arm's length in towards his face - to demonstrate how nearby things occupy a larger angle in the sky when they are nearby! A second one, still unexplained, was the discovery of a Girl Scout blouse.

Another fond HAA memory of mine occurred dur-

ing my research leave at Lawrence Livermore National Lab in Livermore, California. I believe that the first anniversary of the HAA forming had been celebrated at the November meeting. Much to my surprise, I received a piece of cake in the mail! Given the transit time involving both the US Postal Service and Canada Post, I was surprised that it had not set off biohazard sensors! It LOOKED delicious, but somewhat transformed by its journey. Needless to say, I was incredibly touched by the gesture.

Over the years, we have shared many memorable events. Camping at Silent Lake Provincial Park or the York Soaring Association, StarFest, Huronia, lots of beautiful star-filled evenings at the Binbrook Conservation Area, at McMaster, at Rideau Ferry, or at public star parties in town. I count some of my favourite moments out under the skies with friends from the HAA.

The folks on the HAA Council have been an enormous source of strength and leadership over the years and every one of them has pulled their weight to make the club what it is today. Thanks to all of you!! Thanks also to everyone who has shown up at our roughly 100 meetings to date. Our guest speakers always remark on what a fun and knowledgeable crowd we have. Someone once mentioned that they could be sure that it was an HAA meeting when they heard laughter from the meeting hall.

I look forward to another few decades with all of you and thank you for making our group what it is today!!

by *Doug Welch*

Doug Welch is the current chair of the HAA and also a founding member. You can find out more about Doug at:
http://www.physics.mcmaster.ca/people/faculty/Welch_DL_h.html



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Nominations for the new HAA council

Honorary Chair Jim Winger
 Chair Glenn Muller
 2nd Chair Doug Welch
 Secretary Marg Walton
 Treasurer Cindy Bingham
 Observing Dir ... Stewart Attlesey
 Membership Dir ... Ann Tekatch
 Publicity Gail Muller
 Newsletter Anthony Tekatch
 Webmaster Anthony Tekatch
 Councillor 1 Grant Dixon
 Councillor 2 Barb Wight
 Councillor 3 Ray Badgerow
 Councillor 4 Bob Christmas
 Councillor 5 Cathy Tekatch
 Councillor 6 John Gauvreau

Errata

Some issues of the last Event Horizon mistakenly had the wrong credit on the image of page "Open Cluster NGC 7789 In Cassiopeia". This photo was taken by Bob Christmas.

Solar Flares

There has been a phenomenal amount of solar activity in the past month resulting some beautiful Aurora Borealis display. You can see pictures and stories at these two sites:
www.space.com
spaceweather.com

RASC publications



2004 RASC handbooks and calendars Order your 2004 RASC handbooks and calendars. Handbooks are \$20, calendars are \$12 each.

E-Mail Margaret Walton <mwalton@cogeco.ca> to place your advance order. We will take orders at the meetings up to the December meeting.

For Sale

Telescope For Sale
 Bushnell Voyager Model 78-9570.
 Many features: 5x24 Finderscope, Aluminum Tripod, Carrying case, all metal tube and mount construction with ultra sharp 60mm coated glass objective lens.
 Brand new in box, instructions, plus more. Asking \$140.00
 Call Gilles 905-526-9867



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 \$25 individual or \$30 family membership fee for the year. Event Horizon is published a minimum of 10 times a year.

HAA Council

Hon. Chair Jim Winger
 Chair Doug Welch
 Second Chair Grant Dixon
 Secretary Margaret Walton
 Treasurer Cindy Bingham
 Observing Dir. . . Stewart Attlesey
 Publicity .. Glenn and Gail Muller
 Editor/Web Anthony Tekatch
 Membership Dir. Ann Tekatch
 Councillor. Ray Badgerow
 Councillor Barb Wight

Web: amateurastronomy.org

Mailing Address:

PO Box 65578
 Dundas, ON
 L9H 6Y6

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Upcoming Events

Date: Friday December 12, 2003 7:30pm

Event: HAA General meeting. Admission is free. Everyone is welcome!

Speaker: Peter Ceravolo

Details: Peter Ceravolo is a professional optician who has worked on MOST, Canada's first space telescope and the president of Main-Sequence Software, makers of Desktop Universe digital sky atlas and planetarium software. Peter will be speaking on the Comet Odyssey project. The first ever time lapse movie of a comet made in full colour. Best described as extreme astronomy, the effort to photograph the 1996 comet Hyakutake required travel to an Arizona mountain top for all night (for nine nights) of non stop photography. Peter will describe the process of turning a shoe box full of negatives into a stunning time lapse movie of a comet.

Location: The Hamilton Steam Museum

Also: There will also be other short presentations of general interest. If it is clear, there will be observing in the parking lot after the meeting.

Date: Saturday January 10th, 2004 8PM

Event: Cosmology Discussion Group

Topic: 1950's Concepts of Interplanetary Travel and How They Are Just Being Realized Today. Includes discussion and archival footage.

Location: McMaster's Burke Science Building, Room B148 Coffee and refreshments will be provided. We welcome our members to bring a small 'entree'. Everyone welcome, open discussion. For further information, call Larry @ (905) 529-1037 or Mike @ (905) 648-8919

Date: Sometime in January

Event: Saturn viewing party

Location: Hamilton Bayfront park

Eye Candy



Moon Limb Mosaic
Photo by Bob Botts

Here's the humble beginnings of a rather ambitious project, where I shot 52 sets of frames with a webcam and which I hope will eventually be reduced and combined into making a single mosaic of last night's (Oct 12 2003) lunar terminator.

The original data maxed out at about 30 gigs and consumed 7 CDs as zipped archives.

Processing time in "Registax 2" took about 8 hours CPU time @ 2 Ghz.

Ask the Experts

If you have any questions about astronomy we have experts in the following fields that are ready to answer your questions; galactic astronomy, astrophysics, stellar physics and variables, astrophotography using emulsion/print film, polar-aligning an equatorial mount, scanning photos and image processing.

