Orbit
celebrating 100 years
The official publication of the Hamilton Centre of the Royal Astronomical Society of Canada
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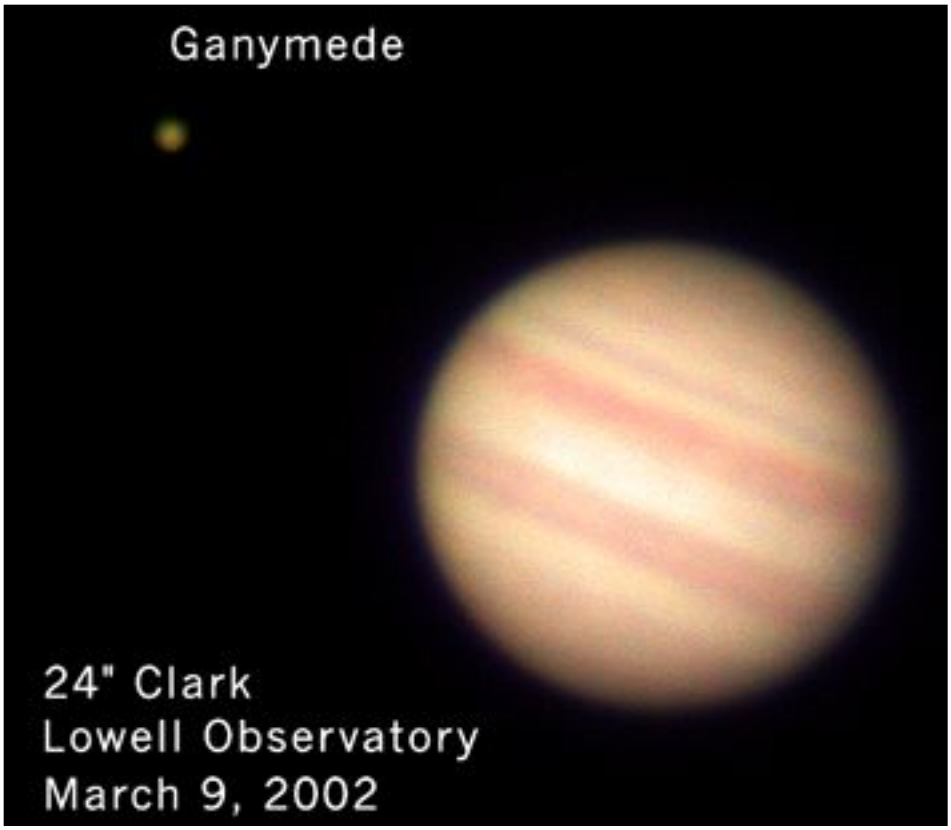

Yes, you read the caption above correctly. The image was taken by Bob Botts through the 24" Clark refractor at the Lowell Observatory in Flagstaff, Arizona. He used a Nikon CP995 digital camera.

What's In Orbit

by: Ev Rilett

Daylight Savings begins this month. That means shorter nights for us, but also the warmer weather is on its way. Not to mention mosquitoes and bats. We like the bats though because they eat the mosquitoes. They can stay.

The two biggest planets, Jupiter in Gemini and Saturn in Taurus are still available at reasonable hours. Both are at an excellent viewing height. Enjoy the dance of Jupiter's moons. Saturn's rings are pretty wide apart at the present time which makes their moons more difficult to see because of the glare from the rings. But test your observing skills and see how many you can spot.

All five of the naked eye planets will be visible in the western evening sky between April 18 and May 18, 2002. Take as many opportunities as possible to watch them. Orbital motion should be fairly obvious and is something to shoot for in the Explore the Universe program. Hint Hint.

*See **What's in Orbit** on page 2.*

This Month... And Next

by: Scott Barrie

April started off with the type of meeting we all look forward to. The guest speaker was **Dr. Robert Garrison**, a professor of Astronomy at the U of T and National President of the RASC. Bob spoke about the history and future prospects of a the Helen Sawyer Hogg Telescope in Chile and Argentina. He was a charming, eloquent and entertaining speaker and his talk was thoroughly enjoyed by everyone in the room.

Mr. Garrison was followed by brief talks by **Ken Lemke**, who shared some of the things he's discovered as he's been learning the night sky, and **Tom Luton** who recalled his early experiences in astronomy when he was young enough that he had to head inside when the streetlights came on.

