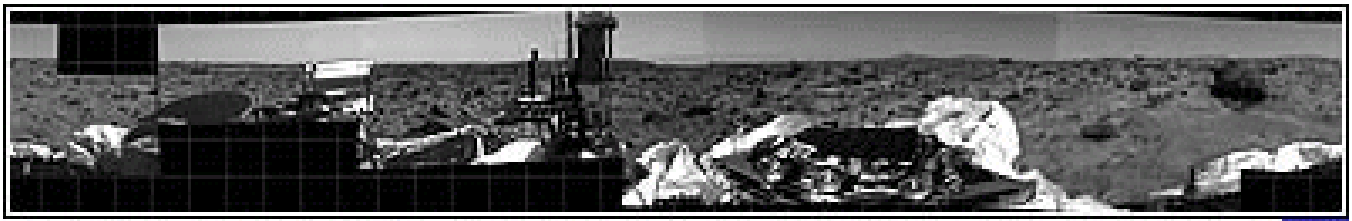
Regulus

The Newsletter of the RASC Kingston Centre 1997 July-August



Pathfinder's cameras captured a 360-degree panorama of the landing site (NASA)

Earth Invades Mars!

You are all probably sick to death or at least overloaded with the Mars Pathfinder and Rover coverage of the last week... so he is some more! I've tried to pick out information that you will not see in the normal media. For those that don't have internet access, I have accumulated dozens of images and other info on StarStream BBS (mirrored by the other two Kingston BBSs), not to mention several hours of videotaped CNN and Discovery Channel info.

How long is the lander and rover mission on Mars? After that time, who and on what bases decides to "turn Mars Pathfinder off"? Or will you perhaps work with it until it totally breaks down and stops responding?

The nominal expected life (the "prime mission") is 30 days for the lander and 7 days for the rover. However there is no known absolute maximum system life for either the lander or rover. Those numbers were chosen because the lander's rechargeable battery was qualification tested for 30 discharge/recharge cycles, and the duration of thermal testing applied to the rover's electronics box. The project has programmed funding for a year on the surface, in case it lasts that long. It really will be "against the odds" for the system to survive that long. But if the spacecraft is still functioning at that time, or if we run out of money before that for some reason, I for one would certainly hope that more money could be allocated. It is hard to believe that ANYONE would turn off a functioning spacecraft on the surface of Mars, especially since it gets cheaper and cheaper to run it the more time goes by. Now, it is true that some parts of the mission objectives are completely satisfied very early in the mission. For instance, we can take a picture of all the terrain features using every filter in the lander camera and send all that data in the first month, and there is probably no reason to take those pictures again. However more time will always add more value in other areas of investigation. The weather (including data from atmospheric imaging) could be profitably measured for years, and so long as the rover can move, new photo angles are always possible. These would include not just new terrain, but also pictures of the lander, so see what parts were damaged in landing, the airbags, the landing path ground imprints, etc. But, I hope we have this problem! It really will be "against the odds" for the system to survive that long. --William Dias, Surface Mission Operations Planner

What is the data rate between the rover and the lander, and how far away can the rover travel away from the lander?

The lander and rover carry 9600baud radio modems. With allowance for the data transfer protocols, the effective data rate between these systems is 2400bps. The communication range of the rover has been measured in tests with engineering models of the modem at 500m. At that range, the link degrades (as determined by bit error rate) for reliable communication. After 10m, the rover is effectively beyond the imaging range of the lander. These images from the lander are used by ground-based operators to plan rover operations. Beyond 10m, rover images will be used to plan traverses.

Someone was looking for the Martian coords for the Pathfinder lander: 19.43 deg N (areographic) latitude and 33.1 deg W (or 326.9 deg E) longitude, For more info, visit our buddies at NASA AMES: http://mpfwww.arc.nasa.gov/mpf/mpftechtraj.html#FPRTS

The main mars site is: http://www.ksc.nasa.gov/mars it will give you the option of going to a closer, less heavily loaded mirror site.

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

Newsletter Submission Info:
Deadline is the Friday before regular meetings in odd numbered months. The preferred method is EMAIL, then disk, lastly paper (I hate retyping... too many mistakes happen). email: [xxx] Fax: 1-613-545-2907 (with cover page to Kevin Kell) Post: Box 2033 Kingston Ontario K7L5J8 Canada ascii or most major word processors (WP6.1 for windows preferred) via email or 3.5" DOS floppy disk

Our Web page can be found at:
http:/www1.kingston.net/~rasc

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To Send email to all members of the Kingston Executive, address it to: rascexec@cliff.path.queensu.ca

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Centre Location: RASC - Kingston Centre, PO Box 1793, Kingston, Ontario K7L 5J6 Canada
Approx Lat: 44.5 Long 75.4

Upcoming Events
Friday 1997 July 11 Dr. Jayanne English of Queen's Physics Dept., is a postdoctoral fellow in astronomy. Her talk will be on "Visualization in Astronomy"--the many different tools and techniques that astronomers now have for visualizing astronomical concepts.

