Orbit
celebrating 100 years
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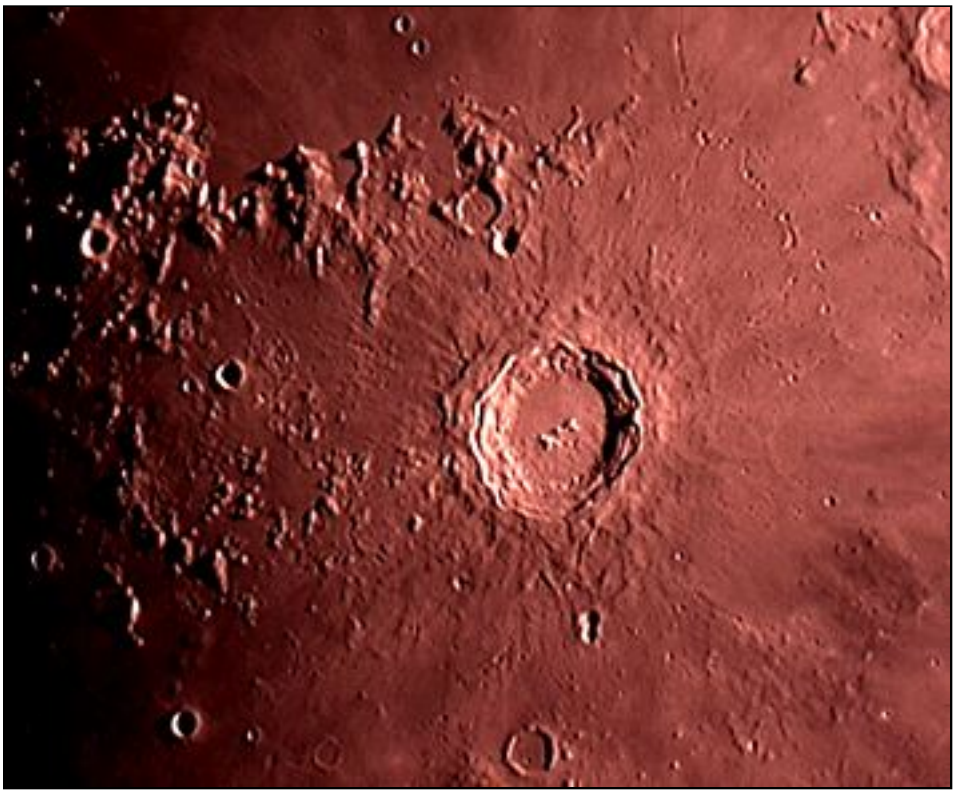

The image of Copernicus above was shot by Roger Hill, on May 21, using his 8" Celestron C8 SCT scope and a Philips Web Cam. It was selected by SkyNews as the 'Astronomical Picture of the Week' on the SkyNews web site. For more details, read Roger's article **Copernicus In Stereo**.

Copernicus in Stereo

by: Roger Hill

It was clear on May 21, 2002, with a nice 9-day-old moon hanging in the sky. So, when it got deep into twilight, I headed outside, hooked up my Philips WebCam into my C8, and took some video of the moon. Some of my favourite areas were nicely visible: Plato and Apennine valley, Clavius, and, particularly, Copernicus.

The seeing was not bad that night, the images seeming to roll around the screen, rather than boiling madly, which is usual for my location. I focussed as best as I could, and started capturing video. What was interesting was that I got the idea that if I could zoom in a bit more, that the seeing could handle it...that for once, it was not the seeing that was limiting the amount of detail that I could capture.

After I had captured a couple of gigabytes worth of data, an hour had passed. I took the camera off the telescope, started copying the data over my network onto one of the machines in the house, dropped in an eyepiece and

*See **Copernicus** on page 6.*

Editorial

by: Scott Barrie

June's meeting had another full program. One of the first orders-of-business was the announcement that Ken Lemke was to be the first Hamilton Centre recipient of the 'Explore the Universe' Certificate. No one is more deserving and no one has worked harder at tracking down the objects on the list. It's gratifying to see Ken's enthusiasm and it's inspirational to see his determination. Congratulations, Ken. What's the next challenge?

Other items on the agenda included Ev Rilett's monthly observing guide, Roger Hill's latest web-cam adventures, and an introduction to a double star observing program by Michael Spicer, all of which are detailed elsewhere in this issue. The main speaker of the evening was perennial favourite, Dr. Doug Welch, who talked about detecting solar flares from your basement. He described an extremely simple yet effective device that he built himself in the space of a weekend. If you'd like to try the technique yourself, contact Doug for information.

On another front, you'll notice that this issue is a little longer than most. That's thanks to all the contributors who took the time to write an article or two, or create an image or two, and send them in. Thanks to all the contributors. You're the one's that make Orbit.

