

Event Horizon

September 2001

Volume 8 Issue 10

Product Review: Scopetronix Digi-T Digital Camera Adapter

Remarkably clear pictures are possible by simply hand-holding a digital camera to the eyepiece of your favourite telescope. Ensuring that the camera is square to the eyepiece can be frustrating, though. It also takes a gymnast to hold the camera still while accessing the shutter, aperture and timer modes for the picture!

There are a number of adapters new to the market that are designed to hold a digital camera firmly to an eyepiece. Scopetronix' new adapter consists of two parts – one is a ring that fastens to where the rubber eyecup would normally be on the eyepiece; the other part is threaded to mate with the filter threads on your digital camera (not all digital cameras have such threads – check your camera's manual). This

adapter was mentioned in the photo credits of some digital pictures appearing recently in the astronomy magazines and we ordered one for our Nikon Coolpix 950.

When the Digi-T arrived, we discovered that none of our eyepieces would work with it – all of them are 10 years and older, so they don't feature the rubber eyecup that the new eyepieces have. We solved the problem by buying a suitable eyepiece. (Meade Super Plossl (series 4000))

The eyepiece part of the adapter slips into the groove in the eyepiece that is left when you remove the rubber eyecup. A set screw holds it securely in place.

The part of the Digi-T that attaches to the digital camera screws into the camera lens'

filter threads and then the camera/adapter is screwed onto the eyepiece/adapter.

The unit is nicely made and everything fits together nice and snug. However, because we are somewhat paranoid, we also used a separate bracket to hold the camera to the scope as a precaution. This precaution was quite unnecessary, but because we already had the other bracket, we thought we'd use it just to be on the safe side.

After using the Digi-T, we heartily recommend it to anyone interested in digital photography! It is available through Scopetronix' website: www.scopetronix.com.

Ann Tekatch

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Event Horizon - New Options for Delivery

The HAA has always prided itself as being "affordable". Not too surprisingly, one of the major costs in our yearly budget is mailing issues of our newsletter, Event Horizon, to our members. In very rough terms, every Event Horizon which we put in the mail costs \$1.

Many, but not all, of our members have access to the Internet. If a fraction of our members who currently receive paper copies elects to receive their Event Horizon's by e-mail as a PDF (Portable Document Format) file, we can dramatically lower our mailing costs. The usual PDF reader, called Adobe Acrobat, is available free of charge as a standalone program and it also contains free "plugins" for the most popular Web browsers.

There are a number of advantages to receiving the PDF version:

- they will arrive more quickly
- they can include colour
- you can receive them when you are away from home, but still have access to your e-mail
- you can elect to print only

- what you wish to save in hard-copy
- you will help to keep our membership fees low
- there is no hard page limit (due to mailing costs) for an expanded EH which might be warranted before or after special astronomical events
- it might even be environmentally friendly!

If you have a very slow dial-up connection, then you may wish to continue to receive Event Horizon's by Canada Post. During the last two years, PDF versions of Event Horizon have varied between 125 and 480 kilobytes. We will make every effort to keep the size of the PDF files as small as possible, but you should judge your patience with e-mail downloads accordingly!

If you interested in participating in this new trial, please send an e-mail to Ann Tekatch at: tekatch@sympatico.ca You can switch back to the "snail mail" version of the newsletter at any time.

Marg Walton and Doug Welch

HAMILTON AMATEUR ASTRONOMERS

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.

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25 Fun Sights On The Moon For New Lunatics

by: Don M. Fox from a discussion on America Online's Astronomy Forum
<<http://members.aol.com/DonMFox/newscope.html>>

OK.... Here we go.
1. Naked eye, binos, or telescope for the first or second day Moon.... not much detail visible due to the low altitude above the horizon, but catch the earthshine effect, especially on Day 2.

2. On day three, Mare Crisum steals the show. It measures appx. 280 miles N to S and 350 miles E to W (it doesn't appear that way due to foreshortening, however in fact, it looks just the reverse ... i.e., longer from N to S). This is probably the best example of a lunar object that will teach someone what the effect of foreshortening is like. Most of the interesting detail in Mare Crisium is nestled along the western portion, where there are some nice craterlets and mountains.