Send in your questions to
editor@amateurastronomy.org

Q. Why do some elements like Hydrogen have multiple spectral lines? By Anthony Tekatch

A. Dear Ask the Expert,

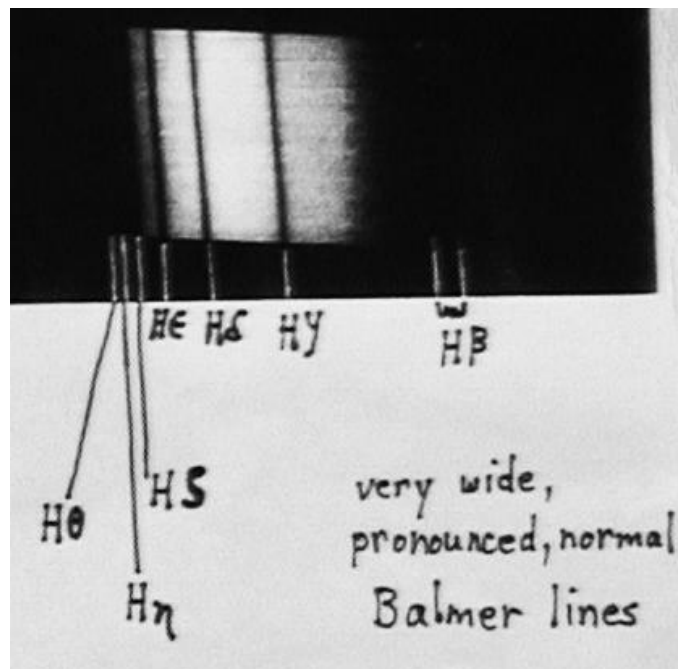
After having my attempted communication with you wiped out on the internet by an overloaded file server, I am resorting to tried-and-true typewritten technology. At least, this method is sure-fire!!

You have asked me to write knowledgeably about the appearance of multiple spectral lines in a single-electron hydrogen atom. First, recognize two things. I have been involved with this kind of work for less than one year at present and my background is liberal arts and science, the science 1) elective and 2) part of my coursework in historical studies (my major).

From what I know at present, spectra are formed when light from an electromagnetically radiating object is bent by the medium through which it passes. This forms the familiar rainbow which we all know. If this light is passed through a slit or pinhole (or if the light source is a point, such as a star) as in an artificial medium, like a spectroscope, we then obtain a 'high-resolution' spectrum or diffraction image. Although it is probably the highest resolution astronomy or astrophotography you are ever likely to do, terms like magnification and resolution are meaningless when speaking of diffraction images. The accepted descriptor for them is 'dispersion'. This is because detail is revealed by spreading out the image as opposed to the accepted method of concentrating detail into tinier areas for higher resolution and contrast.

Light from any electromagnetically radiating body can expose very much information about the characteristics of that body. Hence, spectroscopy is one of, if not THE, cornerstone(s) of modern astrophysics. We 'in the trade' refer to spectra as the "fingerprints of the stars". So, what about the hydrogen atom? I used to think, until quite recently, that "the lines in a star's spectrum" were the indicators of the orbital paths of the electrons in their orbits about the atomic nuclei of cool hydrogen gases that had been formed by the target star. Well, yes

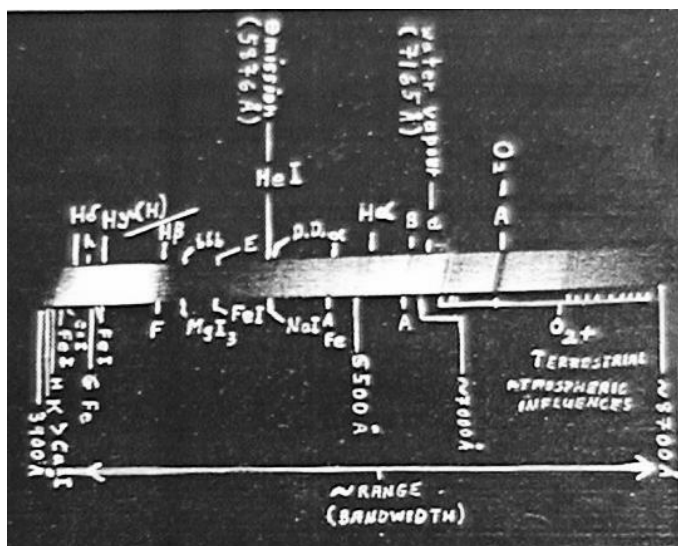
and no. Spectral lines, either emission or absorption, are not markers of electron pathways around a nucleus. Instead, they are indicators of the presence of an electron in a specific quantized area. A parallel might be the smell of carbon monoxide fumes telling that a motorized vehicle had passed recently, but it would not tell which road or direction the juggernaut had taken. All the observer would know is that a vehicle had recently been in a local but very general area near him/her.



Vega AOVa SPECTRUM

Studies of hydrogen gas in laboratory environments, have shown conclusively for years that its atoms are composed of one proton nucleus and one orbiting electron. So, why are there multiple Balmer spectral lines? J.J. Balmer (1825-98), a mathematician, calculated the existence of these lines for the hydrogen atom. These are the ones visible that we can see in the visible part of the electromagnetic spectrum. There are other atomic series as well, which were found after Balmer's work. These include the Lyman (UV), Paschen, Brackett, Pfund and Humphries (found in the IR and beyond). If Balmer had not done the original visible work, it is interesting to speculate on where we might not be today! Try to picture the hydrogen atom as a solar system with one star (the nucleus) and the planet (the electron). That planet may occupy any group of orbital levels between the location of Mercury and Pluto. Each level is dependant on the energy that the planet has at its disposal. It will therefore require less energy (longer light wavelength) to be at a Pluto

level than to be at a Mercury level (shorter, more energetic wavelength). Unlike the real planet though, the electron can only move in a very specific orbits and radii which are dependant on the laws of quantum mechanics and the kind of nucleus or ion. Because of our lack of precision, and reality, we will continue to use the concept that electrons 'orbit' their nuclei. Quantization specifies the orbital diameters and energies. This means that only certain quantities are allowed. So, in the turbulent regions in around a star the nuclei of a gas or plasma are capturing and releasing electrons according to the laws of quantum mechanics. Any electron capture, release or level change results in the emission or absorption of a photon of energy.* If the 'quantum' escapes we see it in a spectrum as one of many emission lines. If it is captured by another electron, it appears as an absorption (dark) line-like a 'dropout'.#



Mars reflected G2V SPECTRUM
 film: high speed infrared
 camera: 35mm
 lens: 135mm with Rainbow Optics Star Spectroscope

It is possible to have $n > 200$ levels of electron jumps, captures or releases in the hydrogen atom alone. If one were to include the rest of the elements on the periodic table and the spectral 'band' levels created by the formation of molecular compounds as well, the resulting picture becomes amazingly complex! +

* The energy of any photon must be exactly equal to the energy difference between two electron orbits. This is the same for all hydrogen atoms. It is E_{21} .

