

# July 2009 Buckhorn Observatory Newsletter

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**Meet the stars under the stars** would have been the perfect theme for the gathering at BHO earlier last June. Thirty members of the Peterborough Astronomical Association along with friends from Brantford and Lakefield joined forces to help put on a make-believe star party for a video shoot. The video will be used at Science North in Sudbury as a pre-show warm-up for their planetarium audiences.



*Lights, cameras, action for the Science North video. Filmed in part at BHO, the production also features still photos of the night sky taken by PAA member Steve Thoms.*

A brief scenario has the film opening at BHO's mock Starparty with some of Steve's Milky Way still shots inter-cut with grown-ups and kids looking into telescopes and slewing them across the sky. From there we take a giant leap for Mankind with some Apollo 11 Moon footage and then we're off to some spectacular Hubble Space Telescope photographs of distant nebula and galaxies. The four-minute film wraps up with a message about what to expect next in the new Star Theatre and then we "roll credits."

It was a new experience for almost everyone, and the six pizzas from Lakefield Restaurant made a good thing even better. My thanks to all for supporting BHO and the project. Your cheques are in the mail...maybe...well...sort of.

**Earth's rotation plunges Canada into darkness.** I love sensationalist headlines. Think about that rotation and you'll realize that it happens daily – or nightly. “Famed Psychic’s Head Explodes” is my all time favourite. So when I read “Boy struck by meteor on way to school,” I just had to dig in and read all about it.

Well, that’s exactly what happened. I confess, I was hoping for something a bit more tabloid-like, but sometimes the truth is unusual enough.

It seems Garret Blank, a 14-year-old school boy in Essen, Germany was walking to school one morning a month ago when he saw a flash of light in the sky above. Suddenly he felt a sharp pain in his hand. A chunk of a meteor had struck his hand and buried itself in the roadway beside him.

According to Garret, “At first I just saw a large ball of light, and then I suddenly felt a pain in my hand. When it hit me it knocked me flying.”

The space rock was examined by experts at a nearby observatory and was found to be a real meteorite. So Garret takes the honour of being the first human to be struck by a meteor. There is also a tale of a dog being smacked by a meteor, but he’s not talking.

Meteors frequently break apart as they slam through Earth’s atmosphere. Young Garret is fortunate for that because a larger piece could have done more damage than leave a nasty gash on his hand. Indeed, even small meteors can do serious damage if they rain down over a populated area.



*14-year old Garret Blank met a meteor on the way to school last month.*

I have read confirmed reports of a meteor striking the ground next to a Canadian who was golfing. In another report from the U.S., a large meteor tore through the roof of a garage and penetrated the trunk and rear fender of the car inside. Yet another confirmed report involves a meteor that crashed through the roof of a house and gave the lady inside a wallop while she was sleeping in bed. The injury was caused by pieces of the ceiling hitting the lady, so she wasn’t officially struck by the meteor.

I guess Chicken Little wasn’t telling wild tales. The sky really can fall on us...just ask your friendly local dinosaur. While we’re waiting, here’s what’s in the sky for July.

On the 3<sup>rd</sup> of July Earth was at its furthest point from the Sun. Earth's orbit around the Sun is elliptical, so our distance from old Sol varies depending on where we are in our orbit.

Early risers will enjoy a Last Quarter Moon on July 15<sup>th</sup>. That's what most people call a "half moon." It's the best time to check out the craters because the Sun's angle to the Moon produces long shadows that really accentuate surface details.