Ev Rilett presented her monthly Observing guide and recommended that we all take advantage of any clear nights to learn the constellation Bootes and get a good look at The Beehive (M44). She also mentioned the upcoming planetary alignment. For more information see **What's In Orbit** on page one.

The evening ended with a presentation of slides by **Mark Kaye** that included some photographs of **Comet Ikeya-Zhang**. One of these images can be seen on the opposite page.

Also mentioned at the meeting were two events in May that you might want to keep in mind: the yellow scope auction and the club banquet. Both are mentioned in detail elsewhere in this issue.

Finally, I want to thank Bob Botts for creating the coloured banner on the front page. Now that Orbit is distributed electronically we have much more flexibility as far as the use of colour is concerned. Over the next few issues we plan to revise the look of Orbit and we invite your comments.

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***What's in Orbit** cont'd.*

The "Explore the Universe" program, specifically geared to beginners, is offered by the RASC Observing Committee, referenced with the "The Beginner's Observing Guide". Learning your way around the sky can be fun and doesn't have to be daunting at all.

A brief description: There is a wide range of 110 Observing objects with a requirement of 55 objects to be hunted down. The categories or organized by seasons, and span the Moon, Deep Sky, Constellations and Bright Stars, Solar System and Double Stars. I will supply the details by email for anyone interested and you can pick and choose which ones you'd like to chase.

This month I've selected the following challenges (but you can pick your own). I've picked the constellation **Bootes** with the bright star **Arcturus**, a reddish orange colour, -0.05 magnitude. The Deep sky object I've chosen is **M44, The Beehive cluster**. It can be found approximately half way between Gemini and Leo. Draw a straight line from Caster & Pollux to Regulus and look half way. It is a naked eye fuzzy. In binoculars it is a lovely open cluster. For the moon, try to pick up **Mare Crisium**. It is best observed in the 1st quarter. Enjoy yourself.

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

Ev Rilett, Observing Director
erilett@cogeco.ca

From the Eyepiece

by: Mark Kaye

April is a bittersweet month for me. I am an avid skier and once April rolls around, snow does not have a chance here in Ontario. But the bulbs are pushing up and the warm weather is nearly here. I always marvel at how the nights go from long and dark with a brief twilight to all of a sudden there being a gentle fading of the light and how the winter constellations are quickly pushed westward out of the sky. I must confess that of all the seasons, spring is my least familiar. The weather often conspires against spring time observing and it seems before I know it, the summer triangle is dominating the sky overhead.

As far as observing goes, March was a pretty good month. Comet Ikeya-Zhang still dominates the early evening sky. This is a really nice little comet, lots of detail in the bright nucleus with a curving tail with a brighter central spike. Unfortunately, it sets pretty quickly and requires immediate attention. To photograph this comet, I had to be ready before twilight ended, framed and set up in the guide scope on the nucleus. Because of the limited time, I elected to manually guide on the nucleus rather than risk loosing the comet to the horizon while trying to set up the ST4. One thing I learned from this comet, it is very important to remove the Hartmann focusing mask before starting a forty minute exposure.

This photo of **Comet Ikeya-Zhang** was taken by **Mark Kaye** on the evening of the March 16th. It is comprised of two 20 minute exposures taken at 5.6 with a 700mm lens on E200P. The shots were manually guided on the comet nucleus. They were then scanned and sent to be stacked by Steve Barnes.

As far as club related activities is concerned, Steve Barnes has been in contact with Matt BenDaniel, an unattached RASC member who lives in Medford, MA. Matt is an accomplished astrophotographer and he has agreed to come and visit the Hamilton Centre to give a presentation about his work and techniques. The board decided that Matt would make a good speaker for a Centre banquet and have made the arrangements to hold a banquet the weekend after the G.A., May 25th. Tickets for the banquet are all ready on sale and available from board members for $37.50. We hope that this event will become the first of a yearly series of banquets to be held by

*See **From the Eyepiece** on page 5.*

Observing Under the Very Big Dome at Roper Mountain

by:Michael J. Spicer

I was invited to attend a star party held on Saturday 23 February at Roper Mountain Observatory near Greenville, South Carolina. This was an intramural for local astronomy clubs and not a public observing night - free access to a huge refractor! I attended with several members of the Foothills Astronomical Society. Steve Prewitt of the Foothills Club and Mark Hornbeck (of FAS and the Ashville Club) and I drove to the observatory, located atop Roper Mountain rather too close to the city of Greenville SC for dark skies. We arrived just as the sun set blood-red over the town.

