

June 2008 Buckhorn Observatory Newsletter

BHO goes from busy to busier. When I was a kid we used to chant “School’s out, School’s out, the teacher let the fools out” all the way home on the last day of school. Well, in a few weeks it will happen all over again. And, while I have long since traded my bright red Schwinn bicycle for a dowdy grey minivan, the sense of being set free for the summer still remains.

Today that means winding down the school tours and cranking up for the flood of tourists and cottagers who will soon be flocking north for the weekends. This summer BHO visitors will have a lot to see. Saturn will still be high in the sky during June as will the galaxies of Leo and Virgo. My favourite, the Hercules globular star cluster is already making an appearance in the late night spring sky. This fabulous ball of over 1 million stars will be with us all summer long.

Other summer favourites, Sagittarius and Scorpius will be front and centre in August. And the gorgeous summer Milky Way will be spilling from horizon to horizon. As summer slips into autumn Jupiter will take to the sky. Hooray for summer! School’s out, school’s out, let the starry nights begin.

There’s a big red maple leaf at the centre of every black hole. The man who put it there is Dr. Tom Bolton. To appreciate it all we have to go back to the year 1971 when Dr. Bolton was a graduate student at the University of Toronto.

At the time Dr. Bolton was studying an odd binary star system dubbed CYG – X1. He was observing two stars in the constellation Cygnus that were performing a very rapid dance around each other. According to grad-student Bolton, the two stars were moving much faster than they should be for a binary (gravitationally bound) star system. His mission was to discover what was causing this jitter-bug whirl, because these two stars were swinging around each other so rapidly that they should have been flung apart.



Dr. Tom Bolton found the first black hole.

Bolton calculated the amount of gravity that would have to be present to hold the two stars in position while they were flying about each other so rapidly. And at the same time, what was flinging them about so wildly?

According to Bolton’s math, the only possible object that it could be was a black hole. Prior to Bolton’s discovery, Einstein had predicted their probability and other astronomers were working on the means to verify their existence. However, until now, no one could be sure.

Bolton’s calculations pointed straight to the only possibility. He theorized that the x-ray jets that were also detected were caused by material being ripped off one of the stars and sucked down into the black hole.

Dr. Bolton's calculations were correct and he now has a place of honour in the history of astronomy. His license plate even reads CYG – X1 after the weird x-ray emitting object he was studying that led to his historic discovery.

The down side to this story is the fact that the University of Toronto is about to sell the 180-acre land package that houses David Dunlap Observatory, the facility in which Bolton made his remarkable discovery. Along with the historic facility, we stand to lose the 72-inch reflecting telescope on which Bolton did his work. It's a remarkable instrument and still remains Canada's largest telescope.

A number of organizations ranging from conservation groups, private citizens and small astronomy clubs to the Royal Astronomical Society of Canada are fighting to preserve the historic grounds. But thus far the U of T seems bent on scooping up the money the real estate will fetch.



Will the sun set forever on David Dunlap Observatory?

It's a tough call. Do we preserve our past to inspire future generations or sell it to finance future education and growth? To find out more take a moment to visit: <http://www.rhnaturalists.ca/save-the-observatory/> or just Google up David Dunlap Observatory.

Put your eyes on steroids and see the stars. You were born with the best stargazing tools ever made. They're your eyes, and for simple backyard stargazing they're all you need. Combine your natural-born eyesight with a good star book like NightWatch and you're off on the adventure of a lifetime.

But let's say you want to make that next step up. You're after something that'll show you double stars, distant galaxies, star clusters and faint nebulas. Think I'm talking telescopes? Think binoculars instead.

Ask a seasoned backyard astronomer what's the smartest tool they ever bought for stargazing and they'll all tell you it was binoculars. Here's why, starting with your eyes.

Your baby blues, greens or browns are what collect the light from an object and send it to your brain. That's where the picture gets developed. When an adult's eyes are dark adapted, they're dilated to about 5mm across. For a young person under the same conditions, the eyes max out at 7mm. That's not a lot of light gathering power.

But imagine your eyes popped open to 50mm in diameter. Now imagine them with the ability to magnify something and make it appear 7 times closer. You're not on drugs. Instead you're on the business end of a pair of 7X50 binoculars. It's like having your peepers on steroids. And you really can see all the night sky objects I mention, including the larger craters on the Moon.



Best of all, most people already have a pair hanging in the closet, on the coat rack, in the locker on the boat or maybe stowed with the hunting gear. Fact is any size of binocular is going show you more than the unaided eye can see. Even a small pair of 8X25 binoculars are a big improvement over your naked eyes.

