Hamilton Amateur Astronomers

Event Horizon

March 1998 Volume 5 Issue 5

Continuing Saga of the Winter Star Party

- *Oksana and Lou Darcie*

As a famous philosopher once said, "... to err is human, but it still pays to have a good bank account ..."

With our van all loaded with our two scopes and other things necessary for a three week sojourn, and our trusty tent trailer trailing along behind, we left the cloudy skies and cool temperatures of southern Ontario, and traveled along the 401 to Windsor and then on to I-75. The date was 19 January 1998, a Monday with the temperature at 3 degrees C. A beautiful travelling day, dry roads and unlimited visibility.

Our first stop was Wapakaneta Ohio, where we overnighted in a nice motel. Now there always seems to be some question here as to why we do not find a camp ground and set up the tent trailer. My response to that is as follows: It is much easier and definitely more convenient to stay overnight in a nice warm motel with a queen size bed, tub and shower for the nominal fee of $25 US than to spend $32 at a camp site. Enough said.

Whenever we crossed a state line, within a mile of such a crossing there would be a Visitor Welcome Center, where we could and did retrieve such things as road maps, discount coupons for food and lodging, and a friendly welcome. So we were prepared for anything that we might encounter. For any of you who watch the weather channel on the television, you could not help but be made aware of the inclemency of the weather in various parts of the united States. I was terrible. As we traveled further and further south, we were amazed at the weather that was behind us, and also in front of us.

The biggest scare came the morning we were in West Plam Beach, Florida. The night before as we sat around the swimming pool playing cards while we waited for the washing machine to do its thing, we were informed by the tele out there that some formidable weather was on the way for our area. Ah yes, and so it was. We woke the next morning to the sound of torrential rain, (unofficially 3 inches an hour) and I made a quick decision, and that decision was to vacate that area as soon a possible and head south away from the storm. This we did, and approximately 30 to 40 minutes after our departure, an twister ran right through the area we just left, leaving a mess in its wake.

By this time we were driving in the sunshine on bone dry roads. And so it was all the way to the keys, and all the way back. The storms were either ahead of us or behind us, while we travelled in the sunshine.

AT last we arrived at the Big Pine Key in lots of time to be 43rd in line to get into the site. We selected our site, got the tent trailer all set up, were about to relax, and it started to rain. No big deal. Florida is like that, a sudden cloudburst then sunshine. It gave us a chance to tour the campground and meet a lot of people. And there were a lot. Germany was represented, so was Austria, England and the Netherlands, a nice representative group from Canada, an also Mexico. As at all star parties, the dominant scope was the Dobsonian, ranging from 4 inches to a mammoth 36 inches. Yes, the yard scope was back. It was finally purchased with the donations given over the last two years, and it is now used as an educational tool, touring various countries. It will be in Halifax, Nova Scotia over the Labour Day weekend.

Speakers at the seminars were top grade. Jack Newton had some fabulous pictures which he put on CD-ROM. I have the disc and if any member would like to view it for a weekend , that can be arranged. Jack's wife, Alice, had a spot on the program also. She talked on hu-

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Editorial

I had been planning on writing a fairly substantial editorial this month on the lecture by Dr. Jill Tarter (of SETI fame) at the University of Toronto. However, we have a such a jam-packed issue that I'm going to have to stick to necessary info only!

Articles can be e-mailed to

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You can mail your hand written, typed or on-disk articles to:

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If there is anything you'd like to see (or have had enough of) please don't hesitate to let me know.

-Tracy Webb

Chair's Report

The fifth birthday of the Hamilton Amateur Astronomers is coming up this fall. We plan on having a special issue of Event Horizon with a colour cover to mark this event. We would like the image to be an astrophoto from one of our own members so we are going to have a contest to select the best one. The final day for submissions will be the September general meeting. The only rules are that the picture should be in colour and taken by a member of the club. A print or an electronic copy of a CCD image or a scan of a slide or print would be great. Slides may pose a problem unless we can find someone who has a slide scanner. You have the whole summer to take pictures but it's not too early to start planning.

