

Event Horizon

June 2002

Volume 9 Issue 8

2002 Star Party Guide *by Stewart Attlesey*

Summer is here which means it's time for star parties. There are a number of events held each summer in southern Ontario. Most offer astronomy related talks as well as the opportunity to experience dark skies and the chance to talk to other amateur astronomers. All events have dark enough skies that the Milky Way is very obvious, unlike observing close to home. Since I don't have limiting magnitude information for each site I have used a subjective comparison of each star party relative to Starfest.

July 12-14

Gateway to the Universe

This is a casual gathering of less than 100 people. Talks are offered on Friday and Saturday nights. There is a 'regular' camping area in the trees but people set up at the periphery or in an adjoining field. Pay showers and flush toilets are available. There is swimming in a river running past the campground. I should warn you, mosquitoes have been vicious in some years at this location. The night sky is darker than at Starfest.

Munro Family Campground, Powassan, Ontario (20 km south of North Bay). Organizer: North Bay Astronomy Club. Contact: Tom Ouellette Tel: 705-474-7666 or Merlin Clayton, 50 Van Horne Cres., North Bay, ON P1A 3L3. Tel: 705-472-1182 E-mail: galaxy@efni.com Website: www.gateway-to-the-universe.org (This didn't work the last time I tried it.)

August 8-11

Starfest 2002

Starfest is Canada's largest annual observing convention and star party. It attracts over nine hundred astronomy enthusiasts from Ontario, and neighbouring provinces and states. It has been ranked among the top seven star parties in North America by Sky and Telescope magazine. Activities include observing sessions, formal and informal presentations, workshops, commercial exhibits, and a children's program. This year's theme, Capturing Photons, examines the vari-

ous methods that are available for observing the night sky and recording what we see. Visual, photographic, CCD, video, digital still cameras, web cams and hybrid techniques will be explored. There is a swimming pool on site. Pay showers and flush toilets are available as well as portable toilets. The conference attendees camp in a bare field which is great for observing but there is no shade during the day. Saturday night dinner is available. Plenty of nearby restaurants. Door prizes on Saturday night. This star party is great even if the weather is bad.

River Place Campground, near Mount Forest, Ontario. Organizer: North York Astronomical Association. Cost: Registration \$50 single & \$65 family, Camping \$12/person/night, Saturday Dinner \$15, Electrical Hookup \$1/night. Contact: Andreas Gada, 26 Chryessa Ave., Toronto, ON M6N 4T5. Tel: 416-221-7375 E-mail: tonyward@rogers.com Website: www.nyaa-starfest.com/

August 12-18

Great Manitou Star Party

This star party offers the best night skies being located away from any significant source of light pollution. They offer much darker skies than Starfest. There is an amazing beach within a 20 minute drive that looks like it belongs in the Caribbean but the water is COLD. They're planning a 'Faces and Phases' lunar photography contest, "Lunar Lore" campfire talk and a moonlight beach party. There is a Saturday afternoon keynote speaker who will make a presentation on astrophotography. Earth and Sky astronomy shop will be selling binoculars, telescopes, telescope accessories, books et cetera. Gordon's Park has a store, bar, restaurant, hiking trails, a children's playground and mini-putt. It also has a couple of bed-and-breakfast rooms. The observing site is set back in the woods.

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Chair's Report

At long last, summer is actually here - well, maybe not officially, but close enough. Sadly, this also signals the last of our regular meetings until September. Happily, it also means the opportunity to get together with folks at star parties and to have some holidays!

In September, we hope to resurrect the HAA's Silent Lake Star Party. Many years ago, we had a wonderful, well-attended get-together at this provincial park near Bancroft, Ontario. It is far enough away from Toronto and Ottawa that the skies are REALLY dark. By holding it on the New Moon weekend after Labour Day, we avoid the summer crowds (and most of the mosquitoes!) and we have the summer Milky Way high in the sky for the early part of the night. What's not to like?!

We are hoping to attract some additional BIG scopes from folks in the Ottawa area, so there should be plenty of photons to go around! I believe that there are more details elsewhere in this issue. Circle the dates of September 6/7/8 on your calendar!

It looks probable that we will hold

our meetings at the Steam Museum when we start up again in the Fall. The Spectator has been graciously allowed us the (free) use of their auditorium for years now, but recent policy changes have prevented us from booking more than two months in a row without substantial hassles. Since we are a volunteer organization, keeping hassles to a minimum is important!! In any case, please keep an eye on the HAA webpage (www.amateurastronomy.org - thanks again, Rick!) and/or your summer issue of Event Horizon for updates on the venue for the September meeting.

