

SASKATOON SKIES

Volume 22, Number 6

June, 1992

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Saskatoon Skies Information

Next month's deadline is Friday, June 26, 1992. Please have any submissions in to me by then in order to be included in the next issue. Saskatoon Skies is a monthly publication of the Saskatoon Centre of the Royal Astronomical Society of Canada. Submissions may be sent to one of the following:

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Submissions mailed to the Centre's address may not be retrieved in time for inclusion unless you tell me it's there.

**Minutes of the Executive Meeting
University of Saskatchewan Observatory
11-May-92**

Attendees: M. Williams, J.E.Kennedy, D. Rybotycki, A. Hartridge, C. Blenkin, J. Wood, D. Friesen, R. Huziak

Item	Detail	Action
114	Meeting called to order 7:02 P.M.	R. Huziak
115	Astronomy Day Lawson Heights Mall Display was a great success despite the planned day-observing and starnight that evening being clouded out. S. Ferguson thanked for organizing.	D. Friesen
116	Camp Circle-of-Friends has requested a starnight sometime between June 25-28 at Danielson Prov. Park. D. Friesen will do, but will take C-8 from Rystrom Obs.	D. Friesen
117	Next Observer's Group Meetings set at June 6 and July 4 at the Rystrom Obs.	A. Hartridge
118	No minutes for the April Meetings as the executive did not have a quorum and the General Meeting was exceptional in format.	R. Huziak
119	July Public Starnight set for Friday and Saturday July 24 - 25, 1992.	R. Huziak
120	Perseid Starnight set for Saturday Aug. 8, 1992 with options later that week.	C. Blenkin
121	Ingrid Benning of Brunskill School is the confirmed speaker for the June 15 General Meeting and will speak on her NASA teacher's training trip and the Space Shuttle Simulator. D. Rybotycki will book slide projector and video player. E. Kennedy suggests we advertise through ASTEP.	R. Huziak
122	Sky and Telescope magazine is up for renewal. Note that WH Smith Bookstores now carries S.& T. Motion to renew subscription to Sky and Telescope.	Motion Second R. Huziak D. Rybotycki D. Friesen CARRIED
123	Charles Scovil has produced a video on buying your first telescope. Suggestion that we should purchase a copy to show to new members once a year at a General Meeting. Deferred.	R. Huziak
124	Alberta Star Party runs July 30 - Aug. 3, 1992 near Brooks, Alberta. R. Huziak has info for those who are interested in attending.	R. Huziak
125	Mount Kobau Star Party runs Aug. 26-30 (?), 1992 south of Penticton, B.C. If interested in attending, contact Al Hartridge. Al Hartridge, J. Young, S. Alexander plan to attend.	R. Huziak
126	New brochures and display boxes are available for the Saskatoon Centre, RASC. R. Huziak has produced these and requests a repayment of approx. \$13.19 to print the first 500 copies.	R. Huziak
127	Eclipse of June 14 - 15, 1992. Note that information in April Saskatoon Skies is incorrect. Note the eclipse occurs SUNDAY night. Mike Wesolowski has prepared handouts for the eclipse. C. Blenkin will advertise the eclipse and the I. Benning Lecture on "Two For The Show". A. HARTRIDGE HAS INVITED ALL RASC MEMBERS TO HIS ACREAGE to view the eclipse. A map will appear in the June issue of Saskatoon Skies.	R. Huziak C. Blenkin
128	E. Kennedy points out that we must quickly point out any requested agenda changes for the National Council Meeting	E. Kennedy
129	National Council Meeting of Feb. 15, 1992 discussed as well as other concerns: i. Nat. Office Library has finished inventory of books. Copy forwarded to J. Wood. ii. Increase in National fees proposed is \$40 regular, \$24 junior, \$800 life. Current fees are \$35/ year of which we pay \$32 to National. iii. Saskatoon Centre has received a letter in opposition to the fee increases from Vancouver Centre and Hamilton Centre. Saskatoon Centre is sympathetic to the cause. iv. Model Centre Bylaws have been referred back to Nat Committee for further study. v. Leo Enright has been appointed for a 3-year term as editor of the Beginner's Observing Guide. vi. Speaker Travel Program has been defeated in Council due to cost concerns. vii. April issue of Bulletin has NOT arrived. Note that there are only 55 days to the meeting and the agenda has not yet been announced. viii. Al Hartridge will investigate proxy votes. ix. National Office has a list of slides available. List given to J. Wood. x. Letter of thanks written to Ken Howland of the Dept. of Energy, Mines and Resources thanking him for their sponsorship and assistance with the Dr. Grieve lecture. Carol Wakabayashi of ASTEP also thanked.	E. Kennedy
130	Meeting adjourned at 7:57 P.M.	Motion D. Friesen CARRIED

