Volume 56 Issue 5 May/June 1999

Winnicentrics

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

New Camera makes Debut

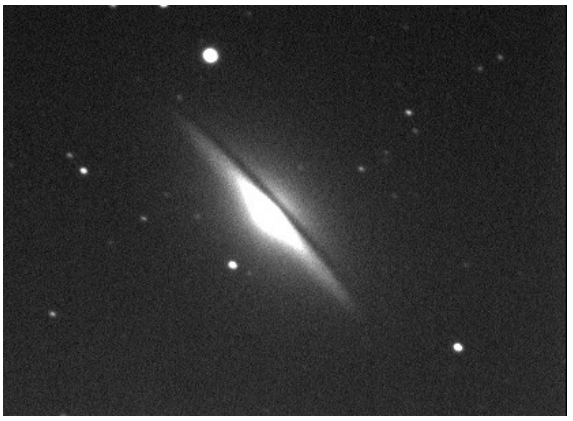
Finally, after all these years of fighting for more light on film, a digital camera has made an appearance in my life. These babies are expensive, and so Kevin and I have shared the price of one. It's a Starlight Xpress HX516 – a small package but an impressive performer. Resolution is 660 x 490 pixels – about what's needed to fill a computer screen at VGA resolution. For the technocrats, it has 16 bit resolution, which means that it has 65,500 levels of light that it can record.

Kevin's been using the beast for a couple of weeks now, but last Sunday was my chance to see it work. We hooked it to Kevin's refractor, powered up the system, and spent 10 minutes getting it to a focus. Not a real tight focus, but as good as we could do by eye. Electronic cameras are fussy – there is a rigorous technique to follow in order to get the best out of them – but when the full Moon is due up in an hour, some things get left behind.

We picked M104 for my first target – the Sombrero Galaxy. First we had to find it, but Kevin's a wiz in the sky (I use setting circles…) and soon the finder was pointing in the right place. So… a quick 20 second exposure to see if the galaxy is in the camera field of view.

Wow!

I've photographed the Sombrero before on a variety of films, but the first 20 seconds on this camera was better than anything I'd ever done. The dark dust lane stood out dramatically in the first picture, silhouetted against the bulge of the galaxy in the background. The surrounding stars were nearly round – there was hardly any tracking error, but how much can you expect in a 20 second exposure? So we tried 60. It was even better – and still the stars were almost round.



We haven't finished reading the book yet, so though we know that flat field and bias exposures are needed to improve the picture, we let most of it go. The HX516 has a very low noise Sony chip, and the first-light performance didn't seem to need much adjustment. We'll get to that in later trials.

(Continued on page 5)

IN THIS ISSUE…

New Camera makes Debut.....1
Meetings..... 2
Observing nights 3
Life Beyond Earth…….4
Fred's Book Review 6
Club News.....7
Instant Book Report 8
Council Highlights 8
Finding the Observatory.....8

Deadline for the next issue is June 30, 1999

WHO, WHERE, WHEN?

Executive Council

President
Kevin Black 897-8239

Past-President
Jay Anderson 474-1485

1st Vice President
Andora Jackson 775-7675

2nd Vice President

Secretary
Stan Runge 261-9984

Treasurer
Chris Brown 775-6392

Councillors

Kevin Georgison 269-8888

Jarod Matwiy 222-3823

Paul Paradis 883-2411

John Smith 237-3203

Mike Wegner 255-4016

Gail Wise 253-8297

Appointed Positions

Librarian
Fred Wood 779-4378

Observatory Director
Paul Paradis 883-2411

Observatory Bookings
Gil Raineault 253-4989

Winnicentrics Editor
Jay Anderson 474-1485

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 councillors above, or write to RASC, Winnipeg

May

May
14

Using a Newtonian

7:30 PM, Friday May 14
7:00 PM Beginners Session
Room 118, St. John's College, University of Manitoba

The Newtonian telescope is the basic instrument for both beginners and old hands. Jarod Matwiy will be presenting a "how-to" of Newtonian use: setting up, aligning and using finders – all the things needed to get the most out of the club's loaner telescopes.

