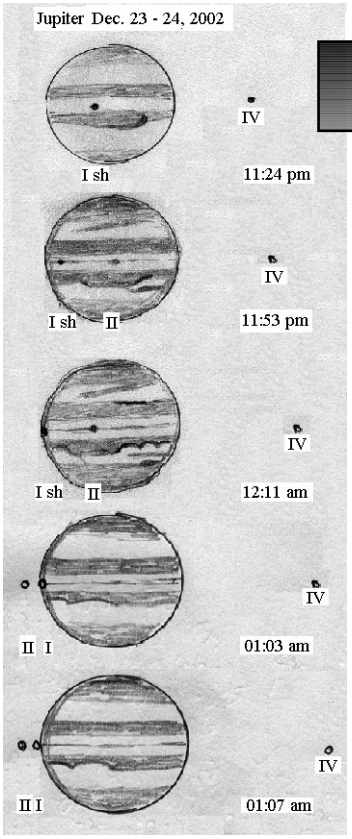
Saskatoon Skies

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

Vol. 34, No. 1 **January 2003**



Mutual events around Jupiter

Because of unique Jupiter-Sun-Earth geometry, mutual satellite events happen almost every night through to October. All events will occur near Jupiter's equatorial plane. In these figures, Io's shadow (I sh) transits the face while Io itself is not visible against the planet. Europa (II) is dimly visible though and transits as well. As time goes on, both moons exit the disk. An hour after the last drawing, Europa partially occults Io. Mutual events around Jupiter are both fun and challenging to watch.

In this issue...

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Membership?

It's never too late to join!

Regular: $52.00/year Youth: $27.50/year

The Saskatoon Centre operates on a one-year revolving membership. You will be a member for the next 12 months no matter when in the year you join. If you do not want to join at this time, ask to get onto our FREE 3-month Temporary Membership list. You will receive regular mailings of our *Saskatoon Skies* newsletter and will be invited to participate in Centre activities. Members are encouraged to renew early to avoid disruption in publications. Renew through the membership coordinator, Bob Christie, or renew through the National Office and let Bob know that you did!

Benefits of Membership in the Saskatoon Centre

- knowledgeable & friendly amateur astronomers
- use of the Sleaford Observatory
- use of the U of S Observatory (after training)
- *Saskatoon Skies* Newsletter
- **Observer's Handbook 2003**
- **The Journal of the RASC** (bimonthly)
- **SkyNews Magazine** (bimonthly)
- 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!

Bottle Drive & Canadian Tire $

by Darrell Chatfield

Please remember our on-going bottle and now Canadian Tire money drive to fundraise for the Centre. Bring them to General meetings. I will collect them after the meeting concludes. If you cannot make it to the meeting but would like to contribute, please call me at 374-9278.

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, Jupiter, Saturn, and other exciting astronomical objects. For further information, phone the recorded Astronomy Information Line at 966-6429.

About this Newsletter…

Newsletter Editor – *Richard Huziak*
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Saskatoon Skies is published monthly by the Saskatoon Centre of the RASC. 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. Submitted materials can be returned upon request. 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 .EPSs, .TIFs or .JPGs (.GIFs also accepted). Send e-mail submissions to the editor at <huziak@SEDSystems.ca>. Please send articles in "generic" formats with simple formatting appreciated – one tab at the beginning of paragraphs, one space after commas and periods. 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.

RASC Calendar of Events

DATE (2003)	EVENT	CONTACT	TELEPHONE
Jan. 10	**Youth Group Meeting** – Nutana Collegiate, 7:00 p.m.	Tyrone Klassen	652-4599
Jan. 11	**Astronomy Gastronomy – Tony Tomas** (Centre at Circle & 8th Mall), 7:00 p.m. RSVP Les Dickson for a head count	Les Dickson	249-1091
Jan. 12	**SSSP Meeting** at Sandy Ferguson's place, 2:00 p.m.	Les Dickson	249-1091
Jan. 20	**General Meeting – "The Canadian Light Source"** – Room 8313, City Hospital, 7:30 p.m.	Les Dickson	249-1091
Feb. 7	**Youth Group Meeting** – Nutana Collegiate, 7:00 p.m.	Tyrone Klassen	652-4599
Feb. 17	**General Meeting – "tbd"** – Room 8313, City Hospital, 7:30 p.m.	Les Dickson	249-1091
Mar. 14	Rick Huziak speaking at **Winnipeg Centre Meeting**	Rick Huziak	665-3392
Mar. 14	**Youth Group Meeting** – Nutana Collegiate, 7:00 p.m.	Tyrone Klassen	652-4599
Mar. 17	**General Meeting – "tbd"** – Room 8313, City Hospital, 7:30 p.m.	Les Dickson	249-1091
Apr. 11	**Youth Group Meeting** – Nutana Collegiate, 7:00 p.m.	Tyrone Klassen	652-4599
Apr. ??	**Astronomy Day – location tbd**	Les Dickson	249-1091
Apr. 21	**Pre-meeting Gastronomy for Rajiv Gupta** – 6:00 p.m., place tbd	Les Dickson	249-1091
Apr. 21	**General Meeting – Rajiv Gupta, National President of RASC** – Room 8313, City Hospital, 7:30 p.m.	Les Dickson	249-1091
May 19	**General Meeting – "tbd"** – Room 8313, City Hospital, 7:30 p.m.	Les Dickson	249-1091
June 16	**General Meeting – "tbd"** – Room 8313, City Hospital, 7:30 p.m.	Les Dickson	249-1091
Aug. 22-24	**Sask. Summer Star Party 2003** – Cypress Hills Prov. Park	Les Dickson	249-1091