**Minutes of the General Meeting
Room B-111, Health Sciences Building
University of Saskatchewan
11-May-92**

Item	Detail	Action
131	Meeting called to order at 8:07 P.M.	R. Huziak
132	Attendees welcomed, speakers A. Walker, A. Hartridge acknowledged.	R. Huziak
133	Motion to approve March minutes as published in Saskatoon Skies.	Motion Second D. Rybotycki G. Sarty CARRIED
134	No minutes for the April Meetings will appear as both meeting were unusual in format. April's General Meeting featured Dr. Grieve's meteor impacts lecture in the Biology Bldg.	R. Huziak
135	Astronomy Day Display. S. Ferguson thanked for organizing. Display was a success.	R. Huziak
136	Next Observer's Group Meetings at Rystrom Obs. will be held on June 6 and July 4, 1992.	R. Huziak
137	Public Star Night to be held July 24 & 25, 1992, btw the Exhibition and Aug. long weekend.	R. Huziak
138	Perseid Starnight will be held Saturday Aug. 8, 4 days before peak.	R. Huziak
139	General Meeting for June 15, 1992 will feature Ingrid Benning of Brunskill School. Her lecture will be a slideshow and video on her NASA training. It will be a great family event.	R. Huziak
140	Sky and Telescope will be renewed by the Centre.	R. Huziak
141	Alberta Star Party runs July 30 to Aug. 3, 1992. See R. Huziak for information.	R. Huziak
142	Mount Kobau Star Party in B.C. runs Aug 26 - 30, 1992. See A. Hartridge for information.	R. Huziak
143	New Saskatoon Centre brochures are available for distribution. See R. Huziak for your copies.	R. Huziak
144	Correction to info in Newsletter on June 14- 15 lunar eclipse. The eclipse is on SUNDAY night.	R. Huziak
145	A. Hartridge is holding a MEMBERS ONLY eclipse viewing session on his acreage.	R. Huziak
146	Minutes of the Feb. 1992 National Council Meeting reviewed: i. National fees may increase to \$40 adult, \$24 junior, \$800 life. ii. Society financial picture is \$17,000 deficit in 1992. One option is to co-produce the Journal with the Canadian Astronomical Society (CASCA). Also, authors of papers will be charged for reprints. iii. Beginner's Observer's Guides are now available. 8 copies have been sold locally and 2 are available for sale at \$10.00 ea. iv. The Speaker's Travel Program has been cancelled due to lack of funding.	E. Kennedy
147	Success of recent events discussed: i. What on Earth? display. S. Ferguson, A. Hartridge, S. Alexander thanked. ii. Dr. Grieve lecture in April. the Centre and C. Blenkin thanked.	R. Huziak
148	R. Huziak wants all members to take lots of slides of all their astronomical adventures this summer for presentations next fall.	R. Huziak
149	Eetook is under repair until approx. May 25 at B. Hydromako's house. June 25 - June 28, the C-8 will be unavailable at the Rystrom Observatory.	R. Huziak
150	There will be a simulated Space Shuttle launch at Sutherland School on May 21st A.M.	C. Blenkin
151	Our local membership is falling and has for 3 or 4 years. Tell your friends about the Centre and sign them up for the new year.	R. Huziak
152	Main Feature. The following presentations were given: i. Alan Walker - Presented a lecture and slide show on Kitt Peak, Lowell Observatory, and the US Naval Observatory. ii. Alan Hartridge - Presented a lecture and slide show on Kitt Peak. iii. Richard Huziak - Presented a lecture and slide show on the upcoming lunar eclipse.	
153	Beginner's Observer's Handbook errors and the RASC's potential liabilities discussed.	E. Kennedy
154	Meeting adjourned 9:40 P.M.	Motion M. Williams CARRIED