The observatory itself is impressive, over 50 feet in diameter and about 65 feet high rising unobstructed from the peak of Roper Mountain (a hill about 100 feet high). The great dome houses the 23" f-17 Clarke refractor and a no-less impressive 6" apochromatic refractor strapped alongside the main tube. A 50 foot astronomical dome can be as awe-inspiring as the nave of a medieval cathedral, and just as cold. This Clark refractor was at Harvard in 1939 and is famous as the instrument that "spotted" the Martian invaders in the radio show "War of the Worlds". It has been expertly refurbished and is maintained by the observatory's hard-working curator, funded by the local school board. Americans know how to spend money on science education.

I did not take my 11" SCT along because there are many instruments available at the observatory. Steve and I hauled out a very long-focal length Cave 12" dob and used that - imagine being perched atop a tall stepladder in a cold wind! Mark Hornbeck and Lee Pettijohn brought their 125 ETX scopes and used them to advantage. Some local Greenville boys set up a very large and complicated-looking reflector. The Clark refractor had a steady line of observers. About 20 people from clubs arrived in all, and there were plenty of telescopes to look through...including the Clarke.

As the evening progressed, the clouds thinned and moved off, leaving a clear but coldly twinkling sky. I am an SCT owner who likes to sit while observing. Perched on the stepladder, I peered into the dob's eyepiece at Jupiter while the cold wind blew into my winter coat. I thought: "Why do falling temperatures bring steadier skies? Can't conditions here be warm and dry and steady? Guess not." I sought the shelter of the huge dome.

I generously was given the opportunity to observe a number of objects including Jupiter and Saturn at length through the great refractor, using a variety of eyepieces including a binocular viewer and some of my own eyepieces and filters. The great refractor can't really perform without very steady seeing. According to the observatory curator, such conditions are becoming rare. This evening, my panoptic 35mm on the Clarke 23" gave some very good views of Jupiter and Saturn even though the gibbous Moon reduced visibility.

We had fun until about 10:30pm when Steve Prewitt succumbed to the cold and Mark Hornbeck and I got hungry. We packed up the dobsonian and replaced it inside the dome's storage area with thanks to our friends. Nothing ends an observing session like a full meal at the Olive Garden with an ebullient waitress. I should add that my wallet fell out of my pocket and was left lying in the restaurant parking lot as we drove home, stuffed. The manager found it and I was able to retrieve the wallet intact the next day... no doubt my friends will expand on our Olive Garden experience.

My latest Roper Mountain experienced again confirmed how friendly and helpful US astronomers are. I watched them stand aside time and again to show people things in the telescopes. They shared equipment and exchanged stories with a lot of laughter. Every piece of equipment was treated with great care and at the end of the night, everyone left feeling very satisfied with the experience. I plan to observe again at Roper mountain every chance I get.

Many thanks to the observatory staff and the Roper Mountain club for hosting a successful star party. My thanks to Steve Prewitt for recommending that we attend, and to his dear wife Lara for putting me up for my recent stay in South Carolina.

MJS

***From the Eyepiece** cont'd.*

the Hamilton Centre. We already have people coming from other centres to this event, so it should be a good way for members to not only socialize with Hamilton members, but to get to know people from some of the other clubs in our area. For more information see page 8 of the newsletter or visit the club web site.