3. A nice large crater (about 100 miles in diameter) on day 3 and 4 is Petavius, located south of Mare Crisium. There are

some great example of rilles on the floor of the crater.

4. Day 5 reveals Posidonius, another fine crater nestled up on the west shore of Mare Sernitatis.

5. Throughout the first 7 days of the lunation, closely observe the floor of all the Mare for signs of the ribbon-like wrinkle ridges. They have their best appearance when near the terminator.

6. Theophilus, on the NW shore of Mare Nectaris, is almost a perfect crater. It measure 65 miles across. it has multiple central peaks that are very interesting, and good detail can be observed inside the crater rim.

Many great objects come into play on days 8 - 10:

7. The prominent trio of craters Arzachel, Alphonuss, and Ptolemaeus, stretching adjacent to each other from south to north, respectively. it is most interesting to note the differences in structure and apparent age of the three craters.

8. The mighty crater Clavi-

us, located to the extreme south. Try to count the number of interior craters/craterlets you can observe.

9. Tycho, just north of Clavius. Observe it near the terminator for detail of the crater itself, and then watch the ray system unveil itself during subsequent nights.

10. Aristotle's and Exodus, a pair of craters that serve as the gateway towards the prominent crater Plato.

11. The Vales Pales ... just west of Aristotle's, and perhaps the best example of a valley on the moon.

12. Plato. Great example of a dark floored crater. Try to observe the very small craterlets on the floor (my experience is that they are easiest to see under higher lighting, not the day when the crater is closest to the terminator).

13. The Appenine mountains, the best mountain range on the Moon for observation.

14. Eratosthenes, which lies directly at the west tip of the Appenines.

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Cosmology Discussion Group

Presents: *The Analysis of Eclipsing Binaries Containing Cepheid Variables*. Graduate student Dave Lepischak will do our presentation.

It has been called the “Rosetta Stone” of variable star research: a cepheid variable star which is a member of an eclipsing binary system. Such a system would allow the first direct measurements of a Cepheid’s stellar properties, such as mass and change in radius, improving both our understanding of stars’ internal structure and our ability to measure distance in the universe.

Dave will discuss the difficulties encountered and the results obtained from the first analysis of several systems explaining this rare coincidence of disparate types of stellar variability,

The meeting will be held:
Saturday, September 29th, 2001,
8pm in McMaster’s Burke Science Building, Room B148. Refreshments will be provided. We welcome our members to bring a small entree. Everyone welcome, open discussion. For further information, call Larry at (905) 529-1037.



Here is a photograph of the summer Milky Way taken by Bill and I from Silent Lake Provincial Park on Aug.21/90. The photo was taken using a Pentax K1000 camera, 50mm lens @ f/2 on Ektar 1000 film. The camera was piggybacked on an equatorial mount and the exposure was 3 minutes.

Ann Tekatch



Here is a photo of the full moon that Bill and I took using a Nikon Coolpix 950 digital camera on September 2/01. The image was shot through a 4" f/6 refractor using a 26 mm plossl eyepiece and Scopetronix' Digi-T digital camera adapter. Shutter speed was determined by the camera.

Ann Tekatch

Here is a photo of Mare Tranquillitatis (dark area left of centre) and Mare Serenitatis (dark area to the right and below centre) that Bill and I took with the Nikon Coolpix 950 using the same setup as used for the full moon, but inserting a 2.5x barlow between the 26mm plossl eyepiece and 4" f/6 refractor.

Ann Tekatch



Fun Sights...

(Continued from page 3)

15. The great crater Copernicus, just WSW of Eratosthenes. the classic lunar crater. Don't miss the multitude of craterlets surrounding Copernicus.

16. Sinus Iridium, encircled by the Jura mountains. On day 10, the mountain ring stands out alone past the terminator like a huge coat hanger.

17. Archimedes, south of Plato. Great light and dark streaks on the floor.

18. Timocharis ... a smaller crater west of Archimedes that is worth high power viewing.

Moving on to the final four days of the waxing moon....

19. Aristarchus ... brightest crater on the Moon. Look for the bright radial markings on the interior walls.

20. Schroter's Valley, a winding complex system directly adjacent to Aristarchus.

21. Crater Kepler, just west of Copernicus. Another very bright ray source, but a smaller crater. Worth high power examination.

