

Saskatoon Skies

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

Volume 33	July - August 2002	Number 7-8
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SSSP'02 is ready to go! If you haven't signed up yet, get to it! Great talks, programs and excellent observing. Don't miss the plaque dedication for Comet Petriew which goes on Saturday afternoon at 4:00 p.m.

In this Issue

In this Issue	Page
Membership, Bottle Drive & U of S Observatory Hours	2
Calendar of Events, Meeting Notices, Books for Sale	3
2002 SSSP Update - Volunteers Needed	3
Asteroid 2002 NY40 to Make a Very Close Approach – <i>by Rick Huziak</i>	4
August Meteor Showers – <i>by Cathy M. Hall (Ottawa Centre, NAMN)</i>	5
Fundraising and the SSSP – <i>by Darrell Chatfield</i>	6
Eccles Ranch (Alberta) Star-BQ – <i>by Rick Huziak</i>	7
Classroom Visits – <i>by Scott Young (Winnipeg Centre)</i>	8
SSSP Unveils the Comet Petriew Plaque	8
Space, the Maple Leaf's final frontier – <i>by Tu Thanh Ha, the Globe and Mail</i>	9
Sky Buys and Mirror Sells – <i>the swap and shop page</i>	9
The Messier, FNGC, H-400 & Binoc Club – <i>by Rick Huziak</i>	10
The 15 th Annual Alberta Star Party	10



Saskatoon Centre

The Royal Astronomical Society of Canada
 P. O. Box 317, RPO University
 Saskatoon, SK, S7N 4J8
 URL: <http://prana.usask.ca/~rasc/>
 E-mail: dicksonl@sasktel.net
 Telephone: (306) 249-1091

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 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!

U of S Observatory Hours

The U of S Observatory is open to the general public every Saturday in July & August from 9:30 p.m. to 11:30 p.m. Admission is 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
 Copy - Brian Friesen & WBM
 Collate - Brian Friesen, Bob Christie, Les & Ellen Dickson, Sandy Ferguson, Walter Essar
 PDF & Web Posting - Gord Sarty

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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 .GIFs, .TIFs .JPGs or similar. Send e-mail submissions to the editor at [<huziak@SEDSsystems.ca>](mailto:huziak@SEDSsystems.ca). 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.

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 the June meeting. 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.

RASC Calendar Happenings

Date (2002)	Event	Contact	Telephone
Aug. 3 - 11	Mount Kobau Star Party	Guy Mackie	(250) 861-3074
Aug. 9 - 11	Saskatchewan Summer Star Party 2002 – Cypress Hills	Les Dickson	249-1091
Aug. 10	Comet Petriew Commemorative Plaque Dedication at Cypress	Les Dickson	249-1091
Aug. 12	Noctilucent Cloud season ends		
Aug. 12 -13	Perseid Meteor Shower Peak – Sleaford Observatory	Rick Huziak	665-3392
Aug. 16	Mini-Starnight for Pike Lake – talk 8:00 p.m., viewing - dusk	Rick Huziak	665-3392
Sep. 5 - 8	Alberta Star Party – Eccles Ranch Observ'y near Caroline, AB	Rick Huziak	665-3392
Sep. 16	General Meeting, Room 8313, City Hospital, 7:30 p.m. – Results of the Star-B-Que & SSSP in Pictures – various members	Les Dickson	249-1091

Notice of the General Meeting of the Saskatoon Centre

Monday, September 16th, 2002 at 7:30 p.m.

Room 8313 City Hospital

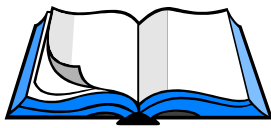
Presenting:

What I Did This Summer! – various members

We will have slides from some or all of the summer activities that occurred over the summer – Comet Ikeya-Zhang, Great Aurora, Noctilucent Clouds, the Alberta Star-B-Q, the Regina Star B-Q, the Sask. Summer Star Party '02, Alberta Star Party – what else? Admission is free. 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! Check out our selection at the SSSP. After the SSSP, contact Debbie Anderson at 242-8854 or bazoo.inc@shaw.ca to see what is remaining. Prices include GST.

