Volume 61 Issue 1 **January – February 2003**

Winnicentrics

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

LIGHT POLLUTION: ARE YOU PRACTICING WHAT YOU ARE PREACHING?

by Fred Wood

Now that you are talking to your neighbours about light pollution, are you practicing what you are preaching? If you are, good for you, if not, what are you doing? You are telling them to do as you say, not as you do. You are doing what you are asking them not to do. You're being an example of an oxymoron.

Check your lights, do you have lights that are on all of the time? If you are asking your neighbours to use motion detectors and you have dusk-to-dawn lights, they are going to ask themselves "Why should I use motion detectors if (*your name here*) isn't? The same principal applies if you have a light that trespasses onto a neighbour's yard.

If you want your neighbours to use light fixtures that allow you to do astronomy, you MUST be an example. Get motion detectors and be sure that they do not trespass onto the yards of others.

If your neighbors or yourself have any questions, they or yourself can email the lpac at: rascwpglpac@hotmail.com.

If you would like to help with the light pollution abatement committee, you can email myself at: fred_wood@shaw.ca.

IN THIS ISSUE . . .

Deadline for the next issue is February 16, 2003

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 above, or write to RASC, Winnipeg Centre, Box 2694 Winnipeg MB R3C 4B3

January 10

Beginners Session 7:00
Regular Meeting 7:30

January **10** **Friday**

Unconventional Imaging with Webcams and Digicams
Interested in digital imaging but not looking forward to explaining to your spouse what that large charge on your credit card from CCDs'R'Us is about? There are alternatives: amateur astronomers are using off the shelf webcams and consumer digital cameras to take high quality images of lunar, planetary and even deep sky objects! Gord Tulloch will demonstrate how you can connect these devices to your telescope, how to capture images, and how to process them for best results. He'll also show some images he has taken, as well as samples from recent postings to Internet newsgroups on the subject.
Plus the regular features: "What's New" with Lloyel Hull, "Explore the Universe" Observing Certificate by Lindsay Price and Gail's "Constellation of the Month" looks at Auriga the Charioteer.

February 14

Beginners Session 7:00
Regular Meeting 7:30

February 14 Friday

Game Show Night
It's Valentines Day, so join us for the Winnipeg Centre's version of "Love Connection" . . . just kidding. Ron Berard and Gail Wise will keep us guessing with what will be a fun evening of questions and answers.
Richard Bochonko will show video from the 1979 solar eclipse on its 24th year anniversary.
Plus the regular features: "What's New" with Lloyel Hull, "Explore the Universe" Observing Certificate by Lindsay Price and Gail's "Constellation of the Month" looks at Gemini the Twins.

Observing Sessions and Other Fun Stuff

January 8 Wednesday

Public Star Night

7:00 p.m. to 9:30 p.m.
Fort Whyte Centre

Bring your telescopes and binoculars. These nights are always lots of fun as we show the public some of the wonders of the night sky.

January 11 Saturday

Members Observing Nights

7:00 p.m. to ???
Glenlea Observatory

February 15 Saturday

In January the moon is just past 1st quarter and we can see the winter constellations.
In February the moon will be full, so this will be the perfect time to work on your lunar portion of the "Explore the Universe" certificate.

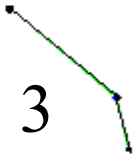
January 18 Saturday

Our Annual Mid-Winter Potluck Party

7:00 p.m. till we collapse
Jay Anderson's House
189 Kingsway

'Tis the season for our annual post-Christmas holiday potluck supper!

Everybody bring your wife/husband/girlfriend/boyfriend/significant/insignificant other and some food for sharing and get ready for a great start to your new year with the RASC.



Humans in Space

by Ray Philippe

This series takes us on a journey through time to explore the human race's quest for space flight.

Part 11

Continued from last issue

With the Voskhod program out of the way (the final Voskhod mission - *Voskhod 2* - having flown in March of 1965), Sergei Korolev, known only as the Chief Designer, was free to focus his team's energies on Soyuz and the Soviet lunar program. The Soviet government continued to keep the Chief Designer's identity a state secret, even within his own country.

The Americans didn't know it at the time, but the Soviets' lead in the space race was beginning to slip. The robotic probes Korolev was launching to explore Mars, Venus, and the moon began missing their destinations due to problems arising in instrumentation and guidance systems. And there were problems with the design of the new rocket that was supposed to carry cosmonauts to the moon.

