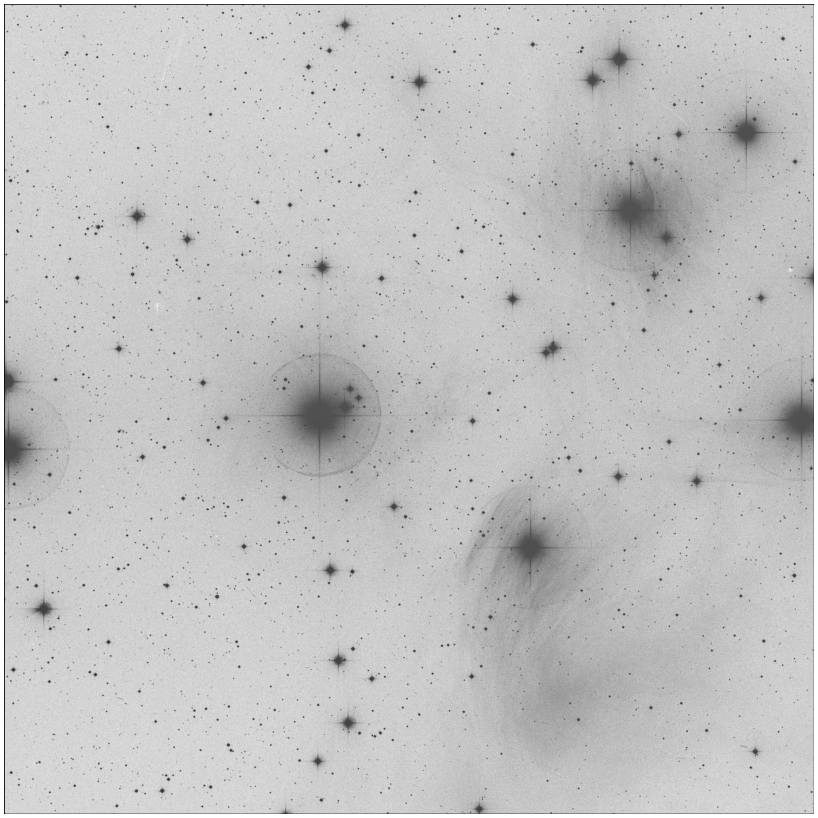
Saskatoon Skies

The Newsletter of the Saskatoon Centre of the Royal Astronomical Society of Canada

Volume 32 December 2001 Number 12



M45 – the Pleiades barely fits into a 1-degree square image taken from the Digital Sky Survey. This is a very pretty cluster to examine with any size optics from eyes, binoculars, small telescopes and large light buckets. The nebulosity is much easier to see than you might think, being easily visible in 4-inch scopes in dark skies.

RASC Calendar Happenings

Date (2001 / 2)	Event	Contact	Telephone
Dec. 13	**Geminid Meteor Peak**	Rick Huziak	665-3392
Dec. 17	**Executive Meeting,** City Hospital, 6:30 pm	Les Dickson	249-1091
Dec. 17	**General Meeting**, City Hospital, 7:30 pm	Les Dickson	249-1091
Jan. 2 & 3	**Quadrantid Meteor Peak**	Rick Huziak	665-3392
Jan. 21	**General Meeting**, City Hospital, 7:30 pm	Les Dickson	249-1091
Feb. 18	**General Meeting**, City Hospital, 7:30 pm **Brigette Hesman, ISAS**	Les Dickson	249-1091
Apr. 2002	Edmonton Centre **Georges Moores Astronomy & Teachers Workshop**	Rick Huziak	665-3392

Sky Buys and Mirror Sells

The Saskatoon Centre's Swap and Sale Page!

Wanted: 25mm eyepiece, 1.25", any technology. Call Rick Huziak at 665-3392.

Wanted: I'm looking for a 6mm eyepiece – most any type will do. Call Gord Sarty at 966-2321 (work).

C8 for Sale: A couple of years ago I sold my old Celestron C8 Schmidt-Cassegrain to a local man, whose greenhouse business has kept him too busy for astronomy. In short, he wants to sell it. Darrell Chatfield and I both owned this scope, and I even used it again this past summer for a lark. It has absolutely excellent optics, and c/w case, dew shield, 25 mm Plossl eyepiece, T-adapter and tele-extender (for astrophotography), a good field tripod and wedge, accurate motor drive and barlow. Both Darrell and I could assure you that this early model C8 is one of the best available, and one of the engineers from Celestron, hearing its serial number, told me that it was one of the originals, and that they simply don't build them that well anymore. Interested parties should **call me, Dale Jeffrey, at 223-4447**, and I will fill you in on the details, and arrange a test drive.

For Sale: New Pelican case #1650 - will hold an 8" SCT. Has foam, 7" extension handle, HD wheels, O-ring seal. Used once - $350.00 obo. **Brass lined trunk** - will hold an 8 or 10" SCT. Excellent shape - $80.00. **Sky Catalog 2000, Vol. 2** - excellent shape - $30.00. ***Introduction to Practical Astronomy*** (Jones) $10.00, ***Burnham's Celestial Handbook*** (hardcover, 3 vol.) $50.00, ***Peterson's Field Guide to the Stars*** (softcover) $10.00. Call Darrell Chatfield, tel. 374-9278.