The lower the angstrom number of a spectral line, the shorter the wavelength and the higher the energy of

the photon producing it. Hence, the more orbital levels an electron jumps, the more energetic (i.e. the lower the angstrom no.) of the photon responsible for the level change.

+ The Rowland/Moore Catalogue lists over 200 pages of spectral lines for the Fraunhofer (solar) spectrum alone! And you thought the Genome Project was big!

by Mike Jefferson

**Spot the spots.
 Count the dots.
 What's your RSN?**

by Glenn Muller

A nice way to increase your telescope time is with the addition of a solar filter. For some reason clear days always seem to be more abundant than clear nights and, with such a bright target, you don't need perfect conditions for useful observations. While any size of scope will do, my preference for filter material is Baader solar film. This can be bought quite inexpensively as a sheet, then cut and mounted into a cardboard cell. Or, if you're all thumbs like me, for a bit more money you can purchase a Kendrick ready-made unit in an aluminum cell. You won't see solar flares or the boiling surface of the Sun with this type of filter, but you do get a nice white image with the subtle shading of faculae and sharp definition of the sunspots.

Now I feel somewhat obligated to state the obvious here, so: solar viewing should only be done through optics that have approved filters covering the objectives, and finderscopes should be removed or capped.

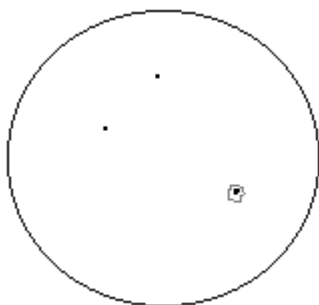
A sunspot consists of an 'umbra'; a dark core that can range in size from a small speck to a fair-sized blemish, and this is occasionally surrounded by a halo called the 'penumbra'. Often, finely structured lines similar to bicycle spokes can be seen throughout the penumbra. Appearing singly, or in groups, spots can last for hours, days or weeks.

At first, the simple joy of seeing these features is entertainment in itself but, eventually, you'll want to make a sketch. In fact, several sketches on consecutive days will show how the spots change and demonstrate the rotation of the Sun. Once you've done that the next logical step is a Zurich-Wolf sunspot count - a fairly easy method of rating solar activity.

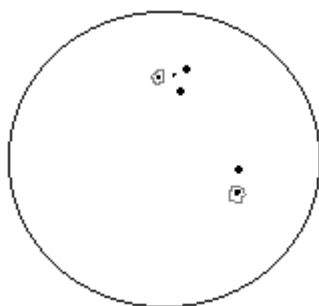
Johann Rudolf Wolf (1816-1893) was a Swiss mathematician and professor of astronomy. In 1855, he accepted a Chair of astronomy in Zurich and was instrumental in the opening of Zurich Observatory on 1864. Although heavily into probabilities, prime number theory and geometry Wolf is best remembered for his work on the 11 year sunspot cycle - a regular period of activity that takes about 4.5 years to go from minimum to maximum and about 6.5 years to recede from maximum back to minimum.

Wolf's proposition that sunspot activity be calculated through a combined count of groups and individual spots is a method that is still in use today. Essentially, each group (g) represents 10 times the activity of a single spot (f). The Relative Spot Number (RSN) or Zurich/Wolf number as it has been coined is calculated by counting the number of groups and multiplying those by 10, then adding the individual sunspots (even the ones that make up the groups) for a total count. It is important to note that an isolated spot is also considered as a group - so if all you see is a single spot then your RSN will be 11.

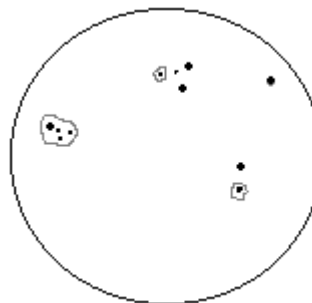
The formula looks like this: $RSN = (g \times 10) + f$, where f represents the total number of the individual spots. A few examples follow.



Example 1



Example 2



Example 3

Example 1 has three individual spots unrelated to each other. $f = 3$, $g = 3$, so $RSN = 33$ (remember to multiply the g by 10).

Example 2 has 2 related groups and 6 individual spots. $f = 6$, $g = 2$, so $RSN = 26$

Example 3 has 4 groups and 11 individual spots. $f = 11$, $g = 4$, so $RSN = 55$

If you enter your counts into a simple spreadsheet, over time you should be able to generate a graph to show the rise and fall of the activity. In order to submit your data for scientific use you'll need to be proficient, and dedicated, but for your own edification you can find a lot of useful information at the AAVSO website: www.aavso.org/observing/programs/solar/

On a somewhat related note, a group of scientists trying to link outbreaks of influenza with peaks of solar activity found that the two did coincide. Although the cycle is heading toward a minimum right now, and the study had no definitive conclusions, in about nine years time you might want to think about a flu shot! Meanwhile, why not grab a hat and your SPF30 and begin your own study of our closest star because, if nothing else, a natural dose of vitamin D is a great way to put a smile on your face 😊

by Glenn Muller

This article was based on information found in *A Complete Manual of Amateur Astronomy* - watch for Glenn's review of this book in an upcoming issue of *Astronomy* magazine.



Grant Dixon has selected the following ten interesting articles from previous Event Horizon newsletters since the beginning of the HAA inception.

From October 1994 Volume 1 Issue 10

Chair's Report This issue of Event Horizon marks the last issue in our first year of existence. Much has happened in the past year and perhaps it is time to take stock. Before proceeding, I want to give my heartfelt thanks to all those who have made the HA the kind of group that it worth joining. It would be difficult to rank the individual contributions of members, so I hope no one will be offended if I mention people in "stream of consciousness" order!

