Orbit

The official publication of the Hamilton Centre of the Royal Astronomical Society of Canada

February 1, 2000 Volume 34, Issue 2

January 9th Lunar Eclipse

Story and Picture on Page 5

Moon photo by Robert Sears. We don't have details but believe it was taken at prime focus through his 8" LX10.

Through the Wrong End of the Scope

By: Scott Donaldson

Just a little note before we look through the wrong of the 'scope. I'd like to thank Steve Barnes for including my contributions in Orbit over the last year. I hope that these articles serve a number of purposes. First, I hope that the content is of interest to fellow members. Second, as the Hamilton Center is in a growth phase, (largely due to the efforts of Colin Haig, and the support given him by you, the membership) we have a good number of new astronomers, including myself.

This collection of articles can be viewed as the chronicles of a struggling new astronomer; struggling to acquire the skills and knowledge to get the most out of my observing periods.

My experiences are likely shared by every budding astronomer, and by sharing them with you, I hope that they will offer encouragement to all who are currently starting out. For the senior members of the club, and the executive, I hope that these articles will provide a window into the world of the new member, and foster an understanding of our needs.

Understanding the needs of junior astronomers is key to continued growth of the center, and to the future of our club. My first scope was a 60 mm. refractor which I picked up at a garage sale for $5.00. It gave me many hours of enjoyment, including my first glimpse of Saturn's rings, and the Galilean moons of Jupiter. I was unsure if the flares which were observed on bright star images where novas. I later learned about chromatic aberration. Many years later, as an adult, it gave me my first view of the Andromeda galaxy, the Ring nebula, the Lagoon nebula, the Coathanger,...

In spite of it's rather poor optics, it gave me a lot of enjoyment. This is a true measure of the value of a scope,

See "Wrong End of the Scope" on page 6

Editorial:

by: Scott Barrie

There's a medical condition, commonly known as SAD (seasonally affected disorder), that refers to (usually) mild forms of depression triggered by the long periods of short, dreary days typical of most Canadian winters. For those of us who enjoy looking at the night sky, that acronym also applies to us at this time of year, only the letters would instead stand for "**S**hort-changed **A**stronomy **D**evotee".

It seems that it's either too cloudy to bother even thinking about going out, or it's just way too cold to spend any time at the scope. In either case, I'm starting to feel symptoms of starlight withdrawal and I'm sure most of you are too.

This frustration was really exacerbated a week or so ago. My 14 year old son and I had been at a meeting and we were just arriving home around midnight. Alex has never had more than a passing interest in the night sky. If my scope is set up and he's in the area he'll have a look, but he won't hang around. Well, on the night in question, the sky was crystal clear, and for the first time I can remember, Alex was sincerely keen for a "tour". The problem is it was incredibly cold and we were both only good for about 5 minutes. It was fun while it lasted though and hopefully a sign of things to come.

Aurora over Sayers Mills. Photo by Scott Barrie

On another front, I want to take this opportunity to thank all those who have been so good about contributing to Orbit these last few months. With different members writing articles and providing photos and other material it really makes it feel like a club effort. So, keep up the good work!

For those of you who haven't contributed in the past, your submissions are invited. If you've got an idea for an article, or have some pictures lying around that you think might be of interest, please let me know. If you don't have an idea but would like contribute, there are lots of possibilities.

Something I'd personally like to see is a series of articles on using the Observer's Handbook. The Handbook is an incredibly useful observing tool, but for newcomers to the hobby it can be pretty intimidating. So if anyone out there feels up to the challenge, why not give it a try.

Long-standing members might want to consider writing up profiles of some of the other members who have been involved with the club for an extended period of time. Upcoming events of interest are also good subjects for articles. The Messier Marathon is coming up. Is anyone interested in writing a few words about it for the next issue?

This is your publication. You're all invited to help make it better.

Board of Directors Contact info.