Saskatoon Centre

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IN THIS ISSUE

Saskatoon Skies is published monthly by the Saskatoon Centre of the RASC. Mail distribution is approximately 100 copies per issue. ***Saskatoon Skies*** welcomes unsolicited articles, sketches, photographs, cartoons, and other astronomy or space science articles. Articles can be sent by mail in any format to the Centre's mailbox. Submissions may also be sent by e-mail - preferred as **plain unformatted ASCII text files without line breaks**. Images sent by e-mail should be attached .GIFs, .TIFs .JPGs or similar. Send e-mail submissions to the editor at <huziak@SEDSystems.ca>. Submitted materials can be returned upon request. Please send articles in "generic" formats, with standard grammatical formatting appreciated - 5 spaces at the beginning of paragraphs, two spaces after periods, one space after commas. A separate by-mail subscription to ***Saskatoon Skies*** is available for **$15.00** per year. *Saskatoon Skies* is also posted on our Saskatoon Centre homepage as a .pdf file and can be downloaded free-of-charge. **Members may choose** to receive the newsletter by regular mail or via the Internet. Articles may be reprinted from ***Saskatoon Skies*** without expressed permission (unless otherwise stated), but source credit is requested. **DEADLINE for submissions is the 26th of each month**. ***Saskatoon Skies*** accepts commercial advertising. Please call the editor for rates. Members can advertise non-commercial items free of charge.

Proper Counting of Meteor Showers

By Rick Huziak

The last few weeks have seen many reports given on the RASCLIST about the most spectacular meteor shower in recent times – the Leonids. These reports told of an amazing shower, with a peak average rate of somewhere around 1 meteor visible per second, though there were times that two or three meteors were visible in the sky at one time. This is indeed a very unusual and rare meteor storm – one that definitely rewarded those who made the effort to wake up and view this once-in-a-lifetime shower on the very early morning of November 18th. But just how good was this shower really, when was the peak, and which parts of the earth saw it? Reading these reports it seemed quite obvious that out of probably 100 reports given on the RASCLIST that virtually all of these reports were useless in containing any real or useful data! I did an email poll to determine how many of these reports would actually be submitted in a standard format to the International Meteor Organization (IMO) or the North American Meteor Network (NAMN). To my great disappointment ***only five*** people responded that their data would be reported.

Although not everyone want to get onto the "*report-your-observations*" bandwagon, I found that most of the reports did indeed include *almost* enough details to be useful, but were lacking a few fundamental parameters that are essential to having good data. These parameters are not at all hard to determine, and only take seconds to do – yet for some reason, it is rare that the observers in the RASC will take these few extra seconds to record what needs to be recorded during a meteor shower! Yet getting these parameters is *dead easy*!

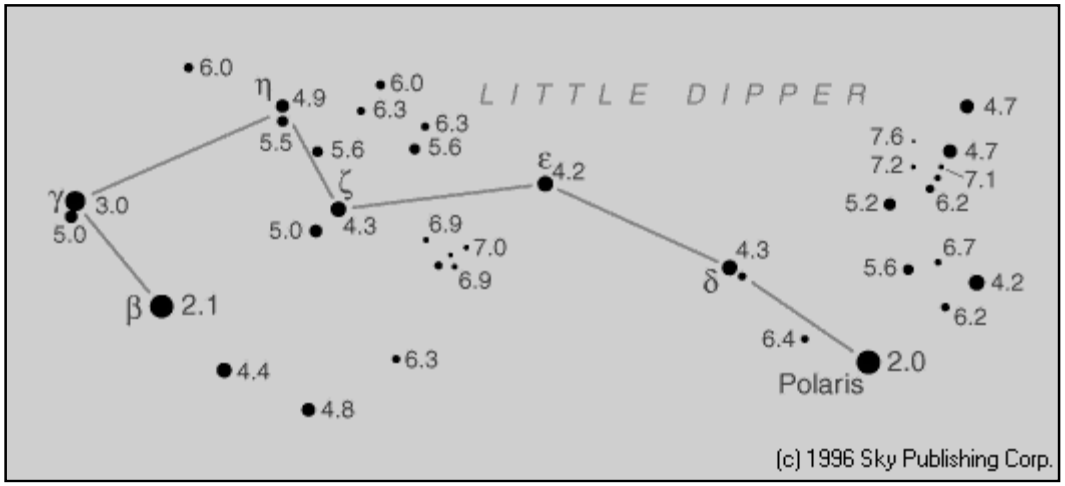
Here are the things you really need to make meteor shower observation data useful.

- **All counts must be *single observer counts*** – even if you are in a group, each member **must** do their own count and record only the meteors they see, uninfluenced by others. (Single observers with a group may end up counting the same meteors that others see, but this does not matter, as shown below).
- **Counts must cover a reasonable length of time.** During a slower shower, counts lasting one hour are generally done. If the meteor rate speeds up, you can shift to smaller time intervals to get 'better resolution' of the meteor shower. (For the Leonids, one-minute counts were the best interval! This is extremely rare for showers!) If you cannot spend one hour counting, any time interval is useful! Record the start time and end time of the observation. *Counts do not have to start and end on the hour* – any start and end times are valid!
- **You must estimate your limiting magnitude** (LM) from the standard chart shown**. This is the parameter that makes your data useful**, and this is the parameter that is often not recorded; though it takes only seconds to do so! Knowing what the faintest star, thus meteor, could be visible allows your data to be calibrated to anyone else's data no matter who they are, where they live or how good their sky was. This allows counts done from the city to be as valid as those done under perfect skies, since the limiting magnitude knowledge corrects for this. You should estimate the LM for every interval counted, since sky conditions change hour to hour due to haze, humidity, aurora, transparency and the coming dawn! Use the chart provided on the next page (taken from *Sky &*

Telescope) to determine the faintest star you can see – your LM! The IMO and NAMN have alternate methods to determine the LM – see their websites.