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|--|---|---|
| <ul style="list-style-type: none"> • Laminated Messier Cards - \$8.00 • Beginning Observer's Guide - \$15.00 • Touring the Universe thru Binocs - \$56.00 • Binocular Astronomy - \$40.00 • Build Your Own Telescope - \$42.00 • Cambridge Star Atlas - \$40.00 • Astrophotography (G.N.Patterson) - \$8.00 ** • Exploring the Sky by Day - \$9.00 |  | <ul style="list-style-type: none"> • Messier Poster - \$20.00 • Milky Way Posters - \$25.00 • RASC 2003 Calendars - \$12.00 <ul style="list-style-type: none"> • RASC Stickers - \$0.75 • Other Worlds - \$9.00 • Extraterrestrials - \$9.00 |
|--|---|---|

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

REMEMBER - YOU CAN SIGN UP TO GET THIS NEWSLETTER ON THE INTERNET INSTEAD OF BY SNAIL-MAIL. CURRENT ELECTRONIC SUBSCRIBERS SAVE US OVER \$220 / YEAR IN MAILING COSTS.

Asteroid 2002 NY40 To Make a **Very** Close Approach

By Rick Huziak

A few weeks ago, a new earth-crossing asteroid was discovered, which comes very close to the earth – a mere 0.004AU. That's only about 370,000 miles away, barely farther than the moon. For the weeks leading up to the close encounter on August 18th it appears almost stationary in the sky near beta Aquarii since it is moving directly towards us, more or less. It is currently 19th magnitude. In the days leading up to August 17th, the asteroid brightens to about 12th magnitude, but does not seem to move much. But then the asteroid moves along broadside to the earth and passes us very quickly! On the evening of August 17th it moves rapidly towards Sagitta. During the day on August 18th, it passes 6 degrees south of Vega, zips between M92 and M13 at the zenith, and as darkness falls it blasts past the head of Bootes heading for Cor Caroli. At closest approach, it will be moving at a rate of 4 arc-minutes per minute (!) and will reach magnitude 9.6. This occurs around 4 a.m. local time. At this rate, it will span the diameter of the moon in 12 minutes! As it passes the earth, it rapidly fades during the night as the sunlit side points away from earth. Indeed, it falls from 9th magnitude to 29th magnitude within one day, since we see only the dark side and it is moving directly away from us! Here are the current elements, as of July 22.

2002 NY40
Epoch 2002 May 6.0
Mean Anomaly 310.49293
Perihelion 267.14323
Ascending Node 147.46840

Inclination 5.75157
Eccentricity 0.7145792
Semi-major axis 2.0947848
H 18.9
G 0.15

Those who will run the elements through a planetarium program should be warned that these elements are preliminary and represent only a short arc. They will be updated regularly by the CBAT. If you do not have a planetarium program, watch for charts to be posted on our web-site or at *Sky & Telescope's* web site.

Note that with an inclination of 5.8 degrees, there is no danger that this asteroid will hit the earth, but will harmlessly pass above our north pole. However, you might want to watch out for another asteroid that was discovered only a few days earlier. Asteroid 2002 NT seems to be on a collision course with earth and may hit the Southern Hemisphere in February 2019! Not a good year to plan a vacation for Australia!

Just how little the asteroid moves is demonstrated by the following coordinates, first given every 5 days (note the very small sky motion), then daily and then every half-day during the flyby. Note also the amazing magnitude changes as the asteroid sails past the earth! It's here for one day only – hope for clear skies!

Date (UT)	RA (2000)	Decl (2000)	Magnitude	
2002 07 23.0	21 33.96	-05 41.3	18.2	
2002 07 28.0	21 34.65	-05 18.2	17.5	
2002 08 02.0	21 34.70	-04 54.6	16.7	
2002 08 07.0	21 33.81	-04 26.5	15.8	<< ONLY 1° SHIFT IN 3 WEEKS!
2002 08 12.0	21 30.84	-03 37.2	14.4	
2002 08 13.0	21 29.61	-03 19.3	14.0	
2002 08 14.0	21 27.90	-02 54.7	13.6	
2002 08 15.0	21 25.33	-02 18.4	13.1	
2002 08 15.5	21 23.50	-01 52.6	12.9	
2002 08 16.0	21 21.07	-01 18.3	12.5	
2002 08 16.5	21 17.66	-00 30.3	12.2	
2002 08 17.0	21 12.56	+00 41.6	11.7	
2002 08 17.5	21 04.07	+02 41.1	11.2	<< QUICK MOTION BEGINS!
2002 08 18.0	20 47.20	+06 36.1	10.5	
2002 08 18.5	19 58.93	+17 07.6	9.6	<< BRIGHTEST
2002 08 19.0	15 12.80	+43 12.8	10.6	<< 26° MOVEMENT IN 12 HOURS!
2002 08 19.5	11 08.23	+23 55.5	18.9	<< 8 MAGNITUDE DROP IN 12 HOURS!
2002 08 20.0	10 25.71	+15 48.9	29.0	<< SEEING THE DARK SIDE!