22. Crater Gassendi, on the north shore of Mare Humorum. One of my favorites. Study the interior closely, and observe the fractures rim.

23. If the seeing and transparency is good, return to Copernicus under high illumination to study the ray system. It is chock full of details and rich in texture.

24. Throughout the lunation, study the lunar limb. Note the mountains in their profile view. Also, observe craters near the limb, as they will appear like you are looking at them more from a surface elevation. It is an interesting effect.

25. And finally, if the libration is favorable, try to observe Mare Orientale on the western limb at Full Moon.

That's my top 25. Hope this helps!

One of the best simple Moon maps is in the Edmund Scientific Mag 5 Star Atlas <http://www.edsci.com/> A more detailed, but still easy to use Moon map, is in the Peterson Field Guide To The Stars And Planets.

Leonid news

Analysis of 2000 Leonid shower observations by Peter Jenniskens of the SETI Institute at NASA Ames Research Center confirm that the pattern of dust trails is slightly shifted towards the Sun compared to calculations by Esko Lyytinen and David Asher. This is good news for observers in Northern America, because peak rates are now predicted to be the same as during the 1999 Leonid storm at ZHR = 4,200 per hour. That is 50 times the best Perseid shower in summer. The storm is visible in all of the continental USA, with best rates on the East coast, on a Saturday night in moonless conditions. The meteors are expected to be slightly brighter on average compared to the 1999 storm, which implies that the view from aircraft will be the equivalent of ZHR = 17,000-21,000 per hour.

Spectroscopy for Amateur Astronomers

A few weeks ago at StarFest I got to say a few words about about optical astronomy to a crowd of like-minded sky admirers. During one of my rants, I got to saying that amateur astronomers are largely missing out on the beauty of looking at spectra on the Sun, stars, nebulae, even streelamps. Judging by the number of questions afterwards, I think I may have made a few converts. In this brief article, I wanted to mention what you need to enjoy visual spectroscopy and what it is good for.

The main piece of equipment you need (that you probably don't already have) is a way to "disperse" light into its different colours. For many, many years, the only affordable way to do this was with a prism - and it is still the first idea which comes to mind. Unfortunately, it is also the most difficult to put to good use. Prisms, especially equilateral prisms of heavy flint glass, will do the job, but they have a number of very annoying drawbacks. First, the total angle by which the prism deviates the light (from the direction it enters the prism) is large and consequently only a small area gets intercepted. Second, light is lost by reflection unless the prism is multi-coated (which they almost

never are). Third, the violet side of the spectrum gets spread out way more than the red end. This is doubly unfortunate because the most interesting stars to examine with a spectroscope are cool, red giants which really only have red light - and that gets all bunched up by a prism!

The alternative to a prism is a "diffraction grating". I won't go into the background theory here, but they are the result of finely scribing numerous parallel, closely-spaced rulings on a surface. The light that goes through a transmission grating (or reflects off of a reflection grating!) is spread out quite evenly with wavelength. Furthermore, you can buy cheap plastic replica gratings whose performance is really quite good.

I recommend that you first check out the "Learning Technologies" page: <http://www.starlab.com/pspl.html>, and think about getting a "PS-09" which is a 35mm slide-mounted piece of grating which they sell for US\$4.00 for one, or US\$35.00 for 10. You can make quite a decent spectrograph or spectroscope with one of those. Also, Efs-tonscience has sold replica gratings of high quality in the past - I haven't checked to see if they still do. I have bought "seconds" of these on several occasions. They have totally inconsequential cos-

metic defects and are way cheaper!

If you want to buy something ready-to-use, I recommend the "Rainbow Optics Star Spectroscope". They have both visual and photographic/CCD models. The visual one has a high-quality grating which screws onto an eyepiece where the filter would go and then also has a cylindrical lens which goes over the eye end of the eyepiece to give a finite width to the spectrum - making it easier to see the spectral lines. A useful webpage for it is: <http://www.astrovid.com/STAR-SPEC.HTM>.

