The Millennium Assembly

Winnipeg

June 30 - July 2, 2000

The Royal Astronomical Society of Canada
La Société Royale d'Astronomie du Canada
The Department of Astronomy, University of Manitoba

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President's Welcome

The President' s Message

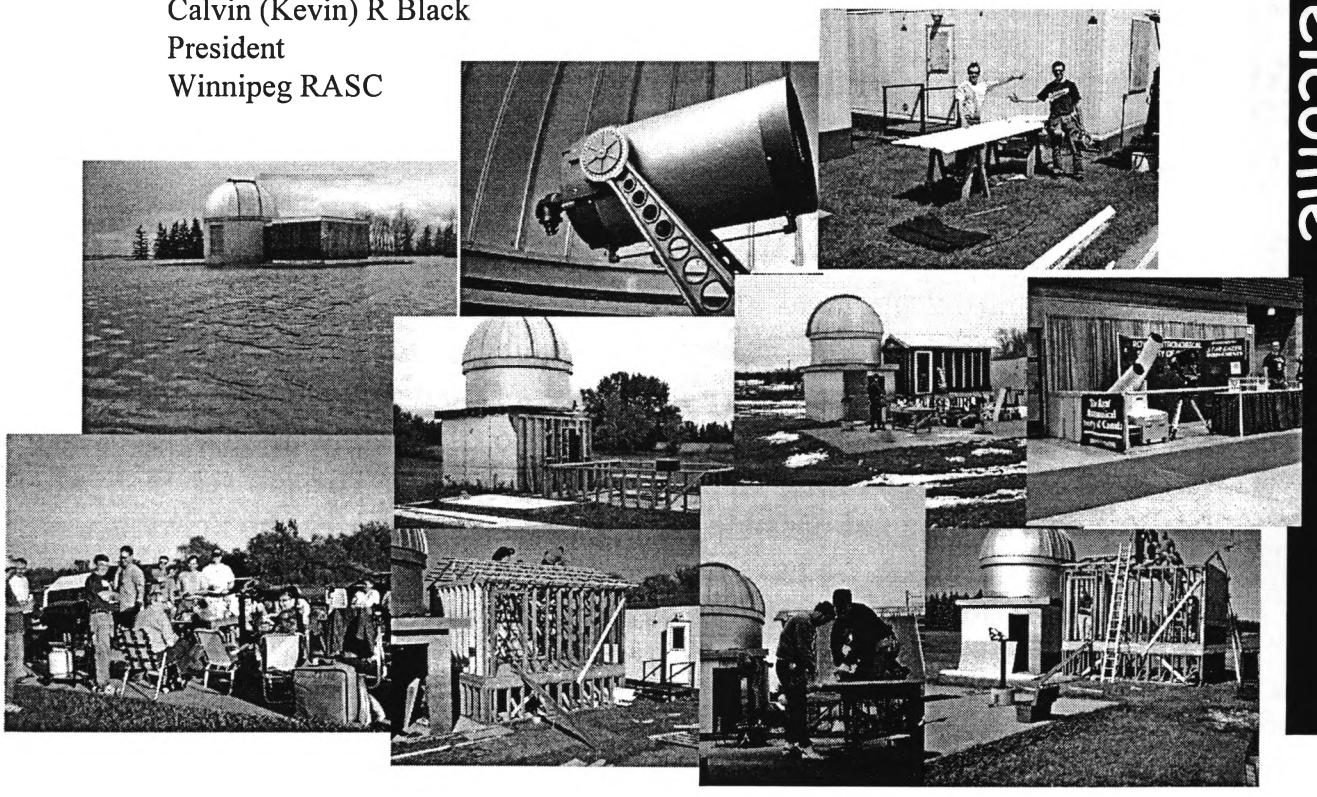
GA2000: the Millennium Assembly

On behalf of the city of Winnipeg, and Winnipeg RASC, I would like to welcome you all to our fine city to share in the continuing tradition known as the General Assembly. Many of us like myself have had the opportunity to attend other GA's in the past and many of us will share in the GA's of the future. This GA2000 is a special event for all of us to enjoy – not only have we passed into a new century, but the future of amateur astronomy has never looked brighter as new technologies, communication and camaraderie with the world community brings additional pleasures for those addicted to the sky.

Whether you are an active, armchair, passive or professional astronomer, I believe the Millennium GA will demonstrate just how much knowledge, technology and experience are shaping our continued love for astronomy and how much the amateur astronomer has gained in astronomical abilities, even when judged by professional standards. My City of Winnipeg, the bridge between East and West in our fine country, and I are looking forward to meeting as many representatives as possible from the twenty-three centres, as well as the unaffiliated members and other interested people who have taken the time and trouble to venture to the West to share in the five days of events.

Take care and enjoy,

Calvin (Kevin) R Black
President
Winnipeg RASC



General Information

Your Registration Kit

The following items are contained in your registration kit:

- This registration guide
- Your name tag
- Lunch tickets for The Daily Bread (if purchased)
- BBQ ticket, if purchased
- Wine and Cheese ticket, if purchased
- Banquet Tickets, if purchased
- A map of Winnipeg (ask for it if you need it)
- Winnipeg city pins
- Tourist brochures for the city's attractions

Registration desk

Information about the program and events around the city can be obtained at the registration desk. Hours of operation are:

Thursday June 29	1300 – 2200
Friday June 30	0800 – 1700
Saturday July 1	0830 – 1000

The desk will be closed for lunch from 1200 – 1300 on Friday.