Notice of the GENERAL MEETING of the Saskatoon Centre

Monday, Jan. 20, 2003
7:30 p.m.
Room 8313 City Hospital

Presenting:

The Canadian Light Source

One of the Canadian Light Source staff will speak on the building and use of Saskatoon's new synchrotron and its applications in high energy physics from genetics to the creation of the universe.

Admission is free and non-members are welcome to attend.

Saskatoon Centre Books 4 Sale

The Saskatoon Centre has purchased a number of Sky Publishing & Firefly Books for SSSP sales, and these are available to general members to purchase at discount rates! Contact Rick Huziak at huziak@SEDSystems.ca or 665-3392. **Note:** *If you would like to be the new Book Sales Coordinator, call Les Dickson at 249-1091.*

- Touring the Universe thru Binocs (1) - $54.00
- Build Your Own Telescope (1) - $42.00
- Cambridge Star Atlas (1) - $40.00
- Astrophotography *by GN Patterson* (lots) - $5.00 **
- ***NEW*** - 2003 RASC Calendars (5) - $15.00
- RASC Stickers - $0.50**
- Other Worlds (1) - $7.00**
- Extraterrestrials (1) - $6.50**

All prices include GST, but NOT shipping.
Prices marked ** are at COST and reduced to clear.

REMEMBER…

You can sign up to get this newsletter on the internet instead of waiting for snail-mail. Current electronic subscribers **save us over $320/year** in mailing costs.

Garry's and Tenho's Great Hanley Adventure

by Tenho Tuomi <tuomi@sk.sympatico.ca>

We arrived at a farm south of Hanley by about 6:30 p.m. We first gathered in a heated shop with about 20 Cubs plus leaders, and gave demonstrations of the phases of the moon using a globe and a golf ball for the moon, and showed the rotation of the stars using an umbrella in which I had marked stars for Ursa Major and Cassiopeia. Garry talked about star maps and distances to galaxies.

At about 7:30 p.m. we went outside and set up our telescopes. The only clear spot seemed to be to the east so we were able to show Saturn, and everybody was very impressed with the object that did not even seem real that was hanging out there somewhere. The first quarter moon was impressive too, though still mostly cloud covered.

By 8:30 p.m. more of the sky cleared up and we were able to show impressive close-ups of the moon craters. The 8 x 30 telescope was used to show star groups like the Pleiades and the Hyades. Some had brought their own binoculars and a spotting scope and were able to follow along. By 9:00 p.m. we were able to show the Andromeda galaxy and the Orion Nebula to the few who were still left. The sky never cleared up completely but there were always enough holes in the clouds that we could show a few things, though no deep sky objects because of the moon. We left before Jupiter rose.

There was some interest in astronomy. Many had noticed the bright star in the morning and some even knew it was Venus. We hope that we left them with some idea of what an astronomer is and what telescopes can show, and maybe they will look up more often.

Sky Buys & Mirror Cells

The Saskatoon Centre's Swap and Sale Page!

For Sale: Sky-Watcher 114mm x 900mm focal length Newtonian reflector with 5 x 24 finderscope, 25mm & 10mm **Kellner oculars**, and 2X Barlow. One year old, with older EQ-2 equatorial mount. Excellent beginner's scope. $200.00. Call Tenho Tuomi at Lucky Lake, (306) 858-2453 or e-mail tuomi@sk.sympatico.ca

For Sale: Large Astronomical and Cosmology library – come and take a peek; **40mm Kellner 1-1/4" eyepiece** – $20.00; **10mm Plossl 1-1/4" eyepiece** – $20.00; **2X Celestron - 1-1/4" Barlow** – $50.00; **Polarizer filter** – $20.00; **23A Wratten Orange (Mars) filter** – $15.00; **T-mount camera adapter for Canon** – $25.00. Call Dale Jeffrey at Laird, (306) 223-4447 or e-mail dale.jeffrey@sk.sympatico.ca

For Sale: One 15mm TeleVue Panoptic eyepiece. Excellent condition with end caps and box. $250.00. Call Bill Hydomako at 384-4781.

Wanted: Pre-1985 2" Visual Back or Diagonal for C-8. Years after this have different threads. Call Les Dickson at 249-1091.

For Sale: *Sky Catalog 2000 - Vol.2,* by Sinnott – $30.00. ***Astronomy,*** 2002, by Robert Burnham – Color sky charts, planet information, etc., – $15.00. **35mm Bausch and Lomb Plossl eyepiece,** fully coated. Excellent shape; in original box with dust caps – $80.00. Call Darrell at 374-9278.