EDITOR'S NOTES

1) **I CAN'T BELIEVE I DID IT! AGAIN!** One of the most common mistakes for beginners to make, and it usually only happens once, is to get mixed up in conversion of Universal Time to local time when a change of date is involved. What happens is that you forget to subtract a day, and you go looking for something to happen one day late. Well, in last month's newsletter, I indicated that the June partial lunar eclipse would take place on Monday, June 15, when in reality it takes place on the evening of Sunday, June 14. Last month's article is reproduced for your convenience (and to fill up white space) with the correct dates indicated.

Ironically, the first time I made this mistake also involved a lunar eclipse. Unfortunately, this time I published the mistake in a newsletter that gets mailed out across the country...

2) On the subject of the lunar eclipse, member Al Hartridge has extended an invitation to all interested members to come to his place on Sunday evening, June 14, to view the eclipse with him. He has an observatory with a Celestron-14, and more importantly, will be supplying coffee and other refreshments. A map to his place is reprinted elsewhere in this issue, and you can contact him at 373-0034.

3) Anyone notice anything different about the minutes this month? They were typed up by Richard Huziak (since he was the one raising most of the issues). He volunteered to spare the pain of typing in the minutes and also promised that they would be two pages in length. Who am I to complain when someone does the work for me?

NOTICE OF OBSERVER'S GROUP MEETING

The next two Observer's Group meeting are scheduled for the evenings of Saturday, June 6 and Saturday, July 4 (mark these on your calendar). This newsletter will not reach you before the June meeting (sorry!) but do try for the July meeting. There aren't too many of these where the weather is warm! For information about the date or how to find the observatory, you may contact the editor at 373-0137 or 931-3425.

NOTICE OF JUNE'S GENERAL MEETING

The June General Meeting will take place on Monday evening, June 15, 1992, at 8:00 PM, in Room B-111 of the Health Sciences Building. This month's guest speaker will be Ingrid Benning, one of the teachers involved in Saskatoon's space program (I bet you didn't know Saskatoon had one!). She will be speaking about "Science in S.P.A.C.E." (come to the presentation to find out what the acronym stands for), and will be discussing her experience at the NASA Manned Space Flight Center. There, she took part in a brief period of astronaut training which was then applied to the space shuttle simulation program in the schools (you may recall that several simulated missions were flown a short time back). This will be interesting for all age groups so bring your kids too!

As a rejected astronaut candidate (yes, I applied, and the rejection letter was almost boring in its mundanity - "We will keep your application on file for six months etc." - yeah, right!), I can appreciate the thrill the students involved must feel in being involved in a program of this sort. Let's all turn out for Ingrid and vicariously experience some of our childhood fantasies...

JUNE 14 PARTIAL LUNAR ECLIPSE

On the evening of Sunday, June 14, observers in Saskatoon will be able to observe a partial lunar eclipse. This eclipse, with a magnitude of 69% will not only be more spectacular than the last partial eclipse visible from Saskatoon, the weather will probably be a lot more pleasant (the last eclipse had less than 10% of the moon covered, and maximum eclipse was at 4:30 AM on December 21!). Unfortunately, the eclipse will already be in progress when the moon rises for observers in Saskatoon; on the brighter side, it should make for an interesting moonrise.