A note about the Red River Cruises

Extremely heavy rains in North Dakota (at one point, 260 mm in seven hours) have raised the level of the Red to the point where the large paddlewheel boats cannot get under the bridges on the river. The city is not in danger of flooding – Winnipeg has a floodway which diverts water around the city – but engineers choose to fill the city waterways to capacity before diverting water through the ditch. The cruises to Lower Fort Gary are not possible, and the boat cannot reach the Forks to view the Fireworks. We have made alternative arrangements to view the Fireworks and to reach the fort. Refunds and price adjustments will be made.

Speaker's Notes

Speakers (except for guest speakers) have been allotted 20 minutes for their presentations. As a general rule, you should allow 15 minutes for speaking, and the balance for set-up and questions. A good rule-of-thumb is to plan on one minute per slide or overhead, including titles and endings – and a few less slides will probably make your presentation more comfortable for you. More than one slide per minute will almost certainly exceed your allotted time.

Please test your presentation beforehand, especially if you plan to use a laptop and the LCD projectors. You are responsible for the compatible operation of your system with the equipment provided. Video should be cued to the start of the section which you wish to show. Moderators will inform you when there are 10 minutes and 5 minutes remaining, and will end the questions when time has run out.

Pembina Highway:

Pembina Highway is the major north – south route to the United States, but inside the city it is usually referred to as "Pembina". The street runs just west of the University and most services can be found along it. We have shown a small sample of businesses in the map on page 10 but a short drive will show many more, especially restaurants. Winnipeg's population is among the most cosmopolitan in Canada and has a huge number of ethnic restaurants to suite every appetite.

The Forks

Winnipeg, to its occasional regret, lies at the junction of the Red and Assiniboine Rivers. The Red drains the area to the south, across North Dakota; the Assiniboine drains the west as far as the Qu'Appelle Valley of Saskatchewan. The meeting place of these two rivers is The Forks. In past years The Forks has been an industrial area consisting mostly of railway sheds, but in recent years it has been purchased by the city and converted back into the central meeting place of its heritage. You will see some of the reincarnated sheds in your visit to The Forks, along with new buildings and grandstands. The Children's Museum and Children's Theatre are both located here, as well as a large number of shops and restaurants. The Oodena Meeting Place, still under construction, has the beginnings of a planetarium display, with an arcing pointer showing the way to the stars.

You will find the legendary "Portage and Main" a few blocks to the north, and beyond this junction, the Museum of Man and Nature, the Planetarium, City Hall and the Concert Hall.

Through the vestibule of the Via Rail Station and west along Broadway about eight blocks, you will find the Manitoba Legislature. The Riverwalk joins the Forks with the Legislature, but is unfortunately under water due to heavy rainfall in mid June.

Program

GA 2000

Time	Event	Location
Thursday June 29		
1300 - 2200	Registration open	St. John's
1300 - 1730	site familiarization, socializing	
1500 - 1730	Social gathering with refreshments	University College Senior Common Room
1730 - 1900	dinner for early arrivals	
2200 - 0200	Observatory tour	Glenlea
Friday June 30		
0800 - 1700	Registration open	St. John's
0900 - 1200	National Committee Meetings	St. John's
0900 - 1630	Tour: Lower Fort Garry	by vehicle
1000 - 1600	Option: Red River Exhibition	west Perimeter
1000 - 1015	coffee	St. John's
1200 - 1330	lunch	Daily Bread, at leisure
1330 - 1730	National Council Meeting	St. John's
1300 - 1800	set up poster boards	foyer Drake Building
1430 - 1500	coffee	St. John's
1400 - 1700	poster set-up	Drake
1700 - 1900	BBQ, free time	St. John's
1900 - 2330	Wine and Cheese Party	Southport Golf and Country Club
Saturday July 1		
0830 - 1000	Registration Open	Drake
0800 - 1000	poster set-up	Drake
0900 - 1200	paper sessions, invited speaker	Drake
0900 - 1200	tour: Zoo and other attractions	
0900 - 1200	displays and posters	Drake foyer
1000 - 1600	Red River Exhibition	west Perimeter – last day
1000 - 1015	coffee	Drake
1200 - 1315	lunch	Daily Bread, at leisure
1300 - 1630	tour: Museum/Planetarium	
1315 - 1400	group photo, pyramid	Concourse
1400 - 1630	paper sessions, invited speaker	Drake

1400 - 1700	displays and posters	Drake foyer
1430 - 1445	coffee	Drake
1730 - 1800	bus downtown	
1830 - 2000	Dinner	bus to Forks/downtown
2200 - 2300	fireworks at the Forks	Forks, St Boniface
2330	bus return to U of M	

Sunday July 2

0730 - 0830	Breakfast	
0830 - 1030	CCD Seminar	Drake
0900 - 1200	displays and posters	Drake foyer
1030 - 1100	coffee	
1100 - 1200	Judging of displays, prizes	Drake
0900 - 1200	Tour: Winnipeg by bus	
1200 - 1300	lunch	at leisure
1200 - 1600	Tour: Assiniboia Downs	
1300 - 1500	Annual General Meeting	Drake
1500 - 1530	coffee	Drake
1500 - 1600	National Council Meeting	Drake
1500 - 1600	removal of displays	Drake foyer
1730 - 2000	Annual Banquet	Beausejour Room
2030 - 2200	Helen Sawyer Hogg lecture	Drake Theatre

