



Winnicentrics

The Journal of the Winnipeg Centre of the Royal Astronomical Society of Canada

Quo Ducit Urania

by Ralph A. Croning

My interest in Astronomy began a few years ago in the spring of 1996 with the discovery of Comet Hyakutake and the resultant media coverage.

Photography has been my lifelong hobby so I decided to test my skills at some astrophotography. Comet Hyakutake was the obvious choice of objects. I had no idea where to begin so I posted a “help” message in one of the photography newsgroups on the internet I used to frequent. I was fortunate to receive a reply from Michael Covington who is an amateur astronomer/astrophotographer and author of a book on the subject. As it turned out, I did not need any exotic equipment to photograph this very bright comet. I was very happy with the results of my first try and was thus drawn into this wonderful hobby.....astronomy.

After acquiring several books on the subject and subscribing to astronomy magazines, I familiarized myself with as much as I could glean from the available material. But something was missing.

In the summer of 2003 I decided I needed to be a member of an astronomy club. As part of a group there is so much more knowledge and experience that I could learn from. After a bit of research I opted for membership in the Winnipeg Centre of the RASC. The meetings have been fun and the people that I have talked to have been most helpful. I have also undertaken the Beginners Observing Certificate Program and have completed 42 of the minimum 55 required observations.

The main focus of this article however is our club motto “Quo Ducit Urania” which appears on our club logo. In English this translates to “Where Urania Leads” which I discovered from the main page of the RASC National website.

Continued on page 6

IN THIS ISSUE . . .

Quo Ducit Urania.....	page 1	Public Events.....	page 7
Meetings.....	page 2	To Boldly Go.....	page 8
Observing Nights.....	page 3	Book Review.....	page 10
ATM Journal.....	page 4	Members Observing.....	page 12

Deadline for the next issue is April 18, 2004

MEETINGS

Room 118, St. John's College

March 12 Friday

Beginners Session with Lindsay Price 7:00

Regular Meeting 7:30

This month Sean Ceaser will talk about the Messier Marathon, a once-a-year, all night session to observe all of the visible Messier objects. It will cover preparation for the Messier Marathon, how to accurately and quickly find all the Messier objects using reference stars, how to move through the Virgo Cluster in under three minutes (and identify each galaxy), what to wear and bring for the Marathon, the order of the objects to observe, pacing and finder charts will be shown for all Messier objects with each season at a glance. The session will not only be for those interested in the Marathon but also for those who wish to quickly find these deep sky treasures amidst the myriad of stars up there.

Plus the regular features: "What's New" by Jennifer West, "Explore the Universe" Observing Certificate by Lindsay Price, the Picture of the Month will feature Joshua Yamada describing M104 and Ralph Croning telling us all about M64, and Gail's "Constellation of the Month" looks at that Granddaddy of all cats, Leo the Lion.

April 16 Friday

(note date change!)

Beginners Session with Ron Berard 7:00

Regular Meeting 7:30

Astronomy, Arizona vs. Manitoba!

Kevin Black will be our featured speaker this evening to show us a comparison of Manitoba vs. Arizona skies and the pros and cons of observing and photographing in each location.

Plus the regular features: "What's New" by Jennifer West, "Explore the Universe" Observing Certificate by Lindsay Price, the Picture of the Month and Gail's "Constellation of the Month" looks at Coma Berenices.

MEMBERS OBSERVING NIGHTS

March 13 Saturday

Glenlea Observatory

8:00 p.m. to ???

Your hosts this month: Robin and Scott

April 17 Saturday

Glenlea Observatory

8:00 p.m. to ???

Your hosts this month: Scott and Ron

The galaxies are on their way so come out and look at the wonders of the spring sky especially since the mosquitoes aren't here yet! This is a great opportunity to come out and learn from the more seasoned observers. Coffee, tea and hot chocolate are available when it gets too cold to stay out very long.