- **Your name and location on earth (latitude and longitude)**. Nuf said.

You also need to record some lesser parameters that are not quite as critical, but useful just the same.



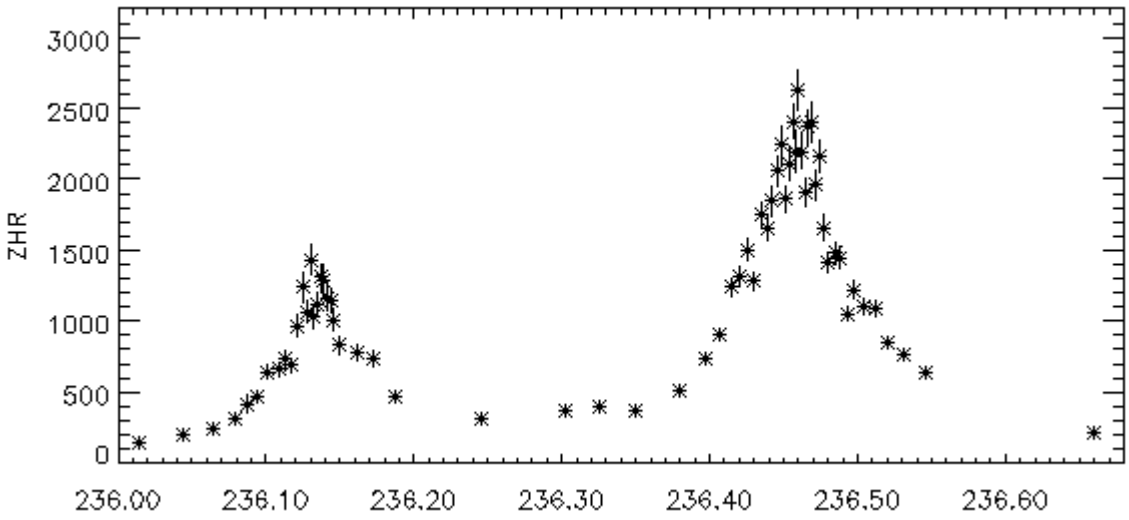
- **Constellation you were looking at** while doing the count. This allows a calculation of atmospheric extinction (done by others). It is OK to look around the sky – you do not have to fix your eyes on the same target area throughout the entire count or for all counting intervals.
- **Amount of time was spent looking away** from the sky, either to take a stress-break or to record your observations. In a 1-hour count, you may estimate that you looked away for 5 minutes to do recording.
- **Whether or not more than 20% of your visual field of view was obstructed** during the observations, by having a poor observing site blocked by buildings, or more commonly by having cloud roll in. If more than 20% of the sky is covered, then counts generally become not so useful, so you would end your count and record the end time.
- **Do not count**, or separately count, **meteors that are not shower members**. These meteors are either from other showers or are sporadic meteors not associated with any shower. Meteors must come from the general direction of the **radiant** to be included in the count.

What the IMO and NAMN are trying to establish from report is something called the **Zenith Hourly Rate**, or ZHR. This is a *calculation* of how many meteors would be seen by as single observer under perfect skies (7.0 mag) looking at the zenith (least extinction) for one hour. This calculation can only be done if the above parameters are included with the count data. The chart below shows preliminary data for the 2001 Leonids Meteor Shower from IMO results. (See the website at http://www.imo.net/ complete data).

The graph shows the ZHR of the meteor shower from data taken from 25 observers, of which only 2 were Canadians (of which I was one)! Eventually, the other 3 observers who responded to my poll will be

included in the analysis when they get around to reporting. I find it quite disturbing that even though hundreds (out of 4000 possible RASC members) observed this showers, that in the end, the RASC will produce fewer that one dozen actually useful counts once everyone reports! With a few more easy parameters, hundreds of reports could have been submitted!

The graph covers the evening of November 17th - 18th, with two distinct peaks of activity. The first peak occurred over North America at 04:35 am CST, with a ZHR of about 1500, or one meteor seen every 1.7 seconds on the average. The largest peak occurred over Asia and Australia 8 hours later – or noon our



time with a ZHR of about 2800, or one meteor seen ever 1.3 seconds on the average. The scale at the bottom is *solar longitude*, which indicates exactly where in space the earth and meteor stream is during the activity. Obviously, we hit two major meteor streams during that night; each laid down, as it turns out, in different years of the comet's passage.

