

# Event Horizon

September 2003

Volume 10 Issue 10

## Scopeless Astronomy

by Glenn Muller

Of the many questions asked at our recent Mars Party my favourite had to be, how much did you pay for your scope? It identified someone with the insight to try before they buy, and their look of pleasant surprise when I said “about \$500” also brought a smile to my face. The astronomy bug was flitting about that night and I was happy to steer those bitten in the direction of local telescope shops for the inevitable purchase.

The purpose of this article, however, is to emphasize those facets of astronomy that can, and should, be done without the resolving power of your Whizzbang 3000. Before digging for celestial treasures first you must understand the map, and that overview can only be gained by learning the constellations. Constellations, of course, are best defined by naked eye and Gail and I make a nightly practice to check the sky before retiring. This ritual not only breeds familiarization but keeps track of seasonal changes so that, when we get that rare night for observing, less time is wasted figuring out “what’s up”.

Simple exercises include identifying the first stars to appear, which planets are up, the constellations they are in, and the cycles of the Moon. Interesting to track is Ursa Major, the Big Dipper, as it circles Polaris and while your at it why not look for the moving points of light after sundown that signify satellites. Satellite spotting can be a pastime in itself and the website [www.heavens-above.com](http://www.heavens-above.com) can help you identify each sighting. Lunar eclipses, meteor showers, and auroras are all also naked eye events.

A multitude of targets await those with binoculars in their closet. In Fall, you can check out the Pleiades open star cluster, the Perseus Double cluster, and the Andromeda galaxy which looks fabulous even in inex-

pensive 7x50 or 10x50 units. Winter brings Orion out to play with the impressive Orion nebula and easy to spot clusters in Auriga, Taurus, and Cancer. Spring can be a time to compare red Arcturus with blue Regulus, bag some double stars, and spot asterisms that aren’t constellations but prompt an image in your mind. Summer’s Milky Way delights steam from the teapot’s (Sagittarius) spout, and Bracchi’s cluster (the coathanger) is another sight exclusive to your handheld oculars.

Naturally, to find these initially you will need the aforementioned map. Monthly sky charts are found in Sky & Telescope and Astronomy magazines, but for neophytes I highly recommend the book *Nightwatch* by Terence Dickinson. Simple to read, full page, seasonal maps outline the main constellations and highlight easy targets. Providing essential information for novices, the book covers all the basic aspects of amateur astronomy and should be the first purchase of anyone contemplating this hobby. Tip: buy the spiralbound softcover edition as it is easier to use outside. Another tip: buy a red LED flashlight or cover a flashlight with dark red cellophane to preserve your night sight when reading the maps.

Most seasoned astronomers know that nights spent with their scopes are rare, but most will look up whenever the sky is dark, and clear. After all, that’s how we know where we are.

by Glenn Muller

Glenn is the Publicity coordinator for the HAA.



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## Chair's Report

What a star party!! The weather was perfect. The night was perfect. About a thousand folks showed up to look at Mars. Everyone seemed to enjoy themselves. Mars even put on a good show. I would like to thank all the folks who helped make this happen. The ones I can remember are: Stewart Attlesey, Margaret Walton and her crew, Barb Wight, Mike DeVillaer, Glenn and Gail Muller, Cindy Bingham, Bob Christmas, Ray Badgerow, Ann and Bill Tekatch, and Ann's son Anthony Tekatch :) Stewart's telescope drew the longest lines - up to an hour at times. This seems like an excellent time of year to hold such star parties - we'll have to think up another excuse at the same time in 2004!

And how about that planet Mars?! I have had my best looks ever this summer. It is nice to have those 12-inch LX-200's hanging around the group in such abundance. The webcam shots which Steve Barnes and others have taken are just spectacular. It makes you wonder why NASA wastes all that money on space telescopes and missions to other planets.

So, what else do we have planned for the autumn? One big event is our 10th anniversary party being held at the Royal Botanical Gardens on the evening of

Saturday, November 8th. Cindy Bingham has put an enormous amount of work into the planning for this event. It looks like we will have quite a nice set of door prizes to hand out that evening. As you may know, Bob McDonald - host of CBC Radio's Quirks and Quarks - will be our guest speaker for the evening. To top it all off, we have managed to arrange a lunar eclipse! Please buy your tickets for this event early and often.

I would like to welcome our new members to the HAA. Please make sure that you let us know what interests you most. I know that we all are anxious to pass along our hard-won knowledge and experience to you. Event Horizon is always looking for new contributors, too! Don't be afraid to throw your hat into the ring and write an article.

As we start our second ten years, I encourage everyone to think about ways to change what we do to make it even more interesting and exciting. We have a very active Council and a great deal of enthusiasm for trying new things. Also, suggestions for speakers are always welcome - some of our best speakers in 2003 were suggested by members.