Sheila Overall has informed me that she will be stepping down as the Council member in charge of publicity in September. Sheila - many thanks for your efforts and your time!

I also want to thank all of the Council members who have, as usual, made it such a pleasure to be part of the HAA.

Have a great summer and see you at one or more star parties!!

Doug Welch

Doug Welch is the current chair of the HAA and also a founding member. You can find out more about Doug at: http://www.physics.mcmaster.ca/people/faculty/Welch_DL_h.html



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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... cont'd from page 1

You can set up your camp in the open fields with other attendees or find yourself a nice, private sanctuary among the trees. Bathroom facilities consist of outhouses and port-a-potties. There is an ingenious “bush shower” - warm water and the open sky.

Gordon's Park & Carter Bay Resort, Manitoulin Island, Ontario. Cost: Registration \$20.00/night/vehicle, Saturday Dinner \$12.00. Contact: Mark Oldfield, 1687 Carol St., Val Caron, ON P3N 1H1. Tel: 705-897-4518 Fax: 705-673-0730 E-mail: greatmanitou@hotmail.com Website: www.manitoulin-link.com/starparty

August 12

Charleston Lake Astronomy Night and Perseid Meteor Watch

I have never attended this event so I can't comment on the facilities or the night sky.

Charleston Lake Provincial Park, near Brockville, Ontario. Talk by Terence Dickinson at 8:30 p.m., followed by telescope viewing. Organizer: Park staff. Tel: 613-659-2065

September 5-8

Huronian Star Party

A gathering of 100 - 150 people held in an open field. They have Friday and Saturday night talks. The featured Saturday night speaker at 7pm will be Paul Delaney and his talk is “Cosmology: Twists, turns, and all the changes in-between”. Vendors will be set up to purchase anything from books to telescopes. They offer a Saturday night dinner and EftonScience has been known to provide a free breakfast to the first 50 people who wake up in time. All other activities are off site. The night sky is not as dark as at Starfest and has been getting brighter over time.

Private campground on Kueper farm, 15 min. northwest of Alliston, Ontario. Organizer: South Simcoe Amateur Astronomers. Cost: \$39 single, \$49 couple, \$10 ages 13-19, Saturday Dinner \$15 Contact: Christopher Trace, 43 Tecumseth N, Beeton, ON L0G 1A0. Tel: 905-729-4982 E-mail: ssaaclub@yahoo.ca or: ssaa@cois.on.ca Website: www.geocities.com/CapeCanaveral/Lab/3681/index.html

September 6-8

HAA Star Party

This is the one that you shouldn't miss. Our very own HAA Star Party doesn't offer any talks but the location is great. The night sky is darker than Starfest but not quite as dark as at Manitoulin Island. There are lots of daytime activities such as fishing, canoeing, wildlife viewing, swimming and cycling. The campsites

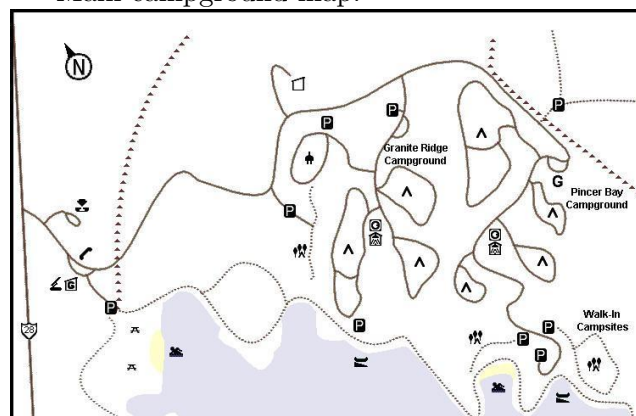
at Silent Lake are not your typical star party quality. They are well shaded, level and quite large. Depending on the campsite, they allow up to three tents and six people! The drawback to these nice sites is that you have to set up and take down your scope at the main parking lot each night. It's worth the effort though. We should try to stay in the same area but make your reservations soon since campsites are already being reserved for that weekend. We are expecting some people to join us from the Ottawa and Peterborough astronomy clubs.