Ann Tekatch has been a constant source of energy and has put numerous hours into organizing activities, tracking our finances, wrestling with government drones, compiling membership information, promoting the HA and astronomy and more. Ann organized our wildly successful Silent Lake observing weekend. We are also indebted to her (and Bill!) for donating our first year of liability coverage - a very significant donation at a time when our group was just getting on its feet financially - and most recently volunteering to donate a family membership for the upcoming Cable 14 charity auction. Ann has always been willing to go the extra mile for astronomy and has been a constant inspiration to me.

Grant Dixon has continued (or perhaps accelerated!) his involvement in public education. Anyone who has seen Grant at work in the planetarium knows that he is a master presenter and captivates audiences of any age. His enthusiasm is contagious and we should be grateful that he is not in the business of working foreign troops into a battle frenzy! Grant spends so much of his evening time in the planetarium that it is remarkable that he has time to do anything else. On several occasions I have had to ask Grant to give "public shows" that are normally given by Mac astronomers. Without exception, he has been happy to do so. As a result of Grant's work, our group is several thousand dollars better off - something that gives us the luxury of considering many additional activities. During the coming year, I hope that many of you will take the time to learn how to give planetarium shows and give Grant some well-deserved relief - not that he has actually asked for it, but because it is better for all concerned!

Ev Butterworth, our tireless observing director, has produced material to help beginners to get their sea

legs in amateur astronomy and has been a crucial part of our Junior Group effort. Her enthusiasm for introducing young people to astronomy is well-known and I hope that she will continue to help us out in performing this very valuable service (perhaps I should refer to it as a calling!) Our many observing sessions are also thanks to Ev's initiatives.

Patricia Marsh has taken up many tasks during the past year. She has made all arrangements with the Spectator for use of the auditorium, arranged for our very handsome banner, volunteered for much of the routine work in running the club, and most recently has volunteered to help edit Event Horizon for the coming year. As an ATM, she has been an inspiration to many of us with the "Cluster Buster". Her energy level never diminished despite the fact that she was up to 10 months pregnant at one point! (Since that time, we have a new youngest member: Cole).

Stephen Sheeler took on the arduous task of editor and produced our superb publication - Event Horizon. Right from the start, he set a very high standard with a visually interesting and information-packed newsletter. As mentioned in a previous issue, Stephen is now in his first year of studies at the University of Waterloo, but maintains his contacts with us through the Internet. Those of you with electronic mail can send messages to him at smsheeler@cayley.uwaterloo.ca. Since arriving at Waterloo, he has helped create the online version of our September 1994 Event Horizon (more on this elsewhere in this issue).

Patti Baetsen was an active observer, our recorder, and the driving force behind the creation of the Junior Group - sometimes referred to as HAJA. She recognized the difficulty of attracting younger children to our Friday meetings and decided to do something about it. With the help of other members, notably Ev Butterworth, she has so far led three Junior Group meetings - each a bigger success than the last. The attendance at the September Junior Group was larger than many (if not most!) of our regular meetings, clearly demonstrating that this concept is meeting a need. It would be wrong not to point out that when Patti first proposed the idea of a separate Junior Group, there was some reluctance and doubt about the ability of this idea to fly. Because Patti was willing to take up the challenge we now have a vital and promising new family activity.

Charles Baetsen has been one of our most active observers, as well as secretary and builder of astronomical equipment. His contributions have been legion, including setting up (and attending to) our post office box, re-

producing our pamphlets, giving talks at our meetings, promoting astronomical software, and more. I suspect that Charles and Patti logged more observing hours this past year than any other member of our group!

Stewart Attelsey has repeatedly hosted Council meetings, contributed to the workings of the Council, and written material for Event Horizon. As you may know, Stewart has also volunteered to co-edit the EH for the coming year - a contribution made possible, in part, by the Internet.

Barb Wight, who volunteered as our first treasurer - one of the most difficult positions to fill in any group! She helped get the HA on its feet before leaving for sunnier climes. She has now returned to Hamilton and has volunteered once again to work on the Council. Welcome back!

The past year has been so full of activity that I am sure that I have forgotten many contributions. To those people, I apologize. To be honest, so many people are willing to do so many different things that I often forget who is "officially" responsible for what! Let me just say that it has been a pleasure and a privilege to work with all of you. I have no doubt that our best years are yet to come. While I am away, I will greatly miss the camaraderie and companionship of all of my friends in the HA. And welcome to all of you who will be part of this great adventure in the coming year!

by Doug Welch

Volume 2 Issue 5 March 1995

Messier Hunting Adventures

March 4th was a scheduled observing night at Binbrook. We spent the entire day monitoring the skies and not a cloud rolled by! We were so excited that it was clear and warm (relative to previous observing nights) and it was a planned observing night. We were so overwhelmed by this miracle that we neglected to verify that all was according to plan. Arriving at the Binbrook Conservation Area (after a few minor setbacks), we discovered that the gate was locked and no one was around. The sky still being PHENOMENALLY CLEAR, we were entertained by an eloquent soliloquy on the Milky Way by Raechel. 8:30 rolled around and by this time we were starting to get worried and decided to drive to Binbrook and call Ann. From her living room, she informed us that it was cloudy, which was in complete contradiction to the clear heavens above our heads. The evening had been cancelled on the basis of data collected from the omniscient Weather Office.

Doubtfully trusting our own senses, we returned to the conservation area to do some observing of our own. Ducking under the gate, we embarked on our courageous excursion into the blackness of the countryside. Well suited as we are to being astronomers, we were immediately seized with terror. We all trembled when Rosa heard a bear (rabbit) in the bushes. Nina exclaimed that her mother would faint if she knew what we were doing. Suddenly, at the peak of our anxiety, we saw the headlights...

Panic struck! We hid behind a well placed shack and watched. A big strapping man got out of his vehicle and flashed a light into Nina's car. He then proceeded to open the gate. Nina shrieked, "He's wearing blue!! It's the police!!" After a few seconds of planning our course of action, we advanced (more like crept) toward the intruder, now locking the gate behind his car.

