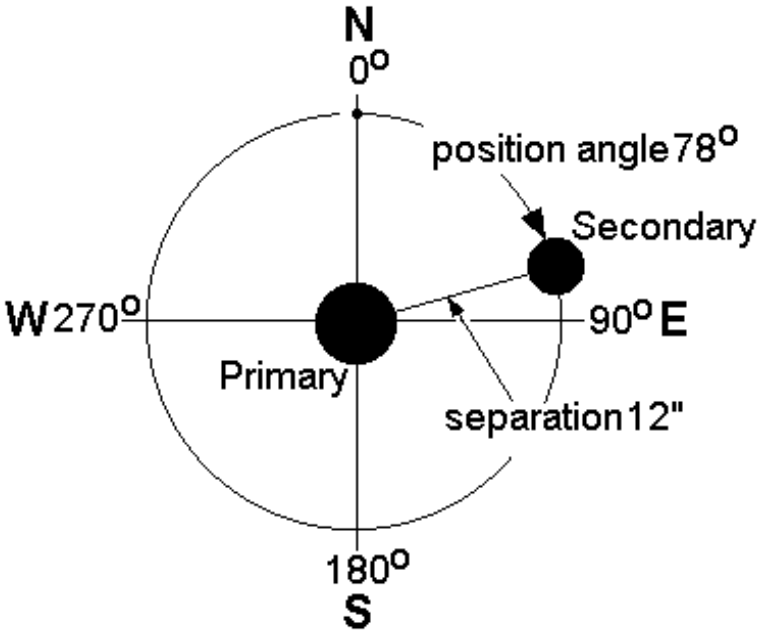
Saskatoon Skies

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

Volume 33 January 2002 Number 1



Observing double stars is fun. My article on page 13 describes the basics of double star terminology. Surely everyone who's looked though a telescope has seen the beautiful double star Alberio (beta Cygni). Thousands of others await the next glimpse. Thousands also desperately need parametric measurement if you really want to get into that kind of observing!

RASC Calendar Happenings

Date (2002)	Event	Contact	Telephone
Jan. 21	**Executive Meeting,** City Hospital, 6:30 pm	Les Dickson	249-1091
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
Mar. 18	**General Meeting**, City Hospital, 7:30 pm	Les Dickson	249-1091
Apr. 15	**General Meeting**, City Hospital, 7:30 pm	Les Dickson	249-1091
Apr. 20	**Astronomy Day Display**	Les Dickson	249-1091
Apr. 21/22	**Lyrid Meteor Peak**	Rick Huziak	665-3392
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).

Wanted: Piggyback camera mount to fit a C8. Call Darrell at 374-9278.

For Sale: ***A Guide to Pocket Astro****nomy*, by Ridpath, 192pp, color - $10.00***; An Introduction into Practical Astronomy***, by Jones, 128pp, color - $10.00; ***Astronomy,*** by Menzel, 320pp, color plates - $15.00; ***Burnham's Celestial Handbook***, 3-vol. set - $30.00; ***Sky Catalog 2000 -Vol 2***, by Sinnott - $30.00; **Brass lined trunk** - will carry an 8" or 10" SCT - $75.00; **Accessory case c/w pull and pluck foam**, 18" x 13"x 8" - $20.00; **Parts tool kit**, 16" x 8" x 7"-$10.00; **9-mm Kellner eye**piece - $20.00; Please note: all items are either in good or excellent condition. Please call Darrell at 374-9278 for details.

Saskatoon Centre

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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.

Telescope Review – the Celestron 8 Deluxe

By Darrell Chatfield

I thought I would write a short article regarding my purchase of a new Celestron 8" Deluxe S/C telescope. As some of you know, I had a Meade 10" LX6 that served me well for 3 years, but was finding it a bit heavy. Last year, I developed somewhat of a lower back problem, and the weight of the 10" was not easy on my back, so I sold it to Tyrone Klassen. Before that, I had a nice orange tube C-8 for about 3 years. That worked well, but as you all know, all astronomers get bitten by the aperture bug, so I bought the 10". (The orange tubed C-8 is now owned by Les Dickson). So, now I am back to another 8" scope. (Funny world, isn't it)?

I bought the C8D from a dealer in Calgary after doing a lot of research on the C8D and the Meade 8" LX10. The telescope arrived on August 18, 2001. Of course I had to try it out that night, and fortunately the skies cooperated. The differences between a standard Celestar 8 and Celestar 8 Deluxe are worth the money; namely a heavy duty tripod, wedge, better finder, declination motor, hand-controller, upgraded Plossl eyepiece, and Fastar capability. (I did not want the standard Celestar 8 that comes with a Wedgepod, which is a non-adjustable tripod arrangement).