Monday July 3

0730 - 0830	Breakfast
all day	departures for those who must
0900 - 1630	tours: Lower Fort Gary
1200 - 1300	lunch (individual)
1330 - 1600	Individual tours

A note about food:

For those who have purchased the lunch package provided by The Daily Bread, lunch will be served buffet style in the restaurant. The restaurant is licensed and beer (especially local beer such as Fort Gary Ale) can be purchased for consumption with your meal. Those in residence will receive breakfast in the cafeteria within the residence building. Coffee breaks in the morning will be accompanied by a generous supply of goodies. Those in the afternoon will have fewer calories, except on Friday where we have decided that council deliberations will require more energy.

Paper and CCD Sessions

Paper Session I
Saturday July 1 morning

0900	Opening Remarks
0915 – 1000	Guest Speaker: Steve Edberg
1000 – 1030	coffee
1030 – 1050	David Turner, Halifax Centre
1050 – 1110	J. Randy Attwood, Toronto Centre
1110 – 1130	David Orienstein, Toronto Centre
1130 – 1150	Richard W. Schmude, Jr., Gordon College
1150 – 1210	Phil McCausland, University of Western Ontario

1210 **lunch**

Paper session II
Saturday July 1 afternoon

1315 – 1400	group photo, pyramid
1400 – 1445	Guest Speaker: Don Parker
1445 – 1510	coffee
1510 – 1530	Mary Lou Whitehorne, Halifax Centre
1530 – 1550	Jay Anderson, Winnipeg Centre
1550 – 1610	Rajiv Gupta, Vancouver Centre
1610 – 1630	Vesna Zdjelar, University of Manitoba

CCD Session
Sunday July 2

0900 – 0940	Guest Speaker: Don Parker
0940 – 1000	Chris Brown, Winnipeg Centre
1000 – 1020	Doug George, Ottawa Centre
1020 – 1040	Gary Billings, Calgary Centre

Don't forget to leave time for the posters and displays during coffee and lunch breaks.

Parking

Free parking is available after 4:30 PM and on weekends during the GA, but not during regular working hours on Thursday June 29 and Friday June 30. The closest lot to the residences is K Lot, across the street from St. John's College. Prices are $1.50 for two hours with a daily maximum of $6.00. A limited amount of parking is available directly in front of St. John's but this is restricted to staff during working hours. Watch out for 24 hour restricted areas – no parking is allowed in these slots at any time.

Food

Food services are very limited during the July 1 long weekend – in fact they are virtually non-existent on campus. We have arranged for lunches to be provided at The Daily Bread Café in St. John's College. Lunches and snacks may be purchased with a ticket or casually. The Daily Bread is licensed: beer is $2.25 plus taxes.

Food Services available (at present) June 29 - July 3, 2000:

Pembina Hall Residence Cafeteria
Monday to Friday only (excepting holidays). Also open on Monday July 3.
8:00 am - 9:30 am Breakfast
11:30 am - 1:30 PM Lunch
5:00 PM - 6:00 PM Supper

Campo Snack Bar
Monday to Friday only (excepting holidays)
8:00 am - 3:30 PM

Greenhouse Cafe, Fletcher Argue
Monday to Friday only (excepting holidays)
8:00 am - 2:00 PM