But the most punishing blow to the Soviet space program came on January 14, 1966, when Sergei Korolev died after what should have been routine surgery. Only after his death was he publicly acknowledged, and he was buried as a Soviet hero within the Kremlin wall.

Meanwhile, Apollo and Gemini continued to make strides in the U.S. A number of unmanned tests of Wernher von Braun's Saturn 1 rocket had been carried out between October 1961 and July 1965. The Saturn 1B, an upgraded version of the Saturn 1, would be used in the Apollo program for some unmanned test launches, and also for one manned Earth-orbit Apollo mission.

The Saturn 1B was a two-stage launch vehicle. The first stage consisted of eight H-1b engines burning kerosene and liquid oxygen, delivering 205,000 lbs of thrust each. The second stage consisted of a single 230,000 lb thrust J-2 engine which used used liquid hydrogen and liquid oxygen as propellants. Both engines were developed by the Rocketdyne division of North American Aviation (now part of Boeing) on contract for NASA.

Project Gemini was moving right along, with the second manned Gemini mission being launched on June 3rd, 1965. *Gemini IV* roared off the pad at Complex 19 of the Kennedy Space Center with commander James McDivitt and pilot Ed White aboard. The Titan II launch vehicle lifted Gemini IV into Earth orbit where it remained for 4 days and 62 orbits. Mission objectives included evaluating the performance of crew and capsule during prolonged space flight, conducting rendezvous and stationkeeping maneuvers, and conducting extra-vehicular activity. Of course, the major highlight of Gemini IV

was the first ever American spacewalk. The EVA began on the third orbit when Ed White opened his hatch and used a hand-held manuevering oxygen-jet gun to push himself out of the capsule. The EVA started over the Pacific Ocean near Hawaii and lasted 23 minutes, ending over the Gulf of Mexico. Initially, White propelled himself to the end of the 8 metre tether and back to the spacecraft three times using the hand-held gun. After the first three minutes the fuel ran out and White manuevered by twisting his body and pulling on the tether.

Ed White walks in space

The rendezvous and stationkeeping activities would have involved rendezvous with the second stage of the Titan II rocket that was still floating in orbit. This rendezvous was attempted during the first orbit, but the exercise was cancelled early in the second revolution after depletion of 42% of the fuel.

Gemini V, carrying astronauts Gordon Cooper and Charles "Pete" Conrad was the third manned spacecraft of the Gemini series. The flight was designed to last eight days and test rendezvous procedures. The major objectives of this mission were to demonstrate a long-duration crewed flight, evaluate the effects of long periods of weightlessness on the crew, and test rendezvous capabilities and maneuvers using a rendezvous evaluation pod. This was the first Gemini spacecraft to use fuel cells for electrical power.

Gemini V was launched from Complex 19 on August 21st, 1965. During the mission, problems developed with the fuel cells and they had to be shut down for a while, forcing the crew to scrap the rendezvous evaluation pod activities. An analysis was carried out on the ground and a powering up procedure was started on the seventh revolution. Over the rest of the mission the pressure slowly rose in the fuel cells and sufficient electrical power was available at all times. Retrofire was made on August 29st during revolution 120, and the capsule splashed down in the western Atlantic 27 minutes later.

Continued in next issue

ATM Journal 1: Introduction and Design Notes

By Gordon Tulloch

This article is the first in a series that will describe my ongoing efforts in Amateur Telescope Making as well as exploring what others are doing in this exciting and rewarding branch of amateur astronomy. Without question if you're minimally handy and able to use hand tools, you can build a telescope for a fraction of the cost of a commercial scope, and probably end up with a higher quality result for your efforts.

A little about me - My first real telescope (other than a junk Tasco 3" department store scope) was a 13.1" Dobsonian built by my father and I when I was a teenager in the early 1980s. The design was a direct copy of the Coulter Odyssey 1 telescope. After using this scope for 20 years, making various modifications as I went, I decided I wanted to finally get my feet wet in astrophotography, particularly the very exciting areas of digital and web cam astrophotos. The 13.1" needed a complete overhaul to replace its sonotube Optical Tube Assembly (OTA) and plywood components with something a lot lighter. After investigating options for computerizing the scope (including the excellent Bartels computer control system (www.bbastrodesigns.com) and a few attempts at prototyping a truss tube scope I decided finally to sell off the components of the 13.1" scope and build from scratch - I decided to build an 8" prototype (which would become a planetary scope) then a 16" for deep space observing, mounted on the same permanent mount. Indeed, I decided (masochist that I am) to endeavor to build from scratch, rather than buying components, where possible.