Cost: Camping \$21.50/site/night. Silent Lake (613) 339-2807 <http://www.ontarioparks.com/sile.html>

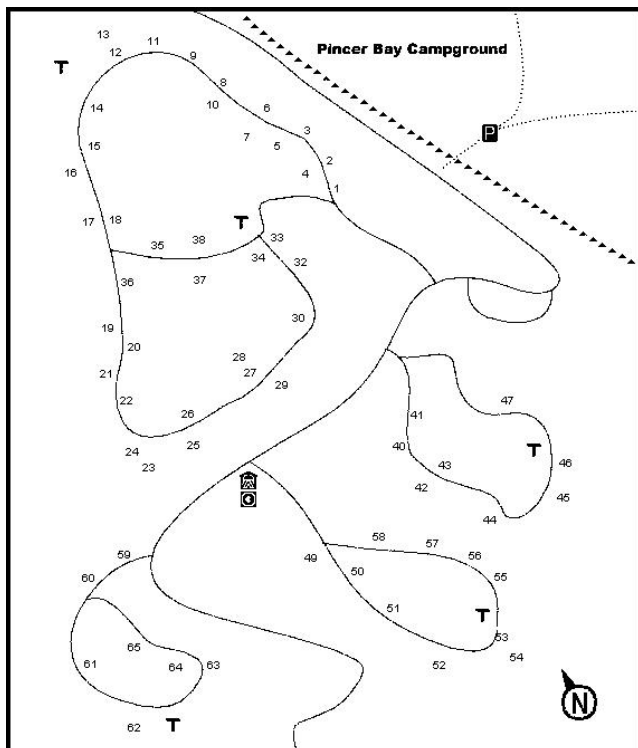
Silent Lake area map:



Main campground map:



I recommend that you make reservations in the 40-58 group of sites in the Pincer Bay campground:



Some simple star party rules:

(Mostly stolen from the web but I've lost the source.)

1) Avoid using white lights. Use red lights sparingly. If for some reason you must use a white light, shout out a warning. 2) Hopefully your car doesn't violate the above but some newer cars can't turn off their headlights. In that case, try to arrive before dark and warn people when you are leaving. Backup lights and even interior lights can ruin someone's night vision. 3) If you come to a star party without a telescope please park some distance away from the main observing area to save room for those with heavy equipment to carry. 4) Never touch anyone else's equipment without permission. But don't be afraid to ask. Never touch any glass

optical surface. 5) Avoid loud and boisterous behaviour. Star-gazing is a quiet, peaceful activity. 6) Don't litter. 7) Drive slowly so as to avoid kicking up dust. 8) Watch your step (but don't use a flashlight). Be especially careful of wires on the ground. Some scopes require power and some folks use their car's battery. If your scope requires power try to make the wires as safe as possible. 9) Don't set up too close to another observer. When in doubt, it's always a good idea to ask, "Is it OK if I set up here?" 10) Be careful when astrophotographers are doing their thing. 11) Some places ban pets and some allow them. If you bring your pet make sure it is firmly under control. No barking dogs early in the morning! 12) Some places ban music altogether, some are less strict. Just remember that music that you love may be extremely irritating to others. When in doubt use a headset. 13) Smokers should stay downwind of non-smokers and their telescopes. Just because you're outdoors doesn't mean your smoke isn't annoying. 14) Be aware that alcohol may adversely affect your night vision, body temperature and ability to drive. 15) Owners of LX-200s must offer coffee to passers-by who mistake the noise of their slewing motors for that of an espresso machine. 16) Refrain from pointing out the failings of your neighbor's telescope until your own optics are safely covered.

by Stewart Attlesey

Stewart Attlesey is a founding member of the HAA. He has held the positions of Chair, Editor, Secretary, Recorder and is currently the Observing Director. He has also held the positions of Recorder and Observatory Curator for the RASC Hamilton Centre. stewart.attlesey@cogeco.ca



Fun with IRAF by Anthony Tekatch

I've been trying my hand at CCD (charged coupled device) image manipulation. I was lucky enough to be invited to an observing session by Bob Botts at the RASC site in Flamborough a few weeks ago. Bob has a 4" Genesis telescope and SBIG ST-6a CCD unit.