S.B.

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What's In Orbit

by: Ev Rilett

I'd like to take this opportunity to congratulate Ken Lemke. He has successfully completed the 'Explore the Universe' program. He has been an enthusiastic participant and has worked very hard for his award. He will be presented with the Certificate as soon as possible. Well done Ken! So the rest of you now have to catch up. This month's objectives are outlined below. (And don't forget you can set your own.)

Moon: Mare Imbrium, waning crescent which is visible approximately the 26th day of the moon's cycle within 3 hours of sunrise.

Planets: Mars & Jupiter, both in Gemini. Gemini seems a very bright constellation this month with its two main stars Castor & Pollux and being the host of these two bright planets.

Constellation & Bright Star: Hercules and its keystone.

Deep Sky Object: M13 & M92 Both globular clusters very much worth looking at. M13 is the brightest Northern GC and M92 is often in M13's shadow. It is magnificent in its own right. Don't leave it out.

Please come out to the observatory and enjoy the benefits and companionship of other members. All can share and learn from each other. Looking forward to seeing you all there.

E.R.

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From the Eyepiece

by: Mark Kaye

What a bust! I spent 11 days in a row at the Observatory in May and it was cloudy for 11 nights. What frustration to have a beautiful, high blue sky day cloud over just at sunset on two occasions. I am still paying for the clear skies that we had for the Leonids. I did get a lot done around the house, walls mudded and painted. I figure at the rate I am going now, the house should be done just about in time for the eclipse in 2024. I had really hoped to capture the planetary alignment and watch Ikeya-Zhang slide past M13 and M92, but it was not to be. I did see a really neat solar halo with an accompanying zenithal halo. Maybe if I start photographing clouds, the clouds will disappear?

As compensation, the Banquet was a very fine evening indeed. We had 44 people show up for the event. Matt BenDaniel gave a very interesting talk, enjoyed by all. His astrophotographic accomplishments are impressive and his enthusiasm catching. The four course meal was very good and the location was well selected. The centre owes many thanks to Grant Maguire, Steve Barnes and Tina Coppolino for all of their hard work in making this event fly. I would also like to thank Grant, Tina, Steve, space.com, Rajiv Gupta, Karen Barnes and Ken Lemke for the great door prizes. It was also great to have RASC members from Niagara and Toronto Centre there, as well as members of the NYAA. I would declare that the first annual banquet was a great success.

The summer months will soon be upon us and that means a different format for meetings. The first meeting will be the third annual Hamilton Centre Family BBQ. It will be held on Saturday, July 13th at the observatory. Last year's meeting was a terrific evening. We had beautiful weather and when our family left early (midnight), the observing was still going strong. Mark the day on your calendar now and be sure to attend. Food will be provided, please bring chairs and drinks of your choice.

Another event this summer is the Kingston Centre Family BBQ. We hold this at The Observatory on the Lake and this year it takes place on Friday the 16th of August. All RASCals are invited to attend. I cook up homemade burgers and sausages and there is lots to do. A mystery speaker will give a presentation once we have all stuffed ourselves.

Do not forget that our club observatory needs people to get out and do basic maintenance. The grass needs to be cut, the buildings tidied. Remember, this is one of the first places that the public sees our club and potential members that go away impressed are more likely to join. Key holders are especially reminded that they have a duty to help upkeep the site. Get out and support your club!

Clear skies!

M.K.

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Interim Report on the 2002 Saturn Study

by: Michael J. Spicer

Saturn has passed into the fiery glare of the sun. It will return later this year and, at that time, the rings will reach their maximum tilt - a great opportunity for the second half of our study. Meanwhile, I will make a brief interim report.

The purpose of the project was to collect measurements of the relative brightness of the various rings and bands of Saturn, to compare the planet's status with a similar study from the late 1960's published in the JRASC.

We have collected over 200 observations of Saturn, including those submitted from various RASC centres across Canada, and a number of observers in the United States. The observations showed great consistency. To date, the study's findings indicate that Saturn's rings have remained relatively consistent in brightness, while the bands on the planet have changed.

My thanks to those who have participated. The study's second part will run this fall and winter. As Saturn reappears, you are all encouraged to obtain copies of the Saturn Study observing form and submit your data to the Les Powis Observatory.

M.J.S.

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A Starry Feast

by: Ken Lemke

When I ventured into astronomy as a hobby, I had no idea of what was above me in the sky, nor had I paid any attention to it (the sky) other than the odd time I would notice the moon. Then, last July, since I needed a diversion from the stress of daily work, I decided to buy a telescope. This was going to be great, I thought to myself, I've got an 8 inch Meade Schmidt Cassegrain (I had read that ability to see was influenced by aperture), and now all I have to do is point the telescope up and life was going to be beautiful. Boy, was I wrong!!! Somewhere, in my reading, I glossed (ignored) over the problems (frustrations) that one would encounter.