Here are my findings on the telescope. The tripod is sturdy, and comes with removable rubber tips that fit over top of the chrome tips. It also has a Velcro strap to hold the legs together when transporting. The wedge is also sturdy, with a latitude adjuster to its credit. The optical tube is gleaming black, and fitted with a corrector plate cover that twists into position. It mounts onto the wedge with 3 generous-sized knobs, which makes for easier setup. The finder is a straight through 9 x 60 mm. (I have since changed it to an Omcon 45-degree finder that is "right" with the sky). The diagonal has been improved in that it is coated to be more reflective. A 26-mm Plossl eyepiece is a nice touch, also. The hand-controller is used for slow motion in both axes and fits well into a person's hand. The telescope can be driven with a 9-volt battery, 12VDC, or 120VAC.

Optically, the telescope is excellent. I was able to see good detail on M31, and NGC 404. Jupiter and Saturn were also very good. On another night here in the city, I was able to see a galaxy from my side drive, namely NGC 1012, which is listed with a magnitude of 12!

I have been very happy with the telescope, even thought the declination motor has not been working since day one. This issue will be corrected by the dealer. I have also been making slight cosmetic modifications to the C8D, but that is just I. I have not tried the Fastar component yet, but if I ever get a CCD camera, the capability is there.

Even thought there are a few technical things I would like to change, I would still recommend this telescope to anyone, whether you are new to astronomy, or a seasoned observer. I wish you all clear skies.

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@shaw.ca.** Prices include GST, shipping and handling.

Binocular Astronomy *(hardcover)* - $37.00
Astrophotography (G. N. Patterson) - $10.00**
Exploring the Sky by Day - $7.00
Cambridge Star Atlas - $35.00
RASC 2002 Calendars - $8.00**
SkyWatchers 2002 Calendar - $8.00**

RASC Stickers - $0.50
Other Worlds - $7.00
Extraterrestrials - $7.00

***** reduced to clear pricing***

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 February 2002 issue. (I've delayed the start of the new format, since my computer is in the shop getting a big upgrade).

Handbook 2002 Errata - Table of Meteor Showers

By Rajiv Gupta, Editor, *Observer's Handbook*, **gupta@INTERCHANGE.UBC.CA**

The *Table of Meteor Showers* in 2002 on page 206 of the *Observer's Handbook 2002* contains incorrect Moon percentage illumination entries. Corrected figures are available at:

http://www.rasc.ca/handbook/2002/HB02page206.html.

Approximate circumstances of the Moon for the meteor showers in 2002 can also be read from *the Sky Month by Month* section on pp. 69 - 91. The correct Moon percentage illumination figures for the prominent meteor showers in 2002 are as follows:
Quadrantid – 77; Lyrid – 71; Eta Aquarid – 42; S delta Aquarid – 80; Perseid – 23; Orionid – 99; S Taurid – 3; N Taurid – 63; Leonid a – 99; Leonid b – 100; Geminid – 74; Ursid – 91.

The Planets this Month - January 2002

By Murray D. Paulson (Edmonton Centre)

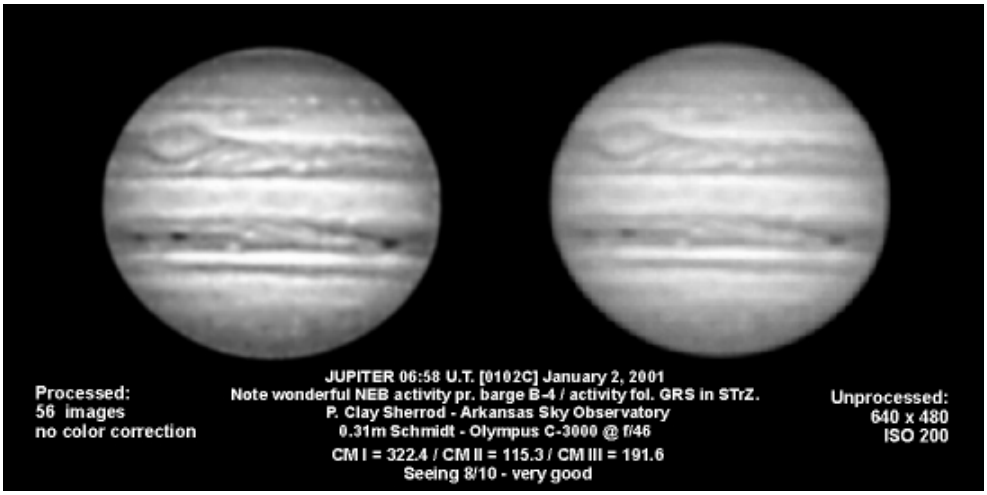
So, how was Christmas? Any new Naglers or telescopes? No, you say, he didn't stop by with that kind of loot. Well darn it anyway! He didn't even send us the clear weather for the Saturn graze. I checked Guide 7.0 and the next favorable occultations of Saturn in our area will occur in 2037.