Friday 1997 August 15 Postponed by one week due to StarFest 97. Observing Group Meeting to be held at the home of Mark Kaye. From Kingston head north on Sydenham Road, past Elginburg and right onto Latimer Road (watch for signs). 2.5 km along Latimer (which becomes Davison). [xxx] A very informal atmosphere! People are free to come and go as they please. No set end time. A handout map will be available at the July meeting.

Monday August 25th The annual Charleston Lake Star Night with Terry Dickinson.
Friday 1997 September 12 Member's Night
Friday 1997 October 10 Annual Elections
Friday 1997 Nov 14 TBA
Friday 1997 December 12 Annual Holiday Dinner & Awards. Speaker: Dr. Richard Schmude Jr (Tentative, weather dependent)

Meetings of the Kingston Centre are held on the 2nd Friday of each month (unless noted otherwise) at 20:00 local time in Room B-201, Mackintosh-Corry Hall at Queen's University (parking available off Union Street at Frontenac).

Regulus is published 6 times per year. Views and opinions expressed herein do not necessarily reflect the official position of the Royal Astronomical Society of Canada or its officers and members. Subscriptions: Members of the Kingston Centre receive Regulus as a benefit of membership. Non-members may subscribe for $15 per year. Advertisements are free to members of the Centre. Commercial advertising is $25 per half page, $50 for full page and must be camera ready copy. Contributions are more than welcome. Submitted material may be edited for brevity or clarity.

From The Editor
This is going to be the quickest edition ever! The GA ended for me at approx 12:01 EDT Wednesday July 2nd, after the last transport dropoff. Took the rest of the afternoon cleaning out the last weeks worth of house chores (did I actually feed the cats?). Went to work for the next two days, madly catching up on a weeks backlog of problems. Slept most of the weekend. Then we come to Today (Monday the 7th), open up the newsletter file... empty. Wonderful. Off to Comdex in Toronto Wednesday which means this has to be at the printers by Tuesday afternoon. Arg! The internet sites I pull info and pictures from are completely overwhelmed by all the Mars Pathfinder traffic. Arg! Less than 24 hours to go to press! Arg! Quickly go through the email submissions.. Aha! There are a few... oh look, there's some more. Hey this isn't too bad anymore. I came up with the idea of taking a Sojourner photo and doing a few changes (putting it up on blocks and removing the wheels)... the Rover and Lander go to sleep at night... who's to say? Too bad not enough time.

I did find my GA Murphy's Slide Show submission... too late? I did get my Starfest registration away. August 7-10! Anyone know where I can get my hands on the Hot Wheels Mars Pathfinder set? I've gone through Kingston's toy stores and come up empty! Terry Dickinson mentioned small kids boats as observing platforms for eye and binocular. Well I went out and picked up an Explorer 100 from Canadian Tire for $15 and boy does it work! (Don't do this at home if you have neighbors! Seeing you passed out in a small rubber boat in your back yard...) Actually, Starfest should be fun... from what I hear, we will have about 9 of these... all docked' neatly in a row at the crest of some hill :) We will be selling pictures!

From The Prez
I suspect that seeing as how our Dear Prez is on her honeymoon, we are not going to hear a lot from here this issue! Congrats!

From The Secretary
[Ed: long boring parts omitted]
(May 9th) Meeting called to order 8:13pm
August Meeting: Postponed to August 15, 1997
There will be NO general meeting in June. We will wait until October.
T-shirts. Only three people want t-shirts that haven't ordered them yet. Hey, these are great t-shirts guys - designed by our artist in residence!
GA- Volunteer sheets are at the front of the room. Please sign up. We need everybody!
Leo Brodeur's comet pictures (and aurora). We need to see who is interested in ordering 8x10's of these photos as a centre fundraiser. They will cost $10.00 ea.

Secretary's report
New member Jim Purser was voted in unanimously. Welcome abord Jim!

Treasurer's report
(financial info is submitted by her, so I won't go into details)

GA fundraisers
50/50 draw - winner Tessa Clarke
Mark Kaye's film - winner Tessa Clarke (lucky!)
Summer Stargazing (autographed) winner Gerry Ladd
LED flashlight for sale - $9.50, $10.00(with batteries), $11.00 personalized comes in white or black case and is waterproof. This is a great flashlight!

GA - Current number of registrants as of May 9th - 100 (this is better than any other centre has ever had at this early date)

Announcements:

Judith Irwin told us more about the adopt - a - star program at Queen's. The funds will be used to build an observing deck, update the dome, and put a new computerized telescope in it. This is a very worthwhile cause, as Queen's uses the telescope both for research and for public education. Since we are also interested in promoting astronomy to the public, we should have a hand in helping our professional counterparts. Stars range in price from a very affordable $25 up to $2500, depending on the magnitude and popularity of the star. GET YOURS NOW!!!!!!!!

Christine Kulyk:
A Photographic Tour of the Universe, the book she edited, is on sale at the special price of $20.00, $2.00 of each sale will be donated to the GA fund. This is a gorgeous book!