As we approached, Raechel squeaked hello and Rob Roy replied, "What, leaving already?" Relieved, we recognized a fellow astronomer and followed him to the observing site. Ann arrived shortly after but the Baetsen's and Patricia spent over an hour circling Binbrook before they happened upon us.

In the end, it was an amazing night! We confiscated Ann's telescope and armed with her knee-pads, we saw some impressive objects. For instance, we found the beehive cluster, the Orion nebula, M35, and were shown M81 and M82 among other things.

We may only be beginners but we know a clear sky when we see one!!

by Raechel Carson and Nina Snaith

Volume 3 issue 6 April 1996

Miranda's Comet Party

The comet event was one of those rare occurrences when things work out even better than planned.

This story starts before Miranda was born, when Halley made its last apparition. My Grandfather, who was a boy for the previous apparition, had been completely oblivious to its passage. When Halley made its approach in 1986, he was almost blind and therefore missed it twice in one lifetime. This made me quite determined not to allow Miranda to suffer the similar fate, of having missed a wonderful comet such as Hyakutake.

Margaret and I had one of those conflicting parental discussions on how much school we would allow Miranda to miss due to late night comet observing. The scheduled comet party at the Dundas Valley Conservation Area on the Tuesday coincided perfectly with a Professional Development Day, that Miranda's school had

scheduled for the following Wednesday. Margaret made a difficult job change so that Miranda could awaken late, instead of being up at her normal time for Daycare. This was a very good compromise.

Things got a little grim when the late breaking news of inclement weather postponed the comet event. Miranda was initially very disappointed, but, she became a little more cheery when she was allowed to come to the observatory with me.

A number of public had found their way to the observatory after having found the gates locked at the DVCA; they being unaware of the postponement. There were a few members on hand, who were checking out the SOFIA project Colin had engaged in with NASA. There were no other children but Miranda here at the time, and she amused herself with the library books when she was not out in the cold. When we had a few minutes to ourselves at her father's telescope, we shared one of those rare moments that I am sure we will both share for a lifetime.

Miranda was quite excited that night, and wouldn't give Margaret a moments rest when she arrived to pick her up after work, at 10:00 PM. We let Miranda stay up and watch for a little while longer, and then Margaret took her home.

Earlier in the year, Miranda, with the kind aid of Ev and Ann, helped to earn space badges for her whole brownie troop. On Monday, we had gone to their meeting armed with binoculars, in the event that the clouds might relent. I kept a watchful eye for sucker holes. One appeared for a brief moment, but, Brown Owl judged that it was more important that the girls finish their nightly songs than catch a fleeting glimpse of the comet.

Margaret took advantage of the Wednesday day to schedule some necessary appointments and this left me in Miranda's safe keeping for the evening again. We had to be near a phone, so Miranda took me to the observatory once more so that she could again show me the comet and the moon through my/OUR telescope.

With only two of us there, we found it necessary to press Miranda's skills into service. Like a trooper she found the moon and Betelgeuse through the finder scope for some other children who had arrived to see the comet. She was quite thrilled that there were some other children to see the comet with, and having the chance to find things for other kids when the BIG PEOPLE give her a chance. The other parents of the other children were quite impressed. Hopefully left with some new HAJA members in tow, thanks to Miranda's diplomatic services.

I am quite proud of Miranda who handled her own little comet party with some children she didn't even know. I am also quite proud of members of this club, who organized star parties for their clubs, friends, family, schools and such, not just in their towns, but, across the country and even across continents, (I organized a comet party for my dive club who is currently in South America).

I would not have let Miranda miss this comet for the world!

by Bob Botts

Volume 4 issue 3 January 1996

Stargazing from On High

The last few hours of an intercontinental flight are always harrowing. You're bored. You're simultaneously exhausted and restless. You might even want to smother the small child in 35F who has been crying since takeoff. My recent return to Toronto from Seoul was no exception. I'd navigated the echoing corridors of too many airports, and eaten too much dubious plane fare to be interested in anything other than the chance to escape those droning engines and maybe lie flat for awhile.

Enter the tiny aircraft window - little more than a hand span wide. A casual glance at the deepening blues showed that night was on its way. It also seemed as if the plane was heading toward an ominous blue cloud bank. Wonderful, I thought, more turbulence.

But a second glance caused me to realise the aircraft was above the clouds and I was actually seeing the place where night begins. Unlike the airless moon, where there is a razor sharp delineation between night and day, the Earth's terminator is diffused by our atmosphere. So the light didn't wink out as the sun sank over the horizon. Instead, the plane cruised through a fairy-kingdom twilight that deepened only gradually.

Sunsets at 30,000 feet are unique. The redness of ground-viewed sunsets was missing because there was much less atmosphere to scatter the blue light. The darkest point seemed to be above the plane rather than in front of it. Even when the sky was nearly black, a strange glow lingered at the western horizon. Also, the event seemed to last longer than usual, although my eagerness to see the stars might have been the reason for this.

When true night did fall, it was a rare treat. Despite the cabin glow and wingtip running lights, the circumpolar constellations were startlingly visible. The sky was clear below, as well as above, so I also had a good view of the ground. White-orange light seemed to run

down roads and pool in towns. Lit up that way, the Earth didn't look much different from one of Hubble's deep field shots.

There were drawbacks, of course. No matter how much I craned my neck, I could see 40 degrees of sky at most. My seatmate's reading lamp created an annoying mirror effect. And the small child in 35F just wouldn't shut up.

But the majestic sight lent me peace, right through the ear-splitting touchdown and the long lines at immigration. So next time you have a red-eye flight, keep one of them open and fixed on a window. You'll get an exceptional look at what we all strain to see from the ground.

by Denise Kaisler

Volume 5 issue 11 October 1998

HAA Fall Star Party

For those of you who didn't show up at the HAA fall star party, this is what you missed. I have been observing for about 11 years and the conditions at Silent Lake were the best I have ever seen. I will go one step further and say that the conditions were spectacular. There was no wind, the temperature was comfortable and there were no bugs.