Mercury swings into its eastern elongation and is visible in the evening twilight in mid-January. In the eyepiece you will see dichotomy, which occurs on January 12th as a 7.5 arc-second half disk. At this time it will sit 18-1/2 degrees from the sun and shine at magnitude -0.3. With luck we may follow it for a week around this period. On January 16th, a 2 - ½ day old moon will sit 10 degrees south and about 3 degrees up from Mercury. Look for Mercury about 3/4 hr after sunset in the southwest. The azimuth is about 235 degrees. Mercury sets at around 6:30 p.m. local time and fades rapidly over this week period to magnitude 1.7 on January 21st. By January 27th, Mercury will be in conjunction with the sun and from there will speed into February's morning sky.

Venus lies in superior conjunction with the sun on January 14th. It is on the far side of the sun and won't make an appearance in the evening twilight until early March.

Mars continues to rise in the evening sky. Its diminutive 5.8" disk will show its characteristic red in the eyepiece and would make a good companion piece while observing Mercury. It lies another 44 degrees eastward along the ecliptic at this time and shines at magnitude 0.8. Mars has paradoxically risen as it sinks into the west. This is a result of the angle of the ecliptic becoming more vertical and drawing Mars higher into the sky even as it moves west. Mars now lies 33 degrees above the horizon shortly after it becomes visible in the twilight!

In early January **Jupiter** shows a 47" disk and shines at magnitude -2.8. I have seen some of the good satellite events with Ganymede but missed the bull's eye transit on New Years eve. Clouds have prevented me from seeing the Callisto event but there is another event this coming month, well placed on the 14th (Sunday the 13th) and again on January 31st (a Wednesday night). If you are fortunate enough to see an eclipse event on a night of good seeing, you may get the chance to see Jupiter's shadow taking a bite out of the disk of the moon. This takes very good seeing and very high powers, but is a very nice observation. Ganymede or Callisto have the largest disks and make the best



targets for this kind of observation. Remember that the eclipse is timed for the mid-event, and the larger outer satellites will exhibit the shadow 3 to 4 minutes before the predicted time.

I also have had some nights of excellent seeing on Jupiter. The **Great Red Spot (GRS)** was well delineated and was followed by some rather large ovals in the South Equatorial Belt (SEB). This belt is divided in two. I could also see some short bits of the South Temperate Belt near the GRS looking rather like an eyebrow. There is some subtle structure just on the edge of visibility in the Southern Polar Region. The North Equatorial Belt (NEB) has some dark barges visible on it. There is a pair of barges near the GRS and another barge on the other side of the planet. Just north of the NEB, the North Temperate Belt is quite sharply defined. Check out ALPO's site for the latest amateur photographs of the planet. ALPO's web site is http://www.lpl.arizona.edu/alpo/. Check the Jupiter section and check the link JUPITER OBSERVATIONS AND ALERTS. I have included a few photographs from their image gallery.

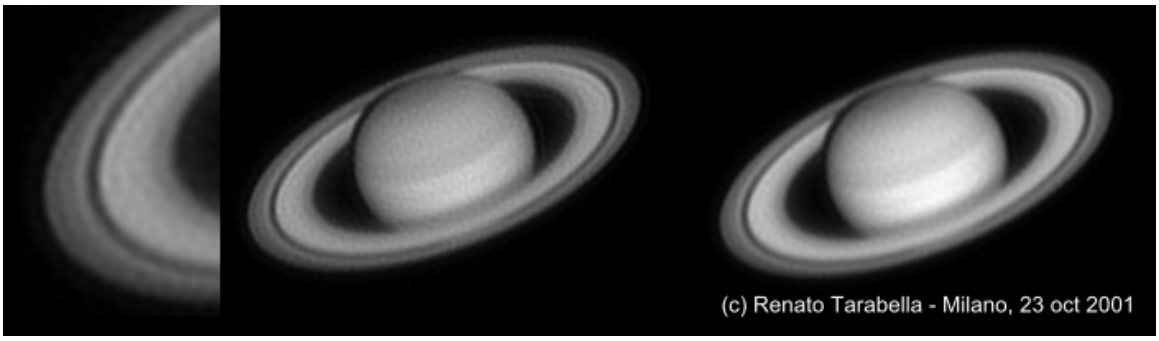
I have included a list of highlight Galilean events for the next month. All times are Universal Time (UT). Just subtract 6 hours to get our local time. (The ephemeris is generated by Guide 7.0).