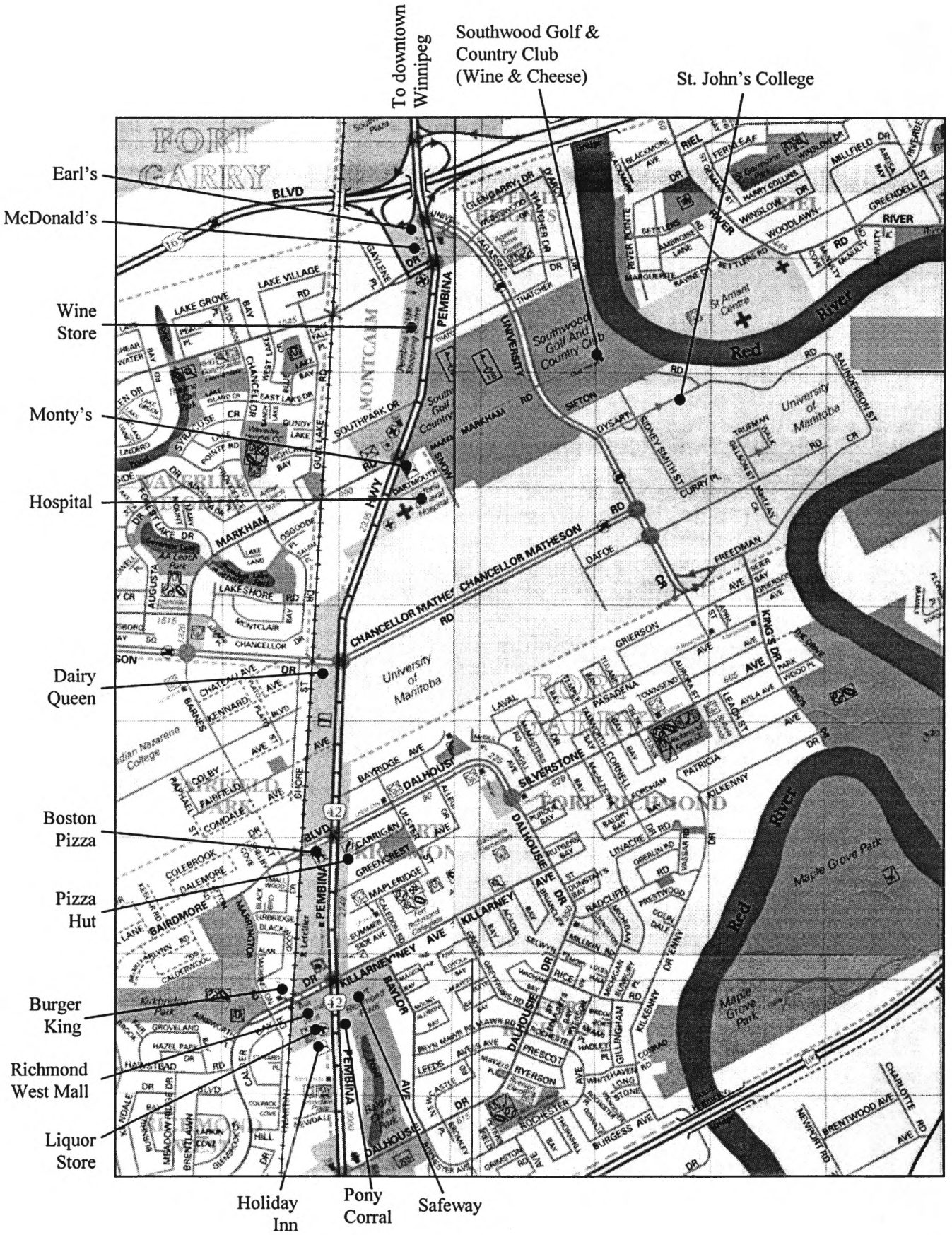
The Daily Bread
St. John's College
We have made arrangements for The Daily Bread to provide lunch and other services to the members of the RASC during the Assembly

There MAY be a canteen operating in Investors Group Athletic Centre on the Sunday & Monday because of Canadian Baton Twirling Championship groups practising in that facility . The organizers have requested canteen service from 8:00 am - 9:00 pm on the Sunday and 7:00 AM - 9:00 PM on the Monday. Food Services have not yet confirmed that service or those hours.