Wanted: Older **opaque projector** or the lens and lamp from one. Call Don Friesen at 343-4962.

Astro Accessories
from Murray Paulson

by Rick Huziak

If members are interested in any of the following items, I am thinking of inventorying some of these for Murray, and to have them available at meetings for sale. Murray makes most of the items himself and supports his habit selling these at star parties or wherever they will sell. Let me know if you are interested and I will bring some of these accessories. – *Rick Huziak*

- A new red flashlight design with a clip. It is quite small. $20.
- Cheshire alignment tool: Mine look as good as the original. $45 (the Tecktron unit sells for $45 US)
- Eclipse Chaser Mini-mount: Camera bag sized Alt-Az head for your tripod that mounts the Sky 90 or the Pronto and soon the Televue 85. $100 (introductory price)
- Machined, black anodized aluminum plug for your 1.25" eyepiece adaptor. Plugs the tube so dust and bugs don't get in. $15
- Plastic version of above: black Nylatron. $10
- Eyepiece heaters. $25

Exploring the Universe Certificate

by Mike Clancy *<mclancy@sk.sympatico.ca>*

This certificate program is offered by the Royal Astronomical Society of Canada (RASC) to stimulate celestial and lunar observing. Information and a copy of the program checklist can be downloaded from their website at: http://www.rasc.ca/observing/page2.html. I found the program by following links from the Saskatoon Centre to the national site, and from there to the observing programs. I discovered the program in March of 2002 and began it almost immediately. Just to set the background, I should state that I am a relative newcomer, the "amateur's amateur" so to speak. Although I had been interested in astronomy as a child, I had no structure or instruction, and so knew little except the major constellations. Our family had for years been looking at the moon and stars with our binoculars, but had never really explored beyond that. Once I had been given a small telescope for Christmas, all that would change!

The program is specifically designed so that the requirements are easily met by focusing on a variety of interests, each group leading the observer along a linear path. One begins by studying the major constellations and bright stars, learning lunar cartography, studying the solar system, then off to deep sky objects and even variable star observing. Within each group, only half of the listed observations are required for certification making the entire program very flexible. Based on your interests and abilities, you can find as many as you want; they have a checklist of 110 of which you need a total of 55 observations. Depending on time of year and location, the entire program can be finished in a very few months, and for the most part completion is not dependent on equipment; your eyes and a pair of binoculars are all you'll really need. I found this very useful as I could see the object, verify with my 10 x 50 binoculars, then observe it with the telescope much easier. After all, I not only had to learn the universe but new equipment as well! Each of the observations listed in the guide has a small but useful section of observing notes. These, along with my own observations, proved most useful in verifying that the object viewed was indeed the one sought. You wouldn't believe how many times the dim grey smudge I saw in the telescope turned out to be something else!

While the program guide offers a checklist referenced to *The Beginners Observing Guide* (BOG, sold by the RASC and an extremely valuable tool for the novice) so you can track your progress, there is no substitute for keeping a logbook. I started one immediately and have been keeping track of my successes and (more notably) lack thereof. Attempting to draw an object is difficult enough for me, made moreso by the need to make the stars in the diagrams of different sizes based on their magnitude or brightness. I am, and I freely admit it, a lousy artist but trying to draw these things forces you to think about what you're seeing and how it looks in your viewfinder. In the 5 months it took me to complete the program, I found I was looking back over the notes fairly often, figuring out how I'd missed an object or perhaps refining my observations as my ability progressed. If you intend to begin this program, I cannot stress enough that you should begin a logbook. As for details on what to put in your log, I suggest you look at pages 81 to 83 of the BOG. Other than that it is your log and should reflect your abilities, so make it your own.

The one overwhelming benefit to this program is that it gave focus to my observations, a purpose to learning the heavens. It has given form to my curiosity and formed the basis of my exploration of the universe as seen from my backyard. Simply standing outside on any clear, moonless night one is confronted with too many gleaming pinpoints to truly understand the glory that is there. In essence, you don't see the forest as the trees are in the way! This program gently led me to begin what I hope to be a lifetime of exploring the night sky by giving me a purpose to each night's observing. I may not have found the chosen objects each night I looked for them but I had a reason for looking up and that helped focus the time at the viewfinder. It also made the victory of finding one even sweeter. To have someone show you the Andromeda Galaxy in a big scope in a dark sky sight is wonderful, but it meant a whole lot more to me to find that celestial jewel swimming in my own viewfinder from my light-polluted backyard. Perhaps that's the thrill of this hobby, the hunt for things beyond human eyesight. Just think – of the billions of people on this planet, how many have stood where you are and seen what you have seen? You are unique!

Once the program was completed, the option was to send the completed list in to the RASC Observing Certificate Committee; there's a document you can download from their website with all the pertinent details. If you have joined your local RASC Centre (and you should if you intend to follow this hobby!), you can ask one of their certification members to review your application and send it in. I found this to be particularly useful as the member I approached to review my data was most helpful. I received my certificate in the mail about 4 weeks after sending it in, apparently a typical turn-around time.