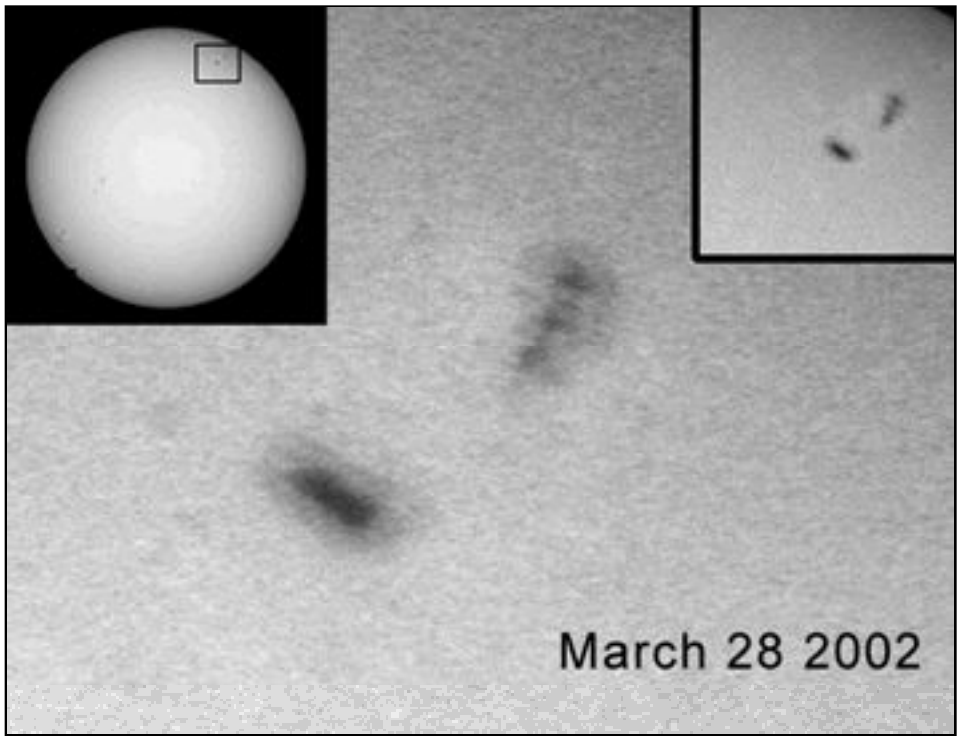
It is almost the time of the year when we can start getting back out and working on the observatory. A lot was done last year to tidy up the property. A few jobs remain. The roll-off building needs more work. The east and north walls need to be shored up some more. The floor really needs some work, the carpet on sand has ceased being a useful working arrangement and the dust level in the building is now too high. Look for work parties to be arranged in the coming months. This is a great way to learn more about the observatory and have some fun too. I always have a good time when a group of people are out helping fix up the observatory.

One final question: Have you observed with the Marsh Refractor? If not, the next time you are out at the observatory, give it a whirl and see how this fine refractor is on the planets. We need your feedback on the telescopes at the site if we are to make them work better. Do not forget to look at that comet. It is worth the effort!

Clear skies!