We knew that the sky was really dark so we checked the RASC handbook, which has a guide to rate the transparency. Each of us who tried was able to see the faintest star listed, which was magnitude 7.4! The Veil Nebula in Cygnus was easily visible in my 70mm f/6.8 at 14X with no filter. We may have glimpsed M33 naked eye but I wouldn't swear to it. At one point after midnight on Friday Atilla Denko, from the Ottawa Centre of the RASC, asked if we wanted to see Jupiter in his 25" Obsession that was equipped with binoviewers. He suggested that it would be worth losing our dark adaptation. I wasn't prepared for what I was about to see. I have N*E*V*E*R seen such a spectacular view of the planet. It was like looking at the finest colour drawing. Of course, I had to see what my 20" scope could do. Jupiter wasn't as good as I expected so I decided to check my collimation. It was way off even though I had collimated it when it was first set up, as is my usual practice. Since then I have noticed that during the night collimation goes off and needs to be checked periodically. Before you get concerned about your Newtonian scope there are a couple of factors that contribute to this. A truss tube design means the scope is set up just a little different each time, which

makes it necessary to collimate the scope whenever it is put together. On Obsession telescopes a nylon sling is used to radially support the mirror and this sling changes length with variations in temperature and humidity. With help, touching up the collimation takes only seconds so it is no real hardship. After that I was happy with the view. At 280X Jupiter was rock steady in the viewfinder. Jupiter's Great Red Spot was actually a dark rimmed pale oval with a small off-centre deep orange spot. There were 3 smaller spots leading away from the Great Red Spot. Another obvious feature was a large festoon on the North Equatorial Belt. Saturn at 375X looked wonderful, with pale brown banding on its "surface". You could drive the proverbial truck through the sharp edged Cassini's division. The B ring, which sits on the inside of Cassini's division, clearly displayed gradations in brightness and the C or crepe ring was obvious to me for the first time. When conditions are this good the time really flies. The first night we were up until 5 am. On Saturday night conditions weren't quite as spectacular but still better than anything you can see close to Hamilton. We only stayed up until 4am that night. As you can imagine, staying up late means that you don't get too much done during the day. In a way that's a shame since Silent Lake is such a nice provincial park.

Members of other clubs in southern Ontario outnumbered those of us from the HAA who went to Silent Lake. We had more inches of aperture per attendee than most star parties, with two 20" and one 25" scope plus other assorted scopes. We will repeat both our spring and fall star parties in 1999 so watch for the notices in Event Horizon.

by Stewart Attlesey

Volume 6 Issue 5 April 1999

An experience of a lifetime of experiences.

On Saturday March 27 at 2:00 p.m. I will be doing my last official public show at the William J McCallion Planetarium.

The show has three reasons for its existence. First it is a show for a small group of children. If you have children bring them along. Secondly it will be a training seminar for all those who would like to attend. Anyone that thinks that they might like to do shows in the future are strongly urged to attend. Finally, to anyone who has ever said, "Boy, I would really like to see how that Grant fellow gives his planetarium shows", this is your last chance.

Why would anyone want to give Planetarium shows? This is a very good question. The short answer is that over half of all of the club's revenue comes from these shows and therefore we are able to keep our dues down and still offer a great value to our members. However, this is not the reason that I do the shows. Firstly, whether my public is eight or eighty, I really like getting out, meeting people and passing on my love for astronomy to them. Public nights have become a sort of learning discipline; it gives me a direction in my astronomical studies, for in order to keep the shows lively not only must I keep current, I must also know my basics. I am not big on television; I would rather be active than passive. Finally, I must confess that I am a bit of a ham.

Not that I am foreseeing a massive turnout, but if there is, this is how the show(s) shall be run. Children first, trainees next, followed by members and their families, and finally the general public will be seated. I will not leave anyone out even if I have to do a dozen shows!

What better way to cap off over 21 years of giving public shows than by giving another public show?

by Grant Dixon

Volume 6 Issue 6 April 1999

Chair's Report

On March 27th Grant Dixon got quite a surprise when he showed up at the planetarium at McMaster University. He had intended to host a 'final' show and teach interested people how to give a planetarium show. Instead he found himself being honored for all the work he has done over the past 20+ years of giving planetarium shows. In the audience were many of his friends from the HAA and RASC plus his wife Doreen, his son Christopher, his daughter-in-law Krista, Doreen's parents Gord & Evelyn Gent and his mother June Merlin.

Grant is one of the founding members of the Hamilton Amateur Astronomers. He has held many positions since the HAA was formed in 1993. At various times he has been Chair, Second Chair, Councillor-at-Large and Web Page Coordinator. Most importantly, he has also held the position of Public Education Director during most of those years.

For over 20 years he has given countless Planetarium shows and has given the proceeds from these shows directly to the HAA or the RASC, Hamilton Centre. Over this time he has introduced thousands of people to the night sky. By giving these shows, people who have never been to the planetarium also benefit through the

low dues that the HAA offers. Grant is solely responsible for the healthy financial condition of the HAA.

In appreciation of all those efforts, the HAA and the RASC, Hamilton Centre both presented Grant with lifetime memberships and the biggest slide rule you have ever seen. You may wonder what a slide rule has to do with astronomy. He doesn't use one to calculate asteroid orbits but Grant is a collector of slide rules. After the presentations and some refreshments Grant treated us to one of his famous planetarium shows. Special thanks go to Ann Tekatch for all the organizational work that she put into Grant's presentation.

I have a couple of web sites for you to check out this month. A really nice compilation of deep sky objects can be found at the site "Adventures in Deep Space" located at <http://www.angelfire.com/id/jsredshift/>. Jere Kahanpaa has a web site with hundreds of great sketches of deep sky objects appropriately titled "Deep Sky Sketches". The URL is <http://www.helsinki.fi/~jkahanpa/>.

Don't forget, it's time to start making plans to attend the HAA star party on the weekend of June 11/12 at Silent Lake.

by Stewart Attlesey

Volume 7 Issue 7 May 2000

Last Night
April 12, 2000

Last night

I stepped from my real world
into one infinitely greater.

With the opening of a door
I left all that experience had provided me
and stepped into a world
unstoppable in its magnitude.

Leaning back into the truckbed
I gazed heavenward
Dwarfed by the fullness
Of what nature had given me.