We are making a small change to our annual star party this year. It was decided to try to book a group campsite at Silent Lake Provincial Park for the weekend of June 19-21. The alternate weekend is June 26-28. The last few star parties have been at the York Soaring Club near Arthur but the sky at that location isn't the greatest. Watch for further details in the April issue of the newsletter but we would appreciate it if you could let us know as soon as possible if you are interested in attending.

In my Chair's Report for the January issue I talked about the just launched Lunar Prospector mission. One of the goals of the mission was to confirm the finding of water on the moon by the Clementine space probe in 1994, I'm sure that most of you have heard the news this past week that water has been found. Preliminary estimates of the quantity are as high as hundreds of millions of tonnes. This is more than enough to establish a permanent bas on the moon!

- Stewart Attlesey
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HAMILTON AMATEUR ASTRONOMERS

The 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 a minimum of 10 times a year.

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

Stellar Concerto In Three Movements

- Denise Kaisler

It's almost time for the vernal equinox. And you know what that means.

Or do you?

Chances are that if you're reading this fine monthly publication that you have at least a passing familiarity with the vernal equinox. Most likely, you're also familiar with its popular cognomen "the first day of spring". Perhaps you've even associated it with some special night a month or so hence. You know what I'm talking about. It's that glorious evening when you can finally stop wearing your big ol' parka at the telescope.

But the vernal equinox is more than just a seasonal marker. A great deal of astronomy lurks in this little point in spacetime. Let me fill you in.

The absolute basics :

Many astronomical reference points can be traced to the Greeks, most of whom (but not all of whom -- more on that another time) thought that the Earth was stationary and the stars were just dots on a the inside of a big bauble known as the celestial sphere. Stargazers of that bygone era noticed that the Sun always seemed to follow the same path among the "fixed" stars. This path is known as the ecliptic. It represents the yearly motion of the Sun.

Another handy reference is the celestial equator, which is just the Earth's equator projected outward, onto the celestial sphere. Now, imagine you're an ancient Greek astronomer. To you, the Sun appears to cross the celestial equator twice a year, once when it's entering the northern celestial hemisphere, and once when it's leaving. On the day of the crossing, there are 12 hours of light and 12 of darkness.

But which of these two crossings is the vernal or spring equinox and which is the autumnal? Well, that depends where you live. An earthly hemisphere has its vernal equinox when the sun enters the corresponding celestial hemisphere. So this month, when Canadians celebrate their vernal equinox by doffing their toques, Australians will be marking their autumnal equinox by donning whatever passes for a toque down under.

Oh, and another thing. Even though most people associate an equinox with a day, it's really just a point in time. To professional astronomers, it takes only an instant for the exact center of the sun to cross the celestial equator. The times of the next three vernal equinoxes are as follows:

03-20-1998 19:54 UT (subtract 5 hours for EST)
03-21-1999 01:46 UT
03-20-2000 07:35 UT

More Involved Things:

Okay, so the equinoxes are just the points at which two great circles, the celestial equator and the ecliptic, cross. No problem.

Things get hairy when we bring in the constellations.

To start with, let me define the zodiac as those twelve groups of stars which lie along the ecliptic. I can do this because there's a precedent : Greek astronomers were doing it when your great (to the power of n) grandmother was still a virgin.

These same astronomers noticed that their vernal equinox occurred when the Sun was in the constellation of Aries. This seemed to give the Ram significance. Thus, the Greeks built their astrology around this coincidence. Unfortunately, they did all this before anybody realized that both the vernal equinox and its autumnal counterpart move relative to the zodiac.

This movement, or precession of the equinoxes, happens because the universe isn't perfect. First of all the Earth isn't completely spherical. It bulges in the middle, much like HAA members who eat too many burgers after the meetings. Secondly, the Earth's axis is tilted 23.5 degrees relative to the plane of its orbit . This tilt allows the Sun (and to a lesser extent, the moon) to exert a gravitational pull on the Earth's bulge. The result is a torque(*) that pulls the Earth's axis in a lazy circle.

There are three major consequences of all this tugging. First of all, the position of the celestial north pole changes. These days, the sky rotates around a point that is within one degree of Polaris, but when the Egyptians built the Great Pyramid at Giza in 2600 B.C., the North Star was Thuban, or Alpha Draconis.