August Meteor Showers

By Cathy L. Hall chall@CYBERUS.CA

From the RASCLIST/NAMN Notes (edited)

NAMN Notes is a monthly newsletter produced by the North American Meteor Network, and is available both via email, and on the NAMN website at: <http://www.namnmeteors.org>

Perseids - The Great Summer Meteor Shower...

In his book 'Popular Astronomy', first published in 1879, the French astronomer Camille Flammarion writes:

"In the clear and transparent night a distant star seems to detach itself from the heavens, glide in silence on the nocturnal vault, shoot along, and disappear. The heart tried by terrestrial sorrows believes that the heavens are concerned with our destinies, and that the shooting star marks the departure of a spirit to another life; the young girl whose pensive gaze is attracted for a moment to the meteor hastens to form a wish, with the hope of seeing it speedily granted; the poet dreams that the stars, the flowers of the sky, bloom in the celestial fields, and thinks he sees their luminous petals swept away by upper winds through the infinite night; the astronomer knows that this ephemeral body is neither a star nor a spirit, but a molecule, a cosmical atom, a fragment more or less minute itself, but of which the lesson may be great, if we can learn whence it comes and how it thus encounters the earth in its course."

Meteors have fascinated people for thousands of years. Some of us take a poetic approach to these delightful flashes of light in the sky, and others of us are also fascinated by studying these bits of (usually) comet debris that hit our earth's upper atmosphere, burn up due to friction, and emit the light events we call meteors.

One of the most famous of all meteor showers occurs in August every year. Meteor showers don't last forever though. The comets that usually spawn the debris that we encounter will eventually run out of material to shed. Or, the comet or its already shed filaments of debris may become perturbed in their orbits by planetary bodies - and sometime in the future - our earth may no longer pass through that debris. Meteors as such are transient phenomena in more ways than one!

The Perseids (PER) have been observed for several thousand years now. This is one of the oldest meteor showers that we have records of. The earliest reference to them seems to have been in the year 36 AD in China. Because the path of the Perseids is highly inclined to the ecliptic, it has not been affected as much over the millennia by the disturbing influences of our major planets that travel basically along the ecliptic path. As a result, the Perseids are a reliable meteor shower, seen in strength each year.

The Perseids were also the first meteor shower to be proven to be associated with a comet. This was found by Giovanni Virginio Schiaparelli (1835-1910), more often remembered for giving the name 'canals' or 'channels' to the markings on the planet Mars. The parent body of the Perseid shower has since been called Comet 109P/Swift-Tuttle, after its discovery in 1862 by several Americans - Lewis Swift of Marathon, New York and Horace Tuttle of Harvard Observatory, Massachusetts. In late August and early September of that year, the comet reached a magnitude of about 2, about as bright as the stars in the Big Dipper, and it had a tail length of between 25 and 30 degrees, about 5-6 times the distance between the pointer stars of the Big Dipper. It must have been an impressive sight!