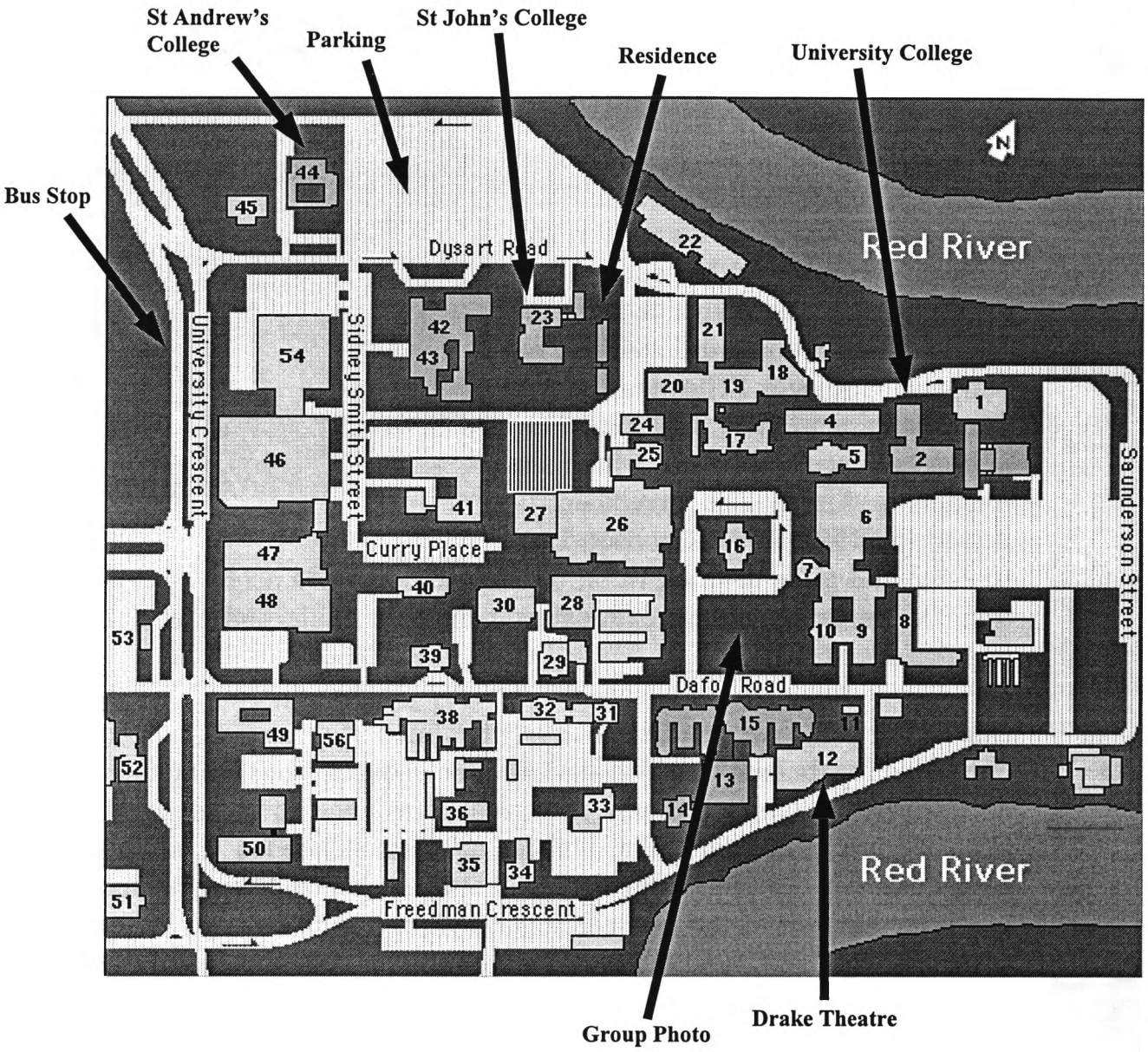
Quiet Hours in St. John's College

Members attending the GA are not the only residents of St. John's College and the College has a policy on noise and quiet hours. The house rules regarding noise are as follows:

Quite hours: 1:00 PM to 4:30 PM and 10:00 PM to 9:00 am. However, it is customary to limit the quiet hours on Friday and Saturday so that the quiet hours begin an hour past midnight, instead of 10 PM and to have no quiet hours after 9:00 AM on Saturday.



Around the University



A few things to do on campus:

Because of the long weekend, much of the campus is shut down during the GA, but if you're here on Thursday or Friday, check out the collection in the Geology Building, the Bookstore, the Planetarium at University College, or take a walk along the Red River. Or you could meet with friends from GAs past in the courtyard of The Daily Bread.

About the University of Manitoba

The Helen Sawyer Hogg Lecture

Dr. Wendy Freedman
Carnegie Observatories

Dr. Wendy Freedman is an astronomer at the Carnegie Observatories in Pasadena, California. A native of Toronto, Canada, she received her doctorate in astronomy and astrophysics from the University of Toronto in 1984. She received a Carnegie Fellowship at the Observatories in 1984, and joined the permanent faculty in 1987 where she remains to this day. Dr. Freedman received the 1994 Marc Aaronson Lectureship and prize in recognition of a decade of fundamental contributions to the areas of the extragalactic distance scale and the stellar populations of galaxies.

One of her principle research interests is aimed at measuring an accurate value for the rate at which the universe is expanding. Many fundamental problems in astronomy require a knowledge of the expansion rate, or Hubble constant. The Hubble constant is needed to set constraints on the age of the universe. It is also needed to determine accurately the amount of the first elements (hydrogen and helium) to form after the Big Bang, how the evolution of the universe has proceeded, and how the first structures formed, the structures that later became the galaxies that we see today. The Hubble constant has a broad impact on many diverse areas of astrophysics and cosmology; hence, the importance in measuring it accurately.

In the mid-1980's a panel of astronomers reviewing the top priority science for the Hubble Space Telescope designated the determination of the extragalactic distance scale and the expansion rate as one of the `Key' (or highest priority) projects to be undertaken and completed by the telescope. Dr. Freedman is one of three principle investigators of a team of about thirty astronomers from the United States, Canada, Great Britain and Australia; this team was awarded the largest allocation of

time on the Hubble Space telescope for a period of 5 years. The Extragalactic Distance Scale Key Project involves determining accurate distances to nearby galaxies. In turn, these galaxies form the underlying basis for a number of other methods that can be applied at remote distances, thus enabling several independent measurments of the Hubble constant.

Dr. Freedman is a member of the National Academy of Sciences/ National Research Council's Committee on Astronomy and Astrophysics.

Abstract

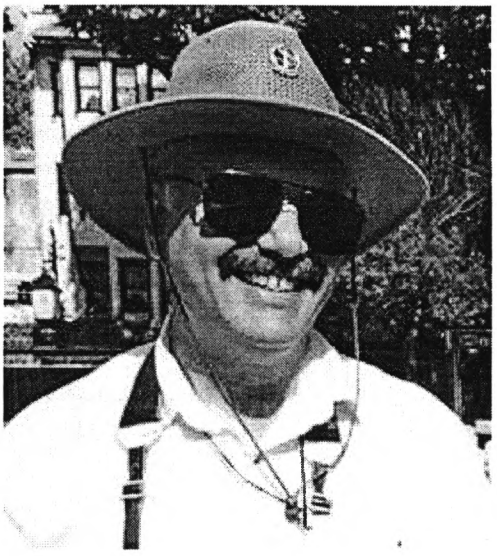
The Age and Size of the Universe

Wendy L. Freedman
Carnegie Observatories

In 1929, the astronomer Edwin Hubble made the fundamental discovery that the universe is expanding. These observations provided the first evidence for a Big Bang origin for the universe. The current rate at which this expansion is taking place, known today as the Hubble constant, is one of the key parameters that yields a measure of both the age and the size of the observable universe. Although Hubble made this discovery about 7 decades ago, a reliable measure of the Hubble constant has continued to elude astronomers, and led to much debate. Recently, observations with the Hubble Space telescope have enabled astronomers to measure new and precise distances to the nearest galaxies, resulting in more accurate estimates of the size and the age of the universe. These and other recent discoveries in cosmology will be discussed within a historical context.

