



# Winnicentrics

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

## Sky Measures

by Jarod Matwi

**T**he dots you see in a star chart are meant to be, and usually are a copy of what's actually in the sky. Why then, does it seem so hard for beginners to find the objects they are looking for? It may be that they are having trouble with the enormous change of scale from the 8"x11" page to the vastness of space. This is quite understandable, but is not that difficult once you become familiar with your favorite star chart. The rank beginner will almost certainly want to make use of the simple star charts in *Sky and Telescope*, *Sky News* or *Astronomy*. They are circular in shape and cover one whole hemisphere on one page. If you realize that facing south you see the stars at the bottom of the star chart, and you have to look up and backwards to see the stars at the top of the chart, you can begin to understand that a pretty small pattern of stars on the paper is quite large in the sky.

The easiest way to get the hang of this is to first find the big dipper on both the chart and the sky. It is up year round and is very easy to find. From here, you know what the relative size of things on paper are compared to what you see in the sky.

The position of everything you see up there and on your paper can be described in Degrees. If you look at one of the two stars on the top of the dipper's bowl, and then turn your head to look at the other one, you have turned your head about 10 degrees. The two stars may be 6 light years apart or 200 light years apart, but they are still separated by 10 degrees as viewed from the earth. Now hold your hand at arms length and make a fist. Your fist should now just fit between the 2 stars you have been looking at. This works for both adults and children since a smaller person will have a smaller fist and shorter arms, keeping the viewing angle correct regardless of who is using this technique. Other "hand at arms length" measures are available and are as follows: Pinky = 1 degree; three center fingers (minus thumb and pinky) = 5 degrees; thumb and pinky stretched as far apart as they can go = 20 degrees.

Once you have the hang of measuring stellar angles from practicing on the big dipper, you can start to find some less familiar objects. Some uses for this skill are finding that galaxy you saw in the star atlas just 3 degrees from that bright naked eye star, or telling

(see 'Measures' on last page)

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**Deadline for the next issue:**  
Feb 27, 1999



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## January

## The Post-Christmas Christmas Party!

**Dinnertime -7:00 pm, Saturday, January 16th**

**Gail Wise's House (see adjacent for map)**

Jan  
**16**

Did you think the holidays were over? Not yet, we still have to enjoy our mid-winter, post-Christmas pot-luck party! This is the perfect party to start off your New Year with the club! It all starts at 7pm and will be held at Gail Wise's house (132 Sterling Avenue, map next page). This is a pot-luck, with an opportunity to show off your culinary expertise. Make sure you call Gail with your proposed dish (253-8297) so that we don't wind up with eight desserts and no vegetables (although that doesn't sound too bad to me.)

Come on out and have a great time, and remember to bring your girlfriend/boyfriend/spouse/significant other. Eat, drink and be merry!