This meeting will mark the start of our **beginners session**, held in the half-hour before the main program starts. Jay Anderson will speak on binoculars, start charts and the simple aids which make astronomy easier for the novice. We'll also take a look at some images from a CCD camera, explore the

June

June
11

The Annual RASC Observatory Picnic
Evening, Friday June 11
Glenlea Observatory

June is time for the annual picnic, held in its traditional location at Glenlea Observatory. Don't know where it is? - see the map at the back of this issue. And don't forget to bring the rest of the family.

Bring a steak, hotdog, smokie, potato, chips, soft drinks – whatever you want to eat. It's everyone for themselves, but everyone shares too. If the night cooperates, there will be a little telescoping when skies darken (which takes a long time in June…). Brilliant Venus will give us an early start, and Mercury will be easy if the horizon is clear. Mars will provide another bright target but there will be no Moon to entertain that night. Start time is whenever work is over, but usually around 6:30 PM. There is no scheduled ending.

May

May
8

Observing night

Saturday May 8
Dusk, Birds Hill Park

This month's observing night will be held at Birds Hill Park, in the Cedar Bog Trail parking lot. The site is reached by taking the north fork (to the left) about a kilometre past the park entrance. The sign announcing the trail will be seen a short distance farther along, and the trail itself leads off to the north (left). The parking lot has plenty of room. Our start time will be late because of the lingering twilight – not before 9 PM. Comet Lee will be just over the horizon at 9 but we'll likely have to wait a few more weeks for a good view of it.

This event depends on the weather.

Objects to look for during the May observing night:

Mars is high in the south at the end of twilight, and only a week past its closest approach to the Earth. If the seeing is very steady, be prepared for a spectacular view.
Venus glows in the evening about 35° above the horizon. Not much to see here – just a gibbous cloud-covered planet.

June

June
11

Observing night

Friday June 11, at the picnic
Glenlea Observatory

June is a poor month for observing – the sky never really gets very dark at any time during the night. So… we'll make a late night of it on the 11th, with the satisfaction of a hearty picnic meal to back us up. Even though the night will start late – not before 10:30 or 11, there are still plenty of things to see, especially with the summer Milky Way with all of its nebulae and clusters rising in the east.

Maybe Kevin will bring out the new electronic camera and we can all watch galaxies at work...

Objects to look for during the June observing night:

Comet Lee will be hugging the Sun and may not be visible at magnitude 7 or so
Venus will show a distinct crescent as it approaches its greatest eastern elongation. There isn't much to see on this cloudy planet, but the phases are always a crowd-pleaser.
Mars (and Spica) are settling into the southwest and gradually fading. Steady seeing will still allow a very nice view of the surface details, especially in the 14" Celestron.
The Ring Nebula will be well up in the east by 10 PM.
The galaxies of the Virgo cluster can be found above and to

LIFE BEYOND EARTH

TITAN

...And yet 'tis not improbable that those great and noble Bodies have somewhat or other growing and living upon them, though very different from what we see and enjoy here. Perhaps their Plants and Animals may have another sort of Nourishment there.

Christianus Huygens
New Conjectures Concerning the Planetary Worlds, Their Inhabitants and Productions (c. 1670)

Curious to find out if there are other inhabitants of our Galaxy, we have searched the family of planets around our star first. Examining the planets, we somehow neglected their moons, although some of them are even bigger than small planets, and have some interesting features which are familiar to our world.

One of them is Titan, Saturn's largest satellite. Bigger than the planet Mercury, it has intrigued exobiologists and astronomers for almost two decades now as a potential cradle of life, or at least a natural laboratory for the chemical-to-biological evolution research.

...if (and oh! what a big if!) we could conceive in some warm little pond, with all sorts of ammonia and phosphoric salts, light, heat, electricity, etc., present, that proteine compound was chemically formed ready to undergo still more complex changes, at the present day such matter would be instantly devoured or absorbed, which would not have been the case before living creatures were formed.