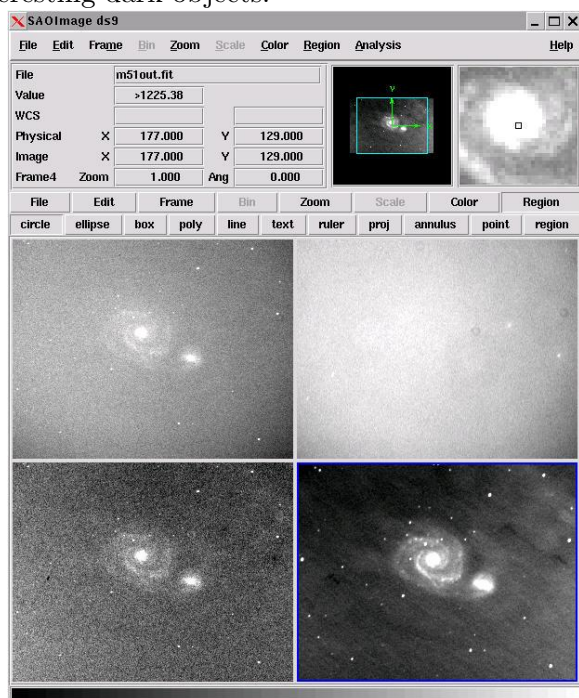
Bob took about an hour to properly set up the scope, electronically chilled CCD and computer interface. We spent the next four hours taking shots of M51 through the clouds. The sky was slightly overcast and didn't clear up until 5 minutes after we had packed up for the evening. Regardless of the poor viewing conditions, the telescope/CCD combination still picked up many nice

images.

The raw images from the special astronomy CCD camera are not suitable for direct viewing since the little cells pick up varying amounts of light that produce an uncorrected image. Modern consumer CCD cameras provide filtering to reduce background noise which makes them unsuitable for deep sky astronomy. The astronomy CCDs provide raw data so that you can manipulate and filter the image as you please, unfortunately that filtering (or image reduction) can be quite a detailed process requiring special software.

Faint objects require either long or multiple expo-

tures. The long exposure would be the best since their would only be one image to manipulate for viewing, however the telescope must track the object accurately and hopefully no satellites pass by while exposing. The multiple exposure method allows you to remove bad shots. When taking pictures of faint objects with a general consumer camera the CCD imperfections are filtered out automatically, but so are any potentially interesting dark objects.



There are programs for DOS that come with the CCD and MAXIM-DL for Windows (<http://www.cyanogen.com/>) that perform image stacking. Bob gave me the raw images to try and put together myself. I only use Linux on my system and had to hunt down something that would manipulate the images. I was in luck since Linux is capable of running many programs that were written for Unix which is widely used for astronomy in universities. I found something called

IRAF (Image Reduction and Analysis Facility)<http://iraf.noao.edu/>.

The IRAF project is funded by the US government and is still being maintained today. It took about 24 hours for me to install and learn the unusual interface of IRAF. I was also given an excellent hands-on tutorial by Doug Welch in the final hours of my initial journey. Also a “must-have” graphical user interface (ds9) is made by Smithsonian Astrophysical Observatory in Cambridge <http://hea-www.harvard.edu/RD/ds9/>.

The adjacent image shows the ds9 software with four image frames at various stages of processing. The top left is one of the original 36 CCD images that was taken at the observatory. The top right image is the “flat” image which is used for correcting the CCD images. The bottom left is the “flat corrected image”. The bottom right is the composite stacked and aligned result of 18 selected images. The process involves selecting the images of value (with no smearing or satellite streaks), “flat processing”, image alignment, then image stacking.

Maxim DL is more user friendly than IRAF, but I wanted to try something available for Linux and totally free. IRAF is very powerful and can be customized with user-written FORTRAN programs. IRAF is very mature and has a many Internet newsgroups where you can get help. The Internet is also full of FITS (Flexible Image Transport System) files from other telescopes that you can use to find new or interesting sky objects, one such site is <http://adil.ncsa.uiuc.edu/>.

by Anthony Tekatch

Anthony is interested in electronics, astronomy and music. He has been a member of HAA for one year. anthony@unihedron.com



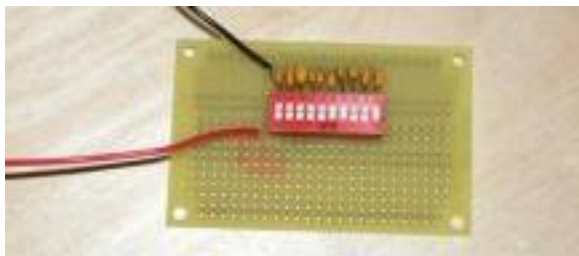
SID City *by Doug Welch*

Last month I described “Sudden Ionospheric Disturbances” (a.k.a. SID’s) and how I wound my receiving loop. It has now been operating for a full month and, believe it or not, is still working! This month I will describe the electronics and show you some typical traces.