Changing stellar coordinates are a second result of precession. As anybody who owns an old star atlas knows, the right ascensions and declinations of celestial objects change over time. That's why modern star atlases attach a year, or epoch to their alphas and deltas. The exact way in which this change happens is too complex to outline here, but the super-nerdly or insatiably curious (pick your label) should check out the kick-butt section on "precession" in Eric's Treasure Trove

Rahoo Ohm Chan, the First Thai Eclipse

-As told by Char Karnchanapee
http://www.rci.rutgers.edu/~karnhan/
-Edited by Denise Kaisler
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Once, long ago, in a country we know as Thailand, there lived a husband and wife named Nai Arthit and Nang Chan. They kept a servant who was called Nai Rahoo.

One day there was a festival at the Buddhist temple in town. All three set out for the temple in good spirits, but when they arrived, they realized that they had forgotten to bring along their rice bowl and the wooden spoon used for stirring the rice. The couple immediately told Rahoo to hurry home to get them. Rahoo obeyed, but in his haste he forgot the wooden spoon.

When Rahoo returned without the spoon, Nai Arthit snatched the rice bowl away, scolding and beating him soundly. "miserable wretch", Nai Arthit cried, "go back and get the wooden spoon, or I'll have your hide!"

As they waited for the return of their hapless servant, Nai Arthit and Nang Chan grew more and more livid. When Rahoo came back and handed over the wooden spoon, they were so furious that they grabbed the big wooden spoon away and struck Rahoo full in the face with it.

Poor Rahoo could not help but burst into tears. Here he had exhausted himself to please his lord and lady, yet they had beaten and shamed him before all of the people at the festival. With an angry heart, Rahoo prayed to the lord Buddha that in their next lives, both Nai Arthit and Nang Chan should be made to feel the shame that they had heaped upon their loyal servant.

The Lord Buddha heard Rahoo's prayer. Thus, in the next life, Nai Arthit was reborn as the Sun and Nang Chan as the Moon, serving her husband by revolving around him eternally. Yet always, they are pursued by their former servant Rahoo. Whenever he catches up to them, he immediately strikes them with all his might. If he strikes them full in the face, there is a total eclipse and if he manages only a glancing blow, there is a partial eclipse.

Thus, at every eclipse, the Sun and the Moon are shamed in the presence of all mankind, just as Rahoo was once shamed.

When an eclipse occurs, Thai people bring out their drums, their gongs, and many other kinds of musical instruments. They play their instruments, shout, or do anything they can to make noise. This sets up such a clamour that Rahoo is frightened away ... until next time.

Dial M for ...

- Doug Welch

In the news and at recent HAA meetings, an images of the beautiful planetary nebula M2-9 was shown, taken by the Hubble Space Telescope. It was clear that M did NOT stand for Messier in this case and after several people asked me and I had to admit that I didn't know, I decided to rectify the problem.

The answer is that it stands for "Minkowski" - an astronomer at Mount Wilson. He made a catalogue of objects which showed up on low-resolution "objective prism" surveys as stellar objects with bright emission lines in their spectra but no underlying "continuum" of colours. This means that the object's light must be coming from a nearly transparent cloud of hot gas. Objective prisms were large prisms which were placed over the front of the objective of Schmidt cameras or astrographs and produced short little spectra for each star in the field (sometimes overlapping!)

One of the reasons that this catalogue (or more accurately, this set of catalogues) is not especially well known to amateurs (or professionals :)) is that the objects appeared to be quite stellar in most cases. That is, they didn't have lots of obvious structure and so, as a group, they weren't all that fun to look at! However, they should be "duck soup" to locate with a light-pollution rejection filter, or even better, a direct-vision spectroscope and it would be interesting to see if any of them show visible structure through amateur telescopes.

Below is the whole set of references and the nomenclature adopted from them as found on the "Centre de Donnies astronomiques de Strasbourt" webb site http://cdsweb.u-strasbg.fr/. Let me know if you find any of them!!

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Star Party Cont ...

(Continued from page 1)

mour. Astrophotography was high on the topic list also, and this year, there were many more CCDers on the site. Some of the pictures taken were absolutely breathtaking, and at the final day of the camp, some of those pictures were given as door prizes. Oh, by the by, the door prize this year was an 8 inch LX200. Yours truly won a 20x50 spotting scope.