If you haven't figured it out already, the 8 in "8x25" is the 8 power magnification that the binoculars have. The 25 is the aperture or distance across the front.

In this case it's 25mm. That beats your God-given goggles by a factor of 5. So they'll let in a bunch more light, plus they magnify the image. This means that just about any pair of binoculars you can lay your hands on are good enough for starters.

There is an ideal size of binocular for stargazing. They're either 7x50 or 10x50. Go for a higher power and the images will be unstable because your hands can't hold the binoculars that steadily. Go for a larger aperture and chances are they'll be too heavy to hold comfortably for any length of time. In the latter case, a binocular mount is required. They're available, but they defeat the single big advantage binoculars have over telescopes, and that's portability.

Just dangle the old bins around your neck and you're off to tour the universe. And let's say you get bored with that. Well, binoculars are also great for sports events, bird watching, deer spotting, as well as keeping up with the Jones – nudge, nudge, wink, wink. The point here is they're portable and telescopes aren't. Plus binoculars show you things right-side-up and left-to-right corrected. Astronomical telescopes skip that because in space, there's no up or down.

If you already have a pair of binoculars hanging around the house, get them hanging around your neck. If not, try to pick up a pair with the specifications I have suggested. You don't have to spend a fortune on them. \$100 at an astronomy store, decent camera store, Canadian Tire or the local hardware should do. Or if you luck out at a yard sale, \$25 may be the going price.

The point is, binocs are a cheap first step. They're also a versatile first step. And that makes them a great first step.

WorldWide Telescope turns cloudy nights into sky tours. Now you can see galaxies, stars, planets and star clusters better than you ever could with a backyard telescope. And thanks to Microsoft, you don't have to pay a cent.

The giant company has launched WorldWide Telescope as a free web-based tool that stitches together the images from some of the best space-based telescopes such as Hubble, Spitzer and the Chandra X-Ray Telescope as well as the best Earth-based

telescopes and puts them right on your laptop's screen. With it you can pan and zoom around our Milky Way Galaxy, travel to other distant galaxies, visit the planets, zoom into star-forming regions of nebulae. Call it a Nerd's Night Out, WorldWide Telescope is the best thing going – and it goes for nothing.



At the moment the WorldWide Telescope only runs on Windows operating systems and the system requirements may outpace some computers that are five or six years old. Perhaps that shouldn't come as a surprise given the fact that the program puts terabites worth of information at your fingertips.

Don't let the term terabites frighten you. The system is web-based, so your computer won't be asked to download all that information. Instead you download the tools to access and operate the program. And the system goes far beyond pretty pictures.

You'll have the opportunity to learn about space from the greatest minds and speakers on the subject. All are professional astronomers who deliver talks on various aspects of astronomy. So the program will be a big plus to teachers around the world as well as aspiring astronomers in school and amateur astronomy club members.

For the more advanced amateur astronomers, you can view different objects in various wavelengths of light to bring out specific details. And regardless of your status, WorldWide Telescope will excite, entertain, and educate anyone with spectacular views and informational aspects. In short, this program may well be the finest learning tool to come our way in a long time.

The system requirements for WorldWide Telescope may exceed the capabilities of some older hardware. But to be honest, maybe this is what it takes to get you to trade in that old dinosaur. Operating system requirements for WWT are as follows:

A 2GHz or faster processor,
2GB of RAM,
1-10GB of free disk space,
Graphics card with 128MB Ram or 256 VRAM,
Windows XP Service Pack 2 or Windows Vista,
An Internet connection,
Mac must run Windows OS

If you've got what it takes, visit www.worldwidetelescope.org and bring the universe to your office, backyard or wherever you are. In 1610 Galileo turned his telescope towards the night sky. In 2008 Microsoft launched WorldWide Telescope.

Great Balls of Fire! There are three celestial targets that blow the “Wow Factor” right out the end of my telescope. Saturn is the first with its beautiful rings. The massive Andromeda Galaxy comes in a close second. It's so big you can see it with the naked eye. Rounding out the terrific trio is the Hercules Globular Star Cluster. Also known as M13 because it is listing number 13 in the Messier Catalogue of Deep Sky Objects, this spectacular sight becomes even more astounding when you know what it is.

As the heading says, it is great balls of fire – about a million of them clustered in a gigantic ball. Each of them is about the same size as our own Sun which is 1 million times larger than Earth. And they are gathered into a ball that is 160 light years across. One light year is equal to 10 trillion kilometers, so that's one very big ball. Winding down with yet another mind-numbing number, M13 is 27 thousand light years away.