This year, the Perseids reach maximum activity on August 12, and at that time will seem to radiate from an area of the sky situated at 046 degrees, i.e. RA 3h 4.2m, Dec +58, about a degree north of the star kappa Perseus. Perseids can be seen from about July 17th until about August 24th though - and the radiant actually moves quite a distance over that time period - from below the constellation of Cassiopeia over to the upper part of Perseus. To see a map of the movement of the radiant area, take a look at the map on the website of the International Meteor Organization (IMO) at <http://www.imo.net/calendar/cal02.html#Perseids>

August 12th is the quoted date of maximum - but this year we could see several times of enhanced activity. According to the 'IMO Meteor Shower Calendar 2002', the times of particular interest to watch are as follows:

August 12 20.15 UT, possible feature
August 12 22.30 UT, normal 'peak' time
August 13 08.30 UT, possible feature

This is UT, Universal Time, time at Greenwich, England. For observers in Saskatchewan on CST, Central Standard Time, these times become (UT = -6 hrs CST):

August 12 14.15 CST, ie. 2.15 p.m. in the afternoon, possible feature
August 12 16.30 CST, ie. 4.30 p.m. in the evening, normal 'peak' time
August 13 02.30 CST, ie. 2.30 a.m. in the morning, possible feature

For observers elsewhere, you will have to adjust your time accordingly.

The Zenithal Hourly Rate (ZHR) for the Perseids is about 110 meteors per hour, for the normal peak time. This is the number of meteors, on average, that an observer would expect to see if they are out under a dark country sky, and if the radiant, the area in the sky where the meteors seem to come from, is directly overhead. However, meteor shower rates do change over time. Rates for the Perseids were higher when the parent comet was in our neighborhood back in 1992. Now that the comet is heading back to the outer solar system, outburst rates will decline. Observations on all nights are useful so that the meteor researchers can get a good profile of Perseid activity, so even if you get clouded out on a couple nights, your observations on other nights are still very welcome!

Perseids are generally bright, with an average magnitude of about 2.3 according to Gary Kronk, on his authoritative website 'Comets and Meteor Showers'. This is roughly the brightness of the stars in the Big Dipper. A large percentage of Perseids have persistent trains - as many as 45% of all Perseids, by some accounts. Their brightness and their trains left behind make them beautiful meteors to witness. The average brightness of the meteors can also be seen to change from night to night, as the comet debris that causes the meteors has been sorted by particle size over time. Perseids are fast meteors, with a velocity of about 59 km per second. Kronk's comments can be found at <http://comets.amsmeteors.org>

For those of you interested in doing some serious observations of the Perseids, using a notepad or tape recorder and an accurately set watch, our NAMN Observing Guide gives details on what you should record - such as time of meteor, its brightness, shower identification, estimation of velocity, and length of train. The Guide can be found at <http://www.namnmeteors.org/guide.html> and forms to use in recording (or decoding from a tape) can be found at <http://www.namnmeteors.org/reports.html>

For some good constellation maps - with standard stars marked on to judge the brightness of the meteors you see - set your printer to 'landscape' mode and print off a set of our 4 NAMN maps at <http://www.namnmeteors.org/charts.html>

If you want to try photographing meteors with a camera, the Perseids are the best shower of the year to do this for! (And, with the Leonids predicted to reach storm levels in November, the Perseids are excellent practice.) What equipment do you need? Use a tripod, a camera with a bulb (time exposure) setting, fast film (ASA 400 or higher), a lens wide open (or close to it), and exposures of about 10-15 minutes each depending on how bright your sky background is. Most serious meteor photographers use black and white film - but color film is very popular too, especially for those who are mainly interested in photography as opposed to just meteors. If you have a telescope with a drive system, try piggybacking your camera on the telescope to keep the stars from trailing in your photos. A regular lens, or wide angle lens, is the best to use to capture a good expanse of sky. Lastly, always put a normal looking photo of some kind at each end of the roll, so the processing lab knows where to (and where not to) cut.

We are fortunate to have dark skies for the Perseid meteor display this year - so take some time to relax, and enjoy a great show! Whether you are into scientific recording of meteor data, or into a poetic appreciation of the night sky - the Perseids are a wonder and a delight.

As Flammarion wrote in his 'Astronomy for Women' about 1903:

"What greater delight can be conceived... at the hour when the crescent moon is shining in the west amid the last glimmer of twilight, than the contemplation of that grand and silent spectacle of the stars stepping forth in sequence in the vast heavens? All sounds of life die out upon the earth, the last notes of the sleepy birds have sunk away, the Angelus of the church hard by has run the close of day. But if life sleeps around us, we may seek it in the heavens... The darkness is profound, the abyss immense... See! Yonder a shooting star glides silently across the sky, and disappears!..."