Very quickly, I discovered that I had no idea of what I was looking at let alone how to find anything - that was the first frustration. Doggedly, however, I was going to win, because I thought that if I kept pointing the telescope up and moving it around, I would get lucky and find something that was on the star charts and I would somehow figure out what it was. That's when frustration number two (cloudy nights that won't let you see the stars) helped me get on track.

With all the cloudy nights, I decided to go back and do some reading, and this time I didn't ignore the authors. I put my telescope away and dusted off an old pair of binoculars and spent every clear evening for many weeks just sitting in the backyard with a star chart, trying to figure out the constellations and the major stars. To this day, I spend time studying new constellations with naked eye and binoculars as they rise in the East. I figure this will be part of my routine for at least two years until I become comfortable that I can recognize the constellations and their primary stars.

Note: As a benefit of my naked eye observing, I was treated to many sporadic meteors and an aurora. In fact, during most observing sessions, I see at least one sporadic meteor.

Last November I learned about the 'Explore the Universe' program from the RASC. For me, this turned out to be the greatest thing since "sliced bread". I got interested in doing the program since I tend to be goal oriented (my wife says obsessive). Armed with my greater confidence of finding things, out came the telescope. I started with the easy primary stars in constellations and found that with my improved knowledge of the constellations, I had no trouble finding them. I also forced myself to draw what I saw and write notes. This resulted in spending more time on each object and thus gaining a better appreciation of star fields, and other details that might otherwise have been missed.

On cloudy evenings, I would keep reading and studying star charts to get an understanding of where more challenging objects (to me) were in relationship to objects that I knew. For example, the Beehive (M-44) is almost at the midpoint of an imaginary straight line drawn between Pollux (in Gemini) and Regulus (in Leo). Having researched this fact, I found the Beehive, using binoculars, the first time I looked for it!! You can't imagine the joy and sense of satisfaction this experience gave me. I felt like I had just won an Olympic Gold Medal for Canada.

I have now completed the requirements for the 'Explore the Universe' program and am filling out the paper work to apply for the certificate. This is a great program from the RASC as it introduces you to a variety of starry delights – major stars, constellations, the Moon, double stars, planets and deep sky objects such as clusters, and nebulae. As a result of recording/drawing the objects, you don't just take a quick glance, you linger a while and savour it.

Personally, it has helped me to start to learn the sky and how to find objects with the real bonus being, that from my reading on all those cloudy nights, I am gaining a better appreciation of what is above us in the sky. I've also learned that you can get a lot of enjoyment with the naked eye, binoculars and smaller aperture telescopes. You don't have to have a monster scope.

The sky above us is a veritable 'Starry Feast' (see Menu below) of objects for us to choose from, and the beauty of these menu items is that they don't go to your waistline!

Some Menu Items:

• Planets: It's neat to watch Jupiter's moons dance from side to side on a nightly basis.
• Stars: I find star fields around the Major stars quite interesting.
• Variable stars
• Double stars
• The Moon: mare, craters
• Deep sky objects: globular clusters, open clusters, nebulae, galaxies, etc.
• Sun Spots: USING A PROPER SOLAR FILTER!
• Meteors and meteor showers
• Asteroids
• Artificial satellites (there's a lot of them)
• Comets
• Aurorae

I was asked the other day, "what's your favourite item". At this point, I'm still sampling the menu and enjoying it all. I will admit that I enjoy the rich star fields that you see around some of the major stars with my favourite being the alpha Persei grouping just below Mirphak in Perseus. Its awesome in binoculars.

As stated in the beginning, I had no idea what was in the sky above when I embarked on the adventure of amateur astronomy. At this point, I am gaining an appreciation and am finding it very enjoyable, and in the process I've met a number of friendly and helpful people in the RASC Hamilton Centre.

To other beginners, I would recommend:

• Work on the 'Explore the Universe' program.

• Get involved with the Hamilton Centre and go to the Observatory.

• Spend time naked eye observing and using binoculars.

• Use those cloudy nights and read, read, read.

K.L.

Report on the Centre Library

by: Michael J. Spicer

The Hamilton Centre has an extensive print library housed in the Marsh Building at the Les Powis Observatory. It is open to all members and very useful to on-site observers. The library is a result of Centre purchases, gifts from members and others, materials provided for various past projects, and the 1989 donation to the Centre of Ian Stuart's extensive library by his parents

The library is a collection of approximately 350 titles and a large collection of magazines and pamphlets, dating from the early 1930's to the present. For example, we have virtually a complete set of Sky and Telescope magazines to 1995. The library material can be divided into introductory texts, coffee-table pictorials, college-level texts, and project-specific data that members may sign out on loan.