As usual, the Horsehead Nebula was the big thing to find, and find it we did. It is still awesome to see it though the 36 inch scope. One other item of interest was IC416. It resembled a dot in a ring with the ring being quite bright, and pink in colour. Eta Carina was there for we northerners to enjoy, as well as Omega Centaurae.

There was some consternation one evening, when right in the middle of viewing, two shrimp boats flooded the area with high intensity lights. It seems that the light attracts the fish, making it a snap to get a net full.

We did a lot of observing in Ursa Major, checking out all the action around M101, M108, M97, all in the Ursa Major area. Later all the sights around the Andromeda Galaxy were brought forth. It is amazing what one sees in space when looking through a 36 inch telescope.

On the way out of Palm Beach, we stopped at a little Planetarium and had a wonderful session on the Hubble story. Lots of good pictures, music and dialogue. It was the Calusa Nature Center and Planetarium, in Fort Myers, Florida. This place is really out of the way, and we got there just in time for the 1330 hours program. We were told not to rush, because there were only three other people there. As I said, it was a small place and not really on the beaten path.

Again, it is really worth driving to the Keys for such a Star party. During the day, fishing was good, We even tried our hand at deep sea fishing. Wow, you should have seen the one that got away.

On our way back to Rockwood, we passed through the mountains of Tennessee. The night before we passed through the area, they had a dumping of almost three feet of snow. Similarly, when we passed through Kentucky. The trees were so heavily laden that their branches were dragging on the ground. The roads were completely dry. Just to show how well we were being protected, we left Rockwood with five gallons of windshield washer fluid. We returned to Rockwood with one pint less than five gallons. It was awesome. Hopefully some of you will be able to take this trip in the future. It is a beautiful experience.

Clear Skies and warm weather ...
Oksana and Lou Darcie
Astronomaires Extraordinaire

Stellar Concerto Cont ...

(Continued from page 3)

of Physics at http://www.astro.virginia.edu/~eww6u/physics/physics0.html.

Finally, equinoctial (or lunisolar) precession means that the equinoxes do indeed move. The direction is westward along the ecliptic and the rate is about 50.26 arcseconds per year. Jupiter and the other planets also play with the Earth in the same way as the Sun and Moon do, except they torque the Earth in the opposite way. This "planetary precession" causes the vernal equinox to move eastward along the ecliptic by 0.12 arcseconds per year. So over the last two millennia, the position of the vernal equinox has shifted by about 28 degrees. Or, as an astrologer would say, it's gone from being on the cusp of Aries, to the cusp of Pisces.

Now : go ahead and tell me you knew all that.

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(*) Hey! Don't flip out because someone mentioned the word "torque". A torque is just a force applied in such a way that it spins something. Every time you tighten a wrench, or turn a doorknob, you exert a torque. So chill.

Dial M Cont ...

(Continued from page 4)

MINKOWSKI R.

Publ. Astron. Soc. Pac., 58, 305 (1946)
>> New emission nebulae.
-> Table 1: <PN M 1-NM> (nos 1-1 to 1-80) . Table II: <Min 1-NN> (Nos 1-81 to 1-103)

Publ. Astron. Soc. Pac., 59, 257-259 (1947)
>> New emission nebulae (II).
-> Table 1: <PN M 3-NM> (Nos 2-1 to 2-56). Table II: <Min 2-NN> (Nos 2-57 to 2-74)

Publ. Astron. Soc. Pac., 60, 386 (1948)
>> New emission nebulae (III).
-> Tables I, II: <PN M 3-NN> (Nos 3-1 to 3-55). Table III: < Min 3-NN> (Nos 3-56 to 3-62)

Minor Bodies 1998

- Raymond Bagerow

This article deals with upcoming events among asteroids and comets for th following year.
- Note: This is a corrected version of an article which appeared in the January issue

Table 1: Forthcoming Close Approaches to the Earth (<0.2 AU)

Object (and Name)	Encouner Date	Distance (AU)
3361 Orpheus	1998 Feb. 12.78	0.1668
6037 1988 EG	1998 Feb. 28.91	0.0318
6037 1994 AH2	1998 June 17.56	0.1930
6037 1987 OA	1998 Aug. 20.55	0.1092
1865 Cerberus	1998 Nov. 24.75	0.1634
1865 1996 FG3	1998 Nov. 25.75	0.0386
1865 1989 UR	1998 Nov. 28.71	0.0809

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Constellation of the Month: Gemini

-Margaret Walton

The two bright stars of Gemini have been noticed and interpreted by many ancient civilizations. In Egypt they were a pair of sprouting plants, the Phoenicians thought they were a pair of kid goats. In Mesopotamia they were a pair of naked boys, and in Rome they were Romulus and Remus, the legendary founders of the city.