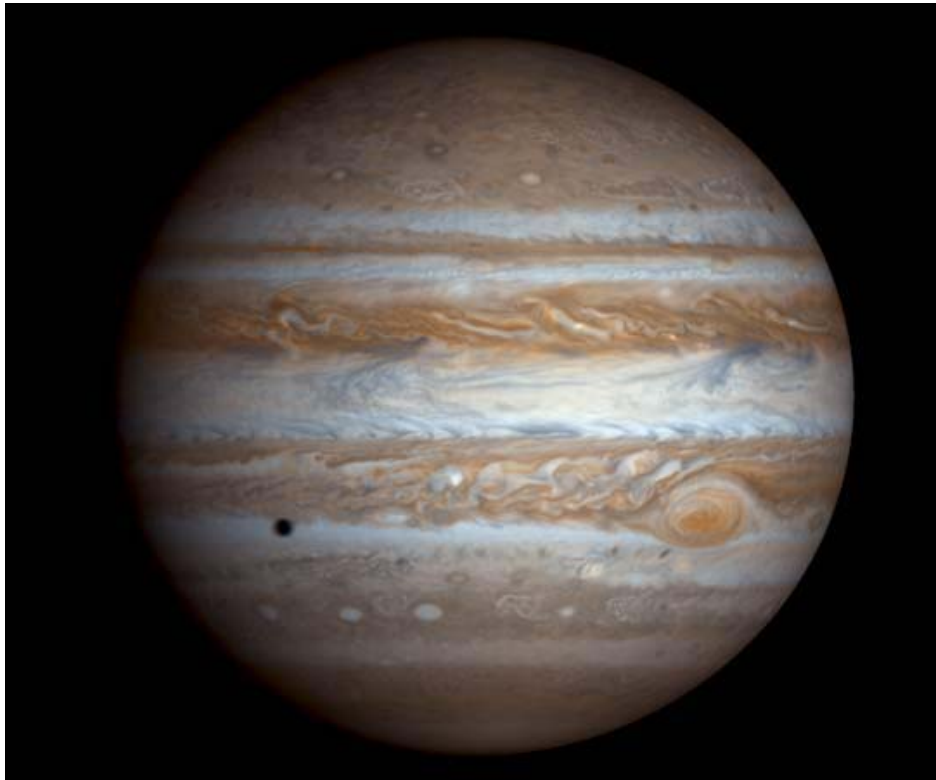
In the predawn of July 18 and 19, Venus will line up with the Waning Crescent Moon and Mars as a treat for early risers.

Later, on the 21<sup>st</sup>, stargazers will enjoy the dark skies of New Moon. If you happen to be in China, India or the South Pacific, you'll see a total eclipse of the Sun.

Until we meet again by the backyard telescope, I suggest that we all wear motorcycle helmets – just in case.

## **If you like to biggie your fries, you'll love Jupiter.**

Everything about Jupiter is big. The planet is 1,000 times larger than Earth. The Giant Red Spot that whistles around the planet is the largest tornado in the solar system – it could swallow Earth two times over. The winds inside the Giant Red Spot are blowing at over 400 km/h. Oh, and when it comes to age, the Giant Red Spot has been storming along for about 300 years since we first observed it.



*This photo taken as the Cassini Mission flew past Jupiter a couple years ago shows the Giant Red Spot as well as the whirling clouds of hydrogen, helium and methane that comprise the gas giant. Photo Credit: NASA*

Then there's the lightening. Compared to a lightening bolt on Earth, Jupiter's zappers are nearly 1,000 times more powerful. Ouch, that's gonna leave a mark!

When it comes to moons, Jupiter tops the list with 67 orbiting its tremendous girth. And if you want a big Moon, Jupiter's Titan is the solar system's largest. It's bigger than our Moon and even out-sizes planet Mercury.

Take all the other planets, dwarf planets plus their moons and mush them into a big ball and Jupiter still comes out on top for size – by about 2.5 times. But don't let Jupiter's size fool you. It's a gas giant, made mostly of hydrogen and helium gas with a touch of methane thrown in. So as big as it is, Jupiter only has 318 times the mass of the Earth. Still, a 100 lb. Earthling would tip the scales at a not-so-dainty 236 lbs. on Jupiter. A Big Mac really would be big – but only in weight.