In addition, there is a very valuable collection of non-circulating reference materials, including many star and lunar atlases, deep-sky observation materials, and a complete set of RASC Observers' Handbooks. Replacement cost for the library materials I would estimate at over six thousand dollars ($6,000.00) but little has been done lately to ensure the welfare of the collection. Some materials are irreplaceable.

I made a survey of the library materials in January of this year, due to the deteriorating state of many of the books and magazines. Mice and insects have been eating at the library, and high humidity and oxygenation are taking their toll as well. I have started some simple conservation procedures, cleaning the books and storing them properly high on the observatory bookshelves.

All of the books and magazines are now placed together against the north wall of the Marsh building on more-or-less solid open-faced bookshelves. There is a lot of work to be done if the library is to be conserved in a useful state. I would say that a dehumidifier on a timer, is a basic necessity.

A lot of materials listed on past collection notes are missing. I suspect that a visit to longtime members' homes might turn up a lot of useful and forgotten books which should be returned to the library.

The library also contains a lot of materials that frankly should be discarded as out-of-date and useless. I think the Reference Section has to be re-evaluated and these materials identified and protected.

*See **Library** on page 12.*

***Copernicus**, cont'd.*

enjoyed the view with just an eyeball.

The following day, I ZIPped up the files I had captured and burned them on to a CD-ROM. Once my data was safe, it was time to play with it and see what I could get. A few days earlier, a fellow in Holland had released a program called RegiStax. Well, he had posted several beta versions of RegiStax prior to that, but this was the first real version. I had been using some of the beta versions before this, and I had found his software to be vastly superior to anything else that I had found.

What his software does is called "Stacking," which is a process for taking the individual pictures from a movie and adding them together. Since noise in any given picture occurs on a random basis, you can effectively remove the noise (or drastically reduce it), by this process.

Suppose that in one picture, the pixel at row 50, column 100 has a value of 240. You don't really know if this is the 'correct' value for this pixel or not. If you take 3 pictures, and two of them have a value of 150, and the other is 240, you can state with a bit more confidence that the value is supposed to be 150. If you take 300 images, and you get 50 of them being 240 and 250 of them at 150, you can be very confident that the actual value should be 150. The actual math gets a lot fancier than this, but I hope you get the gist of what stacking does to reduce noise.

The main problem is that with bad seeing the image is wandering around and this makes it very difficult to precisely overlay one image on top of the other...a process called "Registration". There are several programs that can do this, but RegiStax does as good a job at this as any of them and far better than most. The reason that it does this is due to a technique called Fast Fourier Transform.

So, RegiStax does both of these tasks, Registering and Stacking very well. It does something else too, called "Wavelet Processing", which I am not going to go into right now, except to say that it is a very flexible unsharp masking technique (ask me at a meeting).

Astonishingly, it does all of this and comes in a package only 400K in size. It is nice and fast, too, considering what it is doing.

I had used RegiStax on some old files of Jupiter that I had, and was amazed at how much of a difference it made. If you were at the May meeting, you would have seen an image I took that showed a shadow transit (where the shadow of a moon crosses the face of Jupiter). Now it was time to see what it could do with the Moon.

As I processed each file in turn, I was astonished at what I was seeing. However, when I saw Copernicus, I was completely blown away. In years past I had taken many minutes of video on VHS tape and used a device to grab individual frames as I stepped through the tape looking for the best ones.

This tedious process yielded a couple of (what seemed at the time) to be incredibly good images. Good enough to impress many people who had spent years taking slides of objects in the sky. The image from May 21, though, surpassed anything I thought was possible through my old and venerable telescope.

Remembering that Steve Barnes, Bob Botts, and Mark Kaye had images published in SkyNews, I checked their web site, and found the 'Astronomical Picture of the Week' section. I sent off my image of Copernicus, and it was accepted. (ed. note check out this picture on page 1.)

So, the Hamilton Centre had four people in SkyNews in May...three in the magazine, and one on their web site. The image shows more detail than pictures taken with the Lick Observatory 36" refractor, and the Palomar/Mt Wilson 60" reflector in the 1960's using film.