In closing, the question remains: Did this certification program help me? I completed the program in about 5 months, mostly from my own back yard and without help from more senior observers or computer-driven telescopes. Could I have found these objects without impetus from the program? Perhaps, but there was a sense of purpose I might not have had otherwise. Would I recommend it to persons new to the hobby? Definitely! Small though the accomplishment may have been on a global scale (my certification did not, as I recall, affect the stock market), I took pride in gaining ground with each and every observation. Now, I am off to complete the Messier List. I doubt that I'll be able to do it in 5 months, and I rather doubt I'll be able to do it entirely from my backyard, but it is the next level of expertise I wish to acquire.

The Planets this Month – January 2003

by Murray D. Paulson, Edmonton Centre
<mpaulson@ecn.ab.ca>

Mercury was at inferior conjunction with the sun on January 11th at which time it passed nearly 3 degrees above the sun. If you are adventurous, in exactly one synodic period you could get an airlines ticket to some place in Europe for May 7th and watch as Mercury transits the sun. This would be a fine prelude for the 2004 transit of Venus. 2003 and 2004 really are banner years of Planetary activity; the best Mars apparition in decades, Jupiter satellite mutual events and Saturn's rings at max! What more could you want? Well, I guess there are those pesky clouds...

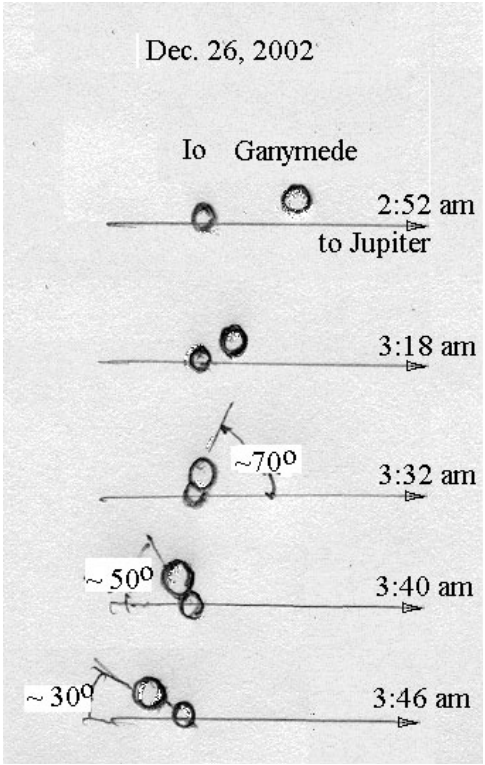
Mercury comes out from in front of the sun and swings into its next morning apparition near the end of January. It sits at dichotomy on January 29 and rises an hour and a quarter before the sun. You should be able to find it in the morning twilight 22 degrees south of where the sun rises, 3 or so degrees from the horizon. It will be at about magnitude +0.0, so it should show up in binoculars quite well. There is nothing in this area of the sky to compete with it, so if you see something, that was it.

Venus shines at magnitude -4.4 in the morning sky, tangled in the claws of the Scorpion. On January 10th it sits at dichotomy at about its farthest extent from the sun, 47 degrees. Another cool item is that you will be able to see Venus just shy of 10 degrees away from due south at sunrise. In the eyepiece you will see a perfect half phase, 24.88" in diameter. Over the month, Venus will continue to fill out and shrink in the eyepiece but it will remain an undiminished beacon in the morning sky.

Mars slides down the ecliptic following Venus and will sit 5 degrees north of Antares at the end of January. Antares will rival Mars on this occasion, quite the opposite of the last time I saw Mars in this area of the sky. Mars will shine at magnitude +1.5 with a 4.5" disk while Antares shines at magnitude +0.9 with a significantly smaller disk. I am not sure which of them will show more details in the eyepiece! Antares' little companion is a tough shot from this latitude, but you occasionally get incredible seeing down low. I did get a great image of Mars over the last apparition when it was only 9 degrees from the horizon! Subtle small details, Wow!

Speaking of amazing images, Saturn was just gorgeous at the last observing session out at Blackfoot, Edmonton's observing site. The rings are so high that Cassini's division can be seen all the way around the rings. The dark polar hood is obvious and there is even a small white spot in the southern mid latitudes. I have yet to see it, but it is there for the challenge. I have it on good word that the RASC Edmonton's new Meade 16 puts out a great image of Saturn. If you want to check the moons off of your observing list, I have heard that the elusive Mimas and Enceladus can be seen with it! I believe the computer at the Deck Observatory is set up with software that will show the current moon positions for you.