### Visitors from Another World: Collecting Meteorites in Antarctica

**7:30 pm, Friday, January 22nd**

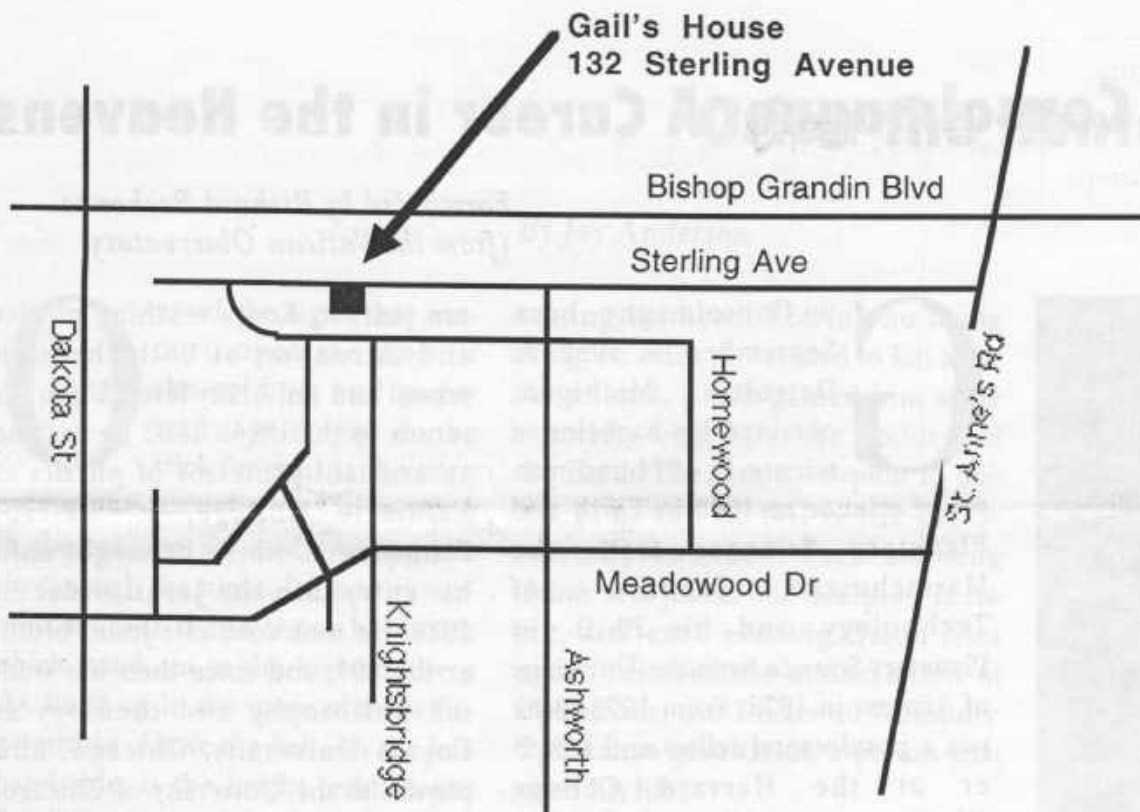
**Room 118, St John's College, University of Manitoba**

Jan  
**22**

Dr. Guy Consolmagno, an astronomer and Jesuit who works part time at the Vatican Observatory and part time at the University of Arizona, will be visiting Winnipeg later in the month. Dr. Consolmagno is a specialist in asteroids and meteors (actually, of small bodies in the solar system, including the moons of the planets). He is also a co-author of "Turn Left at Orion", a popular book on astronomy which is owned by some of our members. His research work includes the modelling of the evolution of the planets and their composition. (for a more detailed bio see page 4).

#### Talk Abstract:

The two simplest rules of astronomy are: wait until it's dark, and look up. This talk is about someone who did astronomy in a place where it never gets dark, and spent all of his time looking at the ground! During November and December of 1996 I was part of a six-person team living on the Antarctic Plateau searching for meteorites, as part of an annual program sponsored by the US National Science Foundation. The samples we returned are themselves, literally, visitors to us from another planet. And the whole process of travelling and living under such extreme conditions is probably as close as one can get at the moment to exploring and living on another world.



## February

### **Sending a Spider to the Moon**

7:30 pm, Friday, February 12th

Room 118, St John's College, University of Manitoba

Feb  
**12**

This month we are pleased to invite our National President, Randy Atwood, to town. His talk will look at some of the exciting development of the 1960's space race and is sure to delight both young and old astronomers (talk abstract below). Remember, friends and family are welcome.

July 20, 1999 is the 30th anniversary of the first manned lunar landing. This talk will take a detailed look at what was involved in the design and construction of the Apollo Lunar Module. Conceived in 1962, the original Lunar Module did not look much like the "Eagle" which made the first lunar landing. Over a period of seven years, as many engineering problems were solved, the design of the LM evolved. Angular in shape, flimsy in construction and bug-like in appearance, the LM was the first true manned spacecraft not meant to fly in the Earth's atmosphere. This talk will be illustrated with many pictures depicting the evolution and construction of the Apollo Lunar Module. A description of how the LM was guided to the lunar surface will be presented as well as analysis of the first lunar landing.

## Brother Consolmagno: A Career in the Heavens

Forwarded by Richard Bochonko  
(from the Vatican Observatory)



**G**uy Consolmagno, born September 19, 1952, in Detroit, Michigan, obtained his bachelor of science in 1974 and master of science in 1975 in Earth and Planetary Sciences from the Massachusetts Institute of Technology, and his Ph.D. in Planetary Science from the University of Arizona in 1978. From 1978-80 he was a postdoctoral fellow and lecturer at the Harvard College Observatory, and from 1980-1983 continued as postdoc and lecturer at MIT.