So what's the first step? Design and research, obviously. The web is a wonderful tool for this, with hundreds of telescope designs available, including some complete plans (see www.atmsite.org). Since a telescope-building project will result in a telescope perfectly suited to its intended use, it is a very good idea to make sure that that you have a clear set of goals. Some criteria are:

Portability - The best scope design in the world is one that gets used! Hence, one must decide whether to build something that is portable enough to haul out to an observing site (such as a truss tube Dobsonian) or do without portability.

Anticipated Use - Lunar and Planetary or Deep Sky? Searching for comets? Imaging or visual observing? This will influence both optical and mechanical design, as we shall see.

Cost - While a home built telescope will be substantially cheaper than a store bought alternative, the build costs of different telescope optical and mechanical designs will vary wildly.

Materials - Wood, metal, composites? This decision is normally driven by the skills and available tools of the telescope builder. Most amateurs build from wood since hand tools suitable for woodworking are commonly found in most workshops, or metal (often aluminum) if they have tools and experience in working in this medium.

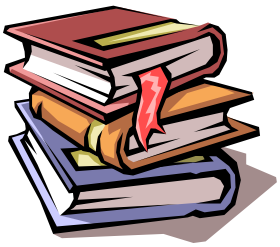
Complexity - For the most part, amateurs start by building Newtonian reflectors since there are only two optical surfaces involved and the telescopes are mechanically fairly simple. Other reflector designs such as traditional cassegrains or refractors are far more rarely seen. Mounts range from the simplest Dobsonian (alt-azimuth) designs to more complex equatorial designs.

These criteria considered, most ATMs opt to build (at least as a first telescope) a Dobsonian of between 6" and 8" aperture. For the purposes of this series of articles, I'll describe the process of building an 8" f5 telescope using a Dobsonian mount. This telescope will be as portable as possible (with a focal length of 8" times 5 or 40"), will be general purpose enough to perform well in visual (untracked) planetary and lunar as well as deep sky observing (although the focal ratio will favour deep sky observing, a trade off required to minimize tube length), will be built from plywood and a simple open tube design using string trusses to minimize costs, make it easy to build, and maximize portability. Conveniently I have an 8" plate glass grinding "tool" allocated to be incorporated into exactly this design for taking to RASC events and the lake. I'll likely build this telescope concurrently with my main project below.

In addition to the 8" f5 telescope I'll relate my experiences building an 8" f10 dedicated planetary telescope to take advantage of excellent prospects for planetary viewing in 2003. This telescope will be very different from the average 8" - first, it will be a long focal length instrument so that the field of view is reduced, concentrating the light gathering capabilities of the telescope over a narrower field of view. Second, the long focal length allows the size of the secondary mirror to be minimized. The secondary on a Newtonian telescope is in the same path that light takes to get to the main mirror, so it will obstruct a certain amount of light and thus reduce the effective aperture. Finally, reducing the secondary size will reduce diffraction, maximizing the ability of the observer to resolve small details.

One trade off of a long focal length is physical dimensions - the tube for this instrument (which has a focal length of 80") will be approximately 85" in length, which is quite considerable. Also, to provide accurate tracking for planetary and lunar imaging, the telescope will be mounted on what I consider the most stable equatorial mounting available, a classic horseshoe mounting. So, this design has abandoned portability entirely. The mounting will be constructed from wood (since I lack tools and experience in metal) and will incorporate many wrinkles that we will discuss as we progress to reduce cost and complexity.

Next time: Pushing Glass: Grinding your mirror



From the Library

The Iron Sun: Crossing the Universe Through Black Holes
by Adrian Berry
Published by Jonathon Cape Ltd 1977

Reviewed by Lindsay Price

A very interesting "Futurist" type of book that looks ahead over a period of what the author predicts could be three centuries. His theme is to address that nightmare of all space travel visionaries: time required to travel the vast distances and the speed limit of the speed of light. He begins with explanations of General and Special Relativity by which Einstein showed that faster than light travel cannot happen and introduce the work of other theoretical and experimental physicists' developments on these. He then goes into detail on topics that many of us have heard mentioned only briefly in the writings of people like Feynman and Hawking, about Black Holes, White Holes, and a connection that was developed by Einstein and Nathan Rosen called an Einstein-Rosen Bridge. The book never uses the term "Worm Hole", but if you are familiar with that you have some idea of what he is predicting. It describes traveling across space not with faster super engines, but by using the gravity of black holes of ten solar masses, to go from one point in space to a far distant point ... instantly.