Date		Time	Moon	event	
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**
19	Jan	5:14	I	Oc	start
19	Jan	6:28	III	Oc	start
19	*Jan*	*7:56*	*I*	*Ecl*	*end*
20	Jan	2:21	I	Tr	start
20	Jan	2:49	I	Sh	start
20	Jan	4:35	I	Tr	end
20	Jan	5:04	I	Sh	end
23	**Jan**	**1:21**	**III**	**Sh**	**end**
24	Jan	0:19	II	Sh	start
24	Jan	1:59	II	Tr	end
24	Jan	3:08	II	Sh	end
30	**Jan**	**2:14**	**III**	**Sh**	**start**
30	**Jan**	**2:30**	**III**	**Tr**	**end**
30	**Jan**	**5:21**	**III**	**Sh**	**end**

31	**Jan**	**1:29**	**II**	**Tr**	**start**
31	**Jan**	**2:03**	**IV**	**Sh**	**end**
31	**Jan**	**2:56**	**II**	**Sh**	**start**
31	**Jan**	**4:18**	**II**	**Tr**	**end**
31	**Jan**	**5:45**	**II**	**Sh**	**end**
5	Feb	0:19	I	Tr	start
5	Feb	1:07	I	Sh	start
5	Feb	2:33	I	Tr	end
5	Feb	3:22	I	Sh	end
6	Feb	0:44	I	Ecl	end
6	**Feb**	**2:53**	**III**	**Tr**	**start**
6	**Feb**	**5:56**	**III**	**Tr**	**end**
6	**Feb**	**6:14**	**III**	**Sh**	**start**
7	Feb	3:49	II	Tr	start
7	Feb	5:33	II	Sh	start
7	Feb	6:38	II	Tr	end
8	**Feb**	**0:51**	**IV**	**Oc**	**end**
8	**Feb**	**6:13**	**IV**	**Ecl**	**start**
8	**Feb**	**9:22**	**IV**	**Ecl**	**end**

Our wonderful weather of late December didn't quite make it to the **Saturn** graze. It was close, but no cigar! This coming month the **moon once more occults Saturn**, but the event is only visible in the eastern part of the world. We have one more chance on a Saturn occultation but it is a daytime event in mid-April. I will have more info on it in the March issue. Saturn shines at magnitude –0.1 and shows a 19.5" disk this month. On the few occasions I have had to observe Saturn I have been luck to have reasonable seeing. The placement of the rings above the South Pole of the planet and the shadow

projected onto the rings enhances the 3-D effect of it all. Subtle contrasts in the various rings and structure that sits at the edge of visibility continually amaze me. Look for the Encke minima in the outer ring A and look for subtle stranding in the inner reaches of ring B. Another 3-D effect is how spread out the moons are from Saturn as they pass above or below it. They really seem to hang in space.



Clear Sky Clocks for Saskatchewan

By Vance Petriew, <vance.petriew@saskeds.com>

Here is the link to the sky clocks for Saskatchewan. The clocks are based on the data from the Astronomy Weather Forecast pages. I've watched these forecasts for well over a year and find them to be pretty accurate within a 24-hour period. The animations allow you to predict more exact times for cloud clearing than the individual, 3-hour images do. Enjoy!

http://cleardarksky.com/csk/prov/Saskatchewan_clocks.shtml
http://www.cmc.ec.gc.ca/cmc/htmls/mainpage.html

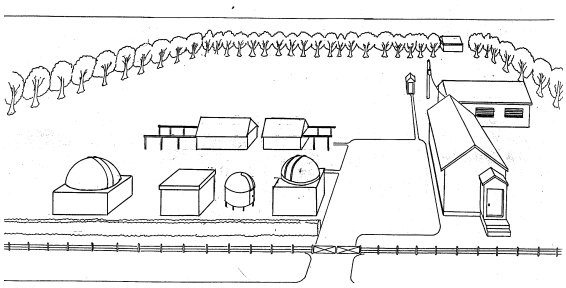
Bottle Drive to Raise Some Cash

By Darrell Chatfield

I'd like to have a bottle drive to do some fundraising for the Centre. Please bring your empties to the next General Meeting. I will collect these bottles from your cars following the meeting. If you cannot attend the meeting and would like to contribute bottles anyway, please call me at 374-9278.

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 – Bill is continuing to work at making the Patterson Dome turn more freely. The C-8 is now installed and the pier has been aligned, though fine, precise alignment is continuing. Completion of railing and outdoor work has been delayed until the spring. Now to raise $17,000 for the next building!

Site Useage for 2001 – We've had excellent use of the Sleaford Observatory in 2001 and we hope that it continues in 2002. The numbers in the table show good overall visitation, with the **number of nights** the site was used by RASC members, excluding visits by the U of S Astronomy 100 or 212 students, and excluding the hundreds of visitors and teachers who have visited the site during open houses. The **number of users** represents the number of individuals that observed from the site, though the same observer may have observed from the site on several occasions during a month (as is the usual case). The numbers show that the site was used on 22% of possible nights during the year. This is a very good percentage, since about 25% of the nights are cloudy, and 40% of the nights have a bright moon present for a substantial part of the night. If everyone who used the site this year was included in the count (including the Public open house, Regina Centre visit, teacher's tours, and Astronomy student usage, the totals would increase to about 130 nights used and almost 700 visitors!