The two ends of the loop need the appropriate capacitance across them if they are to resonate at the frequency of the transmitting station - in this case, 24.0 kHz. Since one of the advantages of this antenna is

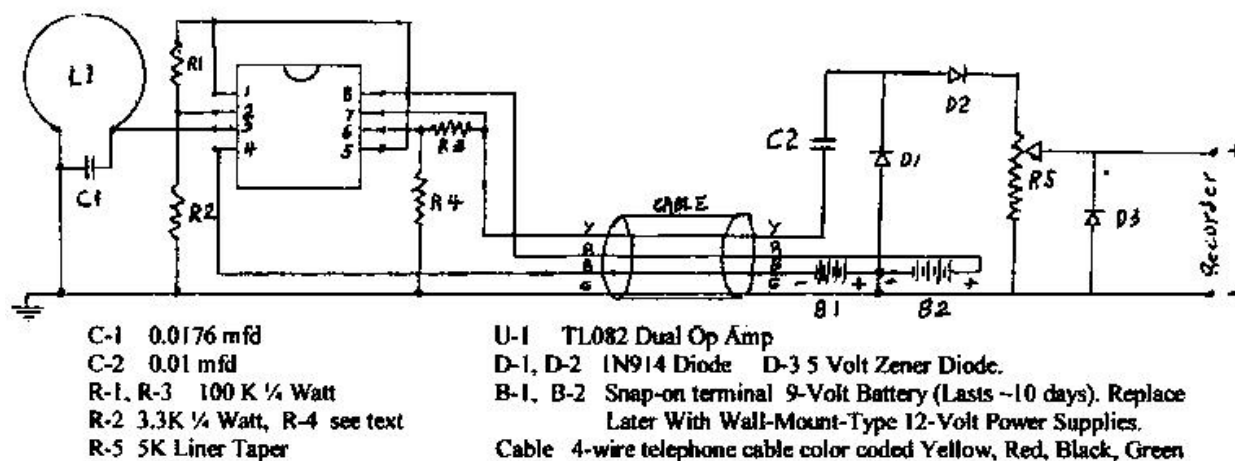
that it can select a narrow range of frequency - and hence reject noise - it is important to be able to set the capacitance with some precision. About 1% precision is necessary for optimum performance. For my loop, the capacitance was about 18000 pF (=0.018 uF). You don’t normally find cheap variable capacitors with this value. It is possible to find a single-purpose piece of test equipment to do this, but even used they cost over \$300. Fortunately, you can make one for under

\$10 which is perfect for the job. The basic idea is to pick a group of capacitors which are different from the next smallest by a factor of two. Then you wire them in parallel, each with a DIP switch switch in line with it. For a 8-position DIP switch, you can select 255 different (non-zero) capacitances! (The photo below shows my 10-pin DIP switch and the capacitors.)



The next item is the dual opamp. While one side of the loop goes to ground, the other feeds the non-inverting input of an opamp. That stage produces a gain of 30x in my system (by using a pair of resistors) and feeds a second stage with a gain of 10x. (I will probably alter this to 20x in the future to increase the output signal level.) A four-conductor cable of some description brings positive and negative voltage to the opamp, a ground, and takes the signal back to the rectifier end.