During the discussions on the RASCLIST, I had a lot of people ask me why Group Count totals cannot be used. This is quite simple. **There is an existing system for single observer counts to calculate ZHR**, which is well established by dozens or years of observing, so why re-invent the wheel? The problem with Group Counts is that every observer in the group has a different limiting magnitude since everyone's eyesight is different! So all in the group are not equal. Also, should a group of several people have to cover 100% of the sky or can a group of 2 also produce data even though they can cover only half the sky? This is not an exercise in trying to count every meteor that hits the earth's atmosphere – this is clearly an impossible task! There is also confusion in a group as to whether or not a meteor was counted once by several observers who saw it simultaneously or recorded several times by these observers as unique meteors. What if one observer gets tired and drops out of the group? How is the count then affected?

Single observer counts do not suffer from these uncertainties, and indeed the vast majority of meteor observations are made by lone observers, who, in the absence of a group, would find it impossible to see

the entire sky at once! Plain and simple, meteor counting is designed to be done in the single observer fashion. Single observer count ZHR data when done by a standard method, can then also be traded between different groups, such as the IMO, NAMN, Japanese and Netherlands Meteor Societies and dozens of other meteor groups around the world, with all the data being standard and reliable! (For example, using last year's world data the IMO prediction for this year's peak was out by only 8 minutes (though not all data has been analyzed yet!)

Advanced Observing

Advanced observers do things just a bit differently, though the counting part is the same. Advanced observers simply observe more things during the shower to produce more valuable data on different phenomena. These are:

- **Record the magnitude of each meteor** (to the nearest full magnitude). I found this very difficult during the Leaned shower since a decision on how bright each meteor was had to be done *and recorded* in less than one second without any time to hum and haw! Recording the magnitude of the meteors gives data on what size particles are entering during which periods of the shower.
- **Recording of meteors from other showers.** During the Leonids, there are at least 3 other active showers all producing meteors at a lesser rate. These are the Northern Taurids, Southern Taurids (short blue streaks) and alpha Monocerotids (bursting every 10 years). Knowing where the radiant for each shower is essential! During the Perseid Meteor Shower, other active showers include the South Delta Aquarids, North Delta Aquarids, South Iota Aquarids, North Iota Aquarids (all faint blue streaks), the kappa Cygnids (short, bright fireballs) and the alpha Capricornids (3^{th} magnitude, slow, long, faint, yellow fireballs). ***You can get right into this.*** The radiant is the area of sky from which all shower meteors appear to be coming from. Each shower has its own radiant usually about 5 degrees wide. Leonids come from an area within Leo's sickle.
- **Recording of sporadic meteors.** These are meteors that cannot be associated from any one shower (though in ancient times likely did have a parent shower, now defunct). The background or sporadic rate is also of interest, and occasionally, undiscovered showers are suspected from changes in the sporadic rate.
- **Plotting of meteors.** Plotting of meteors on a starchart can provide information on the exact location of a radiant, especially for poorly studied showers or showers that have multiple radiants active at the same time, where visual estimates of radiants may be difficult to distinguish without plotting.

So why not turn a purely fun event into a purely fun event that collects some real data? It doesn't matter where you observe from (city or country), how much time you have (1/2 hour, 1 hour reports are useful) or how good your eyesight is, or how many people you are with. If you record the interval, number of meteors and the limiting magnitude, you can produce a report that is scientifically useful and craved for by the meteor groups. You also do not have to observe the day of the peak. Data in the days before and after the peak are hard to come by, since most observers are dedicated only to the best, or peak day. (These observers are often cheated. For example, the traditional Perseid peak of about 100 meteors per

hour has been preceded in recent years by a Perseid mini-storm that produces upwards of 600 meteors per hour for about 3 or 4 hours about one day before everyone usually goes out to watch!). You also do not have to be a member of the group to report!

Why not try doing legitimate counts on the upcoming excellent showers such as the Geminids (Dec. 10 – 14), Quadrantids (Draconids) (Jan 1 – 4), Lyrids (Apr. 20 – 24), and Perseids (Aug. 10 – 14) which will peak during this year's SSSP. Those interested on all of the meteor showers visible in 2002 and information about radiant locations, can download the very excellent IMO Meteor Calendar from:
http://www.imo.net/calendar/cal02.html

But the most important part is to report your observations!

The Planets this Month - December 2001

By Murray D. Paulson, Edmonton Centre

Mercury was in superior conjunction with the sun on December 3rd and will make its excursion into the evening sky in the month of December. It will become visible in the evening twilight in early- to mid-January around dichotomy, which occurs on January 12th. At this time it will sit 18-1/2 degrees from the sun and shine at magnitude -0.5. We may be lucky and have a good line on it like we did last year. I watched it over a one-week period basking in an unusually warm late January. This year you should be able to see Mercury in the evening twilight after 5:30 p.m. when it will sit 6 degrees above the horizon in the southwest.