RASC Sleaford Observer Usage (2001)		
Month	**No. of Nites**	**No. of Users**
Jan.	5	11
Feb.	3	6
Mar.	12	31
Apr.	2	3
May	9	29
Jun.	4	9
Jul.	10	20
Aug.	9	23
Sep.	10	24
Oct.	7	30
Nov.	4	19
Dec.	6	11
Totals	**81**	**216**

Site Access – The roads to Sleaford continue to be in good winter driving condition. In fact, the Highway #5 has been re-paved past the St. Denis turnoff, making for smooth sailing. The site itself has very little snow, making entry easy, with no worry of getting stuck. No reason not to come observing!

Variable Star Charts – An entire set of about 2600 AAVSO variable star charts has been placed out at the site in 8 binders. Please use these if you are observing variables, but please do not remove the binders from the site library. I will maintain and update these charts as AAVSO issues new ones.

Earth Satellite Passes

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

International Space Station* Evening Passes – January 16 to February 21

Date	Mag	Starts			Max. Altitude			Ends		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
16 Jan	1.3	08:28:26	10	W	08:30:59	21	SW	08:33:32	10	SSE
17 Jan	2.2	06:02:04	19	ESE	06:02:04	19	ESE	06:03:07	10	ESE
17 Jan	0.6	07:34:32	22	WSW	07:35:55	32	SSW	07:38:51	10	SE
18 Jan	0.6	06:41:25	38	SSE	06:41:25	38	SSE	06:43:48	10	SE
18 Jan	1.8	08:14:44	10	WSW	08:16:23	13	SW	08:18:01	10	S
19 Jan	1.1	07:20:41	20	SW	07:21:09	21	SW	07:23:40	10	SSE
20 Jan	1.7	06:27:27	19	SSE	06:27:27	19	SSE	06:28:41	10	SE
21 Jan	1.9	07:06:37	12	SSW	07:06:37	12	SSW	07:07:28	10	S
02 Feb	1.8	20:26:07	10	SW	20:27:12	18	SSW	20:27:12	18	SSW
03 Feb	1.1	19:29:30	10	SSW	19:32:01	21	SSE	19:32:32	20	SE
04 Feb	0.2	20:07:26	10	SW	20:10:01	42	S	20:10:01	42	S
05 Feb	0.6	19:10:20	10	SW	19:13:13	31	SSE	19:15:01	18	E
05 Feb	1.7	20:45:54	10	WSW	20:47:20	24	WSW	20:47:20	24	WSW
06 Feb	-0.5	19:48:25	10	WSW	19:51:35	62	SSE	19:52:11	49	ESE
07 Feb	0.1	18:50:57	10	SW	18:54:03	43	SSE	18:56:53	11	E
07 Feb	0.4	20:26:47	10	W	20:29:12	47	W	20:29:12	47	W
08 Feb	-0.6	19:29:02	10	WSW	19:32:14	75	S	19:33:46	28	E
08 Feb	2.3	21:05:06	10	W	21:06:04	18	W	21:06:04	18	W
09 Feb	-0.7	20:07:13	10	W	20:10:24	83	SSW	20:10:32	80	SE
10 Feb	-0.6	19:09:13	10	W	19:12:27	83	SSE	19:14:55	16	E
10 Feb	1.2	20:45:18	10	W	20:47:12	32	W	20:47:12	32	W
11 Feb	-0.6	19:47:11	10	W	19:50:24	76	S	19:51:29	37	ESE
12 Feb	-0.6	18:48:58	10	W	18:52:11	84	S	18:55:22	10	E
12 Feb	0.2	20:25:03	10	W	20:27:59	44	SSW	20:27:59	44	SSW
13 Feb	-0.3	19:26:41	10	W	19:29:52	63	SSW	19:32:09	17	ESE
13 Feb	2.1	21:03:04	10	W	21:04:25	17	WSW	21:04:25	17	WSW
14 Feb	0.8	20:04:23	10	W	20:07:18	33	SSW	20:08:33	23	SSE
15 Feb	0.2	19:05:45	10	W	19:08:54	49	SSW	19:11:57	10	SE
15 Feb	2.2	20:42:34	10	WSW	20:44:22	14	SW	20:44:57	14	SSW
16 Feb	1.6	19:43:21	10	W	19:45:57	23	SSW	19:48:34	10	SSE
18 Feb	2.3	19:22:02	10	WSW	19:24:08	16	SW	19:26:13	10	S