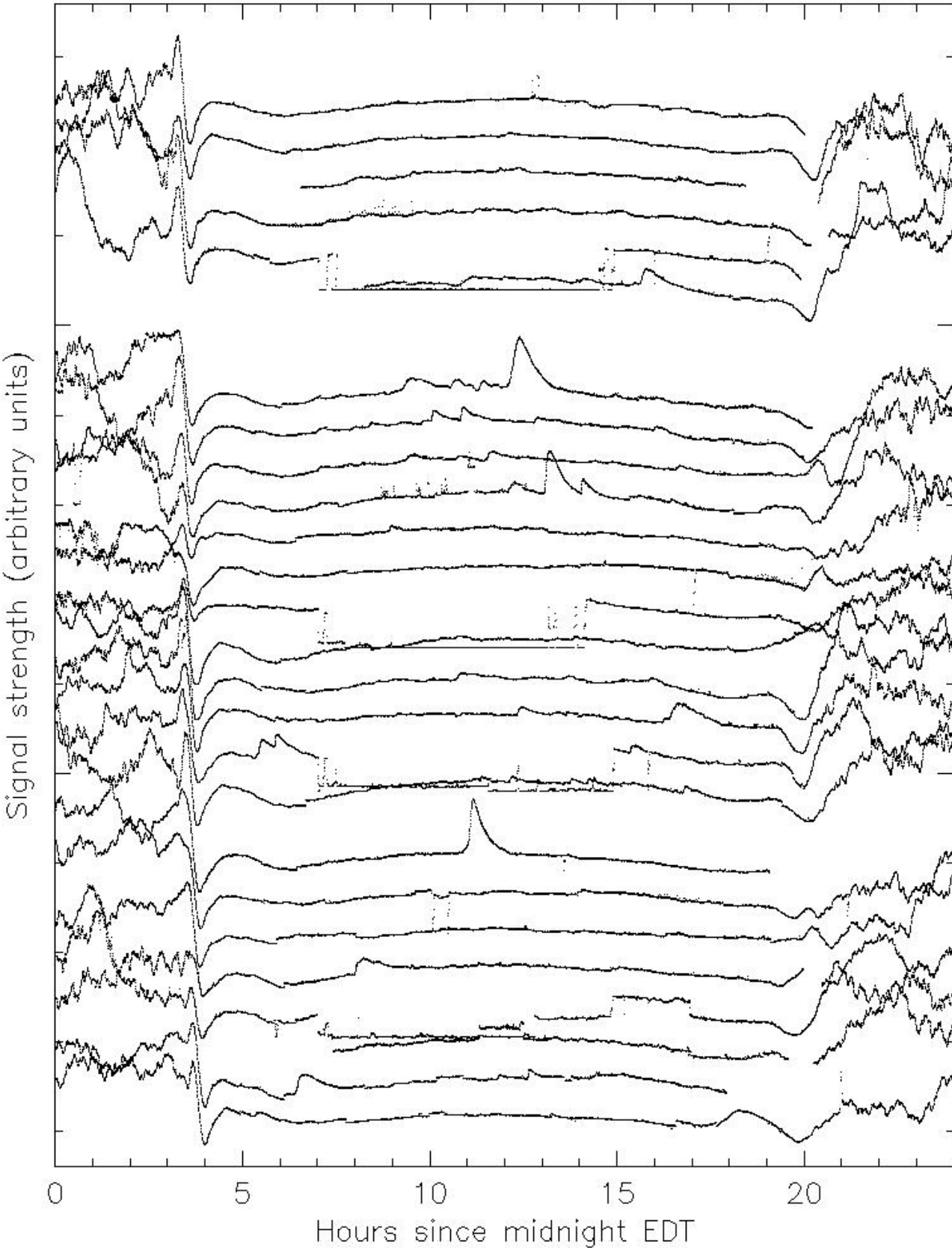
One important physical issue is where the opamp sits. It can't be on the periphery of the loop or feedback will occur (because it is sensing its only amplified signal)! The loop antenna has zero response at right angles along the axis of the loop, so that is where the opamp goes.



In my system, the four-conductor cable is about 10 feet long. At the other end, I rectify the signal using a pair of diodes, a capacitor and a resistor as shown in the circuit diagram above. (The 5V Zener diode is optional - it protects the data acquisition module from overvoltage.) The voltage across the resistor is measured with an analog-to-digital converter unit called a DI-194RS from DataQ (www.dataq.com). It costs US\$24.95 and comes with a serial cable, software for Windows computers, and a screwdriver - surely the deal of the century!!! (Be sure to ask them to send it by regular mail instead of United Parcel Service - if you don't, it will cost an additional CAD\$35 for brokerage fees!) The DI-194RS sits on the 9-pin serial port of a castoff computer which does this one thing - taking SID data! The software is even smart enough to start up another file when the

current one fills up. I now take 24 hours per file at one sample per second. (The DI-194RS can take data from four different sources with voltages between -10 and +10 volts).

Finally - take a look at my traces. They lowest one is for May 10, 2002 and each day is a fixed increment in signal strength higher. NAA has scheduled maintenance days which are typically Mondays. However, the Friday before the Memorial Day long weekend in the US was used for this purpose instead of the holiday Monday. No traces are shown for May 18th or June 1st. The occasional large (positive) vertical step (not due to NAA coming back on the air) is due to the dining room light dimmer being turned on - I have since replaced it with a regular switch!



Several features of the graph are striking. One is that the signal is "ratty" at night when the ionosphere is not illuminated by the sun. Second, there is a very distinctive "sunrise pattern". Third, there are some solar flares which leap off the normal daytime trace! There are also interruptions of the traces due to unusually frequent power outages in May. (I have since put a UPS on the data-taking computer to deal with the relatively short dropouts!) Also, lone high points due to lightning in the area are visible at times.