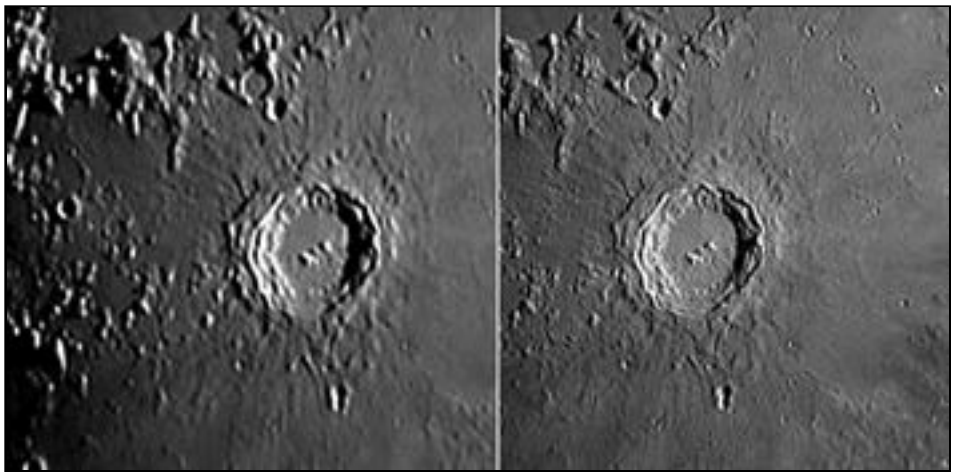
I am a member of the QCUIAG (QuickCam and Unconventional Imaging Astronomy Group) list on the Internet, a group of people dedicated to using devices not meant for astronomy to image the heavens. I wrote to the list and told them that SkyNews had a picture taken using a web cam. A fellow wrote back that he had taken a similar picture of Copernicus a couple of hours earlier on the same night. He too had used a C8 and a similar

web cam. The difference was that he was in Norway! He had put his picture on his web site. I checked it out, and although it was a very good picture, mine was quite a bit sharper.

A thought then occurred to me. I placed the two images side-by-side, and noted that in Carstens image Copernicus was smaller. I shrank mine a bit, crossed my eyes, and a 3-D image of part of the crater showed up. I played around with the images a bit...resizing one, and rotating the other. When I got them all lined up, the 3D image was very noticeable.

A large number of emails were passed around QCUIAG. Carsten and I figured we were about 6,000 km apart (straight line through the Earth), which seemed to be not quite enough for a true stereoscopic picture. The consensus was that the 3D nature of the combined images was due far more to the change in the length of the shadows from one image to the other than to the distance between Carsten and I. We both agreed that when night returns to Norway (sometime in August) we will be trying similar things, and that we need to hone our techniques to get the sharpest possible images out of our equipment.

We also went looking on the Internet to see if anyone else had ever taken 3D pictures of the lunar surface. There were none. NASA had a few that were taken from lunar orbit by various manned and unmanned missions; and there were several people who had taken pictures of the moon at extreme libration values (sometimes the two pictures were taken several years apart). But these latter pictures were typically of a full moon, or very close to it, not close up pictures. We could find no hint that anyone had even tried it before from the surface of the Earth...amateur or professional.



Two photos, one taken by Roger Hill, the other by his friend Carsten in Norway, taken approximately 2 hours and 6,000km. apart. View it through a stereoscope or by correctly positioning (i.e. crossing) your eyes and they combine to form a 3 dimensional image.

When you think about it though, it is not that surprising. Until very recently, it has not been possible for amateurs to take extreme high resolution pictures; direct viewing was ALWAYS sharper than what could be captured on film, by a long shot. It was only when amateurs became able to freeze the seeing with sensitive video cameras that this started to change.

Secondly, even if you took a great slide of the moon, for stereoscopy you need two great images taken as far apart physically as you can get.

Prior to the Internet, the chances of finding someone who had similar (or identical) equipment, and then corresponding with them to set up an observing program was extremely difficult.

In the meantime, Bob Botts, looking at an image I posted on my web site, asked if I knew anything about anaglyphic pictures and, if I knew how to produce them, could I let him in on the secret? A quick check on the Internet to refresh my memory on what an anaglyphic picture was found a fair bit of information.

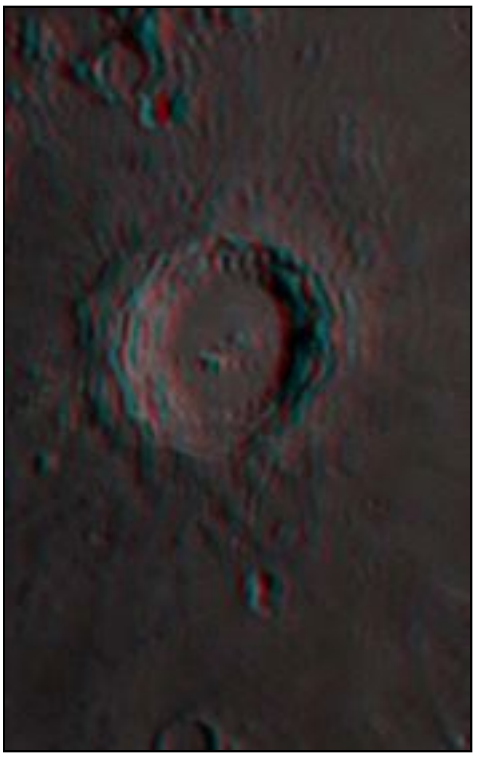
Basically, an anaglyphic picture is a combination of the two stereoscopic pictures, but one is done in shades of red, and the other picture in blue. When a red filter is placed in front of one eye and blue filter one in front of the other, each eye then sees a different image, and the brain combines the two into a single 3D image.