There in the silence
And serenity of night
I saw perfection.....
The moon and each encircling star
Enrobed in clarity
An ocean of infinity
Encompassing them

And for one brief moment

The only sounds to split
the stillness
Came from
Inside my head.

by Barbara Bentham

Volume 8 Issue 9 Summer 2001

If you have been observing this summer, you may have noticed some of our winged “friends” hanging around, sucking blood, and generally being a nuisance. In the spirit of “knowing your enemy”, I have sought to learn more about these beasts. I have no illusions that this will aid me in being bitten less often -mosquitoes have been on this earth much longer than humans and I’m sure when their most delectable species is no longer around, they will make due.

First, you should know that only the females bite. There. I’ve said it - despite it probably not being politically- correct. What do the males eat? Steak and eggs, of course! No ... actually they eat ... nectar - and they call themselves males! The females actually can get by on nectar, too, unless they want to produce a brood of eggs - they need their “blood meal” for the extra energy required for this activity. The itching is caused by a substance the female injects to prevent the “bite” from clotting while she loads up with blood. If there is a vertical surface nearby, you will frequently find that the females heads over to it to rest immediately after dining. (If you get bitten while sleeping, this is useful knowledge to allow you to seek revenge!)

The female lays her eggs in still water. So if you want lots of mosquitoes, it is an excellent idea to build your observatory near a marsh.

How do the male and female find each other? Personal ads, usually. Well, not exactly. It turns out that the wingbeat frequency of the female is well-matched to a very peculiar set of antennae of the male mosquito’s head. The male will “go for the gusto” if it hears the appropriate, species-specific buzz. (The male mosquito also has a wingbeat frequency, but fortunately for all concerned, it is typically a few hundred cycles per second higher in pitch.)

There are a number of “attractants” for female mosquitoes. Exhaled carbon dioxide, lactic acid, and sweat have all been reported as having some attractant value. None is overwhelmingly more important than the other. Having warm, exposed skin is certainly a plus, as

far as female mosquitoes are concerned. While a number of chemicals have some repellent value, none come close to “DEET” in effectiveness.

Mosquitoes seem to take flight in great numbers about 20 minutes after sunset, so illumination level is clearly a trigger in terms of how active they are. Temperature and relative humidity also are important.

You might be amused to know that ultrasonic devices have been repeatedly shown to have no repellent value whatsoever. Not too surprising for a bug which mainly is tuned to a frequency slightly above middle C!

It would be very interesting to find out which species we have here in the Hamilton area. If it gets cloudy some night you are observing, think about collecting up some little beasties for identification. If we get organized, maybe we can make some recording of female wingbeats and see if we can tell the species apart from each other!

by Doug Welch

Volume 9 issue 9 Summer 2002

Hey! Who put those Stars there?

Being a relatively new amateur astronomer (or is that an amateur, amateur astronomer?), I am quickly learning, has some grief and frustrations. The payback for all of this is the joy of finding and seeing something for yourself, for the first time. A great example of this was May 3, 2002.

It was supposed to be relatively good for viewing, so I told my wife I was going to go to Binbrook to the astronomy thing (that actually should read “Honey, but all the other people are going to get to go out and play with their telescopes, so can I, pleeeeee go to?”). I called Stewart and he arranged for me to pick up key and lock. I went out - others would show up - was a beautiful night, a little crisp, but beautiful.

Jump ahead to me, standing alone in the Binbrook Conservation area, looking up at the sky and asking “Who put all those ***** stars there?”, “This doesn’t look like the sky I am used to from my backyard!” Lesson 1: Dark(er) skies can be at first confusing when you are accustomed to seeing them from the city or suburbs.

I start with what I know (which may not be a great starting point but it is all I have). I find M51, but something isn’t right; I see more detail than from my Dundas home, but where is all the intricate detail I see in the pictures from Hubble or in Sky and Telescope. Lesson 2: An 8” telescope will show you what an 8” telescope will show, even under the best conditions don’t expect too much. But the view is much better than from home.

I happily navigate through my list of targets, then I decide to take a break and just look with my own eyes. Low and behold, again I am confused. What is that fuzzy patch I see with somewhat averted vision. I don't even know what constellation that is in! Well, that is Leo to the east, there is Gemini to the west, hmm. I consult my star maps and field guide - Cancer? That can't be right? Hmm, then that fuzzy patch is M44! The Pre, no the Pray, no it is pronounced the Pr ah, the heck with it - the Beehive. I view it through the telescope. I don't even try to draw it in my logbook. I simply write "beautiful, stunning, amazing"

I continue playing, but slowly notice that the views are suddenly very poor. Did the secondary mirror move? Do I have condensation on the mirrors? No and No. Lesson 3: Eyepieces left on the ground during a heavy dew is a bad thing.

Maybe next time, I won't be 24 hours early and I will get to see some of you! (ps. Note to self: don't leave your observing stool in the driveway next time)

by Greg Emery

Greg Emery is a new member of the HAA and has only been active as an amateur astronomer for about 1 year. Greg's interests in astronomy lean more towards deep sky objects as opposed to planetary observing. In addition to observing, interests also include optics design and amateur telescope making.

Volume 10 issue 9 Summer 2003

MARS - From Dream to Reality 07/17/03

A frost fence separated the park from the apartment building I'd lived in around 1970. Another enthusiast was there, trying to decide the best place to view the Mars/Moon conjunction. I suggested the apartment's parking lot and she found a place we could slip through the fence. The hill up to the pavement was snowcovered, but once there a few spaces were available for setting up. I looked skyward. I couldn't see Mars yet, but the Moon was full and sitting next to a Hyades cluster like I'd never seen with about two-dozen red stars interspersed with a dozen or so bright yellow ones. As I cast my eye about, bright red and yellow stars were everywhere. A couple more astronomers drove up and proceeded to unload equipment. Thinking I'd better bring my car over while there was still space I headed for my 1969 Dodge Charger; but before I got there the alarm I'd set for 4:15am went off, waking me. It was time for the real thing!

I scanned the living room to locate the cat then stepped around her to reach the west-facing front door. Lunar rays illuminated the street though I couldn't see the source. Through a window to the South, the Moon sat high and bright above the few wispy clouds that hugged the horizon. I called softly to Gail as I passed the bedroom, "Are you awake?" "Trying to be," was the sleepy reply.