Cathy Hall:
Thanks to all who helped at astronomy day. It was very successful. See Regulus for her write-up. She is passing around blackmail shots she took at the mall.

Speaker: Cathy Hall
Cathy took us on a photographic tour of the Star Hill Inn resort in New Mexico. What an incredible place. When I die, I want to wake up there! She showed us some of the cabins and equipment available for rent. She went there with
fellow members of the NYAA for a week of pure heaven. Thanks for sharing with us!

Video:
Kevin showed us a 7 min video from Discovery.ca about doing backyard SETI. I saw Kim taking notes! If you want to check this out for yourself, check out these sites:
www.setileague.org
www.exn.net

Observing Reports:
I'll shorten this since Kevin will cut it off anyway. If you want details, I'll have them on record.
Terry Dickinson told us that Hale-Bopp broke a record for longest time at magnitude 0 or brighter, after being at magnitude -1 for six weeks. He said it is the brightest comet
since Halley's in 1910. It's new orbit will bring it back in 2380 yrs, so if you missed it this time, you can catch it in 4377!
The meeting was adjourned at 11:07pm

(June 13th) Meeting called to order at 8:03 pm
Leo Brodeur's photos: The two shots chosen for the centre fundraiser are the comet in the aurora and the beautiful aurora shot nicknamed "the snake that ate the moon". They are $10 each for an 8x10.

Adopt a Star:

Queen's University's astronomy department is raising money to fix up their observatory and update the telescope. They are offering stars for adoption, starting at $25 each. Kingston centre will be adopting the star "Regulus" which is in the $2500 category. All members are encouraged to make a tax-deductable donation to the centre so that we can raise enough money to adopt this star. You may also adopt your own star if you wish. Just think, you could look up on a clear night and see your very own star!

General Assembly:
Christine pointed out that this GA will be the 107th annual General Assembly of the RASC, and the first one hosted by Kingston Centre. (It's about time!)

The schedule for the general assembly to be held from June 27 - July 1 was presented to the membership for review to see if there were any errors. No one pointed any problems out, so we will go to press with what we have. Leo Enright suggested we offer a banquet ticket to Mr Babcock senior, the original owner of the farm situated on Holleford Crater. The GA committee agreed unanimously that if we have enough money to do this, then we certainly will make the offer. The Babcock family have been allowing astronomers including the RASC and CASCA access to their farm in order to tour the crater and Leo felt that the offer of banquet tickets was long overdue. Everyone agreed.

Cathy Hall will be doing decorations for the Wine and Cheese as well as the Banquet. She needs volunteers, so if you can help then contact her asap.

New Member:
Karel Chrastina joined our centre as a new member this evening. The vote was unanimous that we accept him as a new member. Welcome to the family, Karel!

Other Stuff:
Hank suggested that members donate slides to the library so we can put together speaker's packages for members who give talks to local groups. He will coordinate this. Mark said he might be able to have duplicates made of member's slides at a bulk rate if people are willing to lend their slides to the centre for this purpose.

Meeting adjourned at 10:35pm

From The Treasurer
Pretty quiet on this front. At least we know she isn't in Cuba or Aruba or any of those other fun places!

Astronomy Day
ASTRONOMY DAY BABY
Astronomy Day in Kingston this year was marked by a very special event: the arrival of a baby daughter to one of our newer members, Theodore Micholias, of Kingston. Theodore's new child was born on International Astronomy Day, April 12, at 12:15am. The baby girl, weighing 6 pounds 4 ounces at birth, is in fine health, and she joins her 5-year-old sister Evanthia, mother Laura, and father Theodore in the Micholias family. Theodore and Laura chose the very appropriate name of Cynthia (full name Cynthia Nicole Micholias) for their new daughter. Cynthia was one of the appellations of Artemis, the Greek goddess of the Moon. Warmest congratulations to Theodore and his family!

CHARLESTON LAKE STAR NIGHT
The annual Charleston Lake Star Night will be taking place this year on Monday, August 25. As in past years, all Kingston Centre members, as well as the general public, are invited to enjoy an evening of stargazing under as the general public, are invited to enjoy an evening of stargazing under the beautiful dark skies of Charleston Lake Provincial Park. The event is organized by Park staff, with a slide show by Terence Dickinson and a chance to get a peek through one of Terry's state-of-the-art scopes as two of the star attractions. Kingston Centre members are invited to bring your telescopes and binoculars to the event to join in the stargazing and give members of the public a chance for a look at the summer sky's marvels. When you arrive, you should tell the Park gate staff that you are with the RASC astronomy club and that you have brought a telescope or are coming to help operate one of
the telescopes; the gate staff will let you in without the normal admission charge per car, and they will then direct you to the open field area where telescopes will be set up. It's best to arrive before dark, to find a spot and get your equipment ready. Terry's slide show begins at about 8pm in the outdoor amphitheatre located a short walk from the scope site. The event has been drawing record crowds of several hundred visitors in recent years, so it's best to find a seat early!