Given this, I told Bob how I thought the process should work, and I also noted this to QCUIAG. One of the QCUIAG members did a bit more digging on the Internet and found

*See **Copernicus** on page 8.*

***Copernicus** Cont'd.*

explicit directions on how to produce these types of images using PhotoShop. This fellow was a guy called Tom Goode, who lives in Milton, Ontario, as do I. Astonishing, really. The instant you start to get accustomed to dealing with people around the globe, and up pops a guy just a couple of kilometers away!



Anyway, what you see here is just the first fumbling attempt at taking high-resolution 3D images of the moon's surface from the Earths surface. Carsten, Tom and I will be doing a fair bit of experimentation, along with others from around the globe once Carsten gets some nighttime back (He's at 60 degrees N). Then we'll really have some fun...and isn't that the reason for hobbies in the first place? If it isn't fun...why do it?

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2002 Double Star Challenge

by: Michael J. Spicer

I have noticed that members young and old are fascinated by double stars and enjoy looking at them in binoculars and telescopes. I can't tell you how many times I have been called over to a telescope at the observatory, to look at Mizar or Albireo. Double stars are an important part of the Beginner's Certificate program, and they are just as important to developing your advanced astronomical acuity.

Mizor and Alcor in Ursa Major comprise one of the better known double stars

A good amateur astronomer has a scientific acuity - he can measure with great accuracy, things like brightness of objects (in magnitudes), the separation between objects (in degrees, minutes and even seconds of arc), the position of objects to one another, relative to North ("position angle"), and the colour of a star, indicating its spectral type. Such acuity and accuracy is not difficult to achieve with practice, and that is the object of the double star challenge.

A Project Book will be available at the RASC BBQ on 13 July, for those who are interested. The project requires teams of 2 - one member assists the other and both record the results in the project book. Like all exercise programs, you will be amazed at the improvement after only 20 minutes a couple of times a week for a few weeks! Your eye will be trained by this program to measure brightness differences of 0.2 magnitude or less; separations of two seconds of arc (2") or less, and position angles of 5° or less! And you may have a lot of fun doing it.

Anyone can look and say "Wow! That's beautiful!" but a trained astronomer can say, without looking it up: "Wow! That Albireo is beautiful! Gold and blue-green stars, magnitudes 3.2 and 5.4, with a separation of 35 seconds at a PA of 55°!!). This accurate visual acuity comes in handy when observing variable stars. But the Variable Star Project can wait until next year. Please come out to the BBQ on 13 July, find an observing partner and sign up for the Double Star Project!

M.J.S.

Michael Spicer is one of the club's more active observers.

Grant Dixon - Celestial Portrait

by: Tina Coppolino

Long time Hamilton Centre member Grant Dixon

Anyone who has met Grant Dixon, will tell you he is a funny guy, a jokester, a great story teller (boy, can he tell you stories) and best of all a really nice person. So without further delay, lets get going on "Grant Revealed".

In 1952, when he was a very young boy, he did all the things that young boys love to do. He played hockey and baseball and generally got his nose dirty. During this time he also contracted a debilitating virus that almost left him an invalid. Although this ended his dreams of a career in the NHL, it also spurned on a new hobby and interest. While in hospital he was given an astronomy related gift and this gave him many days and nights of wonderful thoughts of the cosmos.

Over the next 8 years of convalescence, as a substitute for running and jumping, his interest in astronomy grew. In retrospect, this potential tragedy, turned out to be not such a bad thing.

In 1955 Grant joined the Hamilton Centre and was a member for about ten years. He then took some time off for things like dating, marriage, raising a family, and buying a house (notice he did this all in the correct order). He returned to the club in the mid 1970's and since then has spent over 20 years on the astronomical boards and councils as well as three years as National Rep.

He has been an avid observer for over 40 years and just recently let the cold win out over the desire to observe on those extreme nights. He has observed many interesting objects with his 6" f8 German equatorial reflector. This telescope is dearest to his heart because it is the first one he ever made. All the other telescopes have been just tools, some better than others.