President: Harry Pulley	hpulley@home.com
Past President: Colin Haig	CHaig@Compuserve.com
1st VP: Victor Grimble	vgrimble@attcanada.ca
2nd VP: Mike Jefferson	
National Rep:Blair Batty	bbatty@nseaa.com
Treasurer: Tina Coppolino	tinacoppolino@home.com
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Recorder: Mark Kaye	mark.kaye@sympatico.ca
Webmaster: Scott Barrie	scottbarrie@homeroom.ca
Education: Carmen Martino	
Librarian: Scott Donaldson	
Orbit Editor: Scott Barrie	scottbarrie@homeroom.ca

President's Report for February 2001

by: Harry Pulley

My favorite astronomy pastime of the moment, imaging, has made me more of a cold weather weenie than in past years. I still go out to observe by eye for an hour or two on clear nights but when that is all the time I have before I become cold, it is difficult to setup my imaging scope, polar align the mount and focus the camera properly before I feel like packing up. By the time the scope has cooled to the ambient temperature, my extremities have too.

So I've continued to use my small refractor lately, to view the Moon, Venus, attempt to pick up Mercury, view the gas giants and double stars. The little scope doesn't offer nearly as satisfying a view as a large one, but it is better than no viewing at all. I watch the movement of the Galilean satellites as they disappear and reappear from eclipse, become occulted or best of all transit Jupiter's disk along with their shadow. The 80mm scope doesn't show many of Saturn's satellites from my driveway with its close street light.

Speaking of street lights, the one at the observatory has become a nuisance. Since being shot out, the town replaced it with a normal shield rather than the light cone cutoff model we supplied them. We've called them about it but they've been dragging their feet on getting it replaced. Calls to the Town of Flamborough (or is it the New City of Hamilton now?) in complaint might get them to put a full cutoff fixture on the light.