If you are interested in using the Warm Room please contact Robin Woods for a key (\$10.00 deposit required). If you would like training on the LX200 Robin will be running training sessions, but not on Members Observing Nights. You can contact him at 586-4173 or robin.woods@uwinnipeg.ca or talk to Robin at a meeting.

News in a minute

Congratulations to Marie and Gord Tulloch on the birth of their son, Aidan Alexander on January 31, 2004!



At the Members Observing Night on February 14 we had 13 observers brave the cold -20° temperatures. There was a bit of aurora washing things out but when it settled down, by the end of the evening everyone could see the Beehive naked-eye. The Orion Nebula was particularly beautiful and a lot of people added objects to their Messier and Explore lists. We also had a look at gibbous Venus!

At the last council meeting we approved a Policy Paper on the use of the Glenlea Observatory, loaner telescopes, etc. A copy is included in this issue. Thanks to Robin and Stan for all their hard work putting it together.

There was a green 3-ring binder with the U of Winnipeg logo on the cover in the Warm Room when Robin Woods ran a training session for the LX 200 on November 21st 2003. He hasn't been out since then and it was not visible on Saturday Feb 14th. If anyone has found it or picked it up please let him know. It contains sky charts and other observing notes and a planisphere!

ATM Journal 7: Testing Your Mirror Part 2

By Gordon Tulloch, RASC Winnipeg

Last time, we looked at how null testing of spherical and paraboloidal mirrors work, and in particular basic principles on how the Foucault Test works. This time we'll review the basic procedure for the Foucault test with a Couder mask, and look briefly at a vastly easier way of accomplishing mirror testing with the aid of a digital camera and computer program. Once you can test your mirror and see what the shape looks like as a sphere, we can move towards a paraboloidal figure next article.

The classical Foucault Test involves measuring the focal length of various zones of your mirror by measuring where the shadow of a knife edge blocks out (nulls) the zone of the mirror being tested. To make this easier to see on the face of the mirror, one normally uses a Couder Mask (the easiest way to generate the mask is using the program "Tex" (standing for Texereau) which does Foucault data reduction, as well as printing masks (you may need a program named Ghostscript to convert the resulting image to PDF format for printing if your printer doesn't understand Postscript). We'll assume for the purposes of this article you have a three zone mask as below, although depending on your mirror you may have 4 or more.

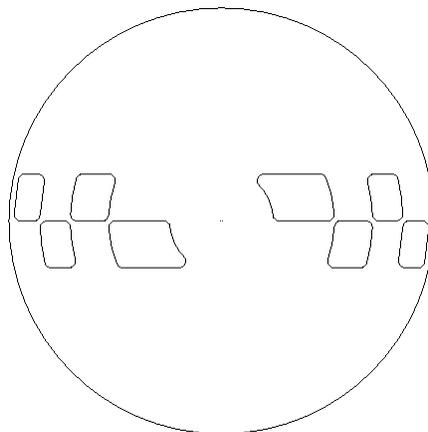


Figure 1 - Couder Mask with four zones

In general (for a far more exhaustive treatment, see Texereau or <http://www.atmsite.org/contrib/Harbour/Foucault.html>) the procedure is as follows:

1. First off, allow the mirror to cool on a stand (such as the one you can build from the Stellafane site) to ambient for as long as is required. Just as temperature will change the figure of the mirror out in your telescope, so the figure will change if you have been polishing and immediately put the mirror on the stand.
2. Set up your tester at a foot less than twice the Focal Length (i.e. the centre of the Radius of Curvature) away from the mirror aligned with the optical axis. A common mistake is to set the tester at the Focal Length, which will result in seeing a nicely focused image of the tester reflected, useless for testing.
3. Depending on your mirror you may need to start with your tester close to the mirror and slowly back away, keeping the image of the LED in your tester centered in the mirror, until the light from the LED completely fills the mirror with light. Alternatively, I use a laser pointer to center everything since the laser will project a dot on the tester stage (or the wall behind you if you're really off centre) so you can line everything up.
4. Position the tester at the ROC – you can tell this by tilting the stage such that you can see the shadow of the knife edge moving across the face of the mirror. If the knife edge comes into the image from the same side the knife is physically on, you are INSIDE the ROC. If the knife edge appears to enter the image from the opposite side, you are OUTSIDE the ROC. If the image of the mirror “greys out” all of a sudden, you're at the ROC. Another indicator of being in the right spot is that you can see air currents and turbulence floating across the