Fundraising and the SSSP

By Darrell Chatfield <novachat@sk.sympatico.ca>

I am pleased to announce that I have received a \$100.00 donation from my mother-in-law, Joyce Wilson. This will be used to cover the cost of making a new *WELCOME TO THE UNIVERSE* banner for use as SSSPs and other functions.

In addition, I made a donation of \$103.48 from collecting bottles. Thanks to Merlin M., the Dickson's, and Rick for supplying some of the bottles.

In talking with Blair Colborne of SkyVue Telescopes, I am submitting an ad on his behalf (see the next page). Blaire was kind enough to provide some great door prizes to the SSSP.

SKYVUE TELESCOPES

Quantities limited:

2 only - 6" Skywatcher Dobs - \$350
8 only - 8" Skywatcher Dobs - \$535
3 only -10" Skywatcher Dobs - \$900
3 only - 100mm Skywatcher EQ3-2 refractors - \$600

These specials are only until SSSP/02, and will be delivered free of charge to the star party if ordered on time. All prices include GST!!

Call Blair at 1-403-239-8386 for more details

Eccles Range (Caroline) Alberta Star-BQ

By Richard Huziak <huziak@sedsystems.ca>

I've just returned home from the Calgary/Edmonton Centre Eccles Ranch Star-BQ - held July 11th -14th at their joint observing site, just east of Caroline, Alberta. This was a fun event - not too serious, and it gave a chance for old friends to get together and newbie members to see what it's all about!

The weather cooperated, with an excellent night of observing on Friday evening, though personally, I was stuck on the side of a road in Saskatchewan - didn't want to waste a perfectly good observing night by driving through the darkness. On Friday evening, I drove for 2 hours toward Alberta, observed for 2.5 hours once it got dark, then drove the next 500 km after the sun came up. The trip also included one unscheduled stop by the RCMP (he thought I was lost) and 3 wratched tires on my car (one flat and two worn tires showing steel belts)! On Saturday, most participants arrived, and we had a good time visiting and looking at sunspots with Glenn Pederman's amazing 16" scope. In the afternoon, Glenn Hawley and a lady from the local Alberta Wildlife Recovery Program entertained us with nature stories and stuffed animals until supper.

The Star-BQ was another stuffed animal - a catered pig roast. (Recipe: cook one delicious pig for 5 hours and serve!) We all made stuffed pigs of ourselves. After many door prizes were handed out, we readied for another night of observing, but were stymied by the close passing of a thunderstorm with scary lightening, which made for excellent pictures. The storm passed by, though, and observers were able to do some looking through reasonably clear skies, on and off. Others decided to socialize, sometimes with liberal offerings to the Clear Sky God issuing from ceremonial brown bottles. We watched satellites go by until sun-up. Fun was had by all, if I can remember this at all.

Of the 84 attendees, the largest Star BQ to date, most were from Calgary, but with Stan Runge coming all the way from Winnipeg, Lee Beck from Regina, and me from Toontown. Participation from Edmonton was totally light (= 0). Hum.....?

I'd like to thank the organizers for their hard work and their friendly welcomes, and for the good food and a fun event! See you next year.

Classroom Visits

By Scott D. Young sdyoung@MB.SYMPATICO.CA
Taken from the RASCLIST - used with permission

When I used to do classroom visits, we'd make the "Toilet Paper Model of the Solar System"...a scale model of the planets, using TP as the distance indicator. One sheet = 10,000,000km or whatever.

A teacher friend of mine wanted to borrow the activity for her class, so I wrote it up for her. Unfortunately, she forgot to bring a new roll of TP, and only had a partial roll (the school used only those silly Kleenex-type single sheets).

As she relates it, her Principal was watching her as she merrily led the kids through the halls, plotting out the planets at their correct distances. They marveled at how far apart the inner planets were, but then how *really* far away Jupiter was. Then Saturn! Wow. Then they reached the end of the roll.

The line that dissolved the kids and her Principal: "Look at that, we've run out of toilet paper and we haven't even reached Uranus yet!"