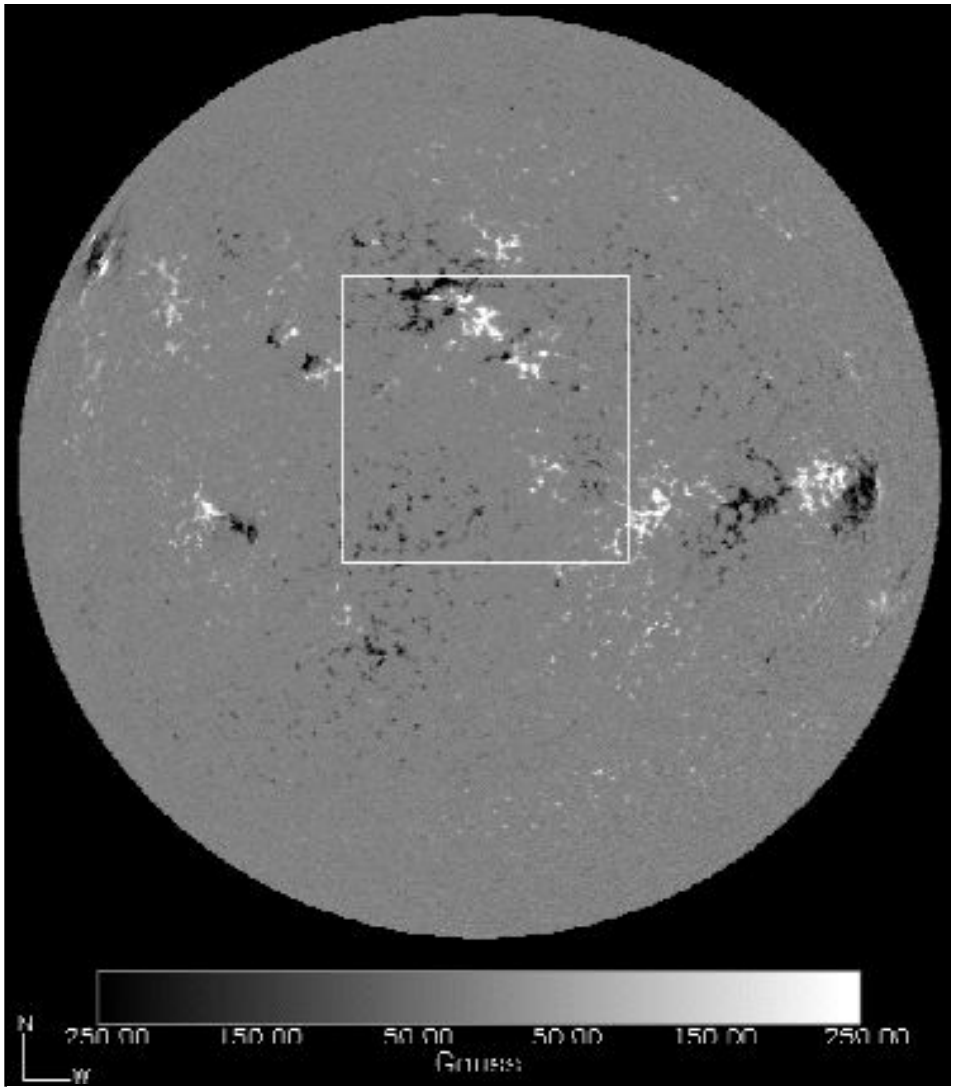


Image form the SOHO website.

With this cold weather and street lights and such, there is opportunity for indoor astronomy. This is time when you can catch up with some reading, process old images, plan observing for the year with charts and planetarium programs and the like. As well, the world wide web on the internet offers ways you can do astronomy from your computer. I've read that NASA will soon be employing amateurs for classification of features in the huge volume of data created by the Mars Global Surveyor orbiter. I don't think the actual program has started yet but you can enjoy the pictures for now at **http://mars.jpl.nasa.gov**.

They've recently released an amazing number of images there. Another online activity is comet hunting using the SOHO images at **http://sohowww.nascom.nasa.gov/**. SOHO is the **Solar and Heliospheric Observatory** and

See "Mars" on page 5

Greek in the Round:

by: Ev Rilett

Welcome once again to the stage of the Greek in the Round, Sky Performers. This month I have chosen to talk of a special changing star. "**POLARIS**." As steady and never moving as it is to us, it also has a history full of circles. With this, let the curtain rise.

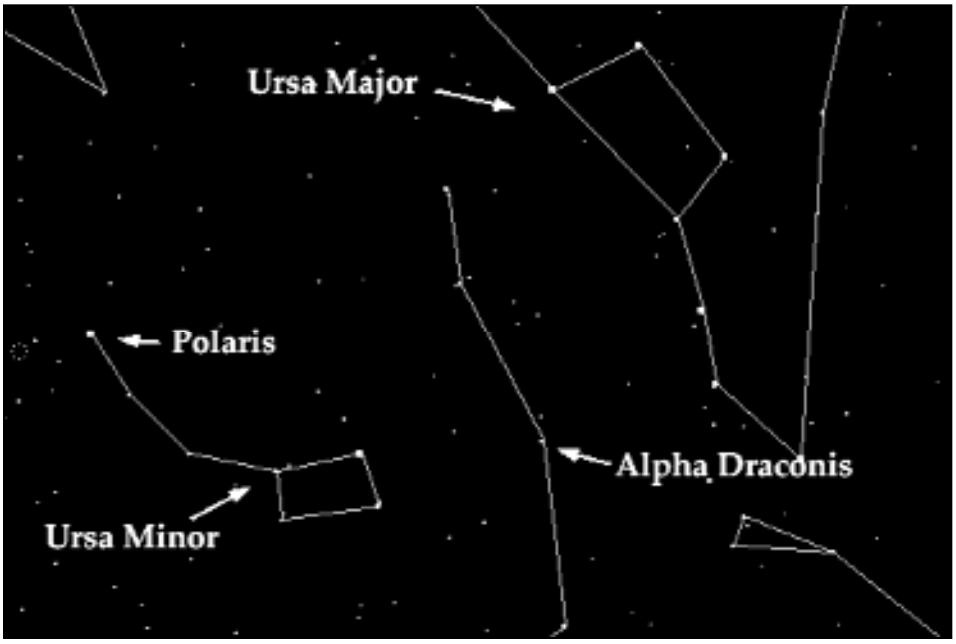
Many people unknowingly believe that Polaris or the North Star is the brightest star in the heavens. It is not. It ranks 49th from the top in brightness at a magnitude of 1.99. This is not to take any of its magic or importance away from it. On the contrary, it is the most important star to current day navigators and travellers.