In Greek myth they were Castor and Pollux, the sons of Leda by different fathers. Castor was the mortal son of Leda and King Tyndareus, her husband, but Pollux was the immortal son of Leda and Zeus, who came to her disguised as a swan. They were born at the same time, from two eggs laid by Leda. The brothers were identical and raised together. They were inseparable. Together, they joined Jason and the Argonauts to search for the Golden Fleece.

On their final adventure, they went to Arcadia with two cousins to raid cattle. The cousins betrayed the twins, and killed Castor. Pollux was saved by Zeus, but didn't want to live without Castor and asked Zeus to remove his immortality. The twins were placed in the heavens as a reward for their brotherly love.

The next month will be a good time to explore Gemini before it moves out of range for the summer. Gemini is located in the east edge of the winter Milky Way.

STARS

Pollux Although this is the beta star, it is the brighter of the twins at mag 1.1. It is a K-type star, orange in appearance, and is about 36 light years away.

Castor This is the alpha star and has a mag of 1.6. It is a system of 6 stars, 3 pairs of binaries. It is about 47 light years away and has a white appearance.

Eta This is a semi-regular variable. Its magnitude range is 3 to 3.9 and its period is about 233 days. It has an invisible binary companion which can pass in front, causing the

(Continued on page 8)

- *continued from page 6*

Table 2: Timing of Cometary Apparitions

Name of Comet	Date of Closest Approach (T)	Longitude of Earth at T	Longitude of Comet at T	Comet Ahead by (days)	Peak Magnitude
130P/McNaught-Huges	Feb. 23.76	153	313	162	17
55P/Tempel-Tuttle	Feb. 28.06	158	63	-96	9
104/Kowal 2	Mar. 2.18	160	77	-85	15
129P/Shoemaker-Levy 3	Mar. 4.95	162	124	-40	17
C/1997J2 Meunier-D	Mar. 9.29	167	330	160	10
C/1997G2 Montani	Apr. 15.8	204	265	58	15
62P/Tsuchinshan 1	Apr. 19.07	208	118	-93	13
68P/Klemola	May 1.67	220	329	106	14
49P/Arend-Rigaux	July 12.60	289	92	-201	15
80P/Peters-Hartley	Aug. 11.74	317	238	-83	14
P/1991 V1(S.-L. 7)	Aug. 25.27	331	45	-291	18
83P/Russell 1	Aug. 26.11	332	200	-137	20
88P/Howell	Sept. 27.25	3	291	288	11
93/P/Lovas	Oct. 14.16	20	54	34	13
98P/Takamizawa	Nov. 7.97	43	272	228	15
P/1983 J3(Kowal-V.)	Nov. 15.18	52	220	167	17
21P/Giacobini-Zinner	Nov. 21.92	58	8	-51	9

*** Bolded entries are favourable returns.**

In addition, 2 NEA's will be coming into the range of amateur astronomers. They are 132 Aethra, a Mars crosser and 1036 Ganymed, an Amor object. These objects will reach 9th magnitude at their oppositions on Dec. 29th and Nov 4th respectively. There will also be a transit of the Earth as from the asteroid 2 Pallas at its opposition on 1998 September 16, at the descending node. I have simulated this event using the program Redshift 2. A similar transit occurred on 1968 March 13 which happed at the ascending node of the asteroid's orbit.

Gemini Cont ...

(Continued from page 6)

magnitude to fall. It is an M-type star with an orange appearance.

Zeta Zeta is a Cepheid variable with a magnitude range of 3.7 to 4.3 and a period of 10.2 days.

OBJECTS TO SEE IN GEMINI

M35 (NGC2168) M35 is an open cluster visible to the naked eye and with 7X binoculars. It is a bright (mag 5.1), very large cluster containing about 200 stars. It is about 2800 light-years away.