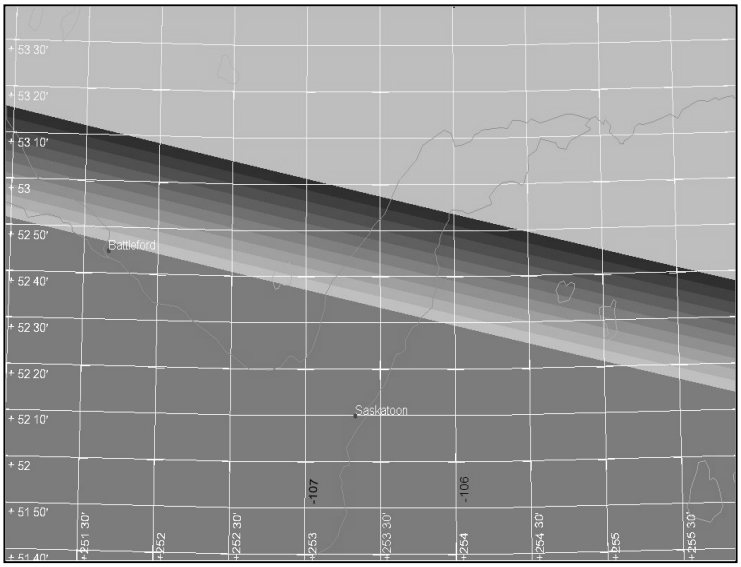
Venus starts out the month showing a 10" very gibbous disk and shines at magnitude -3.9 from its 1.67 au distance. At the beginning of December Venus lies 10 degrees from the sun. Over the month, Venus will close the distance on the sun and disappear into its glare. It will lie in superior conjunction with the sun on January 14th, at which time you might be able to find its 9.75" disk 0.5 degrees below the sun! (Ha!)

Mars was beautiful in the month of November, rising higher into the evening sky. I didn't get to watch it telescopically, but its color added to the spectacle of a crescent moon on one particular evening. Take a good look at Mars this month. This is where it will lie for its 2003 opposition when it will show a 25" disk. Still not at a great position for us northern folk, but it will be the best view in 15 years!

In early December **Jupiter** shows a 46.3" disk and shines at magnitude -2.7. It will sit at opposition on New Years day and its disk will have expanded to all of 47.0"! Look at Jupiter's position on the ecliptic. This is about as high as it gets, and you won't see it this high for another 12 years! This altitude means that Jupiter sits above the horizon for about 17 hours, 15 of which are in the darkness. So if you are inclined to see a complete rotation of the giant planet, there is lots of time to do it. On top of this, New Years Eve also rings in with a Ganymede Bulls-eye shadow transit. Shadow transits on the eve of opposition are relatively rare, and a Ganymede transit is all the more so. This event is handily placed at 2:16 am and goes till 5:20 am, somewhat like the Leonids. What you will see during the transit is Ganymede's dusky disk in bas-relief with its shadow behind it. I have followed up this article with a list of Galilean high lights over the next month. The outer moon events are relatively rare and with the complicating effect of weather you may be lucky to see just one such event. All times are **Universal Time**. Just subtract 6 hours to get our local time and note it will be the evening of the previous calendar day.

Date		Time	Moon	Event	
18	**Dec**	**2:18**	**III**	**Sh**	**start**
18	**Dec**	**3:44**	**III**	**Tr**	**start**
18	**Dec**	**5:19**	**III**	**Sh**	**end**
18	**Dec**	**6:47**	**III**	**Tr**	**end**
20	**Dec**	**0:09**	**IV**	**Ec**	**start**
20	**Dec**	**2:43**	**IV**	**Ec**	**end**
20	**Dec**	**3:02**	**IV**	**Oc**	**start**
20	Dec	3:33	I	Ec	start
20	**Dec**	**5:44**	**IV**	**Oc**	**end**
20	Dec	6:07	I	Oc	end
25	**Dec**	**6:17**	**III**	**Sh**	**start**
25	**Dec**	**7:01**	**III**	**Tr**	**start**
25	**Dec**	**9:20**	**III**	**Sh**	**end**
25	**Dec**	**10:03**	**III**	**Tr**	**end**
28	Dec	2:37	I	Sh	start
28	Dec	2:44	I	Tr	start
28	Dec	4:52	I	Sh	end
28	Dec	4:58	I	Tr	end
28	Dec	8:09	II	Ec	start
28	**Dec**	**10:58**	**IV**	**Sh**	**start**
28	Dec	11:08	II	Oc	end
28	**Dec**	**11:51**	**IV**	**Tr**	**start**
28	**Dec**	**13:39**	**IV**	**Sh**	**end**
1	**Jan**	**10:16**	**III**	**Tr**	**start**
1	**Jan**	**10:17**	**III**	**Sh**	**start**
1	Jan	12:53	I	Oc	start
1	**Jan**	**13:18**	**III**	**Tr**	**end**
1	**Jan**	**13:20**	**III**	**Sh**	**end**
12	Jan	3:11	III	Oc	start
12	Jan	3:29	I	Oc	start
12	Jan	6:01	I	Ec	end
12	Jan	7:23	III	Ec	end
14	**Jan**	**1:56**	**IV**	**Tr**	**start**
14	**Jan**	**4:38**	**IV**	**Tr**	**end**
14	**Jan**	**4:58**	**IV**	**Sh**	**start**
14	**Jan**	**7:50**	**IV**	**Sh**	**end**

Saturn was at opposition on December 3. Did you see the shadow of the planet on the rings change sides? Our weather hasn't been too cooperative since the Leonids but I hope it cooperates with December's big event. There is a grazing occultation of Saturn by a 12.6-day old moon on the night of the 27th (morning of Dec 28) at 1:46:25 am for first contact and 2:06:00 am for second contact (exit). These times are for observers located at 106.5 west and 52.16 north (Saskatoon). The farther west or north you go, the later it occurs. The graze line crosses Edmonton and I have included a graphic of the graze generated by Guide 7.0. Saturn contacts the non-illuminated edge of the moon, so it will start to disappear before you expect it! A graze event of these proportions is well worth staying up for. I think I will be traveling to get a good spot for the graze near the southern limit.