After explaining the theory of the Einstein-Rosen Bridge, he proceeds to formulate the probable steps necessary to actually construct one. Pointing out that it is well beyond our present technology, he is careful to describe the immense scope of the project, and tries to foretell the time frame (always a risky undertaking) to acquire the engineering know how that would enable the process to develop. Another interesting avenue of thought he pursued, and one that I have not seen by other futurist authors, is his attempt to introduce into the time frame, the evolving of world economies to factor into the equation how soon we would be able to afford, this kind of technology. That is a point a lot of authors lose when they share their dreams with us, and it stretches out his time frame. (An analogy to this, not mentioned in the book, is that we have had the technology to go to Mars for twenty years, but it will be probably twenty years more before we do, because of the expense of it.)

For me the fascination of this book is partly the way it relates to my great ambivalence to UFO's. I often tell people that mathematically there has to be life on other planets around other stars. There is simply too much hydrogen, carbon, oxygen and nitrogen out there for there not to be. Since we do not seem to think it would be worth it to spend ten thousand years in cryogenic storage just to get to some other star system, and then do it all over again just to get back, why would a little green man from the 51 Pegasi system want to, just to see if there is life on one of the planets orbiting our sun? Then in books and articles on quantum mechanics, gravity warping time and space, black holes and white holes, there are allusions and hints at "short cuts". This book makes no allusions nor hints, but addresses the possibilities head-on, in a logical, intelligent discussion of what may be, our means of doing that which has been the dream of people since the first cave man noticed little twinkling lights in the night sky; to go to the stars!

Shortcomings? Only one; I never figured out how he got the title, "The Iron Sun".

The RASC Winnipeg Email List

As a Winnipeg Centre member, you might consider joining our with email distribution list. It's a method to send messages to many of the members in our Centre. You can ask questions, or send us updates of your latest Observations. Simply send the messages to the email address rasc-wpg@cc.umanitoba.ca, and all of us on the list can reply. To join, follow the instructions below. Your name will then be checked against the latest membership list. A message will be sent back to you to confirm your acceptance. If you have any problems, write me at stanrunge@hotmail.com and I'll try to help resolve them.

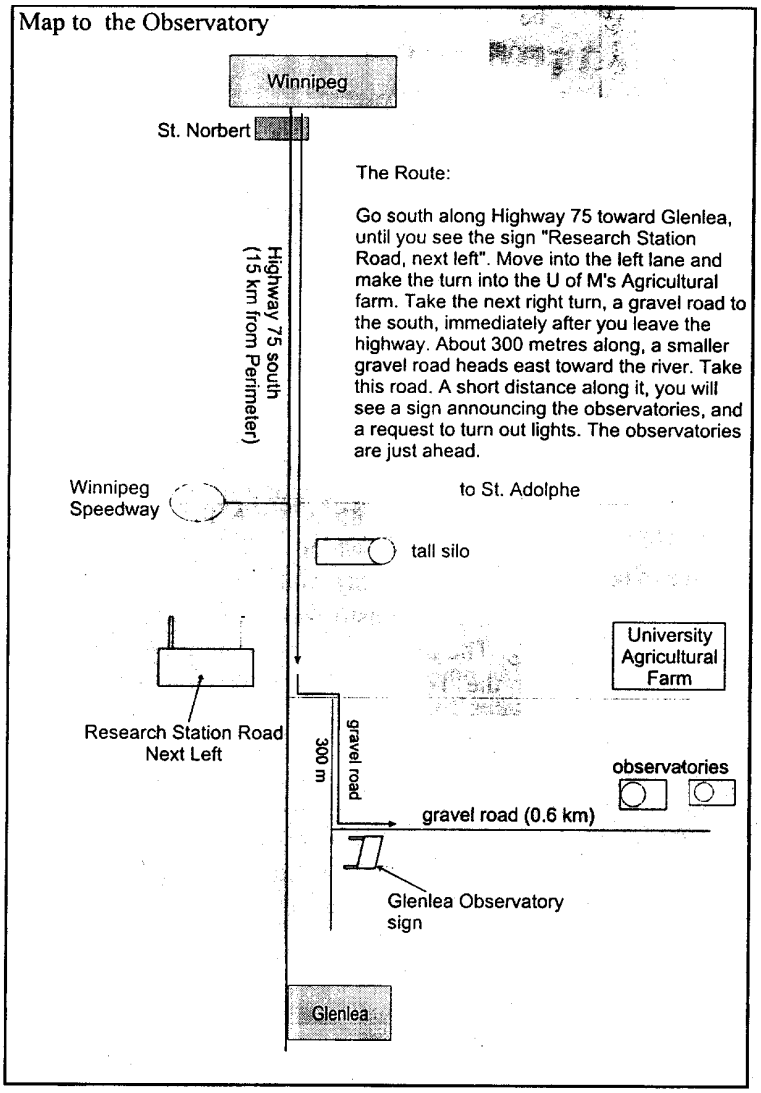
How to join the RASC Winnipeg email list,
rasc-wpg@cc.umanitoba.ca