His master's thesis at MIT and subsequent work modeled the evolution of the moons of the outer solar system, predicting and explaining many of the features later discovered by the Voyager spacecraft. While at Arizona he modeled the geochemical evolution of lunar basalts and basaltic meteorites, identifying on geochemical grounds asteroid Vesta as the parent body of the eucrite and diogenite meteorites. His thesis on the role of electromagnetic forces in chemical fractionations of the early solar system pioneered the field of gravito-electrodynamics, the behavior of dust subjected to both gravitational and electromagnetic forces, and he was the first to apply this concept to describe the dynamics of the dust rings in the outer solar system.

In 1983 he left MIT to join the US Peace Corps, where he served for

two years in Kenya teaching physics and astronomy at both the high school and university level. Upon his return to the US in 1985 he became an assistant professor of physics at Lafayette College, in Easton, Pennsylvania, where he taught until his entry into the Jesuit order in 1989. He took vows as a Jesuit brother in 1991, and since then has studied philosophy and theology at Loyola University, Chicago, and physics at the University of Chicago. He has also spent several terms as a visiting scientist at the Goddard Space Flight Center and as a visiting professor at Loyola College, Baltimore, and Loyola University, Chicago.

He has coauthored two astronomy books: a popular telescope guide, *Turn Left at Orion* (with Dan M. Davis; Cambridge University Press, 1995) and a planetary sciences textbook, *Worlds Apart* (with Martha W. Schaefer; Prentice Hall, 1993).

Although primarily a theorist, Consolmagno hopes to complement his understanding of the evolution of small solar system objects by directly observing asteroids and moons. Two aspects of the VATT will be especially useful: the high resolution possible with the new technology and the possibility for long-term observation programs.

With the possibility of quarter-arc-second resolution, large main  
(see 'Heavens' on page 6)

## Orion the Hunter

By Jay Anderson

One of the signs that winter is upon the land (if the cold air and snowy landscape doesn't do the trick for you) is the presence of the constellation Orion rising in the evening sky and crossing the sky through the night. Its most prominent marker is the three belt stars which stand out in the high southern sky, lined up in the space of a few finger-widths. Above the belt, on the left-hand side, is the bright reddish star Betelgeuse, one of the few stars which can be resolved by large telescopes. To the right above is Bellatrix and below on the left is Saiph. Rigel, a bluish-white star that contrasts well with the ruddy hue of Betelgeuse, marks the lower right.

Just below the belt is a set of three stars that mark the sword of Orion. The middle of these three is actually the Orion Nebula, the brightest nebula in the sky and one that lends itself to a good low-power view with binoculars or a small telescope. The nebula can even be seen as a fuzzy patch with the naked eye. A line drawn to the left, following along the axis of the belt stars points toward Sirius, the brightest star in the sky, belonging to one of Orion's hunting dogs.

Orion was the son of Neptune and the nymph Euryale, and was, as a result, no ordinary mortal. He was of immense size and strength, and exceedingly handsome. He was very tall, and could cross oceans without

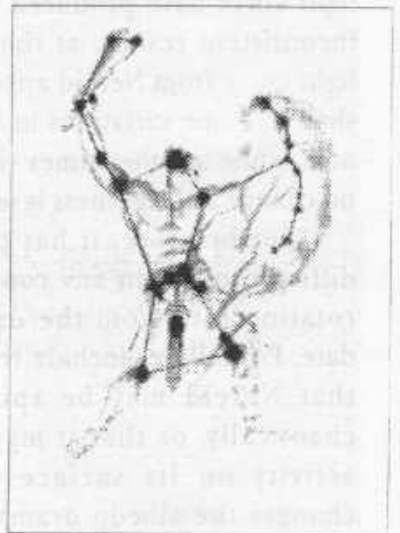
wetting his head. Fearing no living thing, he once threatened to kill all of the animal, which gained him some notoriety with Gaia, the Goddess of the Earth. She sent a scorpion to poison him, and he fell to the Earth, mortally wounded. Each morning Orion sets just as the Scorpion is rising, and each evening Orion rises again, restored the ministrations of Ophiuchus, the Doctor of Antiquity. Ophiuchus gave Orion a potion that saved his life.