face of the mirror like heat waves off an asphalt surface. Practice bringing the knife edge in and out of the image and moving the stage back and forth. As you move the stage, you'll see the surface contours of the mirror in stark relief even though the variations are on the order of millionths of an inch.

5. To perform the test, put the mask on the mirror, and move the stage back and forth perpendicular to the optical axis until the knife edge darkens the centre zone (as seen through the Couder Mask) all at once (rather than being seen to enter from the right or left as above). This is your 0 point – the meter on your tester should be noted and all other measurements will be in relation to this point.
6. The left zone 2 opening will appear to be lighter than the right – draw the knife edge further back along the optical axis until both zones appear equally lit, and note the reading on the meter. Continue on to the third and fourth zones similarly.
7. Upon finishing off the last zone, work your way back through the zones until you have reached the centre zone, recording the numbers along the way. This will provide a check on the numbers originally entered.
8. Using the Tex program, enter your readings. Remember that the Stellafane tester is a moving source tester so the program can calculate the numbers for you. If you're computer challenged, see Texereau for a manual method.
9. Tex will automatically calculate a numerical representation of the surface figure of your mirror for you – you can even graph this data so you can see relative departure from a “perfect” paraboloid for your mirror. Once you know where you have to “shave” some glass off, you can take action accordingly during figuring.

I've always found manually testing mirrors to be tedious so I was pleased to discover a program on the Internet at foucault.sourceforge.net that completely automates the task of testing the zones on your mirror. Essentially, the user takes a series of digital camera photos of a mirror from the same point of view one might test using more traditional methods.

To do this I built a stage onto the back of my Stellafane Foucault tester (as described previously) and mounted my Olympus 3040Z digicam to it so that the camera is looking past the knife edge at the mirror – i.e. exactly where you'd place your eye if manually testing. Setting the camera 1 cm in front of focus, I took 20 low resolution (640x480) shots, moving the camera 1 mm back at a time until I was 1 cm behind focus. These 20 shots are input into the Foucault program and are selectively analyzed to provide a very accurate map of the figure on your mirror, similar to that which can be calculated by traditional methods but with far greater consistency and objectivity. Highly recommended! Note: extreme care must be exercised to ensure that the tester is aligned with the optical axis of the mirror or unacceptable error will creep in.

You may have ended up the polishing stage with a perfect sphere, a paraboloid, or some other figure of revolution. Now that we know what the figure of your mirror is, we'll look next time at how to change the shape of your mirror into a paraboloid, and some ways to fix problems that might occur during the process. As always, questions or comments are welcome at gtulloch@shaw.ca.

Conclusive proof that there is life on Mars! . . . next page

The Winnipeg Centre**Executive Council**

President

Gail Wise 253-8297 wgail@mts.net

Past-President

Scott Young sdyoung@mb.sympatico.ca

1st Vice-President

Robin Woods 586-4173

robin.woods@uwinnipeg.ca

2nd Vice-President

Lindsay Price 831-0150 flprice@mts.net

Secretary

Jay Anderson 474-1485

jander@cc.umanitoba.ca

Treasurer

Stan Runge 261-9984

stanrunge@hotmail.com

Councilors

Jennifer West 284-6548

westjl@cc.umanitoba

Lloyel Hull 256-6510

lloyelhull@shaw.ca

Ron Berard 668-6551

rberard@mts.net

Sean Ceaser 797-4509

drceaser@netscape.net

Kevin Black 224-0182

cblack@shaw.ca

Appointed Positions**Librarian**

Fred Wood 774-3238

fred_wood@shaw.ca

Observatory Director

Ray Andrejowich 667-6896

randrejo@hotmail.com

Observatory Bookings

Kevin Black 224-0182

cblack@shaw.ca

Webmasters

Ron Berard

rberard@mts.net

Gord Tulloch

gtulloch@shaw.ca

Winnicentrics Editor

Gail Wise 253-8297

wgail@mts.net

Winnicentrics is published six times each year by the Winnipeg Centre, RASC.