Doug Welch



Event Horizon is a publication of the Hamilton Amateur Astronomers (HAA).

The HAA is an amateur astronomy club dedicated to the promotion and enjoyment of astronomy for people of all ages and experience levels.

The cost of the subscription is included in the \$25 individual or \$30 family membership fee for the year. Event Horizon is published a minimum of 10 times a year.

### HAA Council

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Web: [amateurastronomy.org](http://amateurastronomy.org)

### Mailing Address:

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### Focus on Magnification

To get the most from your scope you need a quality eyepiece (EP). Decent views can be had with EP's costing less than \$100 though oculars in that price range won't be much improvement on what got shipped with the scope. Factors to consider are field of view (FOV) - how much of the sky is shown; exit pupil - the diameter of the opening you look through; eye relief - how close to the lens your eye needs to be and; before all else, magnification.

Magnification is the place to start because carefully planned increments of power can minimize the actual number of EP's you need, and that equates to money you can spend elsewhere. Essentially, with low, medium, and high power capability you can cover most situations and, since many people own binoculars with nice wide FOV's, I would suggest that low eyepiece magnification be 40x to 60x; medium would be 80x to 120x; and high is in 160x to 240x range. Though 240x may not seem that high seeing conditions, particularly turbulence in the atmosphere, have the tendency to degrade views magnified much more than 300x.

To determine the power of an eyepiece you need to know the focal length of your scope and the focal length of the EP. Eyepiece focal length is easy - it's marked right on the side (ie) 21mm, but if the focal length of your scope is not inscribed somewhere it can be determined by measuring the distance light travels from the primary objective to the eyepiece - simple with a Newtonian or refractor but more difficult with a Cassegrain design. EP's focal lengths are in millimeters so it's best to use metric measurements for all your calculations. A good rule of thumb is that  $1'' \approx 25\text{mm}$ .

Now, using my Newtonian reflector as an example:

- Light travels 48" from the mirror to the EP, so the focal length is 1200mm (48 x 25)
- It has a 6" primary mirror, so the objective diameter is 150mm (6 x 25)
- I give you the objective diameter in case you happen to know the focal ratio of your scope (ie) f8

- By multiplying 150mm by f8 (150 x 8) I know the scope's focal length will be 1200mm
- So, with a low power EP of 21mm, I should get a magnification of 57.14x (1200 / 21)

A good way to get more value from your ocular collection is to use a Barlow to effectively double (or triple) the magnification of any eyepiece while maintaining its lower power (larger) exit pupil. Though you should invest in a good Barlow, the cost will be much less than any \$400 Pentax or Nagler you might buy.

To finish this tale I'll tell you that in addition to binoculars I have a 21mm EP, a 7mm EP, and a 2x Barlow. This gives me the following power selection:

Binos = 10x

21mm = 57.14x

21mm + Barlow = 114.28x

7mm = 171.42x

7mm + Barlow = 342.84x (for those really good nights)

As you can see, a wide range of power in regular graduations can be had for minimal investment with just a little planning. There's lots of selection out there - just do the math!

### Upcoming Events

**Item** Future Observing dates

**Dates** September 19,20

September 26,27 (HAA Silent Lake star party)

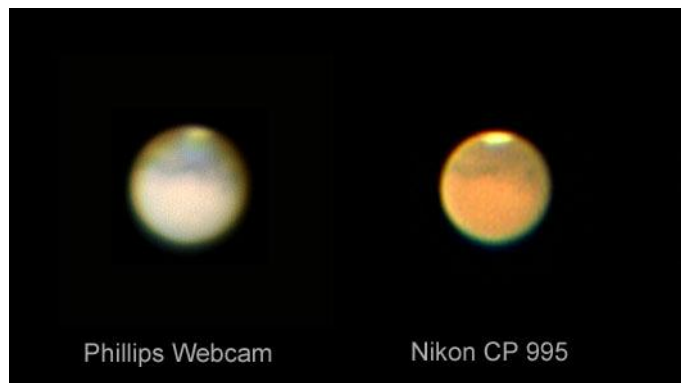
**Date** October 18th, 2003

**Event** Mountsberg star party

**Date** November 8th, 2003

**Event** HAA Anniversary Party (details on Page 8)

## Eye Candy



Here's two examples of Mars as captured via different devices half an hour apart (just after midnight, August 17, 2003) from my backyard.

The image on the left is the sum of 100 selected frames from 600 that were captured by a Phillips webcam (with 2.5x Powermate).

The image on the right, is the sum of 100 selected frames from 1200 that were captured as a MOV file (converted to AVI) as captured by a Nikon CP995 (coupled to a 10mm Radian).

All images were processed with "Registax".

Both images were shot using a 12" f/10 SCT under very unfavourable seeing conditions.