Orion, being a handsome devil, had more than his share of loves. Diana, the Goddess of the Hunt, did her best to attract him, but she had competition from Aurora, the Goddess of the Dawn. He seems to have ignored both of these ladies. But his stars fade very slowly as he sets in the morning light, as if Aurora is trying to remain by his side. The tears that she sheds each night collect on the grass and flowers to form glistening drops of dew (this is certainly not a Canadian legend...).

Another myth associated with Orion mentions him as the son of Hyrius, King of Hyria. One day when Zeus, Hermes and Poseidon were travelling on Earth, they stopped in at good King Hyrius' place and were very well entertained. In gratitude the three gods offered to grant a wish; Hyrius asked for a son. The three deities took a cowhide, urinated on it and buried it. Nine months later

(see 'Orion' on last page)

**Orion was the son of Neptune and the nymph Euryale, and was, as a result, no ordinary mortal.**



## Heavens from page 4

belt asteroids such as Vesta or near-Earth-crossing asteroids may actually be resolved and evidence for "spots" or other irregularities might be detected.

"The physical state of asteroids and small moons can also be a clue to the forces acting on them both now and at the time of their formation," notes Consolmagno. "In this respect, the mystery of Nereid's spin takes on a particular interest. Attempts to measure its light curve have produced widely inconsistent results; at times the light curve from Nereid appears to show extreme variations in brightness, while at other times virtually no change in brightness is seen.

"Furthermore, it has proved difficult to obtain any consistent rotation rate from the data, to date. Possibilities include the idea that Nereid may be spinning chaotically, or that it may have activity on its surface which changes the albedo dramatically for short periods of time. Because it is a sister moon of Triton, Nereid would presumably have participated in whatever dramatic event occurred that resulted in Triton's retrograde orbit and so understanding its present-day orbit and spin may give additional clues as to the sorts of events which may have occurred to the Neptune system. Only a consistent, long-term observing program will be able to pin down the light curve and lead to an understanding of Nereid's orbital and physical state." ●

## OUT & ABOUT: More on Consolmagno

*On the evening of January 22, RASC members will have a special opportunity to hear and speak with Dr. Consolmagno (see page 2). Here are some other talks he will be giving while in Winnipeg.*

### **Friday, January 22nd, 3:30pm, 330 Allen Bldg, U of M** **Meteorite Porosities and the Structure of Asteroids**

Meteorites are hand samples from the asteroid belt, relatively unchanged since the formation of planets 4.6 billion years ago. Thirty years of intensive study has given us many clues about their chemistry; but only recently have we begun to ask certain basic questions about their physical structure, and what that can tell us about the processes occurring when they were formed and the environment they exist in today. My work measuring the density and porosity of meteorites indicates that asteroids today must be loosely assembled piles of rubble, not solid rocky bodies. This in turn suggests that though the asteroids may be chemically unchanged, their physical state may have evolved significantly over the age of the solar system. *This is a free lecture offered through the Department of Physics and Astronomy. RASC members are welcome to attend.*

### **Monday, January 25th, Noon at the Crowne Plaza.**

#### **Searching for God in the Heavens:**

#### **A Jesuit Astronomer at the Vatican Observatory**

This is part of the Lunch & Learn Lecture Series. Cost is \$25 which includes a two course meal with coffee or tea. Register by calling St. Paul's College at 474-8575.

### **Monday, January 25th, 7:30pm, Manitoba Planetarium** **Crossing the Realm: The Search for Heavenly Bodies**

Call the Museum of Man and Nature (956-2830) for details on cost and location for this talk.

#### **StarLine**

StarLine (988-0605) is a recorded announcement from the Manitoba planetarium providing current astronomical information.

## Librarian Report: Book Reviews

### 365 Starry Nights

365 Starry Nights is a book that gives you facts in a plain everyday language. This makes it very easy to understand. When it gives distance, it uses miles, however, when giving the temperature, it uses the centigrade system, which can be confusing.

When you use the book as an observing guide, it gives 1 or 2 celestial objects to look for per night. You will also receive a little Greek Mythological background of some of the constellations. As a bonus, you will learn how the sun looks from planets around other stars.