Guest Speakers

Steve Edberg



Steve has been in the amateur astronomy business since the mid 60's which means he knows how to find things in the sky without a computer. Nevertheless, he has an MA in Astronomy from UCLA, and a neat job at the Jet Propulsion Lab watching spacecraft head off into the distant reaches of the solar system. One of his former charges is currently in orbit around Jupiter, while another successfully navigated past the Earth last year on its way to Saturn.

Older RASC members will remember Steve from the last GA in Winnipeg, when Halley's Comet was the "in" thing and Steve was working hard as a part of the Halley Watch team. We've asked him to bring us up to date on developments in our understanding of comets and asteroids since those days, and he's obliged us with the abstract below. In fact Steve's last talk, in 1986, was titled "A Look Back at Comet Halley". This year's presentation fits well with the former.

In addition to being on the Cassini-Huygens science planning team, Steve is Executive Director of the Riverside Telescope Makers Conference. His review articles appear frequently in Sky and Telescope, and he is author of a number of books, including *Observe: Comets*, *Observe: Meteors*, and *An Observing Guide for Comets, Asteroids, Meteors, and Zodiacal Light,* all with David Levy.

Steve likes to come to Winnipeg in hopes of seeing aurora. We haven't told him about the length of the day in late June, and so he has returned again in quest of "green sky pollution".

Comets and Asteroids: Advances since Halley's Comet

Stephen J. Edberg
Jet Propulsion Laboratory
California Institute of Technology

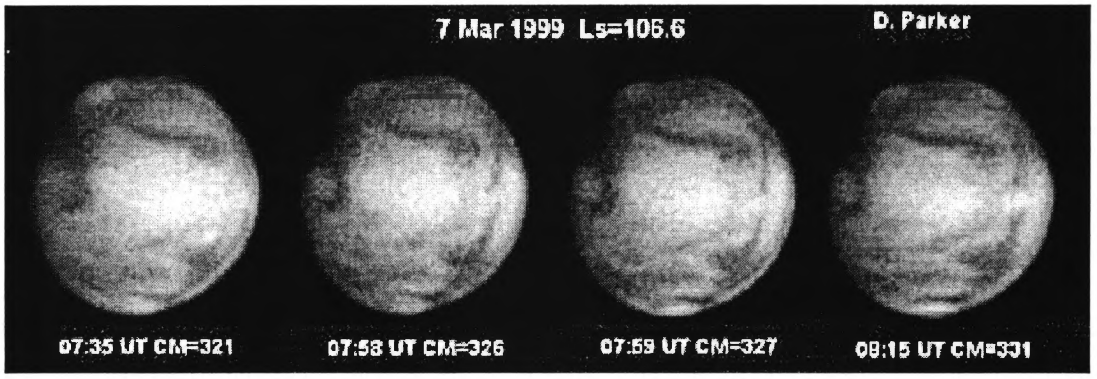
The 1990s have been blessed with two bright comets, yielding new discoveries about these relics of solar system formation. The population of putative Kuiper Belt Objects continues to increase, and a population of Centaur asteroids is receiving recognition. Meanwhile, other objects that decrease the distinctions between comets and asteroids are have been found. This presentation will describe the considerable growth in the understanding of these objects seen in the last decade.

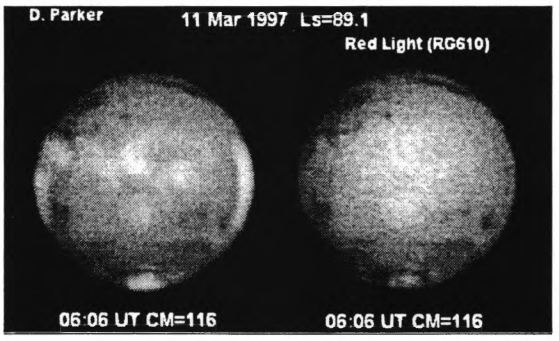
Don Parker

Don Parker is a well-respected planetary observer whose work has graced the pages of *Sky and Telescope* and *Astronomy* for many years. His early work with film set the standard for amateur astronomers and when CCD cameras became available at reasonable prices, he was quick to exploit the capabilities of the new hardware. His images of Mars, especially those at opposition, rival those of professional observatories and his observations have been used in numerous professional papers.

His first observations of the planets began in the early 1950's and he has steadily graduated to larger telescopes and more sophisticated instrumentation in the intervening years. In 1979 Don became the Mars recorder for the Association of Lunar and Planetary Observers, and has since graduated to become Director of the organization. In 1988 he co-authored *Introduction to Observing and Photographing the Solar System,* shortly before changing to electronic observations.

Don has been the recipient of many awards, including the Clifford W. Holmes Award at the 1994 Riverside Telescope Makers Conference and has the distinction of having had asteroid 5392 Parker named after him. He also has a reputation as a humorous and entertaining speaker.





Abstracts

Observational Astronomy without a Telescope

David Turner
Halifax Centre

Tests reveal that the eye can distinguish brightness differences of as little as 0.1 magnitude when it is operating near one's limit of vision. By analogy that means that the light curves of bright variable stars can be constructed successfully without optical aid, provided only that the observer is working near the limit of stellar detection. Such expectations have been confirmed by the dedicated efforts of countless observers over the last few centuries, and were tested recently by the author through backyard observations of the bright Cepheids Delta Cephei, Zeta Geminorum, and Eta Aquilae made during 1998-99 with the aid of newly generated reference charts tied to photoelectric V magnitudes rather than the usual "visual" magnitudes included on AAVSO charts. The derived light curves for the three variables exhibit surprisingly little scatter, and have direct scientific value for the study of period changes in the Cepheids.