IC2157 Open cluster of mag 8.0. With a low power eyepiece both M35 and IC2157 should be visible in the field of view.

J900 A tiny planetary nebula - mag 11.7.

NGC2158 Open cluster of mag 5.6 containing about 100 stars.

NGC2266 Open cluster of mag 9.5 containing about 50 stars.

NGC2304 Open cluster of mag 10.0 containing about 30 stars.

NGC2339 Bright, large round galaxy of mag 11.6.

NGC2355 Small open cluster of mag 9.7 containing about 40 stars.

NGC2371/72 Planetary nebula of mag 11.3. It appears as a small, roundish disk consisting of two lobes.

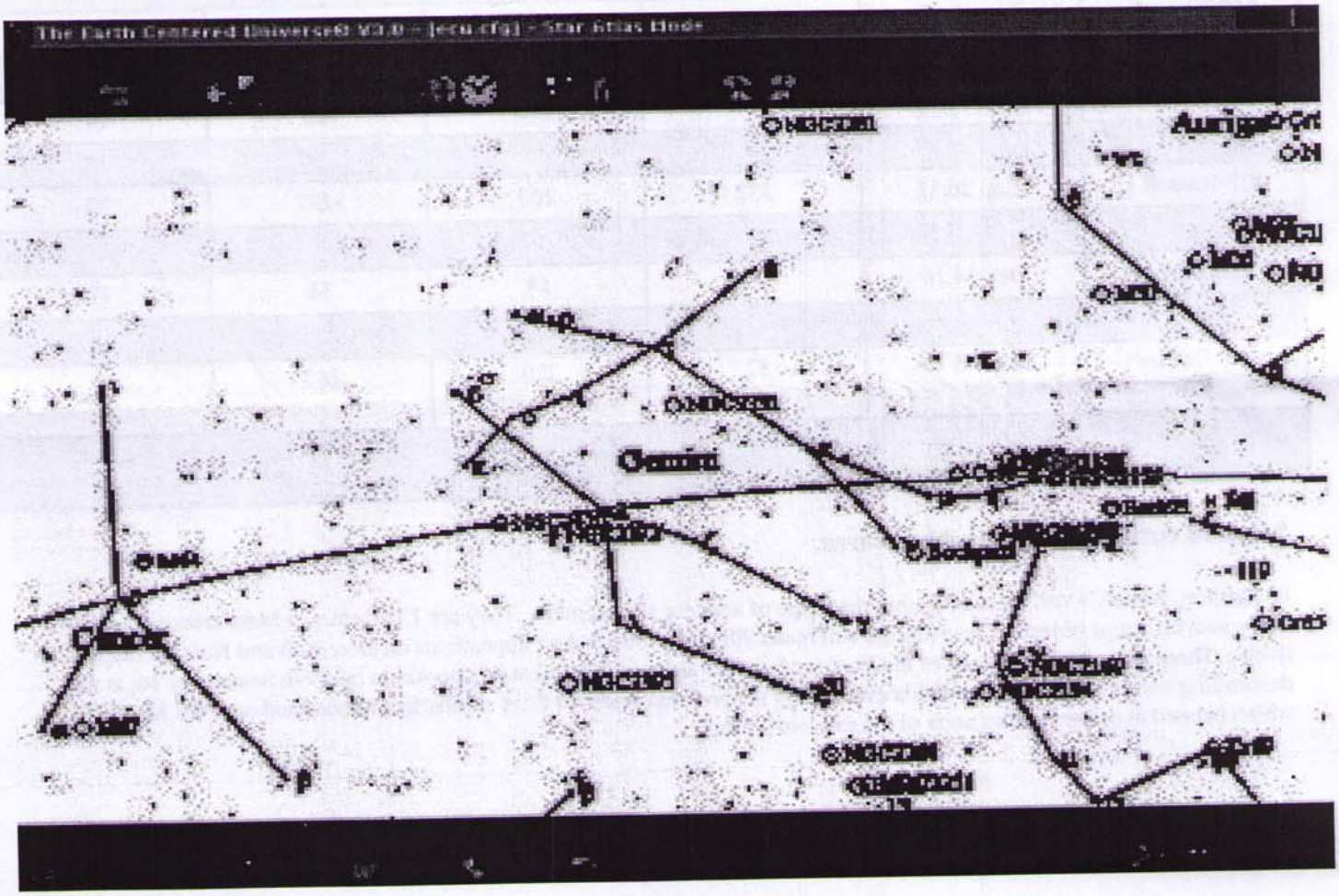
NGC2392 Eskimo Nebula. Round planetary nebula of mag 9.1. The central star is visible and there are traces of ring structure.