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

Starshine 3* Evening Passes – January 16 to February 21

Date	Starts			Max. Altitude			Ends		
	Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
30 Jan	08:11:56	10	NNW	08:14:57	26	NE	08:17:56	10	E
31 Jan	07:33:47	10	NNW	07:36:24	19	NE	07:38:59	10	E
01 Feb	06:55:39	10	N	06:57:43	15	NNE	06:59:47	10	ENE
02 Feb	06:17:54	11	N	06:18:55	12	NNE	06:20:16	10	NE
02 Feb	07:52:20	10	NNW	07:55:43	42	NE	07:59:00	10	ESE
03 Feb	07:13:54	10	NNW	07:16:59	28	NE	07:20:04	10	ESE
04 Feb	06:36:14	14	N	06:38:11	21	NE	06:40:52	10	E
05 Feb	05:58:36	15	NNE	05:59:14	16	NNE	06:01:26	10	ENE
05 Feb	07:32:11	10	NW	07:35:36	76	NNE	07:39:08	10	SE
06 Feb	05:20:57	12	NE	05:20:57	12	NE	05:21:42	10	NE
06 Feb	06:54:27	17	NNW	06:56:48	47	NE	07:00:13	10	ESE
07 Feb	06:16:48	25	N	06:17:54	31	NE	06:21:02	10	ESE
07 Feb	07:50:37	10	NW	07:53:46	33	WSW	07:56:53	10	S
08 Feb	05:39:09	22	NE	05:39:09	22	NE	05:41:36	10	E
08 Feb	07:12:38	19	NW	07:14:52	56	WSW	07:18:20	10	SSE
09 Feb	05:01:31	12	ENE	05:01:31	12	ENE	05:01:56	10	ENE
09 Feb	06:35:00	44	NNW	06:35:59	85	NE	06:39:27	10	SE
10 Feb	05:57:24	46	ENE	05:57:24	46	ENE	06:00:18	10	SE
10 Feb	07:30:54	14	W	07:32:26	18	WSW	07:34:54	10	SSW
11 Feb	05:19:52	17	E	05:19:52	17	E	05:20:53	10	ESE
11 Feb	06:53:22	30	WSW	06:53:30	30	WSW	06:56:33	10	S
12 Feb	06:15:53	28	S	06:15:53	28	S	06:17:46	10	SSE
13 Feb	05:38:30	11	SE	05:38:30	11	SE	05:38:40	10	SE
16 Feb	20:26:08	10	SSW	20:28:01	28	S	20:28:01	28	S
17 Feb	19:47:03	10	S	19:50:00	27	ESE	19:50:29	26	ESE
17 Feb	21:22:29	10	WSW	21:23:58	21	W	21:23:58	21	W
18 Feb	19:08:20	10	SSE	19:10:33	16	ESE	19:12:43	10	ENE
18 Feb	20:42:35	10	SW	20:45:59	57	NW	20:46:12	56	NNW
19 Feb	20:02:49	10	SW	20:06:16	84	ESE	20:08:13	24	NE
19 Feb	21:40:06	10	WNW	21:41:41	16	NW	21:41:41	16	NW
20 Feb	19:23:13	10	SSW	19:26:32	47	ESE	19:29:51	10	NE
20 Feb	20:59:38	10	W	21:02:30	24	NW	21:03:30	21	N
21 Feb	20:19:19	10	WSW	20:22:30	35	NW	20:25:08	14	NNE

* The purpose of the Starshine 3 project "…is to encourage student around the world to participate in an actual space mission. The spacecraft is like a large disco bass 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 website at http"//www.azinet.com/starshine/.

Iridium Flares (> mag. –2) Evening Passes from Saskatoon – Jan. 16 to Feb. 21.