Astronomy on Stamps

J. Randy Atwood
Toronto Centre

Many countries around the world have issued postage stamps with an astronomical theme. These stamps depict astronomical discoveries and events, observatories, objects both solar system and deep sky and astronomers - both professional and amateur. Canada has not chosen to produce any astronomy stamps. The RASC made an effort to convince Canada Post to issue an astronomy stamp in the 1980's. The effort was unsuccessful. Maybe it is time to renew our efforts to support an issue.

High Level High School Mathematical Astronomy

David Orenstein,
Toronto Centre

The Ontario OAC algebra and geometry course is a very challenging pre-university mathematics program. Good students in this course are ready to delve into mathematical astronomy in a very serious way. To do this, each of my students chose a constellation using the data from the Bright Star tables of the Observer's Handbook.

In carrying out this project students reviewed trigonometry, applied and extended their knowledge of vector algebra in 3-space, were introduced to vector calculus, and learned a considerable amount of stellar and deep space astronomy. The first step was to achieve familiarity with a wide range of astronomical concepts and terminology so that their data could make sense. Calculations started using the HIPPARCOS positional data, by verifying stellar distances using parallaxes. Celestial coordinates were transformed by a set of trigonometric equations into rectilinear coordinates in 3-space. This allowed a simple calculation of the Euclidean distance to the stars using the Cosine Law.

Further calculations established the rectilinear components in compatible dimensions for stellar position, radial velocity, whole space velocity, and especially, transverse velocity vectors. This derivation extended over two 75-minute periods and stretched the students to their intellectual limits. A large range of advanced mathematical topics were integrated and applied rigorously to real scientific data.

Brought together, the vectors generate linear equations of the stars' positions over time. Using a spreadsheet with which they were familiar, the students completed all calculations for the bright stars of their chosen constellations. In particular, they found the location of the stars in 3-space for the current epoch, 10,000 years in the past and a similar amount in the future. The final project steps produced a visual representation on the constellation in three dimensions, the astronomical and cultural background of the constellation, and a seminar presentation.

Full-Disc Wideband Photoelectric Photometry of the Moon

Richard W. Schmude, Jr.
Gordon College

Seventy B and V filter magnitude measurements were made of the lunar disc in 1999-2000, and from these measurements, solar phase angle coefficients and normalized magnitudes were determined. The major conclusions of this study are:

1) the B-V colour index of the Moon increases slightly with increasing solar phase angle,

2) there is an almost linear relationship between the normalized magnitude and the solar phase angle for both the B and V filters and

3) the magnitude of the Moon did not change by more than 0.2 magnitudes as a result of the Leonid meteor storm of Nov. 18, 1999 or the solar wind surge that occurred on Feb. 21, 2000.

Starlab & Astronomy Education in Atlantic Canada Schools

Mary Lou Whitehorne
RASC Halifax

This paper will provide a summary of astronomy education activities in Atlantic Canada's schools, in light of the new Pan-Canadian Curriculum & severe budget cuts; with an emphasis on the positive contribution of Starlab to learning outcomes.

Round and Round in Circles – Five Millennia of Eclipse Cycles

Jay Anderson
Winnipeg Centre

The analysis of eclipse cycles has entertained humans since early Babylon; the history of astronomy can be traced through five millennia of eclipse investigations. In the current age,

digital archives of eclipse predictions and spreadsheets can be combined to give insights into the behaviour of the cycles and to extend the work of earlier investigators. The results are not only intriguing and scientifically interesting, but also reveal beautiful patterns which cross the centuries.

Techniques in Digital Photography

Rajiv Gupta
Vancouver Centre

We describe and illustrate various ways in which astronomical images can be manipulated and improved using modern digital techniques. These methods include stacking of images, tricolour imagery, and the luminance transfer technique using the Lab colour model. The starting point for all these processes is the registration of component images which is accomplished using RegiStar, software that was recently co-developed by the speaker.

CCD's for Quantitative Observing

Gary Billings
Calgary Centre

Amateur astronomy has a long history of contributing to science. This has become more difficult as visual observations are less accepted, and observing conditions worsen. CCD cameras, with their sensitivity, linearity, dynamic range, and their 2D array of detectors, are a tremendous aid to "scientific" observing, even under sub-optimal conditions. I will describe the minor planet astrometry and differential photometry that I am able to conduct using a CCD camera from my home within the city of Calgary. I will also describe my observatory setup, and offer comments regarding equipment choices.

Hubble's Variable Nebula: The Movie

Chris Brown
Winnipeg Centre

Time-lapse imagery reveals changes that travel faster than the speed of light across this beautiful nebula, NGC 2261. What's going on and how the observations were made will be discussed. For more details, including the animations, point your web browser to http:// www.umanitoba.ca/faculties/science/astronomy/cbrown/imaging/hvn

Enhancing CCD Images with MaxIm DL

Doug George
Cyanogen Productions

Images from CCD cameras naturally lend themselves to image processing because of their inherently digital nature and high dynamic range. Image processing can help elicit detail already present in the images but not readily visible. Various enhancement techniques will be described and illustrated in a real-time demonstration using MaxIm DL software.