Charles Darwin (1871)

Voyager II encountered Saturn's family in 1981 and confirmed that Titan, unlike other satellites in Solar System, has a thick, hazy atmosphere whose principal constituents are nitrogen, methane and ethane.

It was the presence of molecular nitrogen like on Earth that led Carl Sagan and his team to perform an experiment similar to the one Harold Urey and his student Stanley Miller did in the early 1950's at the Laboratory for Planetary Studies at Cornell University. Simulating lightning in the early Earth's atmosphere, Urey and Miller sparked a mixture of hydrogen, water, ammonia, methane and hydrogen sulfide, and observed how a tar of complex organic molecules was formed. Sagan and his colleagues achieved similar results for Titan using ultraviolet light and charged particles (representing material from the solar wind) to form a dark, muddy organic substance. When mixed with water this elixir produced amino acids, the main building blocks of life, and polycyclic aromatic hydrocarbons. It was named *tholin* ("muddy", Greek). A possible scenario is that methane from Titan's atmosphere is being constantly transformed into chains of complex organic molecules via photochemical reactions, and somehow new methane is produced to keep balance of atmospheric gases.

In latest attempt to resolve the intrigue, NASA/ ESA designed a simple but powerful tool, the same one that proved to be so useful when deployed above Jupiter in 1995. In October 1997, the *Cassini Saturn Orbiter* was launched from Cape Canaveral carrying a probe that will descend through 200 km of clouds to Titan's surface. The probe is named *Huygens* after the Dutch astronomer and physicist who discovered Titan in 1655, and who later worked as a member of a team led by Italian astronomer Gian Domenico Cassini (who discovered more Saturn's moons) at the Observatoire de Paris.

Don't forget – the meeting on Friday the 14th will start with a beginner's session at 7:00 PM.

The Orbiter's 11- year journey is going to be assisted by the gravity of Venus, Earth and Jupiter. Cassini has already used Venus's assistance once, and a second gravity assist is expected on June 20th as the spacecraft passes Venus for a second time. The Earth will give the final push towards Jupiter on August 16th.

Arrival at Saturn is scheduled for June 25th 2004, with the separation of the Huygens Titan

Probe planned for November 6th. Entry to Titan's atmosphere will take place on November 11th. During the 2.5 hour descent the data gathered through 18 different experiments in the chemical laboratory aboard the probe will be send to the Orbiter and relayed to Earth. After releasing the probe, Cassini Orbiter will tour Saturn's family of satellites for three and a half years until the end of primary mission on July 6th 2008.

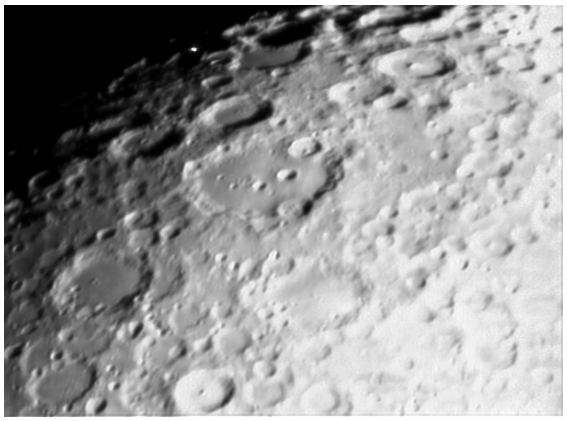
Titan is 9,5 times farther from the Sun than Earth, and it's surface temperature is about 94 Kelvin degrees (-179 C). There is no liquid water on the surface but probably a very thick layer of organic substances -- waiting for warmer days to come and flourish with life. Such a period could be expected in five billion years when the Sun becomes a red giant swallowing into it's outer shell everything inside the orbit of Mars. Ralf Lorentz and his colleagues from the University of Arizona, suspect that Titan's surface will be warm enough to enable life to grow. Before the very end of our star, Titan would have an opened possibility for the creating of life for over 500 million years longer than it was required for the life on Earth to start forming.