NGC2395 Open cluster of mag 8.0 containing about 30 stars.

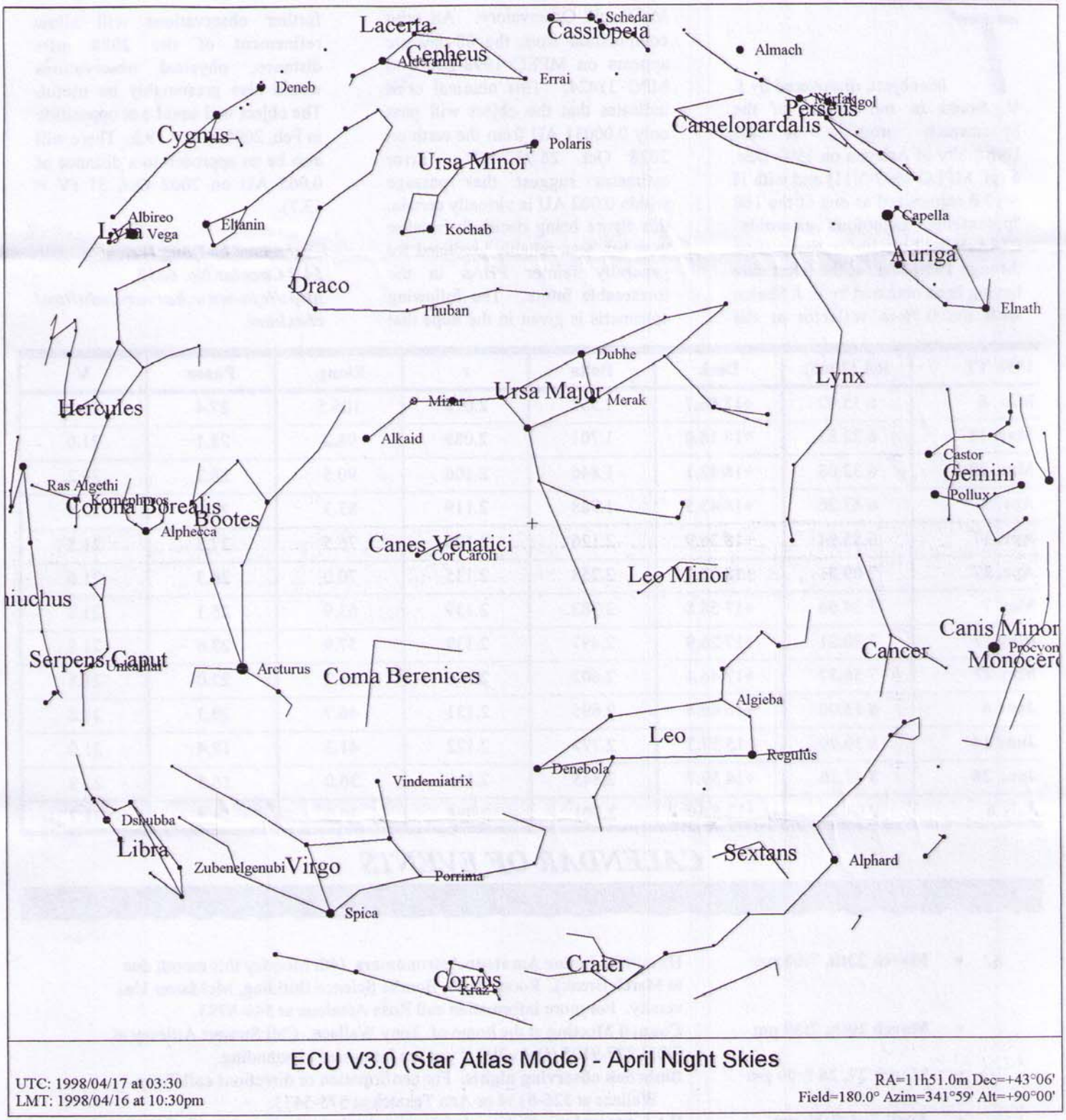
NGC2420 Large, rich open cluster of mag 8.3 containing about 100 stars.

