

 **Current**
Astronomy
RIVER BEND ASTRONOMY CLUB NEWSLETTER

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2010



Rich Dietz's daughter takes a look through the family's new Meade DS-2114
4.5 inch Newtonian telescope. Photo by Rich Dietz

INSIDE THIS ISSUE

Product Review: Meade DS-2114 Newtonian Reflector with GOTO • It's Election Time!
Worden Elementary School Solar Observing • RBAC to Present Stargazing at St. Jacob Park
A Rock Hound is Born • Observing Lists



River Bend Astronomy club serves astronomy enthusiasts of the American Bottom region, the Mississippi River bluffs and beyond, fostering observation, education, and a spirit of camaraderie.

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| | |
|-----------------------|--|
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Affiliated with the Astronomical League, dedicated to fostering astronomical education, providing incentives for astronomical observation and research, and assisting communication among amateur astronomical societies.
www.astroleague.org



Affiliated with the NASA Night Sky Network, a nationwide coalition of amateur astronomy clubs bringing the science, technology and inspiration of NASA's missions to the general public.

Monthly Meetings

Saturday, May 15, 2010 • 7:00 PM
at Camp Warren Levis, Godfrey, IL
Saturday, June 19, 2010 • 7:00 PM
at St. Jacob Township Park
Saturday, July 10, 2010 • 7:00 PM
at Dietz Observatory

Looked Up Lately?

Join River Bend Astronomy Club

Want to learn more about astronomy? The members of River Bend Astronomy Club invite you to join. You won't need expensive tools or special skills - just a passion for observing the natural world.

- Meetings offer learning, peeks through great telescopes, and fun under the stars.
- You will receive the club newsletter, *Current Astronomy*, packed with news and photos.
- Get connected with our member-only online discussion group.
- Borrow from the club's multimedia library.
- Borrow from the club's selection of solar telescopes.
- And that's not all! Through club membership you also join the Astronomical League, with its special programs and colorful quarterly newsletter *The Reflector* to enrich your hobby.
- We meet monthly, observe regularly, email news and quips constantly, and generally have a good time. Won't you join us?

Name _____
 Address _____
 City _____ State _____ Zip _____
 Phone _____
 Email address _____
 Where did you hear of our club? _____

How long have you been interested in astronomy? _____
 Do you have optical equipment? _____
 Are you afraid of the dark? ___Yes ___No (just kidding)
 I am submitted my application for:
 _____Adult Membership(s) ___Youth Membership(s)
 \$20/year each \$15/year each
 (18 yrs. and up) (17 yrs. and under)
 I enclose a check for \$ _____ made out to:
 Mike Veith, Treasurer, RBAC
 Signature _____
 Date _____

Mail to: River Bend Astronomy Club
 c/o Mike Veith, 1121 St. Louis St., Edwardsville, IL 62025.

Product Review: Meade DS-2114 Newtonian Reflector with GOTO

By Rich Dietz

I needed a fun Christmas gift for my 2 daughters (ages 9,12) and I saw that Sam's Club had a deal on the Meade DS 2114 ATS-LNT. They were offering a fully GOTO 4.5" Newtonian reflector for only \$199.99 Sale price. (MSRP \$329.00) I thought that this would be an excellent gift to help get my children more involved with astronomy while also not breaking the bank as it was very affordable.

After the kids opened their gift with much appreciation and excitement it was time to open the box and assemble the goodies inside. I took out all the parts and organized everything for assembly. The scope is modular and went together 1,2,3. I set up the tripod and secured the tripod tray. The tripod is a mix of light-weight aluminum and plastic. It is very light, which is a plus for the kids being able to move it around. I found the tripod to be stable and it extends to height of 40" which works well for viewing.

I then assembled the mount. The mount uses 8 "AA" batteries and threads into the tripod. The mount is an Altazimuth single arm GOTO assembly that uses the Meade #494 AutoStar Controller. The controller has over 1400 pre-programmed celestial objects in its database and is designed for a novice to advanced astronomer to use.

Mounting the OTA to the mount arm was also easy. I just screwed on the locking clamp to the arm head motor and then attached the OTA. One large set screw holds the tube on the motor arm. I did not tighten the screw at first so that I could balance the OTA tube. I leveled the tube to the horizon and slid it left to right until it met balance. Then I tightened the mounting clamp and the declination lock knob.

The only thing left to do was add an eyepiece. This scope comes with 2 eyepieces. The Meade super plossl eyepieces were a 25mm wide view and a 9mm for higher magnification. Both eyepieces offer a good view and compliment the scope nicely.