Winnicentrics is produced by and for the members of the Winnipeg Centre, and any opinions expressed are those of the author.

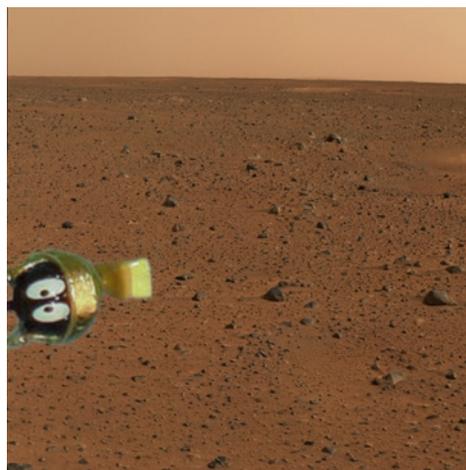
If you have comments, questions or concerns about *Winnicentrics*, you can contact any of the councilors or write to RASC, Winnipeg Centre, Box 2694 Winnipeg MB R3C 4B3

Quo Ducit Urania *continued from page 1*

Being a naturally curious person I was not satisfied with just a translation. I needed to know who Urania is and why she would want to lead us? So I embarked upon a little research mission that turned up some interesting information. Since curiosity is not a trait I have a monopoly on, I figured this would be of interest to others at our Centre.

In Greek Mythology we have heard of the god Zeus. Among his many wives was the Goddess Mnemosyne (his aunt), the goddess of memory. They had 9 daughters also known as the 9 Muses who presided over the arts and sciences. They were Calliope, Clio, Erato, Euterpe, Melpomene, Polyhymnia, Terpsichore, Thalia and URANIA. They were believed to inspire all artists especially poets, philosophers and musicians. Urania is the Muse of Astronomy and Astrology. She is usually represented pictorially with a globe in her left hand and a peg in her right. She is dressed in a cloak embroidered with stars and she keeps her eyes towards the sky.

Now I understand why Urania was chosen to grace our club logo. The club motto too makes more sense to me now, because the reason I joined was to acquire from and share with my fellow members, as much knowledge of my new hobby as I possibly could. The mythical Urania exists in all of us in the form of our natural sense of curiosity, our thirst for knowledge and our willingness to share and inspire. In this, we lead one another in our quest to understand this great big universe that we are a part of.



PUBLIC STAR PARTIES

Astronomy Day Plans

Plans are well underway for this year's activity on International Astronomy Day. For a change for us and to meet a different public, the daytime part of the event has been moved to Polo Park. We shall have an indoor location on the second deck near a passageway to the upper parking level where there will be a space reserved for telescopes and solar viewing. It all happens on Saturday 2004 April 24 from 10:00 to 18:00 (6 o'clock p.m.). Members using this opportunity to introduce our passion to the public will be asked to select a shift from 10:00 till 13:00, 13:00 to 16:00, or 16:00 to 18:00 plus teardown. As usual, anyone is welcome to attend for longer but we do need to ensure that the whole day is adequately staffed.

If the evening is clear, we expect to gather at the Odena at the Forks from 20:30 hrs till whenever, and share with our visitors celestial targets of opportunity.

-- *Lindsay Price*

Pi Kinewabum Anonguk (Come look at the Stars!)

A celebration of astronomy hosted by Rolling River First Nation in cooperation with the Royal Astronomical Society Winnipeg Centre, May 7 and 8, 2004.