One of his favourite observing locations is lying flat on his back on an island in the middle of Skull Lake in Northern Ontario. If you happen to know where Skull Lake is you'll know you can't get there by road. It requires a canoe and a number of portages and it is probably 50 km. from the nearest house light. Carrying a telescope is a bit of a challenge, considering one portage is 3 km. long. Therefore, this location is a naked eye heaven. On a clear night he has seen M33 which was estimated to be at the limiting magnitude of 6.7. That is a very dark sky!

There isn't any particular part of the sky that Grant likes to observe more than others but there are some constellation names he likes. You would have to ask Derek Baker why he likes the name Ophiuchus. Grant also loves the funky name Zubenelgenubi (found in the southern sky). Barry Sherman once said if you could say the name without laughing you were a true observer. (okay, I tried, you're right!)

*See **Grant** on page 10.*

***Grant** Cont'd.*

You can imagine in 40 years he has seen a lot of rare events.

In 1983 a naked eye comet IRAS-ARAKI-ALCOCK(Bert's favorite too) traveled over 90 degrees in one night. You could watch it move over the whole evening. It was beautiful! The impact of Comet Shumaker-Levy 9 into Jupiter was exhilarating to see. Another rare event was a triple conjunction in the early 1980's which only occurs very 800 years.

Observing asteroids are fun too, because they are so challenging.

Grant would love to see the southern sky some day. In the far, far, far, distant future he would like to see Saturn's rings from it's moon Titan. (Okay, who said you have to limit your observing location just to earth?)

Grant's advice to anyone starting out in amateur astronomy is to join a club and become active. You will only get out of it what you put into it. He has lots of tips on observing since it is not a hit and miss affair. Plan your nights in advance. Pre-select your targets and back-ups. He will sometimes spend 3 hours going over charts and data for every hour at the eyepiece.

Many years ago, three people (including Grant) decided to hunt down Pluto using the clubs big scope. This was not an easy task because of the night skies at the site and Pluto was in a very densely populated star region. They spent 30 man hours going over the charts (ain't cloudy skies grand) and when the night finally came, "we turned the scope and had it located in about a minute". We spent the next 15 minutes confirming that it was Pluto. By that time they had attracted quite a crowd. "They thought we were wizards. We just told them 'Ah, we were lucky'."

Another recommendation from Grant is - use your eyes first, learn the constellations (66 out of 88 can be seen from the Hamilton area), then get a good set of binoculars, then think about purchasing a telescope.

Grant's contribution to the Hamilton Centre has been most appreciated and rewarding to both. In 1993 he received the W. Fautley Award. On March 27, 1999 he received an appreciation plaque and a lifetime membership in both the Hamilton Centre RASC and the HAA for his educational work with the public. There are numerous other awards he has picked up along the way.

He has traveled far and wide to give lectures from groups as small as two people to crowds of over 1000. His greatest contribution to the lecturing field was as demonstrator at the Hamilton Centre's Observatory and the William J.McCallion Planetarium over a period that spanned over 22 years, which constituted as many as 150 lectures a year !!. It has been estimated that he has reached over 100 thousand people!!. (okay maybe that's a little inflated).

Grant has also met some interesting people along the way- Bart Bock was one of them(a real live character). He has made some very fine friends while on the board but has also lost some as well. Being involved in the club with a hands on approach, at times was a costly affair. It was a lot of hard work to run a successful club.

A lot has changed from the formal shirt and tie days, to a now much more casual and comfortable club. One area which Grant hopes never changes is the amateur love and awe of the heavens above, always remain the same.

T.C.

June 10th Eclipse photo by: Bob Botts

Geology and/or Astronomy - Part 3

by: Ev Rilett

In Part 2, we looked at Comets and Tektites. This time it's Meteorites. Can you see these subject coming together yet?

METEORITES - are metallic or stony bodies that enter and are hurled downward at a tremendous speed through the Earth's atmosphere, impacting on the ground. They are far more frequent than most people realize. More than 1 million tons of meteoritic material is produced annually, which accounts for a good portion of the atmospheric dust which causes our blue skies and red sunsets. The percentage of landed meteorites is small because the vast majority are extremely tiny. Most burn up completely upon atmosphere entry (meteors), but many do strike. Most meteorites have been discovered by farmers while ploughing their fields. One of the best places to search is Antarctica, where the black stones contrast with the white glacial ice. Meteorites may look just like an every day stone and not be noticed. The geologist/astronomer however, will note a charred surface and recognize it as an extra-terrestrial stone. However, there have been some catastrophic surviving impacts on our Earth in recent times (geologically speaking) of significant size:

1) The Sudbury meteorite, here in Ontario occurring 1,850 million yrs ago. It was originally more than 70 miles wide. The impact cracked the nickel vein and forced it to seep upward to the surface. Nickel is an uncommon element on Earth and the Sudbury Nickel Mine is (or at least was) a major source. This crater's shape has become oblong is no longer visible from the surface.