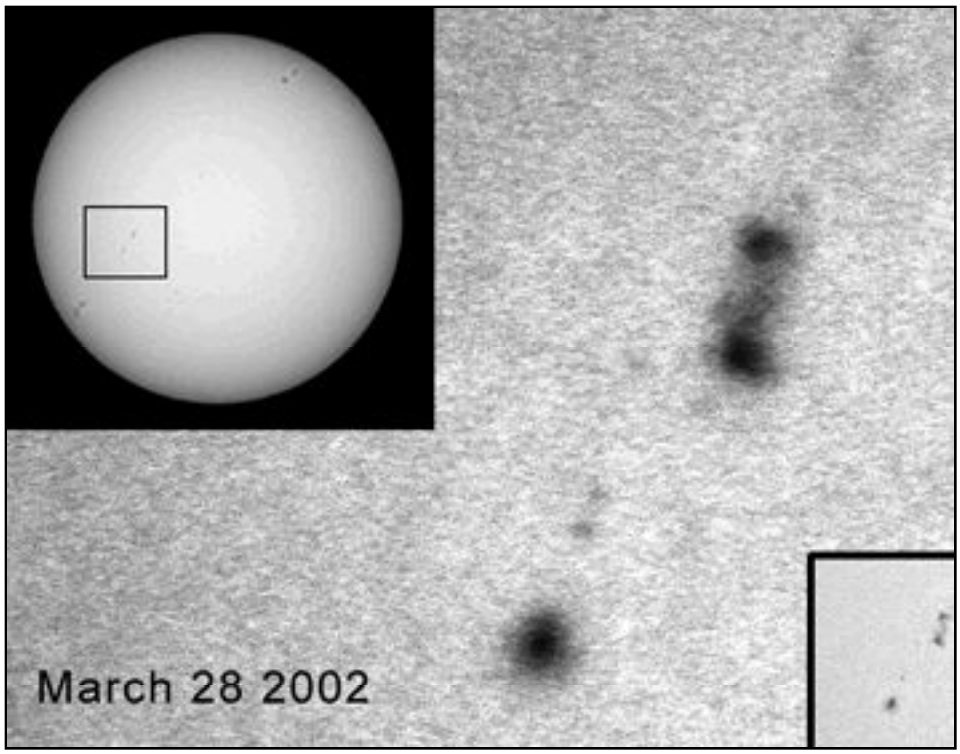
MK

The Observatory by the Lake
http://www3.sympatico.ca/mark.kaye/



Both these sets of images were created by Bob Botts who has been doing a lot of experimenting with his Nikon digital still camera.

"These images were my first attempt at shooting the Sun with a digital camera. The optical setup was a 4" refractor and the "Baader Planetarium" visual grade solar filter. The digital camera was coupled to a 35 mm Tele Vue eyepiece with Tele Vue's proprietary adapter. The close ups were captured with the same setup except for the eyepiece, which was a Tele Vue 8 mm Radian. All images were composites, processed in a well known photo editing suite."



Geology and/or Astronomy - Part 2

by Ev Rilett

In Part 1, I spoke briefly of Meteors, Comets, Tektites and Meteorites. Now lets look at more general descriptions and some examples of the wonders of astronomy and geology.

COMETS - are huge dirty snowballs in space composed of mud, dust and ice. Two comets may travel close to each other for years and eventually come so close to each other that one will be redirected - out into space, or into the solar system beyond Jupiter, Saturn, Uranus, Neptune & Pluto. If we're lucky, it may be directed to the inner solar system, toward Mercury, Venus, Earth & Mars. These are the ones we can see at night in the sky. As the comet travels toward the sun, the ice begins to melt and debris is loosened, remaining close the comet's head, and the Solar Wind pushes the remains away to form the comet's tail. It is the debris from the comets tail that crosses and collides with Earth's orbit. Comets have very limited life spans in the inner solar system since the sun will completely melt and dissolve them and they can't regain their mass. This means that Halley's Comet will eventually melt away. Planets and Asteroids all stay on the pretty much the same plane (relatively flat) and due to other tremendous gravitational forces are unable to collide with the Earth. Comets however, surround our entire solar system like a giant sphere, and are not governed by such forces. They can enter from anywhere, on any plane at any time and at any speed. They enter the solar system quite randomly, get caught in the orbit of any celestial body, including the Earth, and strike it.

In times past, comets struck the Earth quite often. Today, it is a rare occasion for a comet to survive our atmosphere and make an impact with the Earth. On June 30, 1908, a witnessed and recorded explosion took place in the atmosphere, approx. 8 km. above the ground, near the Tunguska River, Siberia and the shock wave leveled hundreds of square miles. It is believed to have been a "tiny" comet (not even close to Halley). The explosion was equivalent to about a 10-megaton nuclear bomb, or an impacting body weighing approx. 100,000 tons. Seismographs all over the world detected the explosion. The more sophisticated seismographs measured 4 shock waves going through the Earth. The comet did not have enough strength to survive to the surface, but rather gave up its energy of motion in the atmosphere, creating the equivalent of an "air burst" in nuclear weapons jargon. When scientists arrived on the scene to explore, only the devastation remained because the comet had melted. No craters were formed. Unfortunately, for the geologist, there are no remains for collection. In July 1994, a comet. Comet Shoemaker-Levy 9 (discovered by the team of the Shoemaker's Gene and Carolyn and David Levy, a Canadian - it was the 9th comet discovered by this team). This comet will collide with Jupiter, the largest planet of our solar system. Close enough to observe the impact and consequent results, yet far enough away to be safe.

So far, yet so close!! Count your rocks!!

TEKTITES - small glassy minerals created from the melting of surface rocks by an impact of a large meteorite. Not only are the rocks shattered in the vicinity of the impact, but the shock wave also causes shock metamorphism of the surrounding rocks, changing their composition and crystal structure. The force of the impact also fuses sediment into small, dark glassy spheres called tektites. Can you imagine an astronomer without one of these? Not this astronomer. I keep my tektite with my mineral collection and small as my collection may be at this point, it is growing.