PURPOSE: an inter-community celebration to stimulate curiosity and wonder about astronomy and space.

LOCATION: Rolling River First Nation, 15 km south of beautiful Riding Mountain National Park, on No. 10 Hwy (near the town of Erickson)

EVENTS:

- ★ Observing sessions – Royal Astronomical Society, Winnipeg Centre
- ★ High Powered Rocket launches – the Manitoba Association of Rocketry
- ★ First Nation Astronomy – Dan Thomas, Manitoba First Nation Education Resource Centre
- ★ "Dwarfs, Hot Smoke, Giant Worms and other Mythical Features of Our Milky Way Galaxy" – Dr. Jayanne English, University of Manitoba
- ★ "Musical Chairs" – a fun way to discuss various astronomy topics with amateur and professional astronomers
- ★ Traditional First Nation Supper followed by drumming and dancing demonstration
- ★ plus opportunities for informal get-togethers for astronomy enthusiasts of all ages

Rolling River First Nation has asked us to bring our telescopes out to show their people the wonders of the night sky. If it is cloudy an alternate program is planned. They will feed us and billet us at no charge, or we can stay at the Elkhorn Resort which has luxurious rooms, large family/group chalets, a great restaurant and a beautiful new spa.

Rolling River First Nation is located 15 minutes from Riding Mountain National Park with the best hiking trails in the province – in case you want to take in some beautiful forest scenery.

-- *For more information please talk to Sean or Gail*

To Boldly Go Why We Explore The Universe

By Scott Young

One of the questions I'm often asked when doing astronomy or space interviews is this: "Why do

we spend so much money on space program X when there are people starving here at home?"

It's a valid question, and one that deserves careful thought. I used to react defensively, pointing out that the Canadian Space Agency's annual budget is \$300 million a year (about \$10 a Canadian), of which 80% goes right back out to Canadian aerospace companies to build things like the Canadarm, satellites and other technologies. So that money is feeding people: it's feeding the families of the thousands of aerospace workers in our country.

After a while I got into my "visionary" stage, where I compared the continued exploration of space to the voyages of Columbus, Magellan and other explorers who were pushing back the boundaries of the unknown. Humans have always been explorers, and always will be.

Then there is the practical aspect: given the current rate of population growth, we are simply going to run out of room on earth for all the people. We have to go somewhere eventually, and so we need to develop the technologies to do that.

It's interesting to see which argument works on which interviewer: some people like the "visionary" idea that humans must explore, while others are only convinced by the financial or resource angle. Few people, however, maintain that the space program isn't worth it after they've heard the numbers and seen the reasons.

I'm also often asked about the spin-off benefits of the space program. Everyone knows about Tang and Velcro, but the space program, particularly the "space race" of the 1960's, has shaped our world more than most people realize. No, the internet didn't come from the space program (directly)! But the field of computers was changed by the space program forever, setting its course to where we are today.

In the 1950's a "computer" was about the size of your house, and performed complicated numerical calculations that no one except a few scientists needed. Estimates were that the United States would require 5 or at most 6 computers to service the ENTIRE country. After all, how many complex scientific calculations were needed?

Then U.S. President John F. Kennedy gave his famous speech that aimed his country at the moon, and NASA was given the task of making a computer small enough to fit into the car-sized Apollo spacecraft. The computer did fit, and successfully took the Apollo astronauts from the Earth to the Moon. And suddenly, people realized that a computer that was small enough to fit in a car might have more uses than a huge room-sized computer did. You could put one in an airplane, for example, or in your car. What would it do in your car? Nobody knew yet, but the limitations that size had put on imagined uses of the computer had been broken.

Since then, computers have become smaller and smaller, to the point where your microwave probably has a more powerful computer in it than the Apollo spacecraft did. No one would argue that computers have been a dominant influence on today's world, and computer development was shaped by the space age. Kennedy didn't know he was creating our future when he sent Americans

to the Moon, but that's what happened.