SSSP Unveils the Comet Petriew Memorial Plaque at Cypress Hills Interprovincial Park

Despite the wrong location and name being published in this month's Journal, the Saskatchewan Summer Star Party is still a go and less than 5 weeks away! (The Journal says it is 'Saskatoon Summer Star Party' held in Saskatoon! - beats me where this information came from). The SSSP'02 will be in beautiful Cypress Hills Interprovincial Park, 30 km south of Maple Creek, SK. Information and the registration form can be found at:

<http://prana.usask.ca/~rasc/sssp02.html>

I'd like to announce a program change for the star party. As part of Saturday afternoon's program, there will be an unveiling of a **plaque commemorating the discovery of Comet P/2001Q2 Petriew** (which was found at SSSP'01). This plaque will be placed on a newly-constructed gateway to the Meadows campground and unveiled at 4:00 p.m. with park official Brad Mason and the Government of Saskatchewan Environment Minister Buckley Belanger present. The plaque was suggested shortly after the last star party, and became reality after some lobbying by Regina Centre member Lorne Harasen. Come to SSSP and be part of this historic event! Note that you do not have to be registered for the SSSP to attend this public unveiling.

However, please register for the SSSP as soon as you can (and you have now missed the 'cheap' early registration cut-off) and get your accommodation booked if you are going to stay in cabins, condos or hotel rooms. There are only about 4 units left, and they will go fast. If any units are not taken by two weeks prior to the star party, we will likely have to release them so we don't get stuck with the deposit. Banquet meals also have to be pre-booked since there is a 48-hour pre-event cut-off for the number of meals, and we will have only a few spare tickets left for at-the-door registrants.

For collectors, in addition to the limited run SSSP hat pins (featuring Comet Petriew), there will also be sewn cloth crests available, which cannot be pre-ordered and will only be available at the star party!

Other small changes are: we have changed the banquet from turkey to beef roast since it's a better meal for the same money. We will also likely cancel the kid's activities, or reduce them, due to lack of kids.

On the RASCLIST, the SSSP got a great promotion from Jay Anderson, Environment Canada jander@CC.UMANITOBA.CA.

"The new cloud cover charts I've made up for the Handbook shows that the SSSP has the highest likelihood of clear skies of any of the summer Canadian star parties. Of course the Tuktoyaktuk SP is never clouded out - there's no water in the air at those temperatures! Forest fires aren't included."

Hope to see everyone there!

Space, Maple Leaf's final frontier...

By TU THANH HA

Globe and Mail, Saturday, June 15, 2002 - Print Edition, Page A1

MONTREAL -- No Canadians ever got to walk on the moon, but this country's space officials are looking even farther away and hoping to see the Maple Leaf on the Red Planet.

The Canadian Space Agency signed on yesterday to a bold interplanetary project that could lead to human travel to Mars.

The CSA agreed to participate in the European Space Agency's most visionary undertaking to date, Aurora, which has been described as Europe's equivalent of the Apollo lunar program.

Aurora will define Europe's long-term plans for the exploration of the solar system, including the possibility of humans journeying beyond Earth orbit, either to the moon, Mars or asteroids.

"We are looking at avenues of co-operation because Canada would certainly want to contribute and use its science and technology in exploring Mars," said Marc Garneau, Canada's first astronaut and now president of the Canadian Space Agency.

"It's a project that will take place in the next 20 years and we should be among the countries participating." It may sound quixotic, but Canadian officials are serious about this.

Partnering with the ambitious 15-nation European Space Agency is a no-nonsense move, considering that the U.S. National Aeronautics and Space Administration is slowed by a budgetary crisis.

In seeking involvement in Martian missions, Canada would position itself in its usual role as a reliable purveyor of small, specialized and indispensable hardware.

That contribution can then be bartered for slots for Canadian astronauts or scientific experiments.

This method has helped Canada gain visibility in the space station and shuttle programs out of proportion with the country's size and monetary contribution.

The CSA already has a small team of three to five planners preparing feasibility studies for Mars-related projects.

"This is exciting because human exploration is right there, first and centre, in this program," Alain Berinstain, who heads the CSA's Mars Project, said about Aurora.

Canada needs to take part in Mars exploration because of the opportunities for scientific research, he said.

Yesterday's agreement, and another on environmental monitoring, were announced jointly by Mr. Garneau and his European counterpart, Antonio Rodotà. "This shows the excellent relationship between Canada and the ESA," Mr. Rodotà said.

The CSA's contribution to Aurora is a preliminary involvement, a modest investment of \$1.1-million over three years.