Christmas Stocking Stuffer Books 4 Sale

Books For Sale: The Saskatoon Centre has a number of Books left over form SSSP sales, and these are now available to general members to purchase at discount rates! There are only one or two copies remaining of the following titles. **Contact Debbie Anderson at 242-8854 or bazoo.inc@home.com.** Prices include GST, shipping and handling.

The Universe and Beyond *(hardcover)* - $22.00
Binocular Astronomy *(hardcover)* - $37.00
Astrophotography (G. N. Patterson) - $15.00
Exploring the Sky by Day - $7.00
Beginning Observer's Guide (BOG) - $15.00
Cambridge Star Atlas - $35.00

RASC 2002 Calendars - $12.00
SkyWatchers 2002 Calendar - $12.00
Moon Map - $5.00
RASC Stickers - $0.50
Other Worlds - $7.00
Extraterrestrials - $7.00

Asteroid Charts Now Available for 2002

By Gordon E. Sarty <sarty@prana.usask.ca>

Asteroid charts for 2002 are now on the Centre's web page! These were plotted by me and posted as but postscript (.ps) and .pdf files. The charts cover 18 of the brightest asteroids visible in the next year. All are visible in 60-mm telescopes. See our website at http://prana.usask.ca/~rasc/

Saskatoon Skies is ON-LINE

By Rick Huziak, Editor, huziak@SEDSystems.ca

Well – we're doing it! *Saskatoon Skies* is **ON-LINE.** Members may convert their subscriptions from paper to electronic if they so desire, by sending either an email with their intention to either me or Bob Christie. Adobe .pdf Reader is necessary, but it is free at:

(http://www.adobe.com/products/acrobat/readstep.html)

Those who wish to retain their paper subscriptions are welcome to do so. Watch for a format change to the newsletter beginning with the January 2002 issue. To date, 8 members have taken us up on this offer!

Earth Satellite Passes

By Les Dickson (from www.heavens-above.com

International Space Station* Evening Passes - December 12 to January 21

Date	Mag	Starts			Max. Altitude			Ends		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
12 Dec	-0.3	18:08:02	10	WSW	18:11:02	55	SSE	18:13:12	17	E
12 Dec	1.6	19:43:44	10	W	19:45:15	26	W	19:45:15	26	W
13 Dec	-0.8	18:42:05	10	W	18:45:09	81	S	18:46:01	43	E
14 Dec	-0.4	17:40:21	10	WSW	17:43:24	66	SSE	17:46:27	10	E
14 Dec	-0.2	19:16:06	10	W	19:18:44	61	WSW	19:18:44	61	WSW
15 Dec	-0.7	18:14:12	10	W	18:17:17	84	S	18:19:19	19	E
15 Dec	1.8	19:50:00	10	W	19:51:21	23	W	19:51:21	23	W
16 Dec	-0.6	18:47:59	10	W	18:51:03	71	S	18:51:53	42	ESE
17 Dec	-0.7	17:45:51	10	W	17:48:55	83	S	17:52:00	10	E
17 Dec	0.4	19:21:40	10	W	19:24:25	40	SSW	19:24:25	40	SSW
18 Dec	-0.3	18:19:23	10	W	18:22:25	61	SSW	18:24:55	14	ESE
18 Dec	2.2	19:55:31	10	W	19:56:57	17	WSW	19:56:57	17	WSW
19 Dec	0.9	18:52:52	10	W	18:55:40	32	SSW	18:57:29	17	SSE
20 Dec	0.2	17:50:19	10	W	17:53:17	51	SSW	17:56:18	10	ESE
21 Dec	1.5	18:23:38	10	W	18:26:16	26	SSW	18:28:51	10	SSE
23 Dec	2.2	17:53:59	10	W	17:56:20	20	SSW	17:58:41	10	SSE

*For more info about the International Space Station, visit their website at http://spaceflight.nasa.gov/station/.