U.S. President George W. Bush has set a bold new goal for the American space program. Whether a new moon mission or sending people to Mars actually gets funded is another question, but setting our sights on something more than 400km away from Earth is probably a good thing. While the International Space Station does do some important research, we've had space stations for over 30 years already. The first one, the USSR's Salyut 1, was launched the year I was born! Incremental progress does not capture the public's imagination.

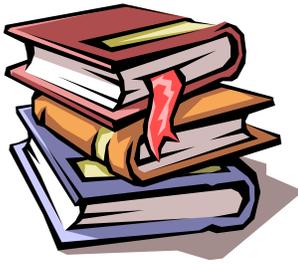
What role will Canada play in the exploration of the Moon and Mars? I asked that very question to Marc Garneau, Canada's first astronaut and the president of the Canadian Space Agency. "There is room for Canadian astronauts on these voyages," he said. "But only if Canada makes the financial commitment." No free rides to the Moon.

Sure, going to the moon will be expensive. But I worry about the price we will pay if we do not go. What scientific event will inspire the next generation to go into science, engineering or technology? Who will run the ever-more-complicated world of the future if science and math skills fade away?

So why do we send people into space when there are people going hungry here on Earth? The answer is, there are many types of hunger, and one of them is intellectual hunger, hunger for inspiration and knowledge. The space program, particularly the human space program, sends representatives of humanity out to explore the stars in a quest that is older than human history. We go because we must, and when we go, we inspire generations to follow us, taking math courses and science courses and engineering courses, not because they must but because they too want to explore. Humanity's path must necessarily lead to the stars, if it leads anywhere at all.

But we've known this for a long time. Over a century ago, a Russian math teacher named Konstantine Tsiolkovsky said it best:

"Earth is the cradle of humanity. But one cannot forever live in a cradle."



Book Review: The Case for Mars

By Robert Zubrin with Richard Wagner, Foreward by Arthur C. Clarke
Simon and Schuster 1997; ISBN: 0684835509

Reviewed by Gord Tulloch, RASC Winnipeg

A recent appearance at the RASC Winnipeg Centre by Robert Dyck of the local Mars Society chapter led me to reread this book, which I bought some time ago at a chain bookstore. I recalled being quite excited by the possibility of a simple and relatively inexpensive way of getting to Mars, although at the time I hadn't thought to join to Society to keep up to date. Mr. Dyck's presentation contained little material on the Society itself so this review is intended to fill in some gaps.

On July 20, 1989, the first President Bush committed the United States to a continued program of exploration including the Space Station, later manned Moon bases, and finally, Mars. Unfortunately, a common trait of the last few Administrations in the US has been to make these grandiose visionary statements, and then vacate the field. The excitement surrounding Bush's announcement was given a final push in the abyss by the price tag that NASA came back with for the missions envisioned, \$450 Billion dollars!

As the NASA plans crashed and burned, a Mars Underground was forming to explore alternative means to getting to Mars. Robert Zubrin was an aeronautical engineer formerly working for one of the big "military industrial complex" contractors in the US. While working on the NASA proposed scenario, it became clear to Zubrin that a simple rehash of the "Die Marsprojekct" program that Werner Von Braun and his collaborators worked out in the 1940s with huge motherships assembled in orbit and moon bases used to supply Mars-bound expeditions was out of the question. He began formulating an alternative approach that was based on a simple concept: Live off the Land.