General Assembly Stuff
Unable to attend the Kingston 1997 General Assembly? You can still be a part of it!
We have tshirts (L/XL) $15.00 and sweatshirts (L/XL) $25.00 left, Holleford Crater postcards at $1.00 each, and mention the Kingston Centre Lapel pin which will be available by mid July.
Contact Kim Hay for more info
If interested make cheque or money order out to Kingston Centre GA Fund for the Tshirts/sweatshirts/postcards and send to :
Kim Hay
1462 Leland Road
RR#2 Perth Road
Ontario, Canada
K0H 2L0

-other than that the finances will take several months to do waiting for various bills to come in, and the total registered attendance at the 1997 GA was 160 (including tour guides, guests, etc).

GA MEMORIES
by Christine Kulyk
1997 GA Vice-Chair & Secretary
After more than three years in the planning, it's hard to believe that the 1997 General Assembly in Kingston is now past. By all reports, it was a smashing success, with an excellent turnout and very well-received programming. I was delighted to see so many RASC members from all across Canada (and beyond) enjoying themselves at our GA; and with all the great networking I saw taking place amongst them, I know there were several new projects launched and contacts made that weekend.

It was great to see so many familiar faces from other RASC Centres (particularly my old friends from Edmonton), as well as having the chance to meet so many astronomy enthusiasts from near and far (including Kingston Centre members Warren Morrison of Cavan, Ontario, and Ray Berg of Crown Point, Indiana). I was especially pleased when Stan Runge and Scott Young showed up from Winnipeg--we had been afraid that this year's floods might put a damper on their GA-going plans--it was great to see our "Raiders of the Lost Ark" arrive after all! I had a wonderful time, and I'd like to thank all the people who worked so hard to make it happen--with a special tip of the hat to Susan Gagnon and Leo Enright.

I would like to extend special, heartfelt thanks to all of our program participants. We were truly blessed with a fabulous contingent of speakers. Terry Dickinson surprised and delighted us all by having a local musician, David Archibald, compose an original symphonic score to accompany his stunning slide show; and we were truly privileged to have David himself there to give a live performance of his music--a breathtaking presentation! Martin Duncan came to us direct from a Paris astronomy conference to present the latest news about Kuiper belt objects and theories. Kathy Perrett, Queen's observatory coordinator, generously hosted two special observatory open houses for us, with the assistance of some of Queen's astronomy graduate students. Bernie Ziomkiewicz of Queen's Physics Department gave us a wonderful guided tour of the astronomical-equipment treasures in the collection at Stirling Hall; several of the items on display had been specially mounted by Bernie to be ready for the GA tour. Mark Badham conducted two very popular guided tours of the Miller geology museum, setting the stage beautifully for the Holleford Crater tour, which was led by our own Leo Enright. Judith Irwin gave a wonderful presentation about recent findings relating to galactic structures. Carolyn Shoemaker took part with her customary grace and eloquence in two of our panels--the SL-9 team and "The Changing Scene for Women in Astronomy," in which she was also joined by Judith Irwin and Denise Sabatini, with me as moderator--very special thanks to the panel participants. Bill Broderick, national RASC Light Pollution chair, chose the 1997 GA as the appropriate venue to launch the Canadian Campaign for Dark Skies. Aksel Hallin of Queen's University gave us some fascinating insights into neutrino theory, along with an up-to-the-minute report on the progress of the Sudbury Neutrino Observatory project. Gene Shoemaker, our Ruth Northcott Memorial Lecturer, presented seminal scientific data and analysis of meteoric impacts and cratering rates throughout the geological history of Earth. Leo Enright ably chaired the Paper Sessions, with many fine presentations by RASC members from coast to coast. Following David Levy's polished presentation about reflections on SL-9, David delighted us all by acting as MC for the Song and Poem contests; this entertainment portion of the program was a hit , with Leo Enright's humorous interjections setting just the right tone for the Murphy slide show, and some terrific song and poem performances--ranging from the sublime to the hilarious. Thanks to you all, and to any I've missed!

The display and dealers' exhibits were a great success as well, as was the Hospitality Area. Many, many thanks to all the Kingston Centre volunteers who helped to set up and staff those attractions--especially Kevin Kell, Susan Gagnon, Ruth Hicks, and Kim Hay. And special thanks to Susan Gagnon for her wonderfully well-organized tours, and all the amazing prizes she collected--thanks also to our many generous prize donors and sponsors. Thank you to everyone who took part in the GA--together, we made it happen! Now, to get some sleep. .

National News
ROYAL ASTRONOMICAL SOCIETY OF CANADA
Motions of the Annual Meeting 1997 06 29

Note: the following is presented merely to foster discussion and rapid communication within the Society. This list of the motions considered at the Annual Meeting is completely unofficial and is the responsibility of the National Recorder.
For official purposes, wait for the completed minutes, which will be available on the Society's web site in a few weeks and are then scheduled to be included in the 1997 Annual Report, which should appear in the spring of 1998.

MOTION AM9701
It was moved by Dr. Hube and seconded by Mr. Loehde to approve the agenda. The motion was CARRIED.