Impact of a C-class asteroid in Canada: The fall of the Tagish Lake meteorite

Phil McCausland, Peter Brown, Ed Tagliaferri, Alan Hildebrand and the Tagish Lake field party
Dept of Earth Sciences, University of Western Ontario and
Dept of Earth Sciences, University of Calgary

A long-duration and exceptionally bright fireball was witnessed throughout the Yukon Territory, northern British Columbia, parts of Alaska and the Northwest Territories on January 18, 2000. The fireball was also detected by infrared and optical sensors aboard U.S. Department of Defence satellites that timed the terminal flares to ~16:43 UT (08:43 PST local) with a two-second duration at 1 micron radiation. The satellite observations provided information suggesting an entry velocity of ~16 km/sec, an entry mass somewhat in excess of 200 tonnes and an entry diameter in excess of 5 m. Satellite and ground observations both suggest that the fireball travelled towards the SSE with an elevation angle of ~16°. The largest burst happened at 33 km altitude over Mt. Patterson on the Yukon/BC border. The back-calculated orbit is of moderate eccentricity with aphelion in the outer asteroid belt. On January 25 near dusk, local resident Jim Brook found meteorites on the snow-covered ice of Taku Arm on Tagish Lake while driving home. He returned the next day, collecting several dozen pristine specimens in total. The meteorites represent a particularly fragile variety of carbonaceous chondrites, and were collected without skin contact and have been kept subsequently frozen. During the spring melt another ~500 meteorites were recovered from a strewn field ~16 km long and ~3 km wide oriented at ~150°. This meteorite represents a fantastic opportunity to study the earliest history of the solar system, and should spur the further development of planetary science in Canada.

From the Small to the Large

Vesna Zdjelar
University of Manitoba

Is it possible to determine the age of the universe from a tiny glimpse of a star?

Scanning the entire sky for small light amplifications of the stars caused by the gravitational lensing effect – microlensing – enables us to "see" what we can not see – dark matter. Searching for dark matter candidates in the halo of our galaxy, the Milky Way, in, roughly speaking, the present moment in the history of the universe, makes it possible to determine several major cosmological parameters. This talk discusses the constraints on the baryonic mass-density parameter and the Hubble constant determined by these observations.

Displays

Pleione: A Spectroscopic Study of the Seventh Brightest Star in the Pleiades

R.F. Garrison, T. Karmo, Chris Capobianco, Cristina Fayet
Dunlap Observatory, University of Toronto

Pleione, the seventh brightest star in the Pleiades, is rotating so rapidly that it occasionally releases a shell. The shell appears with an irregular characteristic timescale of 20-40 years. Shell phases have occurred in the 1940s and the 1970s. New spectra taken during the past few years show that a new shell phase is beginning. The poster will illustrate past shell events as well as what happens to the spectrum during a shell phase and how astronomers interpret the results.

The South Saskatchewan Star Party
Ken Noesgaard
Saskatoon Centre

The Joint RASC/U of Saskatoon Observatory Project
Ken Noesgaard
Saskatoon Centre

LUNA-TAC: An Electric Atlas of the Moon
Dan Collier
Vancouver Centre

Display
Bill Almond
Victoria Centre
A display consisting of an illuminated multi-slide viewer containing slides of my observatory's construction and CCD images taken with an SBIG ST6 and Schmidt-Cassegrain telescope.

Photographic Report on the January 20-21 Total Lunar Eclipse
Leo Enright
Kingston Centre
This display contains a written report of my impressions of the January 20-21 total lunar eclipse as viewed from my observing site in Sharbot Lake, Ontario, along with a series of 10 photographs which I took of the eclipse at various stages from before second contact to after third contact. Data concerning each of the photographs are included for each eclipse photograph. A one-page supplement shows two photographs of the moon less than two weeks later when it was in conjunction with the planet Venus in the morning sky before sunrise on February 2.

Photometric Study of NGC 1907
Marjorie Gonzalez and Jennifer West
University of Manitoba
As an undergraduate third year project, we took images of NGC 1907 at different optical wavelengths and used the analysis software IRAF to obtain photometric data from them. A color magnitude diagram (CMD) of the cluster was then found using these data.

Van Gogh and the Starry Sky
Vesna Zdjelar
University of Manitoba
Mankind has the rare opportunity to meet the most intimate vision of life - nature and art - of one of the greatest artists in the history, Vincent van Gogh, through a strange diary in the form of a remarkable collection of letters written to his brother Theo and friends such as Paul Gaughin. Fully describing the painter's life and thoughts, van Gogh's "Letters" has been an inspiration for me as an astronomer and an inspiration to inquire into the starry sky motifs that had drawn the attention of this great 19th century painter. Analysis of two paintings, with a Planetarium simulation for determining the celestial objects on one of them, are presented in this display.

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Acknowledgements

Thanks are due to the following people for the hard work and dedication that made the planning and completion of the 2000 GA a success...

Richard Bochonko

Alan Sherwood

Scott Young

Ray Andrejowich

Jan Cameron

Kevin Black

Andora Jackson

Stan Runge

Gail Ross

Jay Anderson

Fred Wood

Lindsay Price

Paul Paradis

Brenda Paradis

Guy Westcott

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