Present-day navigators are fortunate to have a star to point the way north. The earth's axis is tilted at an angle of 23 1/2° to the plane in which the earth orbits the sun - called the plane of the ecliptic. It's this tilt that causes the seasons, as the planet's northern and southern hemispheres lean alternately toward the sun's face.

Also, the axis of the earth wobbles, the way the axis of a top wobbles as the top spins. This is the effect called **precession.** Polaris is not exactly at True North. The actual "precession cycle" is about 25,800 yrs. and Polaris is currently .8° from true north. In 150 yrs. from now, the Celestial Pole will make its closest approach to Polaris in the year AD. 2102, at which time it will be a little less than 1/2° or (27' 31") from that star.

Bryant refers to the traditional use of Polaris as a guide to seamen in his ***Hymn to the North Star***:

"Constellations come, and climb the heavens, and go.
Star of the Pole! And thou dost see them set.
Alone in thy cold skies,
Thou keepest thy old unmoving station yet,
Nor join'st the dances of that glittering train,
Nor dipp'st thy virgin orb in the blue western main.
On thy unaltering blaze
The half wrecked mariner, his compass lost,
Fixes his steady gaze,
And steers, undoubting, to the friendly coast;
And they who stray in perilous wastes by night,
Are glad when thou dost shine to guide their footsteps right.
A beauteous type of that unchanging good,
That bright eternal beacon by whose ray
The voyager of time should shape his heedful way."



Polaris has not always been our Northern Pole Star. The Polar Point WOBBLE position has a change circle of 47°. The Earth's axis changes position during the approx. 26,000 yr. "precession cycle". The Polar point moves in a great circle some 47° in diametre. Some 4,600 yrs. ago, about 2830 BC., the earth's axis pointed towards Alpha Draconis or Thuban (less than 10' from true north) in Draco and that was our "**Pole Star**" during the "Old Kingdom" age of the Pyramid builders of ancient Egypt.

The Egyptians built their pyramids with an open shaft directly facing Thuban so its light would penetrate the depths of the pyramid. And last, but not least, 12,000 yrs. ago the bright star Vega held this position of honour and will again in AD. 12,000, some 4 1/2° at its closest approach. Those who live in the southern hemisphere are not so fortunate to have a pole star. The region around the pole is rather vacant. The clos-

est star to the true south pole is the star Sigma Octans, 1° away from the pole. It is a star of magnitude 5.5, barely at the limits of naked-eye vision.

At this time, I would like to mention that I do not actually write these stories. I have used many sources of material, The Greek Myths, Burnham's Celestial Handbooks, Sky & Telescope "Skylore" articles, The Glorious Constellations and other odds and ends I've picked up here and there. I hope I will be able to convey a sense of wonder and lifestyle that our ancestors dreamed and lived by, that can be enjoyed today and passed on to our ancestors.

"Wish Upon a Star"

Mars

it offers many interesting images of the Sun, taken by a satellite out at the L1 Lagrange point. The Sun is a large object with a mighty gravitational pull, and this attracts many comets making death plunges into its surface. By viewing SOHO imagery, you can see these comets. If you are the first one to do so, according to some strict rules, you will be given some credit for finding it, which is said to be much easier than taking hundreds or thousands of hours searching with a telescope. Michael Boschat of the Halifax Centre has been quite successful in finding these comets in the images.
Is anyone interested in centre Mars projects this year? The planet will be fairly low but of a good size. If a group wants to image and sketch the planet we can combine our pictures to make a globe projection map of
the planet.