Jupiter follows in the night's sequence rising at 7:45 p.m. in early January and by February has risen before sunset. In January, it shows a 44.7" disk and shines at magnitude -2.6. On February 2nd, Jupiter is at opposition and has expanded imperceptibly to 45.4". I saw my first shadow transit of the season at the December observing session, but I have yet to see a mutual event. Last month I included a list of events but forgot to credit Bureau des longitudes - Observatoire de Paris - CNRS in the article. I mentioned their site in my November article as being the source for an ephemeris generator for the Jovian satellite mutual events. Guide 7 will show these events, but doesn't have an ephemeris generating capacity for them. I am not sure if Guide 8 can do this or not. It is amazing software none the less. I have compiled a list of the viewable events for our area. In the normal Jovian moon events I have compiled a list of the interesting evenings. I ran the simulations of the "Feb. 1" events which occur on the night of Jan. 31st. These are the closest events to opposition and for that reason most interesting. You should be able to see the moon in contact with its shadow



With my 10" scope, I was able to watch 1.5" diameter Ganymede partly occult 1" diameter Io in this 1 hour sequence. 460x will show these tiny satellites as disks, and a deep red filter makes these moons sharp. — *Rick*

Continued next page

as it transits. Both Io and Europa and their shadows are present for a brief time from 10:24 p.m. to 10:36 p.m. CST. Great night! Look for the moon trailing behind and north of the shadow. As for the mutual events, they should be very interesting to watch so be sure to catch a few.

I have discovered an interesting detail in the ephemeris generator, it doesn't take Jupiter into account! The occultation of a moon by another may not be visible because Jupiter is in the way. One interesting event I noticed in perusing the events is the eclipse of Io by Europa. The shadow of Europa on Io occurs while Io is transiting Jupiter. So you will see a pair of shadows transiting Jupiter which will merge into one, and at 2:20 a.m. an additional shadow will appear preceding the pair of shadows, but is actually sitting on the moon Io! This occurs on the night of January 7 at 3:16 to 3:38 a.m. Maximum occurs at 3:27 a.m. local time. *[Unfortunately, this event occurred before this newsletter was issued. If you have a planetary program, simulate this very interesting apparition! – Ed.]* Good luck with the weather and let me know what interesting events you see.

Satellite events: **All times UT:** (ie: **Jan. 16 4:02** is at **10:02 p.m. on Jan. 15**)

16 Jan	4:02	I	Sha	start:
16 Jan	4:25	II	Ecl	start:
16 Jan	4:27	I	Tra	start:
16 Jan	5:24	III	Sha	start:
16 Jan	6:19	I	Sha	end
16 Jan	6:44	I	Tra	end
16 Jan	7:04	III	Tra	start:
16 Jan	8:07	II	Occ	end
16 Jan	9:01	III	Sha	end
18 Jan	2:00	II	Sha	end
18 Jan	2:46	II	Tra	end
23 Jan	5:56	I	Sha	start:
23 Jan	6:11	I	Tra	start:
23 Jan	6:59	II	Ecl	start:
23 Jan	8:13	I	Sha	end
23 Jan	8:28	I	Tra	end
23 Jan	9:22	III	Sha	start:
25 Jan	1:41	II	Sha	start:
25 Jan	2:07	II	Tra	start:
25 Jan	2:41	I	Sha	end
25 Jan	2:53	I	Tra	end
25 Jan	4:37	II	Sha	end
25 Jan	5:02	II	Tra	end
1 Feb	2:18	I	Sha	start:
1 Feb	2:20	I	Tra	start:
1 Feb	4:18	II	Sha	start:
1 Feb	4:22	II	Tra	start:
1 Feb	4:35	I	Sha	end
1 Feb	4:37	I	Tra	end
1 Feb	7:14	II	Sha	end
1 Feb	7:17	II	Tra	end
8 Feb	4:03	I	Tra	start:
8 Feb	4:12	I	Sha	start:
8 Feb	6:20	I	Tra	end
8 Feb	6:29	I	Sha	end
8 Feb	6:37	II	Tra	start:
8 Feb	6:55	II	Sha	start:
8 Feb	9:32	II	Tra	end
8 Feb	9:50	II	Sha	end

Mutual events: **All times UT, 2003**

mo	Day	hr	m	s	Satellite	Event	Satellite		Magn. Drop	Durat. sec
1	11	8	17	46	2	OCC	1	P	0.06	466
1	14	2	47	1	2	ECL	1	P	0.329	1105
1	14	6	5	24	2	OCC	1	P	0.027	4855
1	14	8	43	57	2	ECL	1	P	0.601	1874
1	16	6	6	3	1	OCC	2	P	0.416	215
1	16	7	40	36	3	OCC	2	P	0.02	156
1	**18**	**5**	**1**	**15**	**4**	**OCC**	**2**	**P**	**0.161**	**1380**
1	**18**	**9**	**58**	**23**	**4**	**ECL**	**2**	**P**	**0.457**	**1269**
1	**19**	**1**	**6**	**55**	**4**	**OCC**	**3**	**P**	**0.16**	**546**
1	23	8	2	53	1	OCC	2	P	0.423	216
1	29	1	57	1	2	OCC	1	P	0.034	286
1	30	9	59	21	1	OCC	2	T	0.425	217
2	3	5	10	2	4	OCC	2	T	0.294	375
2	3	8	39	30	4	OCC	3	P	0.092	376
2	5	4	6	22	2	OCC	1	P	0.02	222
2	**10**	**0**	**54**	**12**	**1**	**OCC**	**2**	**T**	**0.425**	**218**
2	**10**	**1**	**10**	**43**	**1**	**ECL**	**2**	**P**	**0.278**	**62**