All in all, it has been good fun and I plan to keep it going in hopes of detecting more flares and possibly

the occasional X-ray transient or GRB. I am happy to help anyone else interested in putting together such a system - just talk to me at a meeting or send me e-mail.

by Doug Welch

Doug Welch is the current chair of the HAA and also a founding member. You can find out more about Doug at:

http://www.physics.mcmaster.ca/people/faculty/Welch_DL_h.html



WebWatch

Submitted by Stewart Attlesey

<http://www.cbc.ca/one/light/index.html>

Flash is required for these CBC stories on light pollution.

<http://www.astronomydaily.com/preview.html>

Find out what is astronomically happening in your neck of the woods.

For Sale

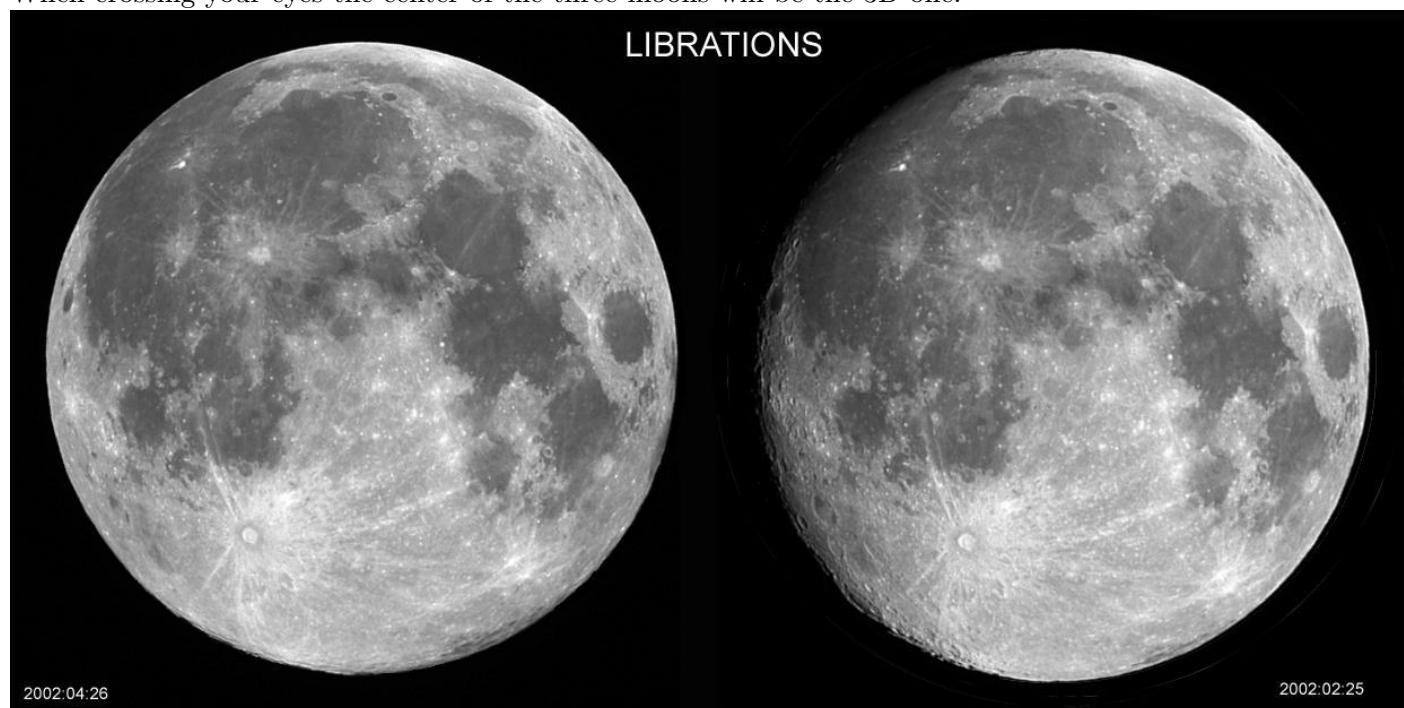
Meade LX200 8" with field tripod and travel case, In pristine condition. Asking \$2000 but am somewhat flexible. Shipping is negotiable. I live in Central Oregon and the easiest way to contact me is at this E-mail gnball@hotmail.com