Despite its large size, Jupiter is a real speed demon. A day on Jupiter lasts only 9.8 hours. This high rotational velocity combined with the fact that the planet is made of gas causes Jupiter to be bigger around than it is tall. The term is oblate – sort of like having the Invisible Man sitting on your beach ball.

Not to be outdone by its neighbour Saturn, Jupiter also has rings. They're larger in diameter than Saturn's rings but aren't visible to ground-based telescopes.

Even in mythology Jupiter was big on humour. He was often called the jovial giant and is sometimes referred to simply as Jove – by Jove. Gustav Holst's *The Planets Suite* calls Jupiter the bringer of jollity. Odd, for a fellow who was also portrayed on Roman coins as a naked old man who flung thunderbolts at people who annoyed him.

There's only one thing in the solar system that's bigger than Jupiter and that's our Sun. Fact is the Sun alone is responsible for 98% of our solar system's mass. So even giant Jupiter is small potatoes compared to old Sol.

If you'd like to meet up with Jupiter in July, look to the East about 10:00 pm. He'll be rising in the constellation Capricorn. By midnight Jupiter will be well up and out of the soupy atmosphere of the horizon. That's the time to reach for your binoculars and see if you can spot the four moons that Galileo first saw in 1609. On that night he became the first person ever to see a moon other than our own.

## **Galactic collision? No make that galactic interaction.**

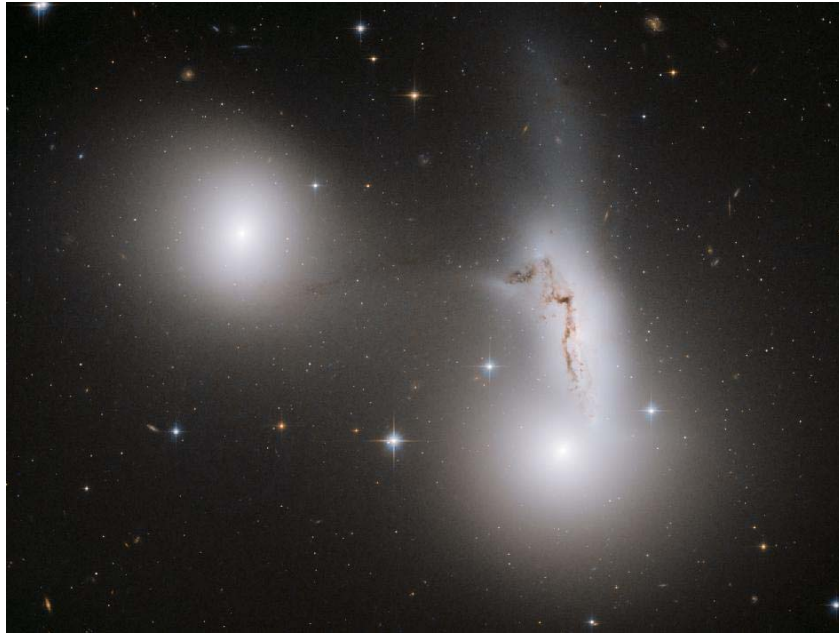
Mention "galactic collisions" and most people conger up Hollywood visions of stars slamming into each other and great slabs of plasma spinning wildly off into space – maybe even a few extra-solar planet smack-downs. But they're not even close to correct.

There is so much space between the stars that the so-called collision would be like spreading the fingers on both hands bringing them together so that your fingers simply pass by each other. That might sound a bit incredible, but consider this. The closest star to us after our Sun is about 43 trillion kilometers away. It would take a beam of light traveling at 300,000 kilometers per second 4.3 years to make a one-way trip to that star (Proxima Centauri). Obviously there's a lot of relatively empty space between stars. So forget all the Armageddon and chaos talk. No boom, boom, splat.