Starshine 3* Evening Passes - December 12 to January 21

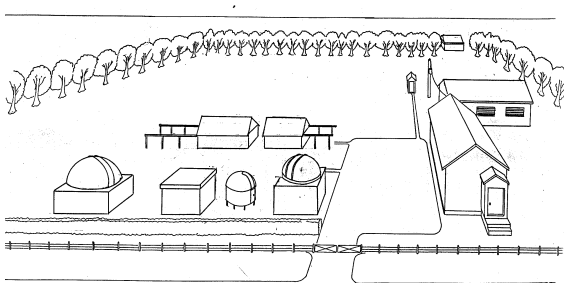
Date	Mag	Starts			Max. Altitude			Ends		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
17 Dec	?	19:11:44	10	N	19:12:00	11	N	19:12:00	11	N
18 Dec	?	18:36:45	10	N	18:37:44	12	NNE	18:37:44	12	NNE
19 Dec	?	18:01:59	10	N	18:02:39	10	NNE	18:03:19	10	NNE
19 Dec	?	19:36:32	10	NNW	19:37:09	14	NNW	19:37:09	14	NNW
20 Dec	?	19:01:13	10	NNW	19:02:52	19	N	19:02:52	19	N
21 Dec	?	18:25:52	10	NNW	18:28:27	19	NNE	18:28:36	18	NE
21 Dec	?	20:01:24	10	NW	20:02:19	17	NW	20:02:19	17	NW
22 Dec	?	17:50:30	10	N	17:52:36	15	NNE	17:54:25	11	ENE
22 Dec	?	19:25:48	10	NW	19:28:08	38	NNW	19:28:08	38	NNW
23 Dec	?	18:50:10	10	NNW	18:53:32	44	NE	18:54:05	40	ENE
23 Dec	?	20:26:37	10	WNW	20:27:49	17	WNW	20:27:49	17	WNW
24 Dec	?	18:14:30	10	NNW	18:17:40	31	NE	18:20:17	14	E
24 Dec	?	19:50:33	10	NW	19:53:46	34	WSW	19:54:02	33	SW
25 Dec	?	17:38:49	10	NNW	17:41:42	23	NE	17:44:34	10	E
25 Dec	?	19:14:33	10	NW	19:17:58	53	WSW	19:20:45	15	SSE

26 Dec	?	18:38:34	10	NW	18:42:06	85	SW	18:45:36	10	SE
26 Dec	?	20:17:18	10	WSW	20:17:29	10	WSW	20:17:41	10	WSW
27 Dec	?	18:02:35	10	NNW	18:06:07	62	NE	18:09:33	10	SE
27 Dec	?	19:39:31	10	WNW	19:41:42	16	WSW	19:43:53	10	SSW
28 Dec	?	19:02:55	10	WNW	19:05:47	24	WSW	19:08:39	10	S
29 Dec	?	18:26:29	10	NW	18:29:46	37	WSW	18:33:00	10	S
30 Dec	?	17:50:07	10	NW	17:53:30	59	WSW	17:57:02	10	SSE
31 Dec	?	18:51:37	10	W	18:52:44	11	WSW	18:53:50	10	SW
01 Jan	?	08:33:09	10	S	08:36:06	26	ESE	08:39:03	10	ENE
01 Jan	?	18:14:09	10	WNW	18:16:33	17	WSW	18:18:56	10	SSW
02 Jan	?	17:37:15	10	WNW	17:40:14	27	WSW	17:43:13	10	S

* The purpose of the Starshine 3 project "…is to encourage students around the world to participate in an actual space mission. The spacecraft is like a large disco ball with many small mirrors which glint in the sunlight as the spacecraft rotates and make it visible to observers on the ground. …In addition to the optical tracking, Starshine 3 also carries an amateur radio payload which broadcasts the current satellite spin rate." For more information, visit the project site at http://www.azinet.com/starshine/.

The Sleaford Observatory

Longitude: **105 deg 55' 13" +/- 13" W**
Latitude: **52 deg 05' 04" +/- 08" N**
Telephone: **(306) 255-2045**
by Rick Huziak



Work at the Site – With the onset of winter, work at the site has slowed down a bit, but Bill is continuing to work at making the Patterson Dome turn more freely. In addition, chart tables have been built by Garry Stone, which after varnishing will be installed in the Patterson Dome and the Warm-up Shelter. These tables will be mounted against the unused wall in the Warm-up shelter extension to allow a Sky Atlas 2000 to be propped up &opened up completely thus reducing table space taken up by atlases.

The Partnership Agreement – Hurray! Discussions and changes to this agreement seem to be done with the last bits agreed on at a meeting at my place in mid-November! The agreement needs to be put to Board of Governors at the U of S, which is expected to happen in January of February, then the agreement can be signed. We do not expect any trouble or changes look forward to the agreement being discussed in detail at a general meeting (maybe January) in the next few months and the long-awaited official signing!

Site Access – The winter access to the site is so far very good. Roads have very little snow and are in good winter driving condition. The site itself has only a few inches of snow. However, you are advised to let someone know you are going out, and carry a shovel, just in case!

Minutes of the General Meeting – November 19, 2001

Held in Room 8313, City Hospital
Recorded by al Hartridge, Secretary

1. Messier Certificate: Presented to Mike Stevens by Les Dickson.
2. Thank you: to the people who allowed their names to stand for the executive positions for the coming year.
3. Presentations:
   - Dale Jeffery: "Organized Observing".
   - Rick Huziak – "Geosynchoronous Satellites" & "The Sleaford Observatory from the air".
4. Open executive positions:
   - Observer Coordinator – need a volunteer.
   - Honorary President – a few names have been put forward, more discussion is still needed however.
5. Partnership Agreement: a meeting will be held next Friday to try and iron out the last few details.
6. Treasures Report: Present balance is $11,326.85.
7. End of Year Report due from secretary and treasurer to National.
8. Membership Report: there are fifty paid members to date and two new members have signed at this meeting.
9. Sleaford: a lot of the work has been done. The C8 is in the dome but has to polar aligned. The dome is still sticking and will have to be fixed.
10. Youth Group: there has been a very poor turn out over the last two months.
11. Books: Debbie Anderson will put an order in to Sky Publishing soon.
12. Fundraising: Darrell Chatfield is working on a few projects.
13. Library: a group of volunteers will get together on Sunday Dec. 2nd at the campus observatory at 2:00pm to continue to organize the library.
14. National Council Meeting: attended by Mike Stevens. He will talk about this at the next meeting.
15. Astronomy Day: will be held on April 20th, 2002.
16. Gastronomy Night: we will try to organize a gastronomy night in the near future.
17. Meeting adjourned at 9:45 p.m.