Try visiting a site that allows you to track the Cassini Orbiter every day, follow the status of a mission, and find data on the equipment that both the Orbiter and the Probe are carrying: http://www.jpl.nasa.gov/cassini/

Vesna Milosevic-Zdjelar

New Camera makes Debut (con't)

The Moon was up so we switched to another galaxy pair near the Dipper — "an interacting set"— according to Kevin. And there they were, 80 seconds later, two galaxies with their arms wrapped around each other. We shot the Moon (too bright) and the Ring Nebula (good, but the tracking was off a bit.) And then the Moon and clouds got in the way and we packed up. Looks like there will be a few sleepless nights in the future. This sure is a new way to do astronomy.



Above: Kevin's picture of the Moon just before full.

Fred's Book Report

The Backyard Astronomer's Guide
By: Terence Dickinson & Alan Dyer

The *Backyard Astronomer's Guide* is divided into four sections, each one for a different aspect of Astronomy. It has helpful information on buying binoculars and telescopes. By doing comparisons with each type of telescope, you can figure out what is best for you. When it comes to eyepieces, the authors compare different designs, stating the quality with consideration for the price range. If you want to accessorize, you can find useful information on what is available.

Terence and Alan take nine myths and explain them away. While they explain no. 9, the term "seeing" is made clear, which I thought was nice to see, no pun intended. There are tips on observing the planets and how to choose your observation site with light pollution in mind.

When it comes to star atlases, the authors explains how they are different using criteria other than just the magnitude limits. They even explain the terms "Messier", "NGC", and "IC" along with other catalogues.

The book has information on how filters can help make the nebulae and supernova remnants visible. They also mention that filters can help cut out the "noise" — the skyglow from city lights They also tell you about the different types of galaxies and of the galaxy clusters. It even includes tips on observing strategies for these difficult objects.

The *Backyard Astronomer's Guide* has a whole section on just astrophotography. It contains tips on everything from film to equipment. There is information on techniques on all aspects of astrophotography including methods for hypersensitizing film. The authors give tips on what telescope to use on different types of photos. There are also tips on keeping the "gremlins" at bay.

The last section has info on clubs such as ours along with other books and magazines. There are even listing of stores for your purchases of scopes and accessories. Last, but still important, this books contains tips on maintenance. A very good book for the intermediate astronomer.

Reviewed by: Fred Wood

This is an 80 second exposure with an HX516 CCD camera showing two interacting galaxies in Ursa Major. The image has not been processed except to increase the brightness slightly to make it show up better when copied. Under ordinary circumstances the image would have a flat field and a thermal bias images subtracted before processing. More exotic levels of processing such as the addition of three frames together or complex mathematical corrections would

INSTANT BOOK REPORT

The Museum of Science and Art
Volumes 1 & 2
Edited by: Dionysius Laradner, D.C.L.
Printed in : 1854

This volume is not devoted to astronomy. The sections on astronomy are interrupted with sections on other subjects such as Railroad Accidents. This book suggests that the author took the manuscript to the printers and someone dropped it.

The sections on astronomy are comparable with knowledge of today. Some of the other subjects are interesting as they border on the area of astronomy and the atmosphere.

Reviewed by: Diana Wood

CLUB NEWS

Library on the move…

St. Paul's College has asked us to vacate our space in the college in order to make room for a new office. This space is currently being used to house the library and several small pieces of equipment, particularly our old brass telescope. Stay posted for further developments.

Observatory Repairs

Now that summer is here, we can continue the repair of the Glenlea Observatory which was begun last year. While the heavy work is done, there's lots of small items which have to be finished off. The biggest job is to finish off the installation of the exterior cladding on the warm room and weather proof the roof of the observatory. A number of little finishing jobs remain in the warm room—put up shelving, renail some of the wall panels, put in carpeting, build another workbench, fix some odds and ends of wiring and so on.

If you'd like to help, ad hoc work parties will make their way to Glenlea on drier weekends to finish off the tasks. Get in touch with Jay to volunteer.