Data used in my column courtesy of COPYRIGHT on the server of the *Institut de mecanique celeste et de calcul des ephemeredes (Bureau des longitudes - Observatoire de Paris - CNRS)*

Web site: **http://www.bdl.fr/ephem/ephesat/en/phenomena_eng.html**

Minutes of the General Meeting

Room 8313, City Hospital, Monday, Dec. 16, 2002, 7:30 pm

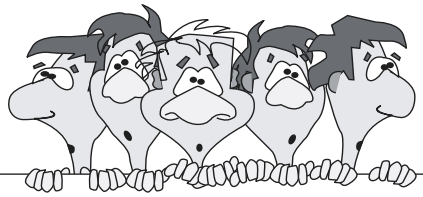
Recorded by Al Hartridge, Secretary

1. Speakers:
   - next month will be a talk from the Canadian Light Source.
   - for April Rajiv Gupta will probably swing through Saskatoon.
   - Rainer Dick, professor of Cosmology at the UofS, is willing to give two sessions, possibly starting in February.
2. Gastronomy: the next gastronomy feast & social will be held on Jan. 11, 2003, 7:00 p.m. at Tony Tomas, Centre Circle Mall.
3. Presentations:
   - Les Dickson – *The Interplanetary Superhighway*
   - Gary Stone – *A Digital Camera Adapter*
   - Darrell Chatfield – *Binocular List Revisions*
4. Fundraising: Darrell has a cheque for over $200.00 from bottle collection. We have also been given $8.00 worth of Canadian Tire money.
5. Approval of minutes of previous meeting: moved by Darrell, seconded by Ellen and carried.
6. Sleaford: nothing to report at present. Work will start again when the weather is warmer.
7. Site Committee: will meet on Jan. 3 at 12:00 noon at the Physics department.
8. Youth Group: only one member at present. Sandy says she has a list of interested people.
9. Newsletter: for next month will be redesigned. Submission day will be the 26th of each month.
10. Books: Rick says there is a special deal this month on all available material.
11. Associate Membership: there appears to be nothing to lose by adopting this proposal.
12. Brochures: all members should have a few on hand that they could hand out when the occasion arises.
13. Meeting adjourned at 9:25 p.m.

The Sleaford Observatory

by Rick Huziak

Poor weather has kept observer numbers down at the Sleaford Observatory throughout November and December, but despite this, some visits have occurred. The site remains in good shape, and should be plowed out by the time this newsletter is issued. Roads to the site are in fine winter driving condition, with no major snow build-up nor drifts. Remember to let someone know you will be at the site and let them know about when you will be returning, just in case! A new addition to the site will be a snow shovel to help with clearing the deck or getting you unstuck!



Linda *Who???*

That's me...Linda Janzen, wife of Saskatoon Centre RASC member Yannis Pahatouroglou (now you know why I kept "Janzen"). I'm trained as a production and layout specialist (not to be confused with a graphic designer) and previously worked for one of Saskatchewan's major advertising firms. At present I am trying the home-based business game. During one of my "un-busy" stretches, I played around with the layout of the newsletter—which Yannis saw and decided Rick should see and I promptly got "hired." The rest, as they say, is history. I also thought it might be nice to somehow be involved with Yannis' favorite hobby and saw the newsletter as a way to start with something I also enjoy doing. I hope you like the changes that I have begun and hope to develop as my knowledge, understanding and appreciation of this subject grows. *(Was that okay, Rick?)*

Earth Satellite Passes by Les Dickson (from <www.heavens-above.com>)

International Space Station Evening Passes – January 18 to February 19 (2003)

DATE	MAG	STARTS			MAX. ALTITUDE			ENDS		
		TIME	ALT.	AZ.	TIME	ALT.	AZ.	TIME	ALT.	AZ.
28 Jan	1.2	19:32:48	10	SSW	19:34:59	19	SSE	19:34:59	19	SSE
29 Jan	1.0	20:09:32	10	SW	20:11:30	30	SSW	20:11:30	30	SSW
30 Jan	2.2	20:46:57	10	WSW	20:47:53	18	WSW	20:47:53	18	WSW
31 Jan	-0.4	19:48:36	10	WSW	19:51:44	55	SSE	19:51:53	55	SSE
01 Feb	0.3	18:50:21	10	SW	18:53:20	38	SSE	18:55:47	14	E
01 Feb	1.0	20:26:01	10	W	20:28:03	36	WSW	20:28:03	36	WSW
02 Feb	-0.5	19:27:29	10	WSW	19:30:39	69	SSE	19:31:51	34	E
03 Feb	-0.1	18:28:58	10	WSW	18:32:04	51	SSE	18:35:11	10	E
03 Feb	-0.6	20:04:50	10	W	20:07:51	77	WSW	20:07:51	77	WSW
04 Feb	-0.6	19:06:08	10	W	19:09:20	79	S	19:11:31	19	E
04 Feb	1.6	20:42:09	10	W	20:43:46	27	W	20:43:46	27	W
05 Feb	-0.7	19:43:22	10	W	19:46:36	80	S	19:47:24	46	ESE
06 Feb	-0.6	18:44:32	10	W	18:47:44	84	S	18:50:56	10	E
06 Feb	0.3	20:20:33	10	W	20:23:14	47	SW	20:23:14	47	SW
07 Feb	-0.5	19:21:38	10	W	19:24:49	71	SSW	19:26:49	21	ESE
07 Feb	2.2	20:57:50	10	W	20:59:03	18	WSW	20:59:03	18	WSW
08 Feb	0.4	19:58:43	10	W	20:01:44	40	SSW	20:02:38	31	SSE
09 Feb	-0.1	18:59:38	10	W	19:02:53	58	S	19:05:56	10	ESE
09 Feb	1.8	20:36:05	10	W	20:38:22	18	SW	20:38:28	18	SSW
10 Feb	1.2	19:36:39	10	W	19:39:26	29	SSW	19:42:08	11	SSE
12 Feb	1.9	19:14:25	10	W	19:16:54	21	SSW	19:19:23	10	SSE