John Mulvenna (- 2001)

We are saddened by the news that John Mulvenna of the Regina Centre passed away from accidental injuries sustained on November 20, 2001. John was an active member of the Regina Centre, a gifted observer and supporter of the Saskatchewan Summer Star Party, which he attended along with his daughter Teresa. Teresa has been a member of the Saskatoon Centre for the past few years.

Messier, FNGC, H-400 & Binoc Club

MESSIER CLUB

Certified at 110 Objects: R. Huziak, G. Sarty, S. Alexander, S. Ferguson, D. Jeffrey, D. Chatfield, R. Christie, K. Noesgaard, Mike Stephens

Wade Selvig	**71**
Bill Hydomako	**68**
Mike Oosterlaken	**68**
Andrew Krochko	**42**
Lorne Jensen	**39**
Brent Gratias	**39**
Stan Noble	**28**
Les & Ellen Dickson	**20**
Debbie Anderson	**17**
Brian Friesen	**15**

FINEST NGC CLUB

Certified at 110 Objects: R. Huziak, D. Jeffrey, G. Sarty, D. Chatfield

Scott Alexander	**89**
Mike Stephens	**36**
Ken Noesgaard	**24**
Sandy Ferguson	**23**
Mike Oosterlaken	**15**

HERSCHEL 400 CLUB

Certified at 400 Objects: Dale Jeffrey, Rick Huziak

Darrell Chatfield	*** GETTING THERE****	**377**
Gordon Sarty		**171**
Scott Alexander		**98**
Ken Noesgaard		**44**
Mike Oosterlaken		**44**
Sandy Ferguson		**18**

Chatfield BINOCULAR CERTIFICATE

Certified at 40 Objects: Mike Stephens

Mike Oosterlaken	**32**

Join the Messier, Finest NGC, H-400 & Binocular Club!

Observe all 110 Messier, 100 FNGC or 400 H-400, or 40 Binocular objects and earn your

CERTIFICATES!

The first 2 lists can be found in ***the Observer's Handbook***. The Binocular List & Herschel 400 list will be available at each general meeting for 50 cents (covers photocopying) or **can be mailed out on request to distant members.** Each month I'll be posting updates.

Hey, Observers!

At the December General Meeting Mike Stephens will introduce the new National Explore ***the Universe*** *Observer's Certificate, and in January, that certificate will appear on this page for those observers who choose to participate.*

Anyone, who wants to observe but are not sure when and where we go, just give me a call. Since dark sky comes very early these days, it is easy to zip out to the Sleaford Observatory any day of the week, get in some observing and get back to town early to get enough sleep for tomorrow's work! Don't let the cold weather get in the way. Sleaford has an excellent warm-up facility! We observe all year around. There is even a lot of observing possible with the moon out, so don't let that deter you!

Send observing numbers to

huziak@SEDSystems.ca

Notice of the General Meeting of the Saskatoon Centre

Monday, Dec 17, 2001 at 7:30 p.m.

Room 8313 City Hospital

Presenting

Dale Jeffrey: Tour *of the Universe.*

This is s NASA slide set, great for in-class use when teaching kids about astronomy. Also, Dale will digress a bit to talk about the Star of Bethlehem.

Mike Stephens: The new beginner's certificate: *Explore The Universe.*

Note: there will be an executive meeting this month.

U of S Observatory Hours

The U of S Observatory is open to the general public every Saturday in December - February from 7:30 p.m. to 9:30 p.m.

Admission if free. The observatory is located on campus, one block north of the Wiggins Avenue and College Drive entrance. On clear evenings visitors may look through the 6-inch refractor to the moon, star clusters and other exciting astronomical objects. For further information, phone the recorded Astronomy Information Line at 966-6429.

Interested in Saskatoon RASC Membership?

Regular - $52.00 per year
Youth - $27.50 per year

It's never too late to join!

The Saskatoon Centre operates on a one-year revolving membership. You will now be a member for the next 12 months no matter when in the year you join.

Benefits of Membership in the Saskatoon Centre

- knowledgeable & friendly amateur astronomers
- use of the Sleaford Observatory
- use of the UofS Observatory (after training)
- Saskatoon Skies Newsletter
- Observer's Handbook
- The Journal of the RASC (bi-monthly)
- SkyNews Magazine (bi-monthly)
- use of the Centre library
- discounts to Sky & Telescope Magazine
- discounts of Sky Publishing merchandise
- discounts to Firefly Books
- free, no cost, no obligation, 3-month temporary membership if you don't want to join right now!

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CHESHIRE COLLIMATING EYEPIECE - $25
ANTARES COLOUR FILTER SETS (7 pieces)
VISTA MOON FILTER - $10 - a stocking stuffer
THOUSAND OAKS - NEBULA FILTERS - 1.25" & 2"
RED L.E.D. FLASHLIGHTS - $20 - a STAR PARTY Must)

And if you've been REALLY GOOD
Sky Vue has a wide selection of telescopes