Gary Ball

3D Moon by Bob Botts

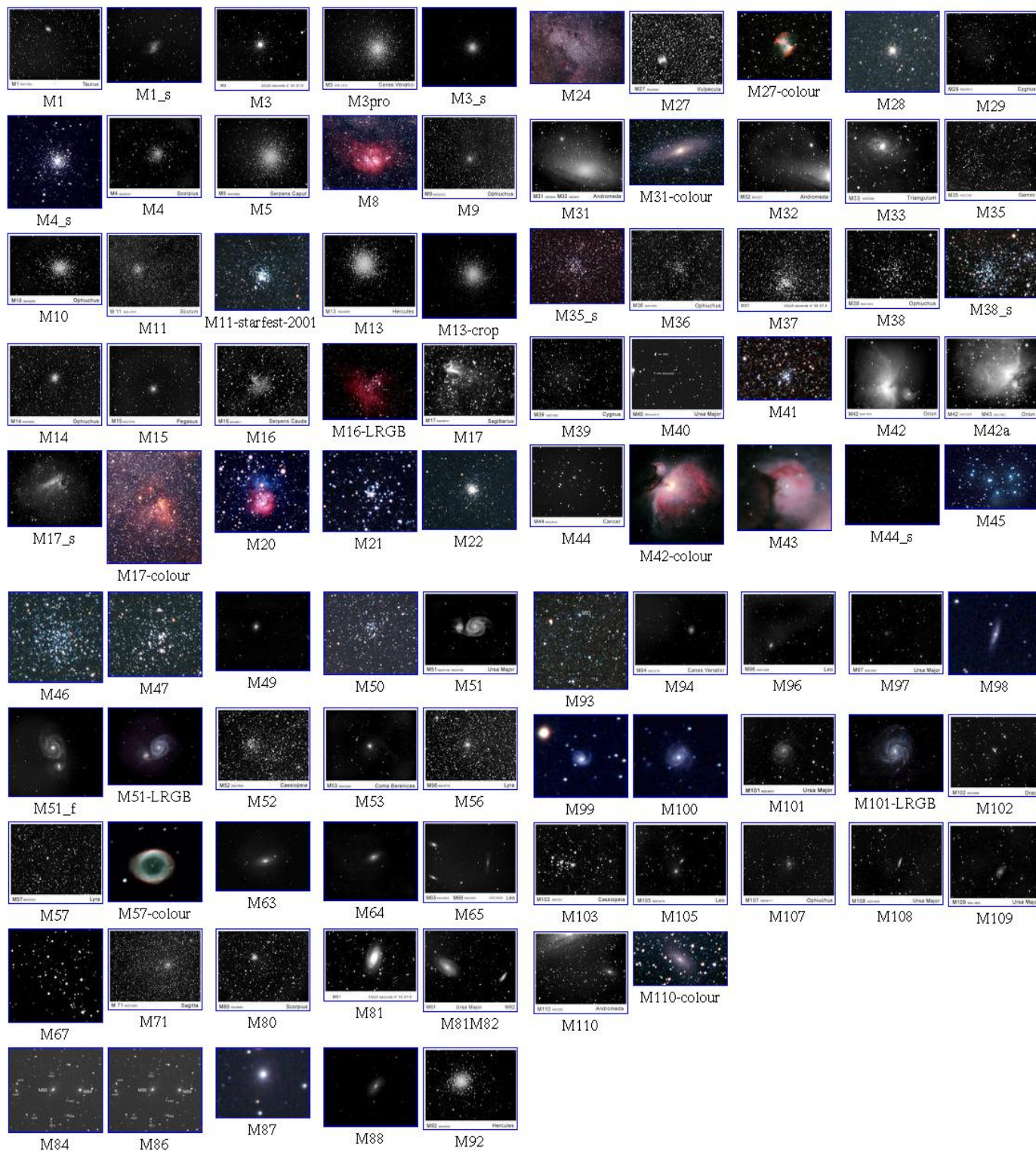
At various times throughout the year we can see the moon from different angles which gives us a partial view onto the seldom seen "far side of the moon". We can see the librations of the moon by photographing at these different times.

Look cross-eyed at the two images which make up this composite 3D image taken in February and April 2002. When crossing your eyes the center of the three moons will be the 3D one.



Bob Botts and Steve Barnes have been very busy in the last month compiling their own Messier collection of photographs. The amount of work involved in this effort is enormous considering how many images must be taken to make up one final photograph. The processing of these images is also very time consuming.

Check out their latest efforts and full size images on the club web website <http://amateurastronomy.org>



July 2002

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