The circumstances of the eclipse are as follows:

- Partial (Umbral) Phase Starts - 21:27 CST 9:27
- Moonrise - 22:06 CST 10:06
- Sunset - 21:30 CST 9:30
- Mid-Eclipse - 22:57 CST 10:57
- Partial (Umbral) Phase Ends - 00:27 CST (June 15) 12:27
- Penumbral Phase Ends - 01:45 CST (June 15) 12:45

The moon will be fairly low in the sky throughout the eclipse, as it will be located in the constellation of Ophiuchus. A low power telescope or binoculars is ideal for observing the eclipse. Some observing suggestions are given in the *Observer's Handbook 1992*, pp. 98-99.

You may also wish to attempt to take pictures of this eclipse. At the very least, a telephoto lens is recommended; a normal 50mm lens will result in a very small, 0.5mm image of the moon. There is no one solution for the exposure time to be used. From the *Handbook of Astrophotography for Amateur Astronomers* by G. N. Patterson, the equation for determining exposure times is

$$T (\text{sec}) = f^2/SB$$

where

T = exposure time in seconds

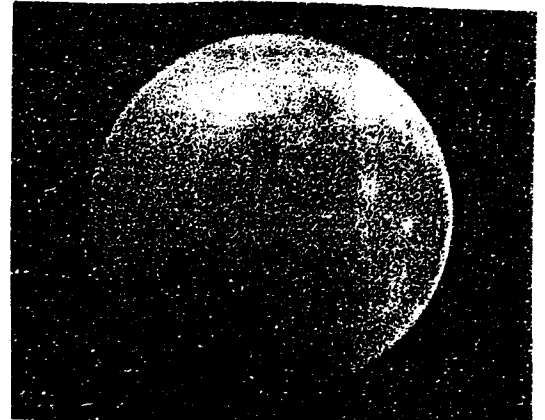
f = focal ratio of system

S - ASA/ISO rating of film

B = brightness of object being photographed.

A suggested value of B is 220 for a full moon, and 0.005 for the umbra. What proportions you use are up to you; one suggestion is $.69(0.005) + .31(220) = 68$ for maximum eclipse. You must also take into account the low elevation of the moon, about 15-20 degrees above the horizon at best. When the moon is just rising, it will be about 20 times dimmer than it would be if it were straight up. Even at its best, the moon will only be about 2/3 as bright as is indicated by the figures given here. The bottom line is that you have to vary your exposure times by up to a factor of 2 in either direction in order to have a reasonable chance of getting a usable picture.

Good luck!



DEAR MIKEY...

As requested, readers have sent in questions to be answered. I hope you enjoy reading them. The first set of questions relate to magnitudes (or brightnesses) of stars. I have another set that I am saving for another month (for those that are *still* waiting for their questions to be answered).

Why is the magnitude scale logarithmic? Why are the brightest objects given negative magnitudes when large, positive numbers seem more natural?

It turns out that not only is there a physiological justification for the magnitude system in use, there's a lot of historical precedent as well. According to the *Cambridge Encyclopedia of Astronomy*, "the physiological response to light is proportional to the logarithm of the stimulus". The example given assumes three stars at an equal distance, whose light energy outputs are in the ratio of 1:10:100. An observer would state that the brightness difference between the first two is about the same as that between the second and third, since the ratios are the same.

Historically, the stars were divided into 6 groups according to how bright they were by a (presumably) Greek gentleman named Hipparchus. He called the brightest stars first magnitude, while the faintest stars that could be seen he called sixth magnitude. It was not until 1856 that a more precise and less subjective system was devised. A man named Pogson noted that a first magnitude star was about 100 times brighter than a sixth magnitude star. He then defined a 1 magnitude difference as being equal to the fifth root of 100, or 2.512. This means that 2.512 multiplied by itself five times would equal 100.