Instead the two galaxies will slowly, over millions of years, pull each other apart. If one galaxy is substantially larger than the other, mass and gravity rule, so you know who to put your money on. The end result when the two finally merge will be an irregular-shaped galaxy rather than the pretty elliptical ones we're so familiar with.

It's a scenario which has already taken place with our own galaxy and a number of smaller ones in the area. The two most obvious are the large and small Magellanic Clouds visible from the Southern Hemisphere. Both are raggedy shaped and thought to

have had a gravitational encounter with the Milky Way billions of years ago. Elsewhere within our Milky Way astronomers have found other evidence of previous entanglements.



*Two galaxies devour a third in a celestial ritual of galactic-scale cannibalism.*

Given the unspectacular and relatively slow-to-happen end results we really should change the name from galactic collisions to galactic interactions. Astronomers have been building computer models of these interactions for years. As you would expect, size is a critical factor in the outcome. So is the angle at which the two galaxies merge. In many cases the models show the two pulling each other apart, then coming back together, only to divide again. Some stars will be ejected from both the galaxies and flung out into space by a gravitational slingshot action.

But what will happen to any planets orbiting those distant stars? We now know of 240 exo-planets within our Milky Way. What's in the cards for them when we merge with the Andromeda Galaxy in about 2.5 billion years?

At the moment all we can say is it depends on where you (or the planet you're on) are located in our galaxy. If you're on the outer edge, you might have a ring-side seat to it all. But you'd have to live for millions of years to watch it all happen. If your home planet is orbiting a star deep within our galaxy you might be torn apart or sucked into the black hole that occupies the centre of most galaxies. Or the star you're orbiting could be hurled out into space. Away you'd go in a solar system rocketing across the universe.

And what about the black holes? The two could merge into one super massive singularity. But again, the two would gravitationally waltz around each other for a few million more years before they embraced. Just something to ponder on a cloudy night.

**A wealth of knowledge still won't pay the bills.** As I write this article, Madison Schmidt is a long way from her home in Buckhorn. She's on her way to Chalk River for what will be one of the most exciting experiences in her life. Madison was chosen for a summer intern program at the Deep River Science Academy.

While at Deep River, Madison will be working with and learning from professional scientists. Assisted by a tutor, she'll analyze problems with pressure tubes in the CANDU Reactors. Without getting into techno-talk only Madison and her buds understand, they will be working to find answers that will lead to changes in the pressure tube manufacturing process - changes that will improve the performance of these key parts of the CANDU system.

As mentioned earlier, it's quite an honour to be selected for this program. Madison is just one of 18 high school science students from across Canada to make the grade. But it's also a hefty expense for the parents. The up-front cost for a student is \$4,400.



*Madison Schmidt of Buckhorn*

The Deep River Science Academy is a non-profit organization, so the families have to kick in, too. Hence, Madison's parents borrowed to put up the \$4,400. That's the good news. The bad news is the past year has been a struggle for the Schmidt family.

Madison's father, Günter, was diagnosed with cancer and has missed a great deal of work. Stacey, her mother, is a long-term diabetic who is legally blind. As you might expect, the medical costs OHIP doesn't cover and the repeated trips to Toronto have been expensive. So Madison is asking you for help to get her family over this financial hump. I hope you'll do like me – dig down, write a cheque and send it to Stacey or Gunter Schmidt, P.O. BOX 107, Buckhorn, ON. K0L1J0.

In addition to thanking those who will donate, Madison and her family also thank the Lakefield Herald, the Promoter in Bobcaygeon, and the Chemung Lion's Club for their help in making this possible. As Madison's Mom said; "when Madison found out she was going to Deep River, it was the first time I ever heard her squeal."

Let's pitch in so the Schmidts can stop worrying about finances and just be proud of Madison. She's a remarkable young lady who deserves to take her future in science and engineering just as far as her dreams.

**CLEAR SKIES AND HAPPY CANADA DAY TO EVERYONE  
JOHN & DEB AT BUCKHORN OBSERVATORY**