Mr. Garneau said he was confident the federal government would give a green light to further participation. "I feel it's probably something that will be supported by our leaders."

The CSA already spends \$20-million to \$25-million of its \$300-million annual budget in joint programs with the European agency.

By agreement, Canadian firms then will be able to tender for the same amount of money once those programs need contractors.

CSA already has a two-year-old agreement with NASA's Mars program, but unlike Aurora that project does not feature human exploration, Mr. Berinstain said.

Mr. Garneau noted that a Mars project would require technical know-how in areas in which Canadians are already considered leaders: robot systems, mining and drilling technology and lidars (the laser equivalent of radar).

The CSA recently gave Sudbury's Northern Centre for Advanced Technology \$625,000 to study the feasibility of developing a hard-rock robot drill for use on Mars.

Sky Buys and Mirror Cells The Saskatoon Centre's Swap and Sale Page!

For Sale: 11mm Televue Plossl eyepiece - used only 3 times, one year old, in excellent shape. Reason to sell – bought Radian. New was \$130. Will sell for \$100. Call Rick Huziak at 665-3392.

For Sale: *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; **Parts tool kit**, 16"x8"x7" - \$10.00; **9mm Kellner** eyepiece- \$20.00. Please note: all items are either in good or excellent condition. Please call Darrell at 374-9278 for details.

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

The Messier, Herschel 400, Finest NGC and Binocular Club

Join the Club! Observe all 110 Messier, 110 Finest NGC, 400 Herschel, or 40 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

Bill Hydomako	Wow!	109
Tenho Tuomi		100
Mike Oosterlaken		93
Wade Selvig		71
Lorne Jensen		49
Brent Gratiias		39
Teresa Mulvenna		38
George Charpentier		30
Stan Noble		28
Tyrone Klassen		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	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
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HERSCHEL 400 CLUB

Certified at 400 Objects:

D. Jeffrey, R. Huziak

Darrell Chatfield	Applying	400
Gord Sarty		231
Scott Alexander		102
Mike Oosterlaken		68
Ken Noesgaard		44
Sandy Ferguson		18

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.

It is with sad reserve that I remove Mike Stephen's name from the incomplete observing lists, as he is now an official member of the Winnipeg Centre. However, his name will stay on the honour list for the Messier Club, since he earned this certificate while with the Saskatoon Centre! **Congratulations to Darrell Chatfield – this month's biggest news – with his completion of the Herschel 400 list!** I will be making an application for his certificate and pin, which will be awarded to him at a meeting this fall! Announcements of new observing numbers have been scarce - please send your new numbers in for the September issue! Send observing numbers to huziak@SEDSsystems.ca

The 15th Annual Alberta Star Party

Come to the Alberta Star Party, which runs September 5th through 8th. The star party is located on the Eccles Ranch Observatory, 3 km NE of Caroline, Alberta. The observing site is quite rustic, with no running water, no showers, but has clean outhouses. You have to be fairly self-contained, but the dark skies and friendly atmosphere make up for the rusticity! This star party is for observers, though families do come. There is a nature walk, and Burnt Stick Lake and Sylvan Lake are not that far away for swimming and birding. You can also stay in Caroline if you don't want to camp. (Caroline Hotel (403) 722-3000, Caroline Gateway Hotel (403) 722-3322).

Red light rules apply – all lights (internal and external) must be covered in red, and you will have to walk into the site if you arrive after 9 p.m. Pets are allowed, but they must be leashed.

There will be an astro-equipment competition, an astrophotography contest, Binocular Observing Challenge and Telescope Observing Challenge (for a hatpin), talks, a swap table and great observing!

Registration is in advance or on site (same price) at \$20.00 single, \$30.00 family. Do not send pre-registrations after August 24th. Make cheques payable to "RASC Calgary Centre", and send to: RASC Calgary Centre, c/o Dennis Goodman, 28 Southland Crescent SW, Calgary, Alberta, T2W 0K3.

For more information, contact: Roland Dechesne (403) 246-7353 rolandd@cnrl.com, Murray Paulson (403) 459-1168 mpaulson@freenet.edmonton.ab, or Rick Huziak (306) 665-3392 huziak@SEDSsystems.ca (I have maps and brochures for Saskatoon members! See you there!