2) The Barringer Meteor Crater in Winslow Arizona. It measures approx. 1300 metres across and 180 metres deep. The rim rises 45 metres above the level of the surrounding ground. there have been 25 tons of iron meteorite fragments found, some scatted as far a 7 kl. It crashed approx. 22,000 yrs ago. weighing over 60,000 tons - a recent event.

3) The Meteorite of February 12, 1947 near Vladivostok. It produced 106 craters, the impact holes ranging in size up to 28 metres across. It covered an area of nearly 5 sq kl. There were more than 23 tons of iron fragments recovered.

4) The largest known meteorite, Hoba West, was found in 1920 near Grootfontein in south-West Africa and weighed about 60 tons.

5) One of the largest meteorites actually seen to fall was a 776 lb. stone that landed in a farmer's field near Paragould, Arkansas, on Feb 7, 1930.

6) The new Quebec Crater, in Northern Canada, which is 2 miles in diametre, 1300 ft deep and filled with water.

7) One of the largest impact structures is outlined by the distinctively circular Manicouagan reservoir in East-central Quebec nearly 60 miles in diametre. Erosion has taken its toll on this crater and we now see the remains of the impact.

8) Here in Ontario are the remnants of Holliford Crater. I do not have the statistics but have been to this site. It is almost unrecognizable. The rim is barely visible in small areas and the crater has been filled in by farmland crops. It is an extremely old crater and again erosion has all but healed this wound.

Despite the intensity, speed, light and thunder of these bodies, the damage to the Earth is slight. Many large meteorites have been found to survive. These however, are not the massive ones which leave the vicious inflictions behind. Although many of the particularly massive meteorites leave tremendous craters, the meteorite itself disintegrates upon impact dispersing tons of meteoritic fragments for examination. Shockwaves are also experienced, sometimes globally. It is this impact explosion which actually cuts the crater. Of all the large craters on earth, not one massive meteorite has been found underground.

Thankfully, these impacts are very rare. The solar system has settled down and we no longer suffer from the bombardment of millions of years past. Also on the positive side we are allowed the luxury of examining the small to large space visitors, first hand.

In the final article, I will wrap things up with a picturesque look at craters and impacts. Look for it.

E.R.

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Coming Events:

July 13, 2002 - Hamilton Centre pot luck Barbeque and Family Night at the Observatory.

July 19, 2002 - Sidewalk Astronomy at Spencer Smith Park in Burlington. Come and see the moon and stars through members' telescopes.

August 16, 2002 - Sidewalk Astronomy at Spencer Smith Park in Burlington. Come and see the moon and stars through members' telescopes.

September 5, 2002 - General Meeting at 8:00pm at the Steam Museum. Program TBA.

September 12, 2002 - Board Meeting at 8:00 at the observatory. Come on out and shape the future of the centre.

September 13, 2002 - Sidewalk Astronomy at Spencer Smith Park in Burlington. Come and see the moon and stars through members' telescopes.

Directions to Observatory:

From Hamilton or Guelph:

- Hwy 6 N of Hamilton,
- Take Concession 7 East eastbound, cross Centre Rd.
- Continue on 7E, past the rail tracks, proceed to near the end.
- Our gate is on the south side on the last lot (south west).

From Mississauga or Milton:

- Britannia Road past Hwy 25, Guelph Line, Cedar Springs to end
- South 1 block on Milborough Town Line to Concession 7 East.
- Right on 7th Concession, then first driveway on left.
- Our gate is on the south side on the last lot (south west)

From Burlington or Oakville:

- Dundas Street (HWY #5) to Cedar Springs Road
- Cedar Springs Road to Britannia Road
- Left (west on Britannia road to Milborough Town Line
- South 1 block on Milborough Town Line to Concession 7 East.
- Right on 7th Concession, then first driveway on left.
- Our gate is on the south side on the last lot (south west)

Hamilton Centre Observatory
43° 23, 26" N 79° 55, 22" W **Telephone 905-689-0266**

Club web site - http://www.rasc.ca/hamilton/

***Library** Cont'd.*

Our collection of Astronomy magazines is quite colourful but of little reference value. Council has agreed to donate the library's "Astronomy" magazines to any interested person. Would you like them?

The Centre used to have a librarian to oversee and speak for our valuable collection. In recent years we have had no Librarian. I recommend that someone be prompted to volunteer for this position on Council. If we do not take steps to keep the library in good shape, we may one day rue our lack of foresight.

M.J.S.
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June 10th Eclipse photo by: Steve Barnes