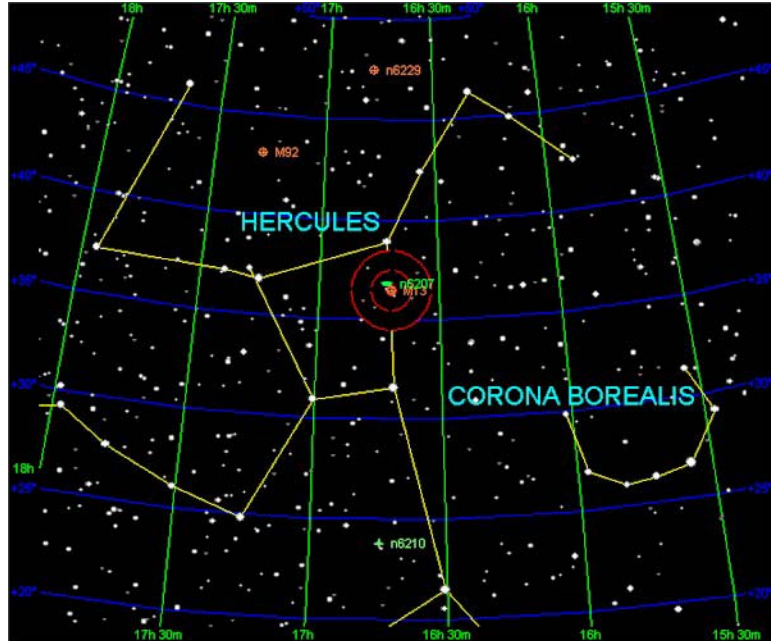
*M13 is
made up of
1 million
10-billion-
year-old
stars.
Photo by
Gord Rife
of
Schomberg
, Ontario.*

Recently I was showing M13 and Saturn to high school students visiting BHO from Adam Scott in Peterborough. The following night I made the trek to Lakefield College School where we set up by the lake for an observing session. In both cases, the

nights were filled with comments like, “Oh my God look at it.” “Wow it’s just like the pictures.” “This is soooo cool.” Anything that garners those reactions from a group of “OK-impress-me teens” has to be pretty spectacular stuff.

Globular star clusters are comprised of some of the oldest stars in the universe. And when it comes to age, M13 takes top candle on the birthday cake. It’s populated by stars that are estimated to be 10 billion years old. Given that our universe is about 14.5 billion years old, these are some very old stars, indeed.

Hercules the strongman hangs upside down in the Kawartha night sky. North of M13 between Hercules’ kneeling legs is another globular cluster known as M92. It is also visible in binoculars.



To find M13, you must first locate the big dipper. It’s almost straight overhead at sunset in June and beginning to stand on its cup. Follow the three stars in the arc of its handle and you can arc to Arcturus, the very bright star in the constellation Bootes. About half way up Bootes is a small semi-circle of stars called Corona Borealis or the Northern Crown. They point directly to a keystone formation that makes up the body of Hercules. He’s hanging upside down in the sky, so don’t expect his head or feet to be where you’d think. About two thirds of the way up on one side of his body is where M13 is located. It’s an easy find in binoculars and as I said, spectacular in a telescope.

So next clear night, grab the binocs and a star chart and head out for a little star gazing. Or do it the easy way and visit BHO. I can just push a button and the big C-11 will swing right to the target. Your Wow will follow immediately thereafter.

Observing session at BHO June 6th. Along with the summer constellations, June brings the first of our monthly weekend observing sessions. This coming June 6th the observatory grounds will be open to amateur astronomers and astro-imagers who wish to set up their gear and camp over for the weekend. The indoor washrooms will be open to all.

Power will be available at \$10 for the weekend, but there are a limited number of outlets available. Six for the south lawn and four for the east lawn. Bring your own extension cord – 100 feet is a good start – and power bars.



Those who are astro imaging are encouraged to set up in the south lawn as I will be doing sky tours with the laser pointer on the John Kidner StarDeck in the east lawn and that can wreck your carefully guided photograph in a nanosecond.

If enough people are interested we can do a group gobble at TA's grille nearby on Saturday night. Good food and good beer.

Also, I will be giving a basic astronomy presentation to the PAA Friday night, so I will be arriving back at BHO about 11:00 pm. If you'd like to take in the presentation, you're cordially invited to join us in the Orientation Centre of the River View Zoo on Friday night at 8:00. There's plenty of parking and admission to my talk is free.

If you're going to be here for the weekend, please confirm your attendance by E-mail. You can reach me at: johnstargazer@xplornet.com or call me at 705.657.2544.



THAT'S IT FOR THIS EDITION. CLEAR SKIES TO ALL.
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