MOTION AM9702

It was moved by Ms. Goodman and seconded by Ms. Sabatini to adopt the minutes of the 1996 Annual Meeting. The motion was CARRIED.

MOTION AM9703
It was moved by Dr. Gupta and seconded by Ms. Moreau to adopt the audited financial statement as published in the 1996 Annual Report. The motion was CARRIED.

MOTION AM9704
It was moved by the Constitution Committee that the changes proposed to By-Law Number One be accepted. The motion was CARRIED by the required majority.

MOTION AM9705
It was moved by Mr. Marshall and seconded by Dr. Gupta that C. J. Tinkham and Associates be reappointed as auditors for the Society. The motion was CARRIED.

MOTION AM9706
It was moved by the Finance Committee that the formula for life membership fees be reduced from 25 times the annual fee to 20 times the annual fee.
The motion was CARRIED.

MOTION AM9707
It was moved by Mr. May that the meeting adjourn. The motion was CARRIED at 15h26 edt.

General Assembly News
Wow. It's over. Am I tired. Me too!
What was the question? Where am I?
Who am I? Have another! Are you Nuts?????

BBS News
Lotsa! New images and info fom the Mars Pathfinder Mission from the Internet.

The following Kingston BBS's are RASC support boards: Observatory East (Mark Kaye) 613-353-6495 FidoNet 1:249/109 2400-28800 bps 8N1V.34
StarStream (Kevin Kell) 613-546-6403 FidoNet 1:249/112 14400-28800 bps 8N1V.34
Moonlight Cascade (Kim Hay) 613-353-7369 FidoNet 1:249/133 2400-28800 bps 8N1V.FC

Submissions from the Members

Pretty quiet this month.

Comet Watch
Comets Currently Visible from
http://encke.jpl.nasa.gov/whats_visible.html
Last Updated: 1997 June 19th

Long-Period Comets
C/1995 O1 (Hale-Bopp)
C/1997 D1 (Mueller)
C/1997 H2 (SOHO)
C/1997 J1 (Mueller)
C/1997 J2 (Meunier-Dupouy)

Short-Period Comets
2P/Encke
29P/Schwassmann-Wachmann 1
46P/Wirtanen
81P/Wild 2
118P/Shoemaker-Levy 4
121P/Shoemaker-Holt 2

C/1995 O1 (Hale-Bopp)
This fading super-star comet is no longer visible in the Northern Hemisphere. It is only visible in the Southern Hemisphere. It is currently m1=3 and fading.

C/1997 D1 (Mueller)
This comet is well-placed for Northern Hemisphere observers. The comet will brighten very slowly over the next couple of months. The comet is currently about magnitude 13.5.

C/1997 H2 (SOHO)
the SOHO (SOlar Heliospheric Observatory) satellite has discovered a comet on images obtained with coronagraphs. The orbit of the comet, published in IAU Circular 6650 (May 9, 1997) indicates that the comet reached perihelion on May 2.8 at a distance of 0.14 AU. It should be noted that this is NOT a member of the famous Kreutz group of sungrazing comets. The orbit suggests that this comet may still be bright enough to be seen visually as it moves away from the Sun. However, no successful observations have been reported (by either amateur or professional to my knowledge).

C/1997 J1 (Mueller)
IAU Circular 6642 (May 5, 1997) reports the discovery of a comet by (my good friend) Jean Mueller on a 40-min IIIa-J exposure by J. D. Mendenhall and herself with the 1.2-m Oschin Schmidt telescope in the course of the second
Palomar Sky Survey. The object is reported as condensed, with a diffuse coma and a hint of a tail to the southeast. An orbit, given on MPEC K04 (May 17, 1997) indicates that perihelion occurred on May 3, 1997 with a perihelion distance of 2.3 AU.

This is Jean's 12th comet...a full dozen...and the second one this year. Congratulations Jean!! This comet is well-placed (high northern declination) for Northern Hemisphere observers. The comet will fade slowly as it drifts towards conjunction with the Sun. The comet is currently about
magnitude 12.5.

C/1997 J2 (Meunier-Dupouy)
IAU Circular 6648 (May 8, 1997) reports the discovery of a comet by Michel Meunier (Arbonne la Foret) on May 7.9 UT, only some 6' southwest of comet C/1997 J1. The new comet is perhaps 0.5 mag brighter than C/1997 J1 but having a much slower motion. Philippe Dupouy and J. F. Lahitte (Observatoire de Dax) report additional observations (apparently, they made an independent discovery of the comet). An orbit published on MPEC K05 (May 17, 1997) indicates that this comet will reach perihelion on March 10, 1998 with a perihelion distance of 3.06 AU. This comet is well-placed (high northern declination) for Northern Hemisphere observers. The comet will brighten very slowly as it drifts south and east. The comet is currently about magnitude 12.6.

2P/Encke
This comet has been recovered visually at m1~5.7 by Colin Drescher in Australia. It is very close to the Sun. The comet will become more observable for Southern Hemisphere observers as the comet moves away from the Sun in the evening sky. The comet is expected to fade to m1~8.0 in early July and will probably be lost visually in August. This is totally a Southern Hemisphere show.