The only criticism I have is that it uses many single paragraphs and there are times, I think, that there should have been at least two. Other than that, I feel that this is a good book for an introduction to Astronomy. *This report was submitted by Fred Wood, Centre Librarian.* ✎

### A Walk Through the Heavens

As I read this book, I found it a good book for the beginner who wanted to get into astronomy. It starts at the Big Dipper and takes you through most of the sky's big constellations.

I found the legends of the heavens interesting. It talks about the constellations before they were in the skies, why they were given immortality by the gods for their

deeds or their punishment.

It also talks about the other stuff that inhabits the sky such as the Milky Way and other galaxies. So, if you want to start looking at the sky in depth, I suggest this book. *This report was submitted by W. Peters.* ✎

### Cosmos: A Sketch of a Physical Description of the Universe

This book by Alexander Von Humboldt was translated from

German by E. C. Otte and published in 1851.

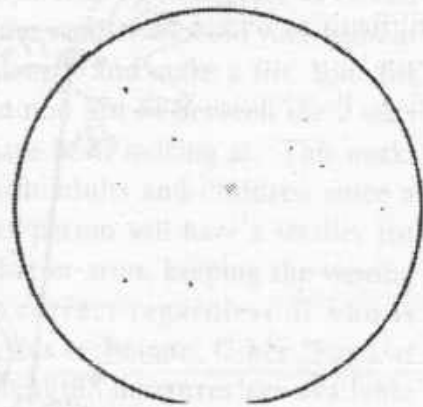
I enjoyed reading this book and comparing the conclusion drawn in the Regency Period to what is known now. There is an extensive use of Latin in this book, and an overall history of Astronomy. The only drawback to reading this book is the size of the script. *This report was submitted by D. Wood, Mother.* ✎

## Kev's Deep Sky Picks

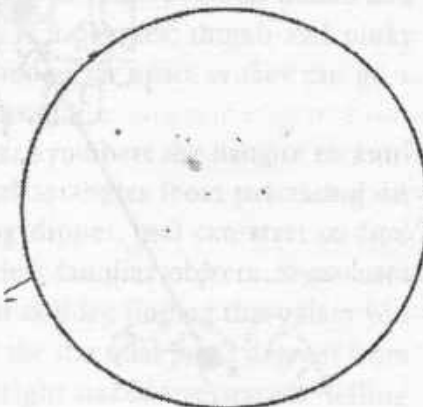
### NGC 1535 and NGC 2371-72

Kevin Black  
all winter

The first object I have picked for this month's deepsky pick is NGC 1535 (➔). NGC 1535 is a pretty planetary nebula located in the constellation of Eridanus. The planetary RA is 4:14.2 and Dec. -12.4. The visual magnitude is +9.6 and size of planetary is 20" x 17"



The second object lies in the constellation of Gemini; NGC 2371-72 is a really neat planetary. Low power shows the planetary easily as a nice and bright hazy disk, but at high power the planetary becomes 2 connected nebulae. (➔)



There is a big difference in brightness between the two sides of the object. The planetaries are at RA 7:25.6 and Dec. 29.29. The visual magnitude is +12 and size is 74" x 54" ●

## Orion from page 5

Orion was born. In this legend the constellation does not represent the figure of Orion but instead the cowhide which gave him birth.

To the Egyptians, the constellation represents Osiris, the God of Light. Osiris was engaged in an ongoing rivalry with his brother Set, the God of Darkness. Set tricked Osiris into climbing into a box, and then quickly closed the lid, suffocating him. He then cut the body into 14 pieces, scattering the pieces around the Egyptian kingdom. Isis, Osiris' wife, travelled the kingdom, collecting the parts, but could only recover thir-