The Messier, H-400, FNGC, Binoc & EtU Club

Join the Club! Observe all 110 Messier, 110 Finest NGC, 400 Herschel, Explore the Universe, or 35 Binocular objects and earn great OBSERVING CERTIFICATES!

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

Tenho Tuomi	Appy	110
Bill Hydomako	Appy	110
Mike Oosterlaken		93
Wade Selvig	Up	75
Lorne Jensen		54
Brent Gratias		39
George Charpentier		30
Stan Noble		28
Tyrone Klassen		26
Les Dickson		20
Mike Clancy	Up	19
Debbie Anderson		17
Brian Friesen		15
Kathleen Houston		13
Ellen Dickson		6

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

Scott Alexander	97
Ken Noesgaard	24
Sandy Ferguson	23
Mike Oosterlaken	20
Bill Hydomako	10

Chatfield BINOCULAR CERTIFICATE
Certified at 40 Objects:
M. Stephens

Mike Oosterlaken		32
Tenho Tuomi		30
Mike Clancy	NEW	17

EXPLORE the UNIVERSE
Certified for Certificate:
M. Clancy

Nowen Inthewings	0

HERSCHEL 400 CLUB
Certified at 400 Objects:
D. Jeffrey, R. Huziak, D. Chatfield

Gord Sarty	251
Scott Alexander	102
Mike Oosterlaken	68
Ken Noesgaard	44
Sandy Ferguson	18

The Messier & Finest NGC lists can be found in the *Observer's Handbook*. The Explore the Universe list is available on the National web site. 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.

Wade Selvig writes: *Speaking of things I should have mentioned a long time ago, you can now update my astro equipment to include a 6" f/8 Stargazer Steve Deluxe Reflector. Because of the weather this year I haven't used it much this year, but when I have used it (like at SSSP'02), it was quite impressive. Last month I used it to find 4 new Messier objects (M69, M70, M54 and M55 in Sgr), so you can update my Messier list (I've been stuck at 71 for over 2 years!).*

Tenho Tuomi writes: *I have 30 objects observed to report for the Chatfield Binocular Certificate, as of Dec 5. Some of the rest are waiting for clearer skies, and some will have to wait for a different time of the year. I haven't had a chance to look for the new NGC 2281 since the Club meeting. I am somewhat humbled that Darrell would change the list for the Binocular Club award at my suggestion, my being a newcomer to the Astronomy Club. Thanks.*

On-line Messier and Finest NGC Lists: For those who'd like electronic Messier or FNGC lists, check out the Edmonton Centre's version at http://www.edmontonrasc.com/catalog.html

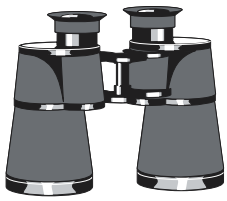
If you promise to look at M45 (Pleiades) sometime in the next few months with eyeballs, I'll enter you onto the Messier Club as '1' object, and you can go from there! << This offer still stands!

Small Error in the 2003 Observer's Handbook – *by Robert Hawkes <rhawkes@mta.ca>*

I would like to alert you to an error I made in the time listed for the Geminids in the Meteors section in the *RASC Observer's Handbook* for 2003. It should give **14h UT** instead of 4h UT. The solar longitude value and date and other entries are correct as published. My apology for not catching this mistake.

Darrell Chatfield's *Binocular Object List I*

for the RASC Saskatoon Club, March, 2000



This list has been prepared from various sources of information. I have tried to include enough variety so as not to rely solely on just the Messier List. All of the objects should be visible with a pair of 7X35-50 binoculars, although a larger pair will show more detail. I hope this will encourage you to get out under the stars and enjoy the heavens with minimal equipment. A certificate will be available to those who complete the list. A few rules are:

1. You must find the objects on your own.
2. You cannot use a telescope, or any such instrument to locate the objects.

The use of a good star atlas, such as *Sky Atlas 2000* or *Uranometria,* is recommended. A good dark site will help you in finding the objects as well assist you in seeing more details.