REFERENCES

Burnham's Celestial Handbook, Robert Burnham Jr.
Exploring the Night Sky with Binoculars, Patrick Moore
The Starlore Handbook, Geoffrey Cornelius
Hawaiian Astronomical Society Web Site



April Night Skies



ECU V3.0 (Star Atlas Mode) - April Night Skies

UTC: 1998/04/17 at 03:30
LMT: 1998/04/16 at 10:30pm

RA=11h51.0m Dec=+43°06'
Field=180.0° Azim=341°59' Alt=+90°00'

Potentially Hazardous Asteroid in 2028

This object, discovered by J. V. Scotti in the course of the Spacewatch program at the University of Arizona on 1997 Dec. 6 (cf. MPEC 1997-Y11) and with H = 17.0 recognized as one of the 108 "potentially hazardous asteroids" (PHAs), has been under observation through 1998 Mar. 4, the latest data having been obtained by P. J. Shelus with the 0.76-m reflector at the McDonald Observatory. An orbit computation from the 88-day arc appears on MPEC 1998-E13 and MPC 31424. This nominal orbit indicates that the object will pass only 0.00031 AU from the earth on 2028 Oct. 26.73 UT! Error estimates suggest that passage within 0.002 AU is virtually certain, this figure being decidedly smaller than has been reliably predicted for generally fainter PHAs in the foreseeable future. The following ephemeris is given in the hope that further observations will allow refinement of the 2028 miss distance; physical observations would also presumably be useful. The object will next be at opposition in Feb. 2000 at V = 19.3. There will also be an approach to a distance of 0.065 AU on 2002 Oct. 31 (V = 13.7).

- submitted by Doug Welch
IAU Circular No. 6837
http://cfa-www.harvard.edu/iau/cbat.html

1998 TT	RA (2000)	Decl.	Delta	r	Elong.	Phase	V
Mar. 8	6 15.92	+17 56.7	1.557	2.070	106.5	27.4	20.8
Mar. 18	6 22.81	+18 18.0	1.701	2.089	98.2	28.1	21.0
Mar. 28	6 32.08	+18.42.1	1.846	2.106	90.5	28.3	21.2
Apr. 7	6 43.26	+18 43.5	1.988	2.119	83.3	28.0	21.4
Apr. 17	6.55.94	+18 36.9	2.126	2.128	76.5	27.3	21.5
Apr. 27	7 09.81	+18 22.1	2.258	2.135	70.0	26.3	21.6
May 7	7 24.64	+17 58.8	2.382	2.139	63.9	25.1	21.7
May 17	7 40.21	+17 26.9	2.497	2.139	57.9	23.6	21.8
May 27	7 56.37	+17 46.4	2.602	2.136	52.2	22.0	21.8
June 6	8 13.00	+16 46.4	2.695	2.131	46.7	20.3	21.8
June 16	8 30.00	+15 57.3	2.777	2.122	41.3	18.4	21.0
June 26	8 47.30	+14 59.7	2.845	2.110	36.0	16.5	21.8
July 6	9 04.85	+13 54.0	2.901	2.094	30.9	14.4	21.7

CALENDAR OF EVENTS

- **March 23th, 7:00 pm** — **Hamilton Junior Amateur Astronomers** (4th Monday this month due to March Break). Room B148, Bourke Science Building, McMaster University. For more information call Rosa Assalone at 540-8793.
- **March 20th, 7:30 pm** — **Council Meeting** at the home of Tony Wallace. Call Stewart Attlesey at (905) 827-9105 (Oakville) if you are interested in attending.
- **March 27, 28 8:00 pm** — **Binbrook observing nights**. For confirmation or directions call Tony Wallace at 526-6154 or Ann Tekatch at 575-5433.
- **April 3rd, 7:30 pm** — **HAA general meeting** - note irregular date! At the Spectator Building Auditorium. Topic to be announced.