Zubrin's "Mars Direct" program is clearly and compellingly detailed in this book. In stark contrast to the "Battlestar Galactica" mega-billion dollar plans that NASA and their contractors have dreamed up, Mars Direct is simple – send a spacecraft to land on Mars that contains a propellant factory and an Earth return vehicle in it. Once the factory has generated the propellant needed for the return to Earth (easily done from materials abundant in the Martian soil) send a crewed habitat vehicle to spend a year on the surface before rocketing back to Earth in the return vehicle. Alternate the launches with two a year, and you have a continuous flow of missions to the Red Planet for a fraction of the cost of the proposed NASA missions. Even better, eliminate NASA and the contractors from the equation entirely (for example by offering a series of prizes up to and including a \$20 Billion prize to the first group that successfully lands a team on Mars and returns them safely) and you end up with costs an order of magnitude less. Needless to say, Zubrin is critical of NASA and it's contractors (who quite plainly "run up" the costs of the proposed Mars Missions to create a fatter margin for themselves.) Indeed, in dealing with common misconceptions as to barriers to Mars Missions, he concludes that many of them (interpersonal

problems between astronauts, radiation, long duration zero-G) are being emphasized by scientists and contractors looking for funding for their pet projects rather than being true barriers to conquering the Red Planet. Zubrin is also appropriately critical of calls to re-establish Moon bases. He presents detailed arguments why it's silly to consider the Moon a way-station between Earth and Mars.

Finally, the book compellingly sets forth reasons why, despite all the problems Man is experiencing on Earth, we should set our sights on Mars. His discussion of the physiological benefits of establishing new frontiers for the human race makes a lot of sense, particularly when he points out the slowing of progress in Western Civilization since the taming of the Western Frontier in the late 1800s.

The Mars Society (www.marssociety.com) is an activist organization intent on convincing policy makers that Mars Direct is the way that we can reach the Red Planet without needing to empty the treasury to do so. With recent political rhetoric from yet another President Bush fresh in the minds of the work populace, there is an opportunity to push the Mars agenda forward with a momentum that hasn't been seen since the Apollo days. I encourage everyone to read the book, and get involved. Join the Society and help move mankind into a new tomorrow. I have!

Also see:

Mars on Earth: The Adventures of Space Pioneers in the High Arctic

by Robert Zubrin

J. P. Tarcher, 2003; ISBN: 158542255X

Entering Space: Creating a Spacefaring Civilization

by Robert Zubrin

J. P. Tarcher; Reprint edition 2000; ISBN: 1585420360

Jen in the Journal

Our own Jennifer West has made it into the most recent edition of the RASC Journal. She recently presented to our meeting results of her research from the big radio telescope in Penticton on finding a huge chimney transferring heat to a place far above the galactic plane. An abstract of this, her Master's Thesis, has been printed in the Journal of the RASC. The issue is the last one, the one with a picture of a British postage stamp on the front cover. Turn to page 277 and you can read the article about her paper. Congratulations Jen!



Messier Certificates:

Eugene d'Auteuil	41
Robin Woods	87
Lindsay Price	21
Kilmeny Jones	12
Carey Deschamps	64

Explore the Universe:

Terra Jentsch	13
Stan Runge	6
Lindsay Price	73
Timothy Kennedy	8
Kilmeny Jones	40
Don Radford	39
Sandy Shewchuk	14
Judy Starr	22
Ray Starr	21

Herschel 400's

Stan Runge	93
Sean Ceaser	133

Finest NGC's:

Sean Ceaser	67
Robin Woods	7
Mike Stephens	58



Congratulations to **Mike Karakas** on receiving his Messier Certificate!

The following members have completed their:

Explore the Universe

Gail Wise
 Janet Pollock
 Janice Low
 Mike Stephens

Messier Certificates

Kevin Black
 Alan Sherlock
 Mike Stephens
 Rick Turenne
 Gail Wise
 Ray Andrejowich
 Stan Runge
 Bernie Plett
 Sean Ceaser
 Mike Karakas

Finest NGC's

Kevin Black
 Stan Runge
 Gail Wise



We have the following new members

Le Ngo, Winnipeg
 Harry Wall, Winnipeg
 Terry Bailey, Winnipeg
 Norman Henderson, Winnipeg
 Vic Kafka, Winnipeg
 Eril Turico, Winnipeg

Welcome to our club!