Date	Time	Local Intensity	Alt.	Azimuth	Distance to Flare Centre	Satellite
16 Jan	19:06:27	-6	13°	294° (WNW)	15.9 km (E)	Iridium 52
17 Jan	18:51:33	-6	15°	291° (WNW)	19.5 km (W)	Iridium 84
18 Jan	06:59:05	-4	15°	46° (NE)	38.4 km (E)	Iridium 65
18 Jan	18:36:37	-6	18°	287° (WNW)	17.9 km (W)	Iridium 54
19 Jan	06:33:57	-6	10°	39° (NE)	34.7 km (W)	Iridium 66
19 Jan	06:43:20	-3	12°	42° (NE)	78.7 km (W)	Iridium 67
19 Jan	18:07:41	-4	11°	223° (SW)	28.7 km (E)	Iridium 54
19 Jan	18:21:34	-4	21°	284° (WNW)	24.4 km (E)	Iridium 13
21 Jan	07:43:02	-3	53°	348° (NNW)	16.1 km (W)	Iridium 40
21 Jan	18:00:24	-6	25°	280° (W)	13.0 km (E)	Iridium 52
22 Jan	07:27:21	-3	11°	139° (SE)	37.7 km (E)	Iridium 75
22 Jan	07:37:03	-4	52°	350° (N)	9.7 km (W)	Iridium 17
23 Jan	07:30:01	-6	14°	143° (SE)	3.3 km (E)	Iridium 64
23 Jan	07:31:04	-6	50°	351° (N)	6.2 km (W)	Iridium 38
23 Jan	18:50:44	-3	34°	185° (S)	15.9 km (E)	Iridium 39
24 Jan	07:25:02	-6	49°	353° (N)	5.3 km (E)	Iridium 18
25 Jan	07:19:07	-4	47°	354° (N)	9.7 km (E)	Iridium 39
27 Jan	20:06:23	-5	38°	25° (NNE)	8.2 km (E)	Iridium 65
29 Jan	07:20:08	-6	23°	156° (SSE)	6.8 km (E)	Iridium 63
30 Jan	18:26:48	-7	30°	201° (SSW)	1.5 km (E)	Iridium 80
31 Jan	08:40:31	-6	35°	69° (ENE)	9.8 km (W)	Iridium 3
01 Feb	07:11:04	-6	26°	162° (SSE)	7.6 km (E)	Iridium 62
02 Feb	18:17:51	-6	27°	208° (SSW)	5.8 km (W)	Iridium 39
03 Feb	19:32:29	-8	51°	28° (NNE)	3.5 km (E)	Iridium 65
04 Feb	07:01:54	-4	30°	170° (S)	11.7 km (W)	Iridium 70
05 Feb	07:51:52	-4	25°	62° (ENE)	26.3 km (W)	Iridium 23
06 Feb	07:36:14	-3	21°	59° (ENE)	34.9 km (E)	Iridium 25
08 Feb	05:56:53	-7	18°	4° (N)	0.5 km (W)	Iridium 42
08 Feb	06:46:03	-7	33°	177° (S)	1.3 km (E)	Iridium 63
08 Feb	07:04:49	-3	15°	53° (NE)	58.1 km (E)	Iridium 11
08 Feb	19:09:42	-5	11°	286° (WNW)	14.6 km (W)	Iridium 41
09 Feb	06:49:24	-6	13°	50° (NE)	8.5 km (W)	Iridium 26
09 Feb	18:54:41	-4	14°	283° (WNW)	37.6 km (W)	Iridium 18
09 Feb	21:01:51	-7	19°	13° (NNE)	4.7 km (E)	Iridium 46
10 Feb	18:39:49	-5	16°	280° (W)	24.4 km (W)	Iridium 40
11 Feb	07:47:06	-6	18°	136° (SE)	1.0 km (E)	Iridium 22
11 Feb	18:24:49	-6	19°	276° (W)	9.6 km (E)	Iridium 80
11 Feb	18:52:14	-8	65°	32° (NNE)	2.8 km (E)	Iridium 68
12 Feb	18:46:59	-6	67°	33° (NNE)	6.1 km (E)	Iridium 75
15 Feb	07:40:37	-6	25°	145° (SE)	6.5 km (W)	Iridium 25
16 Feb	06:14:11	-3	38°	196° (SSW)	15.0 km (W)	Iridium 67
17 Feb	06:10:01	-3	39°	198° (SSW)	16.9 km (W)	Iridium 72
18 Feb	07:31:45	-7	29°	150° (SSE)	3.8 km (W)	Iridium 76

A Double Star Primer

By Rick Huziak

Observing double stars is just a lot of fun. There are a number of very nice pairs in the sky, and you often chance on double stars near or within most objects you star hop to or observe. You can observe double stars just for the fun of it, or you can also get into precisely measuring the separation of these stars for scientific study. This articles deals more with the basic terminology of double star observing.

A **double star** is a term for two stars that are seemingly close in the sky. There are 2 main categories to double stars: **binaries**, which are gravitationally connected and rotate around each other, **and optical doubles,** which seem close together but are in reality just lined up in the sky and may be light years apart in reality, having no real physical association. **Multiple stars** are just double stars with more than one companion. As in double stars, each companion may be gravitationally associated, or it may be completely non-associated.

The fun of observing doubles comes from two places. First, double stars often let you compare the **colours** of the stars against one another. All stars have some sort of colour, but these colours seem more pronounced when the stars are found in pairs. Secondly, doubles can be used to test sky conditions or optical performance using the two stars' separation. **Separation** is the distance from one star to another, and this is always expressed in **seconds-of-arc**. Close separations are difficult to resolve in smaller scopes or under poor sky conditions. Exactly how close of a double can be separated will be based on your telescope's quality, the quality of the sky, and by your observing experience.

The other attribute that a double star has is **position angle**. This is a measurement of the angle in the sky that the dimmer star is away from the brighter star. This is measured in angular degrees, with north being 0 degrees, east being 90 degrees, south 180 degrees, and west 270 degrees. The separation and position angle are always measured to the **secondary** (dimmer star), using the **primary** (brighter star) as the zero position.

Lastly, double stars come in all **magnitudes** as so all other stars. Close doubles are easiest to separate if the magnitudes of each star are similar, and hardest if the magnitudes are markedly different.

So, a complete description of a double star may be: a blue primary, 4.6 magnitude and yellow secondary, 8.4 magnitude, separation 12", position angle 112 degrees.