Our 6" reflector was on the deck under its Desert Storm cover, the binocular box with the 10x50's inside sat beside it, both covered with a light dew. By naked eye, the sight of a glinting topaz chip accentuating a brilliantly etched orb was alone worth the price of admission. With the binocular/mirror box combination there was a slight flaring of the planet but a couple of stars entered the picture giving a nice size and colour contrast.

Gail came out as I attached a Moon filter to the 21mm Pentax eyepiece. Through slight turbulence a myriad of craters, peaks and rilles along the terminator swam into view. A little nudge of the scope and there, inverted, was Mars jauntily wearing its cap of South Polar ice! Barely detectable changes of hue teased across the planet's surface and I switched to an orange filter which enhanced the cap a bit but didn't make an appreciable difference on any other features. The 7mm Pentax bumped the power from 57x to 171x. With a light green filter, again the ice cap was prominent but other details were hard to discern. Moon glare also caused a reflective kidney bean effect that is not normally present. Perhaps the most pleasing view of the pairing was a barlowed 21mm with Moon filter. At 114X, this gave a happy combination of magnification, sharpness and content.

At 5am Gail decided she'd sacrificed enough sleep and left me mixing and matching optics. Dawn was brightening in the East and the early bird could be heard chirping in the distance. Telescopic, binocular, and naked eye, I committed each view to memory, then began to pack up. Racing to the Walnut tree only Farley, our dog, knows how close I came to being ravaged by a pair of Canadian killer squirrels. It had been a good night for such a rare sight.

by Glenn Muller

Glenn is the Publicity coordinator for the HAA. You can read more of Glenn's work in the September 2003 edition of Astronomy Magazine where he reviews "Astronomy with a Budget Telescope" by Patrick Moore and John Watson



Hurricane Team Work

by Dr. Tony Phillips

On a gray breezy day last month thousands of people got in their cars and reluctantly left home. U.S. east coast highways were thick with traffic. Schools were closed. Businesses shut down.

Perfect!

When powerful Hurricane Isabel arrived some 38 hours later nearly everyone in the storm's path had fled to safety.

Days later Vice Admiral Lautenbacher, in a briefing to President Bush, praised the National Atmospheric and Oceanic Administration (NOAA): "Without NOAA's excellent track forecasts, hurricane Isabel's toll on lives and property would have been even more devastating. This is NOAA's first year of providing 5-day forecasts-and the 5-day forecast for Isabel was as good as our 2-day forecasts have been over the last decade."

Many people in NOAA played a role. A team of pilots, for instance, flew Gulfstream-IV High Altitude Surveillance jets right up to the approaching hurricane, logging 25,000 miles in the days before landfall. Their jets deployed devices called dropsondes-little weather stations that fall toward the sea, measuring pressure, humidity, temperature and wind velocity as they plummet. The data were radioed back to the aircraft and transmitted to forecasters on shore.

While two Gulfstream-IV crews flew night and day around the storm, a NOAA satellite named GOES-EAST monitored Isabel from above. (GOES is short for Geostationary Operational Environmental Satellite.)

From an orbit 22,300 miles above the Atlantic Ocean, GOES-EAST had a unique view. "It could see the entire hurricane at once," says Ron Gird of NOAA. "Scientists used infrared spectrometers onboard the satellite to estimate the height of the storm clouds, their temperature and water content. GOES can also measure the temperature of the ocean surface-the source of power for hurricanes."

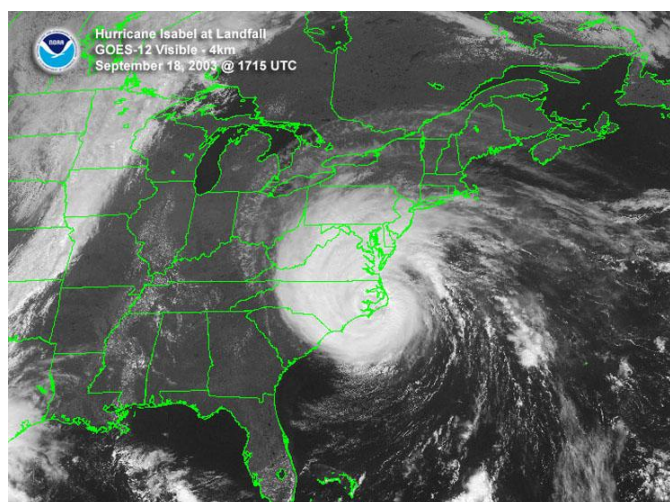
Constant streams of data from GOES and the Gulfstream aircraft were fed to supercomputers at NOAA's Environmental Modeling Center in Maryland where sophisticated programs, developed over the years by meteorologists and programmers, calculated the storm's most likely path.

Supercomputers. Satellites. Jet airplanes. Scientists. Programmers. Pilots. It took a big team using a lot of tools to predict where Isabel would go-accurately and with time to spare.

Says Vice Admiral Lautenbacher: "I hope everyone at NOAA shares the pride of being part of a team effort that so effectively warned the public of impending danger and enabled citizens to take action to protect themselves and their loved ones."

Well done, indeed.

To learn more about the GOES, see www.oso.noaa.gov/goes/. For kids, the SciJinks Weather Laboratory at scijinks.nasa.gov has lots of fun activities and fascinating facts about the wild world of weather.



GOES-East satellite image of hurricane Isabel as it makes landfall on September 18, 2003 at 1715 UTC.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

10th Year
Anniversary Banquet



Many thanks to these donors for their generous contributions of door prizes for the HAA 10th Anniversary Banquet.



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December 2003

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12 Geminids meteor shower until the 14th HAA General Meeting Hamilton Steam Museum	13
14	15	16	17	18	19	20 Observing Night
21 Observing Night	22	23	24 Christmas Eve	25	26	27 Observing Night
28 Observing Night	29	30	31 New Year's Eve			
			For observing info, call Stewart Attlesey 827-9105, Rob Roy 692-3245, Glenn and Gail Muller 945-5050, http://amateurastronomy.org/events.php		November 2003	
					January 2004	
					1 2 3	
					4 5 6 7 8 9 10	
					11 12 13 14 15 16 17	
					18 19 20 21 22 23 24	
					25 26 27 28 29 30 31	