GA 2000

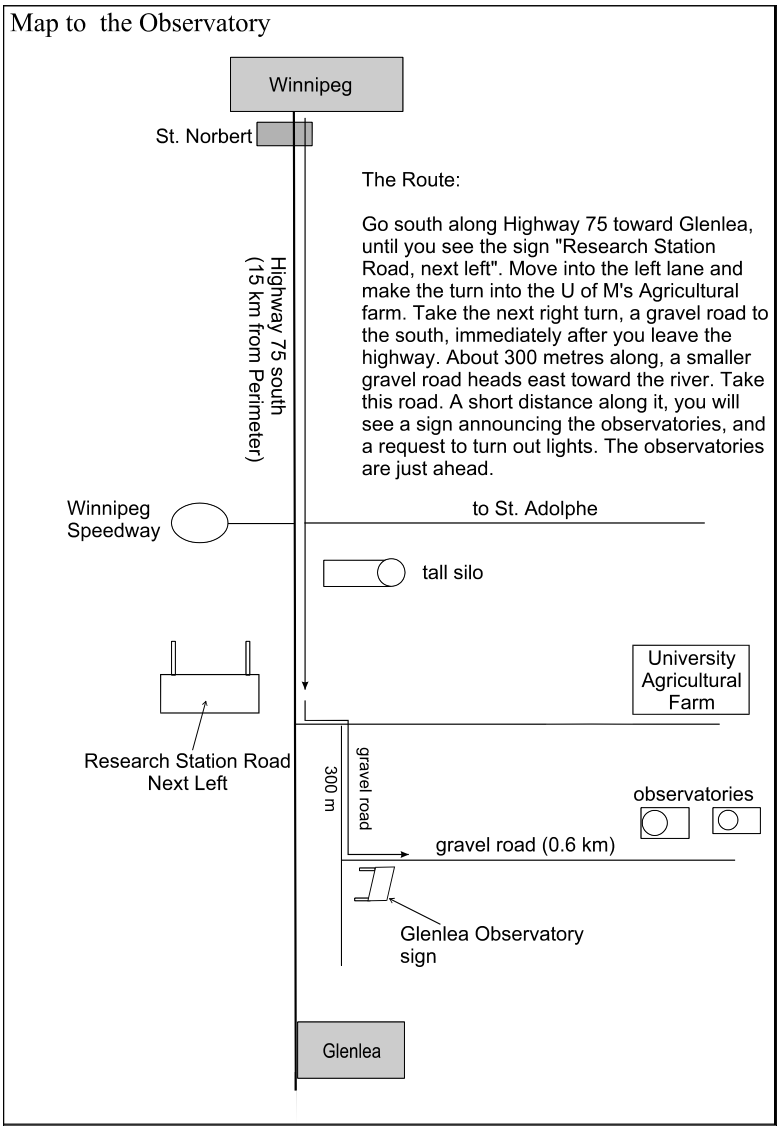
The first meeting of the GA2000 committee was held during the past month. During the meeting, committees were formed to handle the many tasks which will ensure a successful General Assembly and entice a large number of our fellow astronomers to travel to Winnipeg. The immediate task is to prepare material for the Toronto GA at the end of June this year.

The committees and their chairs are:

Registration:	Stan Runge
Communication:	Andora Jackson Lindsay Price
Facilities:	Andora Jackson Dr. Richard Bochonko
Program:	Jay Anderson Ian Cameron Kevin Black
Tours and Transport:	John Smith Paul Paradis
Social Affairs:	Ray Andrejowich Gail Wise
Budget:	Chris Brown Alan Sherwood

If you would like to help out, contact one of the committee chairs in the area which attracts you.

A Viewing tip
When looking for those hard-to-see planetary nebula that look just like stars, try inserting a diffraction grating between the eyepiece and your eye. Planetaries have distinct emission lines while stars have a continuous spectrum. The planetary should be obvious...



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 14" Celestron telescope on a fork mounting. Members of the Centre may sign out the use of this telescope provided they have first taken a short instruction course on its use.

The Celestron provides outstanding views of the night sky. Its large aperture collects more than 2500 times as much light as the human eye. It is capable of magnifying more than 700 times under favourable conditions. The telescope also has a solar filter for those wishing to carry out day-time observing.

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 space 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 break 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.