To be able to send and receive email sent to this address you must first subscribe to the mail list by sending the following message using plain text. (Fancy HTML formatted messages will not work. Also be sure to send the following message from the email account you want to send and receive RASC mail from.)

To: listproc@cc.umanitoba.ca
Subject: (doesn't matter - no subject is OK)

In the body of the mail type only the following line, nothing else (be sure to replace Firstname and Lastname with your own):

sub rasc-wpg Firstname Lastname



Finding the Observatory

The Winnipeg Centre maintains a working observatory and warm room at the University of Manitoba's Research Farm. The observatory contains a 12" LX200 telescope and a 14.5" Dobsonian. Members of the Centre may sign out the use of either of these telescopes provided they have first taken a short instruction course on its use.

The warm room provides a convenient place for members to take refuge from winter temperatures and summer mosquitoes, or to wait out a passing cloud. The building also provides desk space and lighting for planning a night's observing session. A cement pad in front of the warm room and observatory provides a convenient spot to place members' telescopes while conducting personal observing programs.

Etiquette requires that you approach the observing site with your headlights off. On newer cars, stop the engine at the Glenlea Observatory sign, engage the parking brake by one notch, and then restart. Your headlights should remain off, but you can still use your parking lights to drive. Proceed slowly, and be careful about parked cars along the road, or people walking. If you cannot turn off your headlights, make a cardboard or garbage bag mask to dim the lights. You might wish to turn around at the end of the road so that you are facing the direction back toward the highway at the end of the evening.

OBSERVING

The following members are working toward their

Messier Certificates:

Explore the Universe

Eu Janice Low 37

Mi Lindsay Price 29

Ro Kilmeny Jones 9

Lindsay Price

Wayne Keith 20

Kilmeny Jones 3

Finest NGC's:

Stan Runge 69

Sea

Gail

Are you working on your Messier list?
Explore the Universe?
Finest NGC's?
Herschel 400's?
Let me know how many you have and I will publish it here so we can encourage each other!

Gail Wise 246

You Can Do *What* With A . . . ?

by Gail Wise

Did you think that you have to spend a lot of money on astronomy equipment? With a few everyday items that you already have around the house you can easily get started on your way to enjoying this fascinating hobby.

Plastic Shower Caps: to cover the ends of your Dobsonian tube to keep out the dust and dirt.

Clothespins: to hold your star charts together so they don't blow all over the countryside.

Rubber Bands: make great page markers for smaller books like the *Observer's Handbook.*

Nail Polish: Paint a flashlight lens with red nail polish to make an instant "night vision" flashlight.

Balloons: If you don't want to show your feminine side you can achieve the same effect by stretching a red balloon over the end of a flashlight.

Bits of old t-shirts: make nice soft cloths for wiping dew off your finders and eyepieces.

Dishwashing Liquid: Put some water in a white dinner plate and add a couple of drops of *Lemon Joy*. This is (supposed) to keep the mosquitoes away within 10 feet. Good riddance to them!

A Jar of "Pounce" Cat Treats: Just the right size for tracing circles for your sketches.

"Beach Boys" CD's: While you're out there freezing to death you'll want something to remind you of warmth and sunshine.

A Stack of Comic Books: You'll need something to do when the clouds start to roll in.

There are likely many more items that our members use for observing. Anyone who can't think of at least one more must be stark raving sane!