29P/Schwassmann-Wachmann 1
This comet is well-placed for observation throughout most of the night for both hemispheres. The comet has irregular outbursts to m1~12-13. It should be monitored.

46P/Wirtanen
This comet is low in the evening sky. The comet is currently 10.5 magnitude or fainter and slowly fading. (Perihelion was on March 14, 1997.)

81P/Wild 2
This comet is well-placed for observation the early evening, with Northern Hemisphere observers somewhat favored. The comet is currently about magnitude ~10.7. The comet should fade slowly as it moves south. Perihelion was on May 5, 1997.

118P/Shoemaker-Levy 4
This comet is an early evening object. However, there have been no reported observations recently.

121P/Shoemaker-Holt 2
This comet is well-placed for observation. However, there have been no recent observations.

Space Calendar
The Space Calendar covers space-related for the coming months. This Calendar is compiled and maintained by Ron Baalke. Please send any updates or corrections to baalke@kelvin.jpl.nasa.gov
You can find this on the web at:
http://newproducts.jpl.nasa.gov/ calendar

Updated Monday, July 07, 1997 at 11:24 PM PDT
Jul 16 - Possible Mars Occultation of SAO 138979 (8.5 Magnitude Star)
Jul 18 - Comet Helfenzrieder Perihelion (Lost Comet)
Jul 21 - Asteroid 9 Metis Occults PPM 118511 (9.1 Magnitude Star)
Jul 21 - Neptune at Opposition
Jul 25 - Moon Occults Saturn
Jul 25 - Possible Mercury Occultation of SAO 98906 (8.2 Magnitude Star)
Jul 27 - Asteroid 444 Gyptis at Opposition (10.8 Magnitude)
Jul 29 - Moon Occults Aldebaran, Visible from Southern USA
Jul 29 - South Delta-Aquarids Meteor Shower Peak
Jul 29 - Uranus at Oppostion

August 1997
Aug 01 - Alpha Capricornids Meteor Shower Peak
Aug 01-03 - 62nd Stellafane Convention, Springfield, Vermont
Aug 02-09 - 4th Annual Nebraska Star Party, Merritt Reservoir, Nebraska
Aug 03 - Mercury At Its Greatest Eastern Elongation (27 Degrees)
Aug 04 - Mars Pathfinder, End of Primary Mission
Aug 04 - Asteroid 2 Pallas Occults PPM 104597 (7.5 Magnitude Star)
Aug 04 - Asteroid 306 Unitas at Opposition (10.7 Magnitude)
Aug 05 - Moon Occults Mercury
Aug 05 - Asteroid 67 Asia at Opposition (10.0 Magnitude)
Aug 06 - Southern Iota Aquarids Meteor Shower Peak
Aug 07-10 - Starfest '97, Mount Forest, Ontario, Canada
Aug 08-10 - Northwoods Starfest '97, Fall Creek, Wisconsin
Aug 09 - Jupiter at Opposition
Aug 12 - Perseids Meteor Shower Peak
Aug 12 - Asteroid 19 Fortuna Occults PPM 206231 (8.9 Magnitude Star)
Aug 15 - Comet Haneda-Campos Perihelion (1.267 AU, Lost Comet)
Aug 15 - Possible Mars Occultation of SAO 158218 (8.6 Magnitude Star)
Aug 16 - Possible Mars Occultation of SAO 158243 (9.2 Magnitude Star)
Aug 21 - Moon Passes 0.008 Degrees South of Saturn
Aug 22 - Moon Occults Saturn
Aug 22 - Asteroid 4209 Briggs Closest Approach to Earth (1.864 AU - 14.5 Magnitude)
Aug 23 - Asteroid 19 Fortuna at Opposition (9.4 Magnitude)
Aug 24 - Asteroid 138 Tolosa at Opposition (10.6 Magnitude)
Aug 25 - Northern Iota Aquarids Meteor Shower Peak

Aug 28 - Asteroid 1986 PA Near-Earth Flyby (0.2061 AU)
Aug 29-Sep 01 - 11th Annual Nova East Star Party, New Brunswick,
Canada
Aug 30 - Comet Grigg-Skjellerup Perihelion (0.997 AU)

September 1997
Sep 04 - Asteroid 1 Ceres at Opposition (7.7 Magnitude)
Sep 09 - Asteroid 1996 FG3 Near-Earth Flyby (0.356 AU)
Sep 09 - 105th Anniversary (1892), Edward Barnard's Discovery of Jupiter
Moon Amalthea
Sep 12 - Mars Global Surveyor, Mars Orbit Insertion
Sep 16 - Lunar Eclipse, Visible From the Eastern Hemisphere
Sep 16 - Closest Full Moon of 1997 (356,966 km)

News from the Net
CANADIAN SPACE AGENCY - MIR INCIDENT DID NOT AFFECT CANADIAN EXPERIMENTS 19:49 EST Friday, June 27, 1997

ST-HUBERT, June 27 /CNW/ - The Canadian Space Agency (CSA) announced today that its two main space science experiments onboard the Mir orbiting station are among those that will not be lost as a result of this week's incident.