A good starting place for all of this on the Web is the link: <http://users.erols.com/njastro/faas/> which is the "Forum for Amateur Astrospectroscopy".

So, what can you see with a spectroscope? Lots of different things. In a hottish star like Vega, the hydrogen lines are very prominent. Cooler stars like the sun have many lines of iron, chromium, magnesium, vanadium, as well as calcium, sodium, and hydrogen. Red giants show beautifully coloured bands due to titanium oxide and carbon stars show molecular carbon bands (surprise!). Planetary nebula show one visible line due to twice ionized atomic

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Spectroscopy..

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oxygen for the most part - in fact, their images remain unaltered by dispersing the light, making this an easy way to identify small planetary nebulae which look almost stellar. And the sun, oh the sun, so much light and so many absorption lines!!!

There is NOTHING more beautiful than the purity of colour in the Sun's or a star's spectrum. You must experience it at least once in your life - and hopefully even more frequently!

Doug Welch

HAA Website

You have probably noticed by now that Anthony Tekatch has done an amazing job on the HAA website.

(www.science.mcmaster.ca/HAA)

If you have anything you would like added to the website, such as photos, etc., send Anthony an e-mail at tekatch@idirect.com

Additional HAA Membership Levels Proposed

The HAA has always prided itself on its affordability relative to other clubs, which has resulted in low membership fees. We have also benefited from the generosity of numerous members who "give a little something extra" along with their fees each year. However, we have not pursued a quite common practice (among non-profit groups) of having named membership levels corresponding to higher fees, for individuals and/or their families who would like to contribute routinely at a higher fee level. The increased fee membership levels described below are *in addition* to the regular single and family memberships which we will continue to have. They do not confer any additional votes beyond the two which family members have. Rather they recognize an additional degree of philanthropy.

If your circumstances allow, I hope that you will consider joining at one of the new, higher levels for 2002 (starting November 1st, 2001). Even a few members at these levels will ensure that regular membership fees stay where they are, or, dare I say it, go down!

Doug Welch

I move that the following, additional classes of membership be added to the Bylaws of the Hamilton Amateur Astronomers:

Royal Membership	\$50/year
Friend of the Hamilton Amateur Astronomers	\$100/year
Patron of the Hamilton Amateur Astronomers	\$250/year

A Royal membership shall include the family members of a person who has paid the Royal membership fee. Family members are limited to the person named on the membership application form, their spouse and children.

A Friend membership shall include the family members of a person who has paid the Friend membership fee. Family members are limited to the person named on the membership application form, their spouse and children.

A Patron membership shall include the family members of a person who has paid the Patron membership fee. Family members are limited to the person named on the membership application form, their spouse and children.

These new classes of membership are entitled to all the rights and privileges of a Family Membership.

The Royal, Friend and Patron memberships will be recognized for their financial support of the Hamilton Amateur Astronomers in a manner to be determined by the Council of the Hamilton Amateur Astronomers.

Respectfully submitted by
Ann Tekatch
September 13, 2001

Membership Renewal

November 1, 2001 - October 31, 2002

Name: _____

Address: _____

Province: _____ Postal code: _____

Phone number: (____) _____ E-mail: _____

Type of membership: Individual \$25.00/year

Family \$30.00/year

Voluntary Donation: \$ _____
(tax receipts will be issued)

Total: \$ _____

Please make your cheque payable to:

Hamilton Amateur Astronomers
P.O. Box 65578
Dundas, Ontario
L9H 6Y6

Membership renewals are due November 1, 2001

CALENDAR OF EVENTS

- September 15 ~ 8pm
October 13, 19, 20
- Saturday, September 29th, 8pm

BINBROOK OBSERVING NIGHTS - For confirmation or directions call Ann Tekatch 575-5433, Marg Walton 627-7361, Rob Roy 692-3245

COSMOLOGY DISCUSSION GROUP - The meeting will be held at McMaster University, Burke Science Building, Room B148. Dave Lepischak will speak about: *The Analysis of Eclipsing Binaries Containing Cepheid Variables*. Call Larry at (905) 529-1037 to confirm.

- Friday, October 12, 7:30pm

HAA GENERAL MEETING - The meeting will be at the Spectator Building auditorium.