I'm interested in other centre observing projects too. In the past, I've suggested many but received few responses so I want to try it the other way: please tell me what YOU would like to do as a project in 2001!

hpulley@home.com

Total Lunar Eclipse of 09-01-2001

I don't know how many of you were able to take in the January 9th total lunar eclipse, but for those of you who missed it, here's an excellent photograph taken at totality by Aadil Desai.

Aadil Desai is the Secretary of the Amateur Astronomers' Association, located in Bombay India. He took the photograph through an Intes 150mm diameter, 1500mm focal length, f/10, Maksutov-Cassegrain. It is a prime focus image taken with a Practika MTL-5B SLR camera body on Kodak 400 ISO colour print film with an exposure time of 40 seconds from 203200 to 203240 UT from Mumbai city, India. Star to the top right corner is Delta Geminorum.

Aadil was good enough to send us a colour jpeg of the picture through the club website and in colour it's truly a spectacular shot.

Wrong end of the Scope

however subjective it may be.

In the December 1989 issue of Sky and Telescope, a test report was published comparing the optical performance of 6 Schmidt-Cassegrain telescopes manufactured by Meade Instruments and Celestron International, two of the leading manufacturers of amateur telescopes. The report included photographs of the mirror surfaces under both a Ronchi test, and null Foucault test. The photos were very revealing. Each mirror which was tested showed surface roughness, (primary ripple), high and low zones, and spherical aberration. These defects are extremely difficult to avoid in an optical system with an f/2 primary mirror. Further, these 'scopes are focused by shifting the primary mirror over a range far greater than the optimum image quality permits. Yet, Schmidt-Cassegrains are among the most popular telescopes among backyard astronomers because they are a joy to use.

How can we objectively evaluate the optical performance of a telescope? There is a quick and simple test which can help you to evaluate an entire optical system in seconds. By the entire optical system, I mean this procedure tests all optical elements, tests the tube for tube currents, and tests the atmosphere for steadiness! We'll take a look at this next time. 'Til then,

TWINKLE, TWINKLE

Scott takes a break from one of his other passions.

Contrary to how it appears, this is not a photograph of a hostage-taking. Rather it's a picture of your board, captured by Harry Pulley at the most recent board meeting. For those members who are new to the club and may not now all the board members, they are, from left to right: Carmen Martino, Scott Donaldson, Blair Batty, Tina Coppolino, Robert Sears, Mike Jefferson, and Victor Grimble. They're probably all smiling because Harry has just adjourned the meeting. Colin Haig, Scott Barrie and Mark Kaye were unable to be there, and consequently were likely the butts of a lot of jokes.

Comets & Asteroids - 2001

by: Ray Badgerow

I) Close Approach NEO's

Name	Date	Encounter Distance(au)
(4688) 1980 WF	Jan. 3.61	0.1701
1997 GH3	Feb. 14.06	0.1474
(4034) 1986 PA	Apr. 3.05	0.1465
(3103) Eger	Aug. 6.31	0.1161
1987 QB	Aug. 16.74	0.1629
1996 PC1	Aug. 22.37	0.0986
1998 SD9	Oct. 9.10	0.1438
1996 GD1	Nov. 19.79	0.1997
(3362) Khufu	Dec. 29.46	0.1597