Many of the international life science studies may have been compromised because the refrigerators containing the blood and urine samples were located in the damaged Spektr module. Blood samples from CSA's Sleep-Wake Immune Function (SWIF) experiment are stored in a working freezer that is not located in Spektr.

"NASA and Russian ground personnel worked very hard to continue to provide power to the freezer to save the experiment, even after Mir lost about half of its electrical power," said Barry Wetter, Director General of CSA Space
Science program. "We will therefore be able to bring results of the SWIF experiment back to earth for analysis."

The experiment, which examines the changes in astronauts' immune function and the affect of sleep loss during long-duration spaceflights, is expected to help determine why astronauts staying in space for long periods are more likely to catch minor illnesses. This experiment will provide insight into sleep-related illnesses, such as chronic fatigue syndrome, which affects 1 in 4 Canadians.

CSA's other experiment on Mir also appears to have been fortunate. The QUELD/MIM experiment, which studies how microgravity can be used to produce better performing materials and semiconductors, had just been removed from
the Spektr module in preparation for an experiment that was to be run this week. "The experiment will have to be delayed, but we are very pleased that the astronauts were able to install QUELD in Mir's Priroda module before this unfortunate accident happened," said Wetter.

The Canadian Space Agency has participated in the NASA-Mir program through its science programs since 1996, and has taken advantage of the long durations of near-weightlessness that are only available on Mir.

Overview of the Mars Microrover
Sojourner is the name given to the first robotic roving vehicle to be sent to the planet Mars. Sojourner weighs 11.0 kg (24.3 lbs.) on earth (about 9 lbs. on Mars) and is about the size of a child's small wagon. The Microrover has six wheels and can move at speeds up to 0.6 meters (1.9 feet) per minute. This isn't very fast, but during the course of a day on Mars the Microrover can cover a lot of territory (perhaps up to 3 meters). However, that speed will be fast enough to accomplish many tasks during a day, since we are not planning on driving the Microrover more than 10 meters (32.8 feet) away from the lander.

The rover's wheels and suspension use a rocker-bogie system that is unique in that it does not use springs. Rather, its joints rotate and conform to the contour of the ground, providing the greatest degree of stability for traversing rocky, uneven surfaces. A six-wheel chassis was chosen over a four-wheel design because it provides greater stability and obstacle-crossing capability. Six-wheeled vehicles can overcome obstacles three times larger than those crossable by four-wheeled vehicles. For example, one side of Sojourner could tip as much as 45 degrees as it climbed over a rock without tipping over. The wheels are 13 centimeters (5 inches) in diameter and made of aluminum. Stainless steel treads and cleats on the wheels provide traction and each wheel can move up and down independently of all the others. Three motion sensors along Sojourner's frame can detect excessive tilt and stop the rover before it gets dangerously close to tipping over. Sojourner is capable of scaling a boulder on Mars that is more than 20 centimeters (8 inches) high and keep on going. (Ref:JPL 96-207 p.32)

Microrover Mission Objectives and Highlights
The primary function of Sojourner is to demonstrate that small rovers can actually operate on Mars. The Russians placed a remote control vehicle on the moon called Lunakhod, and even though there was only a 3 second signal delay, that rover proved very difficult to drive. Sojourner will be humanities first attempt to operate a remote control vehicle on another planet. After landing, Sojourner will stand up and drive down one of the two ramps mounted to the lander petal. A lander IMP (IMager

for Pathfinder) camera mission panoramic image as well as images taken on either side of the rover petal will assist the mission operations engineers in deciding which ramp is safest to drive down. After a successful ramp egress we will begin a nominal 7 sol (1 sol = 1 Martian day) mission to conduct science and technology experiments. This mission is conducted under the constraint of a once-per-sol opportunity for command and telemetry transmissions between the lander and earth operators. Communications with the rover is not done in real-time because of the approximately 11 minute light-time delay in receiving the signals. Sojourner must be able to carry out her mission with a form of supervised autonomous control. This means that goal locations (called waypoints) or move commands must be sent to the rover ahead of time and Sojourner then navigates and safely traverses to these locations on her own.

Sojourner will perform a number of science experiments to evaluate its performance as a guide to the design of future rovers. These include:

Conducting a series of experiments which validate technologies for an autonomous mobile vehicle.

Deploying an Alpha Proton X-ray Spectrometer (APXS), on rocks and soil.

Imaging the lander as part of an engineering assessment after landing.

Also, Sojourner will perform a number of specific technology experiments to evaluate its own performance as a guide to the hardware/software design for future rovers as well as assisting in verifying engineering capabilities for Mars rovers. The technology experiments are listed below:

Mars Terrain Geometry Reconstruction from Imagery — Each Mars sol, images are taken by the rover and lander as a means of planning the next sol of operations. As a collection, these images will be used to construct a map of the landing site.