The convention established some 2000 years ago for categorizing the brightnesses of visible stars has not changed. Obviously, some benchmark star was chosen (I don't really know which one) to which all of the other stars are compared against. If a star is bright enough, it has a negative magnitude, while fainter stars have large positive magnitudes, even though it is not intuitively correct.

With apparent magnitudes, what methods or constants are used or compared to so that all observers would derive uniform results when measuring a particular object?

As noted above, someone, somewhere, had to make a decision about choosing a star to be a benchmark. After that, it's relatively simple in principle to measure the brightness of stars, derive a difference with respect to the known benchmark, and assign a magnitude. In practice, however, things aren't so tidy.

First of all, the different objects you look at in the sky are not all the same colour, and different detectors respond in different ways to different colours (for example, the human eye will see a red star as being brighter than a blue star of the same magnitude, although there are tricks to get around this). This could lead into a discussion of multicolour photometry, so I won't dwell on this. Suffice to say that quite often you measure the light of an object at a particular colour, and this will affect the observed magnitude of the star.

I confess to not knowing for certain how thousands (millions?) of stars have had their magnitudes determined. Perhaps some reader could answer this for me. I suspect that, for the most part, once the magnitude of a star has been determined, there usually isn't much call to go back and measure it again, unless the star is known to be variable in brightness. In this case, electronic equipment would be used which would generate a signal (usually electric current) proportional to the brightness of the star. The brightness of the star of interest could be measured and compared to the measured brightness of a nearby star (assumed to be of constant brightness). If the star is indeed variable, a plot of delta magnitudes (with respect to the comparison star) versus time could be derived. While

not as satisfying as having an actual set of brightness measurements that can be compared to other stars, a set of measurements of this type would be sufficient to identify the range and type of variation.

How are absolute magnitudes attributed to a star?

The absolute magnitude of a star is the magnitude of the star at a distance of 10 parsecs, or 32.6 light years. It allows a comparison of the absolute luminosity of a star by removing the effects of distance. For those who are mathematically inclined, the absolute magnitude can be derived from

$$m - M = 5 \log_{10}(d/10)$$

where

m = apparent magnitude

M = absolute magnitude

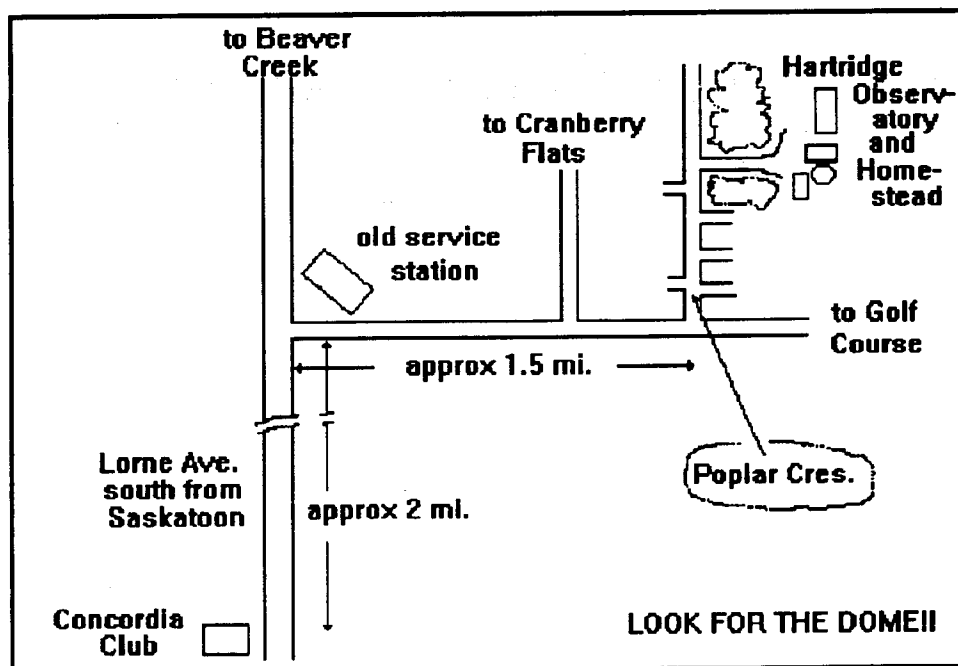
d = distance in parsecs.