II) Timing of Cometary Apparitions

Name	T	q(au)	Nearest	Dist(au)	Mag.
47P / Ashbrook-John	Jan. 6.5	2.3054	Nov.27	2.21	13
41P / Tuttle-G-K	6.98	1.0523	July 19	1.52	12
74P / Smirnova-Chernyk	15.65	3.5458	Mar. 13	2.57	15
73P / S-W 3	27.73	0.9374	Jan.17	1.79	6*
P / 1992 G3(Mueller 4)	Feb. 7.86	2.6470	Apr. 2	1.82	16
44P / Reinmuth 2	20.00	1.8897	Nov.24	1.91	15
113P / Spitaler	25.88	2.1273	Feb.21 / 02	2.28	20
75P / Kohoutek	27.35	1.7873	Mar.30 / 02	2.49	14
110P / Hartley 3	Mar. 21.4	2.4783	Mar. 13 / 02	2.23	15
45P / H-M-P	29.89	0.5284	Apr. 23	1.24	9*
97P / Metcalf-Brewington	Apr.10.24	2.6054	Jan. 14 / 02	2.33	16
P / 1993 X1(Kushida-M)	29.55	2.7526	Feb. 7 / 02	2.15	16
24P / Schmausse	May 2.66	1.2050	May 1	1.49	10*
61P / Shajn-Shaldach	8.99	2.3301	Dec. 8	1.79	16
51P / Harrington	Jun. 5.89	1.5681	Nov. 18	1.34	16
86P / Wild 3	18.60	2.3103	May 28	1.30	17
P / 1994 A1(Kushida)	27.79	1.4313	June 23	2.44	20
16P / Brooks 2	Jul. 19.83	1.8349	Nov. 18	1.18	14
82P / Gehrels 3	Sep. 3.07	3.6266	Jan. 29 / 02	2.67	19
19P / Borrelly	14.73	1.3582	Dec. 29	1.29	9*
P / 1987 Q3 (Helin)	24.75	2.5308	Sept. 19	1.53	15

III) Space Missions

This year there are 3 space missions that are active with minor bodies.On January 15th, the **STAR-DUST** spacecraft flies past Earth at a distance of 5000 km to obtain a gravity assist to send it onwards to its target, comet **Wild 2**. The **NEAR-Shoemaker** mission to the asteroid **Eros** comes to a dramatic end on February 12 th with a controlled crash-landing on the asteroid's surface.Finally, **Deep Space 1** will fly past **Comet Borrelly** on September 20th which will be the swan song for that spacecraft.

Coming Events:

February 1, 2001 - General Meeting at 8:00pm at the Steam Museum.

February 3, 2001 - Beginners' Observing session at the observatory. Come on out and meet other members and share the night sky. Bring your scope along and if you've got questions about how to use it there will be people there to ask.

February 8, 2000 - Board Meeting at 8:00pm at the observatory. Come on out and help shape the future of the centre.

March 1, 2001 - General Meeting at 8:00pm at the Steam Museum. Program TBA.

March 8, 2000 - Board Meeting at 8:00 at the observatory. Come on out and help shape the future of the centre.

Directions to observatory

From Hamilton or Guelph:
- Hwy 6 N of Hamilton,
- Take Concession 7 East eastbound, cross Centre Rd.
- Continue on 7E, past the rail tracks, proceed to near the end.
- Our gate is on the south side on the last lot (south west).

From Mississauga or Milton:
- Britannia Road past Hwy 25, Guelph Line, Cedar Springs to end
- South 1 block on Milborough Town Line to Concession 7 East.
- Right on 7th Concession, then first driveway on left.
- Our gate is on the south side on the last lot (south west)

From Burlington or Oakville:
- Dundas Street (HWY #5) to Cedar Springs Road
- Cedar Springs Road to Britannia Road
- Left (west on Britannia road to Milborough Town Line
- South 1 block on Milborough Town Line to Concession 7 East.
- Right on 7th Concession, then first driveway on left.
- Our gate is on the south side on the last lot (south west)

Hamilton Centre Observatory
43° 23, 26" N 79° 55, 22" W
Telephone 689-0266

Colin's Christmas Eclipse Expedition

This is a series of shots of Colin and his faithful assistant taken on Christmas day when he photographed the eclipse with The Big Mak from near his home in Hamilton.

The middle picture above shows Elizabeth Wasiliuk from West VA showing off her sunspotter - a homemade gizmo for viewing the sun.

The eclipse shot to the right has been processed in Photoshop with an unsharp mask and on the computer screen it shows quite a bit of sunspot activity.