Revision December, 2002

In an effort to keep this list accessible and user-friendly, I have decided to change my list slightly. I have removed Cr 62 in Auriga from the list after reviewing the difficulty level of this object. I have replaced it with NGC 2281, which is an open cluster consisting of about 30 stars. It is very bright, and therefore should be able to be found quite easily. Another major change is that I have opened up the requirements for a certificate. You will only have to find 35 out of the 40 objects in the list. This will give you a choice of objects, if you find it hard to locate some of them. I encourage you to make notes on your observations, which can be in any format you choose. This will help in developing your observational skills. Thank you. *—Darrell Chatfield*

CONSTELLATION	R.A.	DEC.	OBJECT	TYPE	MAG.	DESCRIPTION
ANDROMEDA	00 40.0	+41 00	M31	GAL	3.5	Famous Andromeda Galaxy
ANDROMEDA	01 57.8	+37 41	NGC 752	O/C	5.7	75 stars. Large. Irregular.
AQUARIUS	21 33.5	-00 49	M2	GL/C	6.5	Rich globular. Fine object.
AURIGA	05 28.7	+35 50	M38	O/C	6.4	Large. Easy to resolve.
AURIGA	06 49.3	+41 04	NGC 2281	O/C	5.4	Group of 30 stars. Bright.
CAMELOPARDALIS	03 58.0	+63 06	Kemble 1	O/C	4.0	Kemble's Cascade. Chain of stars.
CANCER	08 40.0	+19 59	M44	O/C	3.1	Beehive Cluster. Excellent.
CANES VENATICI	13 42.2	+28 23	M3	GL/C	6.0	Small object. Bright.
CANIS MAJOR	06 47.0	-20 44	M41	O/C	4.5	Large glowing patch of light.
CASSIOPEIA	23 57.0	+56 44	NGC 7789	O/C	6.7	300 stars. Large white patch.
CASSIOPEIA	01 46.0	+61 15	NGC 663	O/C	7.1	80 stars. Rich.
COMA BERENICES	12 25.0	+26 00	Melotte III	O/C	1.8	Coma Cluster. Huge.
CYGNUS	20 58.8	+44 20	NGC 7000	E/N	5.9	North American Neb. Obvious glow.
CYGNUS	21 32.3	+48 26	M39	O/C	4.6	Loose. Bright cluster.
GEMINI	06 08.9	+24 20	M35	O/C	5.3	200 stars. Very rich.
HERCULES	16 41.7	+36 28	M13	GL/C	6.0	Famous globular. Fuzzy glow.
HYDRA	08 13.8	-05 48	M48	O/C	5.9	80 stars. Large. Triangular shape in the center.
MONOCEROS	07 03.2	-08 20	M50	O/C	6.0	80 stars. Bright smudge.
MONOCEROS	06 41.1	+09 53	NGC 2264	O/C	3.9	Christmas Tree Cluster.
ORION	05 35.4	-05 27	M42	E/N	4.0	Great Orion Nebula.
OPHIUCHUS	16 57.2	-04 06	M10	GL/C	6.6	Glowing ball of light.
OPHIUCHUS	16 47.2	-01 57	M12	GL/C	6.9	Large globular.
PEGASUS	21 30.0	+12 10	M15	GL/C	6.4	Nice object.
PERSEUS	02 19.0	+57 09	NGC 869/884	O/C's	4.4	Double Cluster. Beautiful field. Very easy.
PERSEUS	02 42.0	+42 47	M34	O/C	5.5	60 stars. Easy.
PISCES	23 30.0	+03 00	Circlet	ASTER.		Circlet of 5 main stars.
PUPPIS	07 36.6	-14 29	M47	O/C	4.5	30 stars. Hazy patch.
SAGITTARIUS	18 36.4	-23 54	M22	GL/C	6.0	Excellent globular.
SAGITTARIUS	18 18.4	-18 25	M24	O/C	11.1p	Star Cloud. Excellent view.
SCORPIUS	16 23.6	-26 31	M4	GL/C	6.5	Large fuzzy ball of light.
SCORPIUS	17 40.0	-32 12	M6	O/C	4.6	130 stars. Bright.
SCUTUM	18 51.1	-06 16	M11	O/C	5.8	Wild Duck Cluster. Very rich.
SERPENS	15 18.6	+02 05	M5	GL/C	6.2	Very rich cluster.
SERPENS	18 39.0	+05 27	NGC 4756	O/C	5.0	Very large.
TAURUS	03 47.5	+24 07	M45	O/C	1.2	Pleiades. Very bright. Fine object.
TAURUS	04 27	+16 00	Melotte 25	O/C	0.5	Hyades. V-shaped. Look for Aldebaran.
URSA MAJOR	09 55.6	+69 04	M81/M82	GAL	7.0/8.4	Easy pair.
URSA MAJOR	13 23.9	+54 56	Mizar/Alcor	D/S	2.3/4.0	Easy-to-see pair.
VULPECULA	19 59.6	+22 43	M27	PL/NEB	7.5	Dumbell Neb. Misty glow.
VULPECULA	19 25.4	+20 11	Collinder 399	ASTER.	3.6	Coathanger Cluster. Look for upside-down coathanger.