Double stars are denoted on star atlases as a **dot with horizontal line** through it. Most atlases show double stars using this symbol. Doubles also have names, and there are several catalogues of double stars, with the designations named (generally) after the observer who discovered them. Common double star names are Burnham, Aitkens, Struve and many others. Probably the most complete double star listing is the *Washington Double Star Catalogue*, found at http://ad.usno.navy.mil/proj/WDS/wds.html; a compilation which contains thousands of entries, most of which are in dire need of being remeasured. Many of these doubles have not been remeasured since their initial discovery a half-century or century ago! Doubles are measured using a tool called a Filar Micrometer, which fits on an eyepiece and measures separation and position angles. Modern double star observers now have converted to using CCD cameras and sophisticated software to automatically measure these star separations. Only by making continuous observations over many years can it be distinguished whether a double star is a binary or an optical double.

A great list of double stars is printed in your *2002 Observer's Handbook* on page 239.

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

Bill Hydomako		**78**
Wade Selvig		**71**
Mike Oosterlaken		**68**
Andrew Krochko		**42**
Lorne Jensen		**44**
Brent Gratias		**39**
Stan Noble		**28**
Tyrone Klassen	**** NEW ****	**26**
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	**42**
Ken Noesgaard	**24**
Sandy Ferguson	**23**
Mike Oosterlaken	**15**

HERSCHEL 400 CLUB

Certified at 400 Objects: Dale Jeffrey, Rick Huziak

Darrell Chatfield	*** ALMOST THERE***	**381**
Gordon Sarty		**171**
Scott Alexander		**98**
Mike Stephens	**** NEW ****	**59**
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!

I've had updates from several observers this month. With the nice weather, several members are taking the opportunity to tweak up their numbers. Updates were received from Lorne Jensen, Bill Hydomako, Darrell Chatfield, Tyrone Klassen and Mike Stephens! Bill takes over first place in the Messier race. Mike gets added to the H-400 list! Tyrone gets entered into the Messier list. It's great to see more observing going on!

But that is still not enough! I'd like to see every member of the Saskatoon Centre on one of these lists! It's easy. A few months ago, I mentioned Messier objects visible to the naked eye. Go outside – look at M45 & M31 with your eyes and get yourself started in the Messier Certificate program.

Send observing numbers to
huziak@SEDSystems.ca

Notice of the General Meeting of the Saskatoon Centre

Monday, Jan. 21, 2002 at 7:30 p.m.

Room 8313 City Hospital

Presenting

Gord Sarty: The Rare Eclipse of OW Gem

Rick Huziak: The New Uranometria 2000.0 Star Atlas

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 January - 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 (printed or on-line)
- 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!

Minutes of the Executive Meeting – December 17, 2001

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

1. Minutes of previous moved approved by Bob Christie and seconded by Dale Jeffery and carried.
2. National Report – the Secretary's report is in the works and will be sent to National in the near future.
3. Library Report - a group of volunteers put in 3 hours work at the Campus observatory and made a fair bite in the organization and sorting of books and journals.
4. Membership Report - currently there are 72 paid up members.
5. Fund-raising Report - no further progress at this time.
6. Beginner's Certificate - Mike Stevens described a beginner's-oriented *Explore the Universe* certificate. It was moved, seconded and carried that our Centre act as the approval body for this certificate.
7. IDA- the *International Dark-sky Association* is having a membership drive.
8. A request was made by Darrell that the Centre buy the shelter used at SSSP 2001. Further discussion tabled until next month.
9. SSSP committee needed early in January 2002. Next year it is hoped star party will be more heavily into workshops and clinics with possibly no guest major speaker.
10. Meeting adjourned at 7:00 p.m.

Minutes of the General Meeting – December 17, 2001

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

1. Presentations:
   - Dale Jeffrey – *Tour of the Universe*
   - Mike Stevens – The new beginner's certificate *"Explore the Universe"*
   - Darrell Chatfield – slides of the aurora at Sleaford.
2. Approval of minutes: moved by Dale and seconded by Scott and carried that the minutes of the previous meeting be approved as read.
3. Letter to National: will be taken care of before the end of December.
4. Library clean up: 7 volunteers showed up at the campus observatory and over a period put a large dent in the work to be completed on the library.
5. Membership: there are 72 paid up members at present.
6. Fundraising: Darrell encouraged all members to bring there empties to the next meeting and he will pick them up and turn them into money.
7. SSSP: the emphasis next year may be on more workshops and clinics.
8. Tent: used at the last SSSP for registration will be purchased from Darrell Chatfield.
9. Gastronomy Night: will try and hold one in January, possibly a Dim Sum.
10. Partnership Agreement: 99% complete. Still waiting for a paragraph to be revised. Will be sent U of S administration.
11. Speakers: Dale Jeffrey mentioned that obtaining speakers for meetings is very difficult. If people have a short talk they would be willing to give at a meeting let him know.
12. Meeting adjourned at 9:30 p.m.