In South Africa, extensive deposits of these pherules, over 1 foot thick and dating back to 3.5 billion yrs. old, have been found. This discovery might support the idea that massive meteorite bombardments during the Archean, (the Earth's oldest geologic time period) played a major role in shaping Earth's first surface and providing it with the necessary ingredients for life. It has also been suggested that a very large meteorite might have triggered the process of plate tectonics by cracking the Earth's crust into several plates.

Did you read the article last month in the Gemini Newsletter on "All About Asteroids?" It was quite enlightening. If not, please do so! These bodies also come from space (the "Asteroid Belt" between Mars and Jupiter), can collide with Earth and deserve our attention. My apologies to asteroids for not including them in this series of articles. There are collisions of asteroids with the Earth, and in the beginning it was a common occurrence. but, at this stage in the Solar Systems evolution, it is an extremely rare occurrence. Jupiter and Mars have gravitational forces which determine the orbits of asteroids. Jupiter has a very strong gravity and can pull asteroids into its influence easily, and they're pulled through the Jovian system and destroyed or sent out at the outer reaches of its system.

Mars does not have the gravitational pull to force large asteroids off course and small ones are unlikely to be disturbed. Gaspra and Apollo are small asteroids, disrupted by Jupiter's influence, causing their orbits to become more and more elliptical and eventually crossing Earth's orbit and showering us with meteorites. Although Apollo passed within 20 millions miles of Earth and we believe we've received debris from it, it does not seem that we are in any danger at this time, or in the near future.

In Part 3, look forward to Meteorites.

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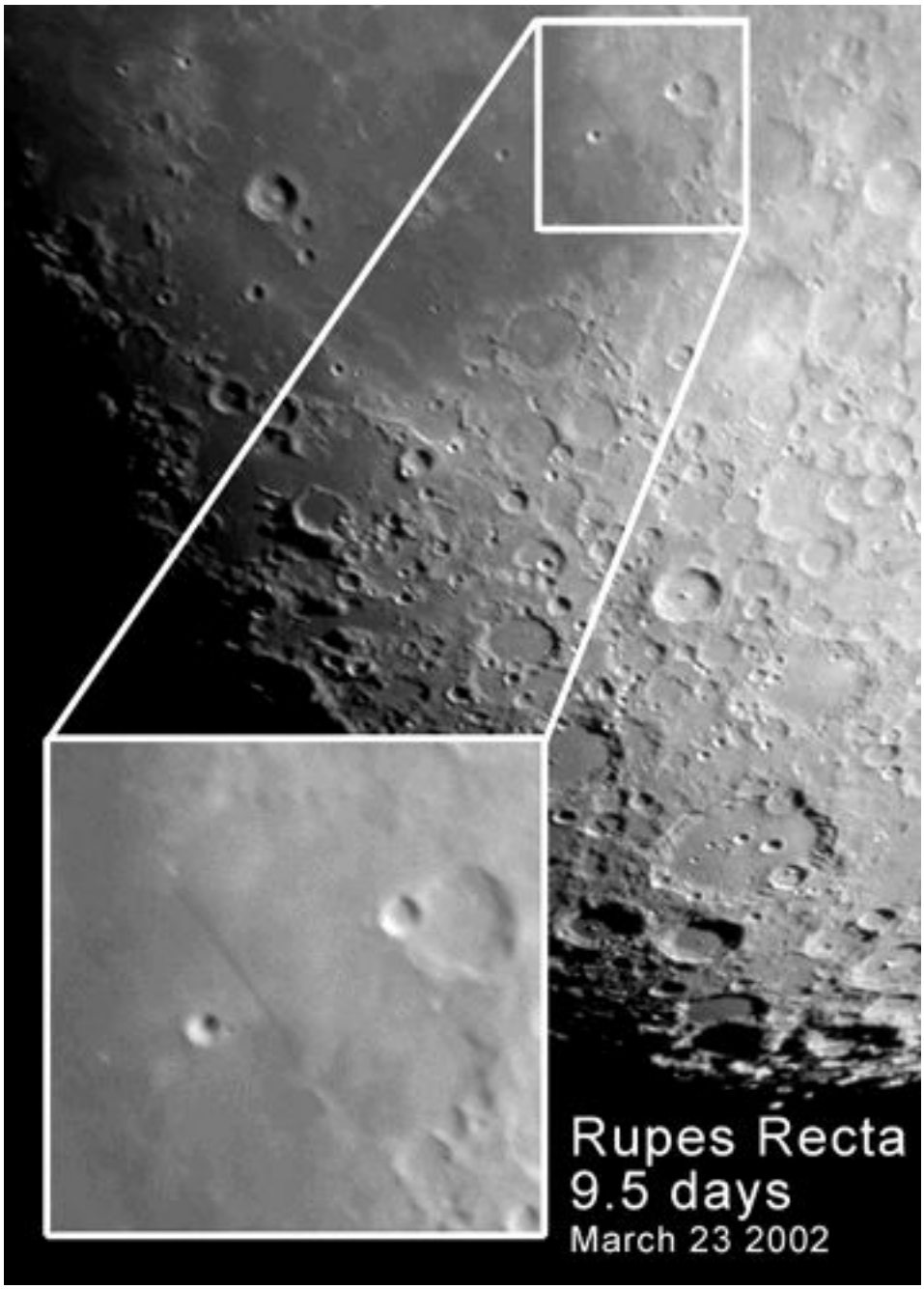