After the scope was setup, I set the Red Dot view finder against a terrestrial object and got ready for first light. Once a clear night became available we went outside and setup for viewing. This was where I was worried that a GOTO scope may be too much for the kids to have to deal with, as a star alignment can be somewhat difficult for a novice. However the Meade DS 2114 was unbelievably easy to use.

We simply pointed the scope at magnetic North (used a compass), and turned the scope on. The Autostar controller prompted us for time/date and then zip code. It then told us to set the Home position. This is simply pointing the reflector north and then leveling the OTA to the horizon. Then press Enter. Next it prompts you for an alignment process. It offers Easy, one star, and 2 star alignments. We chose the Easy method.

The scope automatically picked 2 stars. The first was Sirius, one of the brightest stars out that night. After pressing enter the scope slewed to Sirius but missed the target. No worries though, press the GOTO button and this scope begins a clockwise rotation and continues until Sirius is in the eyepiece. Once there, press enter and then center the star with the arrow keys, and then press enter again. Your first star is aligned, just that easy.

We then slewed to Capella and repeated the process. Viola! We were aligned. The 25mm eyepiece made searching the night sky easy with its wide field of view and once we found a target the scope tracked very well for observing.

Once we were aligned we chose some targets. The Moon was an obvious one and was full on

our first night out. The optics are so clear and bright that I had to add a Lunar filter to the eyepiece because the Moon was so bright in the clear sky. The 25mm offered a full view of the Moon's disc and the craters had excellent contrast and detail. The 9mm brought us much closer and we were able to see fine details of the Moon's surface.



Rich Dietz's daughter enjoys a look at the Moon in their new Meade 4.5 inch reflector.
Photo by Rich Dietz.

I removed the filter and we chose M42, Orion's Nebula. Again, the GOTO missed slightly and we pressed GOTO again, started the clockwise rotating search feature, and found our target. The scope's 4.5" aperture was more than enough to see the gas clouds and faint stars. Again, the 9mm brought us closer and offered more detail without problems. I was unable to detect other DSO nebulas in the light of the Full Moon, but am sure we will be able to detect many of the objects listed in the database from our Southern Illinois location. I then removed the eyepieces and added a 40mm Televue Plossl. This offered a great view of star fields and made viewing star cluster very easy. I was happy to see that the scope worked well with the larger eyepiece and had no problem focusing. I then switched to my 8mm TMB Planetary eyepiece and checked M42 again. Focusing at this magnification was a bit touchy, but it did well again.

I then attempted to use a 2x Barlow to push the optics of the scope, but unfortunately this scope is designed with a built in Barlow to achieve the right focal length of the shorter OTA. So I was unable to get good focus.

I later discovered on the Meade Website (http://www.meade.com/educational/ds%20videos/qt_chap1.html) that there are very informative instructional videos. While watching the videos I found an option to "train the drive" so that pointing accuracy during GOTO would be greatly improved. After I followed these easy steps I was targeting much closer to my intended locations.

I have only been using telescopes for a little over 2 years and am a novice astronomer. I am not very familiar with the night sky, but this scope made things very easy to find, track, and enjoy. My children have fun using the motorized scope and Red dot view finder. I believe after some more time with this scope it will get easier and easier to use.

The only problem I noticed with the scope is that the motors are loud and vibrate a bit when tracking. This causes a slight blurring of an object at times when viewing at higher magnification. Another downside is that the scope uses 8 "AA" batteries, which depending on the amount of use could get expensive in batteries. Meade does offer an A/C adapter, but out at remote locations this is of no help, so extra batteries are a must.

It would be nice if Meade offered a cigarette lighter adapter for this scope.

The scope also came with an Accessory duffel bag for transport, but I just collapse the tripod and remove the mount from the tripod and reassemble in the field. This makes transport in the car easy.

After using this scope I would give it a 4 out 5 star review. The optics and the easy GOTO mount are strong pluses for this scope. I highly recommend this scope for beginners and for introducing children to astronomy. That is not

to say that this is a "Kids" scope, but to say that it is so easy to use that kids will enjoy it too! I was lucky to purchase mine for \$200, but even at \$300 MSRP I feel this is a great scope for the money. [RBAC](#)

It's Election Time!

By Bill Breeden

The following members have either been nominated for River Bend Astronomy Club board positions, or would like to continue their positions:

President (Bill Breeden nominee)
Vice President (Jeff Menz nominee)
Treasurer (Mike Veith nominee)
Newsletter Editor (Bill Breeden nominee)
League Correspondent (ALCor) (Rich Dietz nominee)
Secretary (Mary Hebert nominee)
Outreach Coordinator (Terry Menz nominee)
Librarian (Rita Breeden nominee)



Elections will be held at the meeting on May 15. We will meet at Camp Warren Levis in Godfrey, Illinois at 7:00PM. We will conduct a simple show of hands to elect the nominees listed above, unless

a competing nomination is received before the election. My hat's off to the members that have served in the past, and for our current list of volunteers. Thanks for doing what you do to keep River Bend Astronomy Club active and exciting!