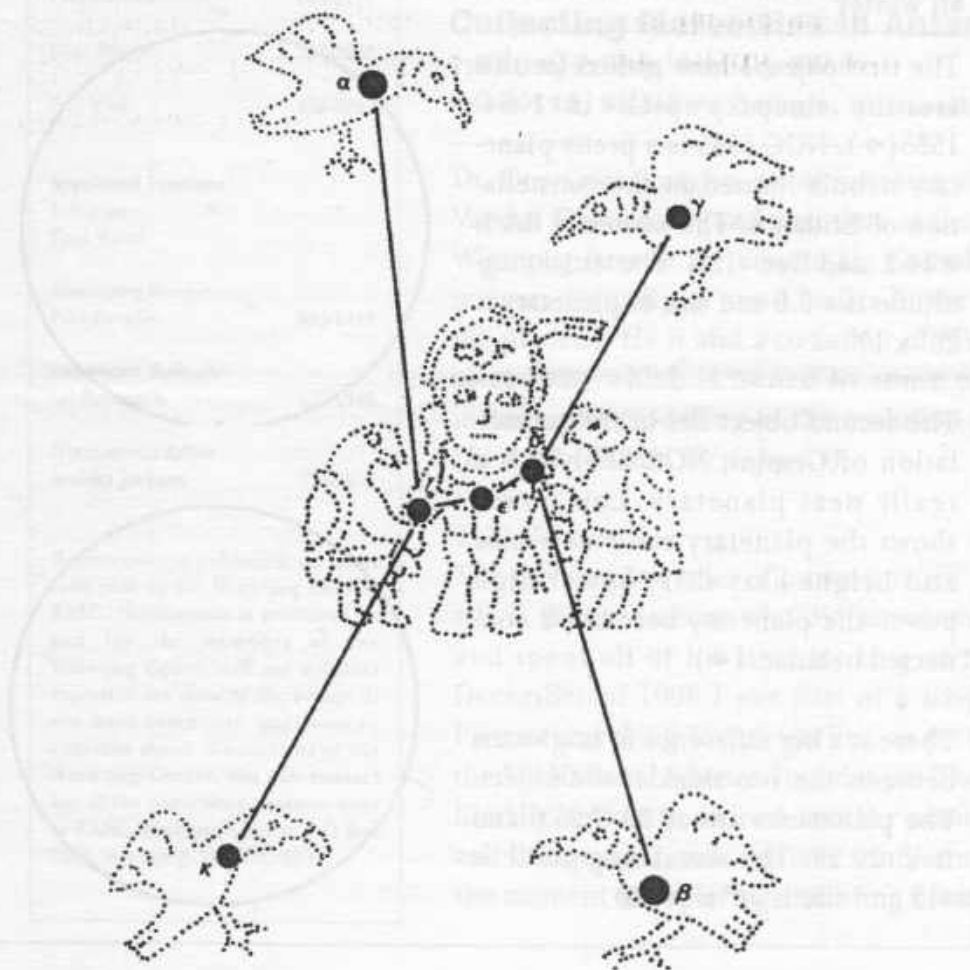
teen - the phallus was missing, haven been thrown into the Nile and swallowed by a fish. Without the entire body, Osiris could not be granted immortality, so his widow carved the missing part from a pine tree, breathed life into his nostrils, and sent him on his way into the sky.

To the Taulipang of northern Brazil, the constellation represents part of a large human figure, Zilikawai, with the belt stars being the right ankle. Apparently his wife hacked off his left leg during a fierce argument, and Betelgeuse represents the bloody stump. Parts

of Taurus make up the rest of the figure and his head is the Pleiades. To the Chimu of Peru, the middle star in the belt is a mischief-maker whom the Moon Goddess wishes to punish. The surrounding stars on the belt are messengers sent to restrain him, while Betelgeuse, Bellatrix, Saiph and Rigel are four vultures to whom the miscreant will be served.

Marshall Islanders in the Pacific Ocean interpret the stars of Orion as a fisherman and a giant octopus. The three belt stars represent a stone adz with which the fisherman defended himself from the sea-monster. The Dayak of Borneo saw the constellation as a large animal trap while the Bororo Indians of central Brazil see a huge cayman (alligator) which stretches from Auriga in the north, through Taurus and Orion to Lepus in the south. ☉

FIGURE 1: Orion in one of his many incarnations



## Measures from front page

your friend that there is a nice cluster 15 degrees north of Jupiter. You will both be looking at roughly the same place in the sky. You will also know what it means when your Observer's Calendar says "Saturn just 1 degree south of the moon" on a certain date. You will find that you will quickly drop the hand gestures as you are able to mentally estimate the separations between stars, but being able to do this is an important step towards finding and enjoying some of the things that are just a little bit harder to pinpoint. ☉