Basic Soil Mechanics ---

In a soil sample, as a single front or rear wheel is turned in place, the motor current is measured and an estimate of torque is derived.

Small trenches can be dug by dragging a single wheel during a move, allowing analysis of topsoil compactness and density.

Dead Reckoning Sensor Performance and Path Reconstruction ---

The telemetry logged by the rover during traverses provides a means of reconstructing the path traversed by the vehicle.

Sinkage in Each Martian Soil Type ---

At the end of selected wheel rotations performed during the soil mechanics experiment, images of the resulting rut or trench are taken.

Logging and Trending of Vehicle Performance Data — During vehicle operations, engineering measurements are taken regularly which will help to verify rover performance and identify trends.

Rover Thermal Characterization ---

The rover has 7 temperature sensors internal to the WEB and 6 external sensors. These sensors will be sampled during both day and night each sol in tracking the thermal characteristics of the vehicle.

UHF Link Effectiveness ---

The rover routinely communicates with the lander, transmitting telemetry and receiving commands. Data transfer errors will be logged and graphed to develop a model of the UHF link effectiveness as a function of location.

Material Abrasion ---

Wheel material wear can be correlated to the amount of abrasion caused by Martian soil per distance of wheel travel.

Material Adherence ---

Power from a "clean" solar cell will be compared with that from a "dusty" cell. The correlation between the amount of dust and cell output measure the effect of dust on solar panel performance during the mission.

APXS ---

In addition to the technology experiments the Alpha Proton X-Ray Spectrometer and the visible and near infrared filters on the lander imaging system will determine the elemental composition and constrain the mineralogy of rocks and other surface materials at the landing site.

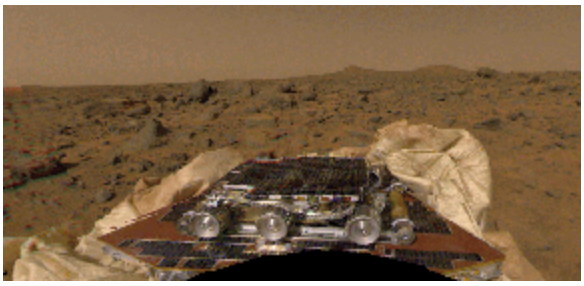
Lander Assessment ---

During the mission, the rover cameras will be used to image portions of the lander.

After the first Mars sol, which will be devoted to the release and deployment of Sojourner from the lander and the acquisition of an APXS measurement on soil, the rover will perform more and varied measurements. The next two Martian sols will be used to acquire an APXS measurement of some rock near the lander. Along the way to the rock, a soil mechanics technology experiment will be performed. With continuing success, sols 4, 5 and 6 will be devoted to positioning the APXS for measurement of a specific rock: the rock selected through an evaluation of the panoramic image of the landing site taken by the lander IMP camera. In addition, stereo images from the rovers front cameras and rear color camera will be taken of rocks, soil and terrain to assist in the terrain reconstruction at the landing site. Images of the lander will be taken in an attempt to complete a full survey. The last day in the 7 sol nominal mission will be devoted to ensuring data has been collected for all the technology experiments.

After sol 7, if it is decided to continue with rover operations, we will enter into what is known as the 'extended 30 day mission'. An extended mission will be

much more conservative because the 3 strings of rover batteries, which are not rechargeable, may become depleted limiting it to solar power only. In that case, the rover will totally shut down at sunset and be incapable of performing any nighttime operations (like APXS measurements). When the sun rises on Mars and there is enough solar energy to power the rover, it will wake up, boot its software from memory and send a signal to the lander saying it's ready for commands. We can then uplink a rover operations sequence and proceed with normal operations during the day. Seven or more successful days of Mars surface operations will provide earth's scientists with a wealth of new Martian geologic information and add to our knowledge of the red planet.



Date sent: Sat, 24 May 1997 15:37:34 -0400 (EDT)
From: SEDS Canada <seds@conveyor.com>
Subject: SEDS-Canada multimedia space essay contest

Dear Astronomy Clubs,
I would like to inform you of a contest that we are organizing. The teachers and students among your membership may be interested in participating in our multimedia space essay contest. The challenge is to create a web document about space and to explore the possibilities of conveying information via multimedia. There is $1200 in prize money to be awarded, and contest details can be found at http://www.seds.ca/Contest/.
If you wish, I could also mail/email you the contest details as well as posters to distribute. I would greatly appreciate it if you could mention our contest to your members.

For your information, Students for the Exploration and Development of Space (SEDS) is a student-run space education and exploration group for Canadian students from Gr. 7 - PhD.

Our homepage URL is http://www.seds.ca/ I hope that teachers and students in your membership will be interested in participating in our contest and our organization. Ideally, the contest would involve not only students in Computer Science and Science courses, but also students taking English and Art. If you require more information about the contest or SEDS-Canada, please do not hesitate to contact me.
Sincerely, Calvin Li SEDS-Canada, Vice-President
ccli@cantor.math.uwaterloo.ca