The trick then is to determine the distance to a star, and that is a major discussion in itself.

What is the faintest magnitude achieved by the largest observatories and what range of visibility do amateurs work within?

I don't really know the answer for sure, but it seems to me that I've seen something about 29th magnitude being used, and if so, it was probably achieved with a CCD (Charge Coupled Device) detector. As to what range amateurs work with, it depends upon the telescope available, the experience of the observer and the observing conditions. In the past, I've seen stars near 14th magnitude with a Celestron-8, based upon charts provided by the American Association of Variable Star Observers. The *Observer's Handbook 1992* has a table on page 24 which provides approximate limiting visual magnitudes for a range of telescope apertures up to 44 cm. Some amateurs have access to telescopes in the 75 cm range, which suggests a limiting magnitude of 17 or so, using the equation provided in the *Handbook*.

AL HARTRIDGE'S FARM: THE MAP



ASTRONOMY DAY REPORT

Sandy Ferguson

Following five weeks of sunny weather here in Saskatoon, May 9, Astronomy Day dawned gloomy and cold. Over the course of the day, weather varied from drizzle to rain, then freezing rain, and even a period of snow. How disappointing!

Prior to Astronomy Day, Carol Blenkin invited me to be part of her morning show on CFQC to promote the Big Day. The interview included a discussion on light pollution, the theme of this year's Astronomy Day, with some slides showing the detrimental effects on our skies.

On the day itself, despite the poor weather, our members were out and about anyway. We set up our Centre display tables at the Lawson Heights Mall, where we would be able to take advantage of the Saturday shoppers (perhaps more inclined to go shopping indoors, since the day was so poor). Our display included astrophotography by Centre members, variable star project results, descriptions and photos of some of the observatories and other facilities available to the Centre, as well as a good variety of astronomical literature and publications available, including one publication in Braille for the visually impaired. We also displayed some items of interest to astronomy enthusiasts (such as planispheres and star charts).

Adjacent to the display tables were five telescopes and a set of large binoculars, including Rick Huziak's solar scope. Had the day been cooperative, it would have been set up in the parking lot so the shoppers could get a peek at some sunspots. Scott Alexander set up his 14" Dobsonian, which certainly drew a lot of attention! A few children considered climbing it! Other scopes ranged from 6" to 12".

A slide presentation on light pollution was shown throughout the day, using the 20 slide package available from the Astronomical Society of the Pacific. We also presented a variety of astronomical slides showing deep sky objects and activities of the Centre.

The planned public star night was to have been held that evening in Diefenbaker Park under relatively dark skies. However, it was not to be, again due to the inclement weather. The Centre plans to host another public star night in July.

All in all, we feel Astronomy Day was very much a success here in Saskatoon. Although it was disappointing not to be able to bring to the public the opportunity to view the sun or experience the pleasure of a stargazing session in the evening, we feel we were certainly successful in drawing to everyone's attention the problems all astronomers have with light pollution. We were also able to bring everyone some of the joy we experience in the night sky, through the presentation of slides of deep sky and other objects.

Centre members Bill Hydromako, Mike Wesolowski, Don Friesen, and Jim Young are to be thanked for their time, assistance and public relations expertise, with special thanks going to Allan Hartridge and Rick Huziak for being available super early on a Saturday morning to haul panels, set up and generally get things going, Scott Alexander for making the 300 km round trip, at a very busy time of year for him, and Carol Blenkin for her continuing (and determined!) efforts to keep the RASC in the public eye. [Many thanks to Sandy for organizing us all! Ed.]

See you all next year!!