Bob Botts created the image above from a shot taken with his Nikon CP995 digital camera through his 8" SCT. The eyepiece was a 10mm Radian and the focal ratio was f6.3. The image is of Rupes Recta, also known as "The Straight Wall" (item "X' on the Lunar map pg. 107 of the "Observer's Handbook").

Hamyln's Lunar Atlas notes that it is the "best known fault on the Moon, easily observable even through a small telescope. The length of the fault is 110 km, its height 240-300m, and its apparent width is 2.5 km. Thus, it is not a steep scarp but a moderate slope. When illuminated by the rising Sun (less than a day after First Quarter) it casts a striking shadow. Before sunset (shortly after Last Quarter) the illuminated slope of the fault shines brightly."

Coming Events:

April 11, 2002 - Board Meeting at 8:00 at the observatory. Come on out and shape the future of the centre.

May 2, 2002 - General Meeting at 8:00pm at the Steam Museum. Program TBA.

May 9, 2002 - Board Meeting at 8:00 at the observatory. Come on out and shape the future of the centre.

May 25, 2002 - Centre Banquet. Special Guest astrophotographer Matt BenDaniel. For details see below.

June 6, 2002 - General Meeting at 8:00pm at the Steam Museum. Program TBA.

June 13, 2002 - Board Meeting at 8:00 at the observatory. Come on out and shape the future of the centre.

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/

Scope Auction at May Meeting

Several years ago a couple of small scopes were donated to the Centre by a former member . The club was invited to do with these scopes whatever was in the best interests of the Centre. After several discussions at board meetings it has been decided that one of the scopes - a 15cm (6" Dobsonian) will be auctioned off.

The scope has a 15cm (6") f4 mirror, a secondary mounted on a glass window, a focusser and a yellow box tube and base. It does need some work to bring it up to optimum condition. If you are interested it will be available for inspection at the April meeting or at the observatory. The auction will take place at the May meeting.

Actual item different than illustration

Proceeds will go towards servicing scopes already in use at the club observatory.

Hamilton Centre Banquet

The Hamilton Centre is pleased to be hosting a spring banquet on Saturday May 25, 2002. Our special guest speaker at this event will Matt BenDaniel, an extraordinary astrophotographer. A software engineer with a degree from MIT, Matt also teaches a Telescopic Astronomy course at the Boston Museum of Science. He has had numerous articles and photographs published in Sky and Telescope. To see some samples of his work visit "www.starmatt.com".

Date: Saturday May 25, 2002
Location: The Atrium, 5420 North Service Road, Burlington, Ontario.

Take the Burloak Drive exit off the QEW in Burlington, Proceed North on Burloak Drive. It is the first multi-story office building on the west side of the road (Providence Building) The Atrium Restaurant is on the main floor.

Price: $37.50 (a great deal!)

Agenda: 5:00 - 6:00 Happy Hour (cash bar)
6:00 - 7:30 Banquet
7:30 - 8:30 Guest Speaker