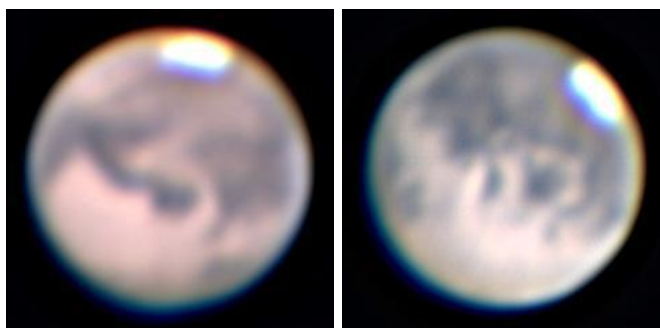
Photos by Bob Botts



The image above was taken with a Philips TouCam Pro webcam and processed with Registax 2. Image taken with Bob Botts's scope and Doug Welch's webcam on Wednesday 27 Aug 2003.



Many people saw large fireballs on late Saturday night August 30, 2003. It looked so spectacular that it could have been a fireworks demonstration. Drawing by Anthony Tekatch.



Mars photos by Ann & Bill Tekatch.



Photo of M11 and V Aquilae by Bob Christmas.



Photo by Margaret Walton from the Mars observing night at the Hamilton Bayfront Park on August 30, 2003.



Photo by Stewart Attlesley from the Mars observing night at the Hamilton Bayfront Park on August 30, 2003.

## WebWatch

**Site:** [www.alllearn.org/course.jsp?C=278](http://www.alllearn.org/course.jsp?C=278)

**Description:** Discovering Black Holes – Online Course (20% off the price)

**Site:** [www.exn.ca/Stories/2003/09/05/52.asp](http://www.exn.ca/Stories/2003/09/05/52.asp)

**Description:** Steve Barnes on Discovery Channel. He drove to the Florida Keys to get webcam images of Mars with his Meade 12" telescope.

**Site:** [www.skypieces.com](http://www.skypieces.com)

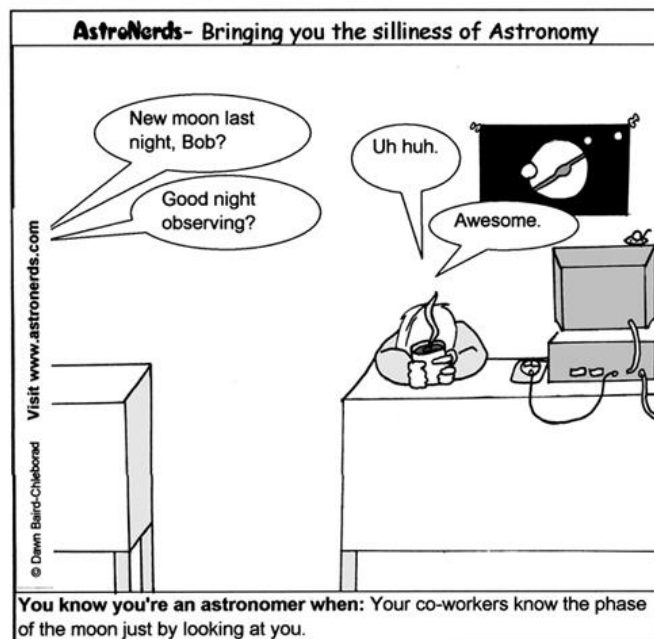
**Description:** Soft, durable polypropylene eyepiece containers

**Site:** [www.celestron.com/polar.htm](http://www.celestron.com/polar.htm)

**Description:** Instructions for polar aligning telescopes

**Submitted by:** Ann Tekatch

## Humour



Comic provided free of charge by [www.astronerds.com](http://www.astronerds.com). Be sure to visit them.



## Careful Planning and Quick Improvisation Succeed in Space Biz

By Tony Phillips

On December 18, 2001, ground controllers at JPL commanded NASA's Deep Space 1 (DS1) spacecraft to go to sleep. "It was a bittersweet moment," recalls Marc Rayman, the DS1 project manager. Everyone was exhausted, including Deep Space 1, which for three years had taken Rayman and his team on the ride of their lives.

DS1 blasted off atop a Delta rocket in 1998. Most spacecraft are built from tried-and-true technology—otherwise mission controllers won't let them off the ground. But Deep Space 1 was different. Its mission was to test 12 advanced technologies. Among them: an experimental ion engine, a solar array that focused sunlight for extra power, and an autopilot with artificial intelligence. "There was a good chance DS1 wouldn't work at all; there were so many untried systems," recalls Rayman.

Nevertheless, all 12 technologies worked; the mission was a big success.

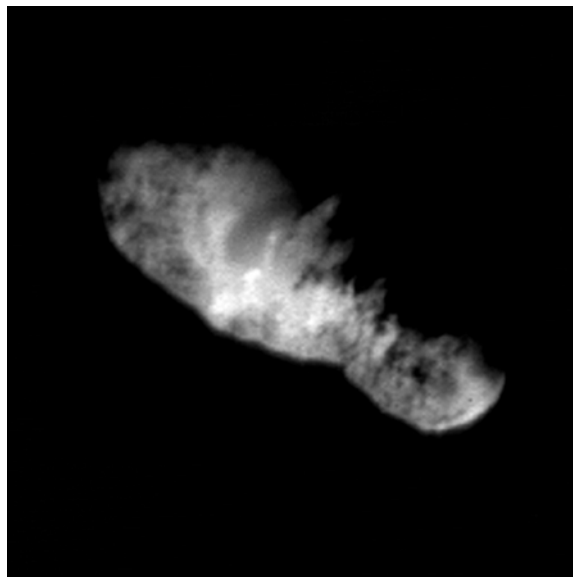
Indeed, DS1 worked so well that in 1999 NASA approved an extended mission, which Rayman and colleagues had dreamed up long before DS1 left Earth—a visit to a comet. "We were thrilled," says Rayman.

And that's when disaster struck. DS1's orientation system failed. The spacecraft couldn't navigate!

What do you do when a spacecraft breaks and it is 200 million miles away? "Improvise," says Rayman.

Ironically, the device that broke, the 'Star Tracker,' was old technology. The DS1 team decided to use one of the 12 experimental devices—a miniature camera called MICAS—as a substitute. With Comet Borrelly receding fast, they reprogrammed the spacecraft and taught it to use MICAS for navigation, finishing barely in time to catch the comet. "It was a very close shave."

In September 2001, DS1 swooped past the furiously evaporating nucleus of Comet Borrelly. "We thought the spacecraft might be pulverized," Rayman recalls, but once again DS1 defied the odds. It captured the best-ever view of a comet's heart and emerged intact.



*This was the final image of the nucleus of comet Borrelly, taken just 160 seconds before Deep Space 1's closest approach to it. This image shows the 8-km (5-mile) long nucleus from about 3417 kilometers (over 2,000 miles) away.*

By that time, DS1 had been operating three times longer than planned, and it had nearly exhausted its supply of thruster-gas used to keep solar arrays pointed toward the Sun. Controllers had no choice but to deactivate the spacecraft, which remains in orbit between Earth and Mars.

Rayman has moved on to a new project—Dawn, an ion-propelled spacecraft that will visit two enormous asteroids, Ceres and Vesta, in 2010 and 2014. "Dawn is based on technologies that DS1 pioneered," he says.

Even asleep, DS1 continues to amaze.

Find out more about DS1 at <http://nmp.jpl.nasa.gov/ds1>. For kids, go to <http://spaceplace.nasa.gov/ds1dots.htm> to do an interactive dot-to-dot drawing of Deep Space 1.

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This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

# October 2003

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# The Hamilton Amateur Astronomers

*proudly announce:*

## THE HAA 10<sup>TH</sup> YEAR ANNIVERSARY BANQUET

*When:* Saturday, November 8<sup>th</sup>, 2003, 6:00 p.m.

*Price:* \$40 up to and including October 10<sup>th</sup> - \$45 thereafter

*Where:* Royal Botanical Gardens  
680 Plains Rd. West, Burlington

*Who:* Everyone welcome! (spouses, friends, non-members etc.)

*What:* Cash bar, dinner, guest speaker and door prizes

*Speaker:* Bob McDonald, Quirks and Quarks (CBC)

*Bonus:* Total lunar eclipse that night!



### HAA BANQUET REGISTRATION FORM

NAME: \_\_\_\_\_ #TICKETS:  E-MAIL: \_\_\_\_\_  
TELEPHONE #: (    ) \_\_\_\_\_

ADDRESS: \_\_\_\_\_

Please mail your cheque or money order to: Hamilton Amateur Astronomers

c/o Margaret Walton

114 Cameron Avenue

Dundas, Ontario L9H 1J3

\*\*Tickets are \$40.00 up to and including October 10<sup>th</sup> and \$45.00 after October 10<sup>th</sup> to November 4<sup>th</sup>, the cut-off date.

I will pick up my tickets at our general meeting     I will pick up my tickets at the door     I would like acknowledgement by e-mail/phone

\*If you are paying by mail, you have a choice of picking up tickets at one of our general meetings or at the door on the date of the event. We will acknowledge receipt by e-mail or telephone. If you have any questions, please contact us by e-mail at: [secretary@amateurastronomy.org](mailto:secretary@amateurastronomy.org) or call Margaret Walton at (905) 627-7361. Please visit our website at [www.amateurastronomy.org](http://www.amateurastronomy.org) for details