We have an outreach event for a group of Boy Scouts on May 15. After our elections, we will set up our telescopes. Here is the location of the May 15 event:

CAMP WARREN LEVIS
5500 BOY SCOUT LN
GODFREY, IL 62035-1519

You may want to use Mapquest (or similar) for driving directions. Here are the directions from the McKinley Bridge coming from Missouri:

Turn slight left on IL Rte 3 north and go 16.8 miles.
Turn slight right onto Homer M. Adams Parkway (IL-3 N) and go 6.1 miles.
Turn right on W. Delmar Ave (IL-3 N) and go 1.4 miles.
Turn right on Boy Scout Ln and go 0.6 miles.
5500 Boy Scout Ln is on the left.

Hope to see you there! [RBAC](#)

Worden Elementary School Solar Observing - RBAC Outreach Event 4/9/2010

By Rich Dietz

My Daughter Kylea is a 3rd grader and her class is doing their science curriculum called Science Anytime. The unit they were working on is called "Wings and Rockets" and it leads them to discussions about space. They were just reviewing the Hubble Telescope and the associated picture gallery provided by NASA. Their next unit was Solar system and the Sun so I offered to do a Solar Observing with my telescope and they accepted. (I talked to them on Wednesday and the date was set for the following Friday so very short notice, sorry more planning time was not available)

Once a date and time was set I talked to Terry Menz about Outreach materials provided by the Night Sky Network that were Sun related. Terry provided me with posters, postcards, bookmarks, button, stickers, and brochures about the Sun and the satellites that NASA uses to measure and record info from the Sun including SOHO and STEREO. She also provided interactive DVD's for the teachers to use.

For more info about SOHO you can go to the following link.....

<http://sohowww.nascom.nasa.gov/>

For more info on STEREO you can go to the following link....

http://www.nasa.gov/mission_pages/stereo/main/index.html

I ordered a Thousand Oaks 6" Type +2 yellow solar filter for my scope and it came in just in the nick of time! I went out to the school and set up my 6" refractor on the south parking lot and got a beautiful clear sky and perfect view of the Sun! The Sun was a magnificent yellow/orange and there was an active Sunspot at the 11 o'clock position that all the students hunted for with their new observing skills! What fun it was!!!



3rd grade students at Worden Elementary School gather around Rich's refractor set up for solar observing. Photo by Rich Dietz.

There were a total of (39) 3rd graders and 2 teachers (Mrs. Brown and Mrs. Weber), plus myself present for the demonstration. The children were very excited to see the Sun and even more excited to have received the learning materials from the Night Sky Network!!! The all had a great day and asked questions about the telescope and the Sun.

The teachers had shown the video and the website image galleries to the children while I set up 2 telescopes. I had brought a 4.5" reflector to view the daytime Moon with, but it fell below the horizon after 1 pm so I was unable to show both the Moon and the Sun which would have been a special treat!

The presentation took about 2 hours with both going through the provided materials and viewing time through the telescopes. I also discussed the differences between a reflector telescope and a refractor telescope. I showed them the mirrors and the lenses associated with both types of scopes. I also passed around the Celestron Sky Scout personal planetarium so they could see it also.



Worden Elementary students working on solar projects. Photo by Rich Dietz.

Mrs. Weber was very impressed with the presentation and she wanted the RBAC club to work with Worden Elementary again on a larger scale and has contacted Terry Menz. Hopefully they can work out a schedule or program for either this year or next year where more members of RBAC could bring their scopes too. A special night time viewing through the school district would be awesome indeed!!!!



Worden Elementary students working on NASA space projects. Photo by Rich Dietz.

It was an extremely rewarding experience to have been able to do this mini-outreach, but what was even more rewarding and unexpected was a gift from the students. They all wrote me a personal thank you that explained what was their favorite part of the presentation and what they saw in the scope. They then bound it in a nice spiral book. It is a keepsake to be added to my library!



Worden Elementary students working on solar projects. Photo by Rich Dietz.

Thanks again to all members of RBAC for showing me how to do an Outreach to others, for showing me how to use my scope more proficiently, and for exposing me to the Night Sky Network! A very special thanks to Terry Menz for all her help and advice!!! [RBAC](#)

RBAC to Present Stargazing at St. Jacob Park

By Bill Breedon

Thanks to our former president and club founder Gary Kronk, we have made contact with Bruce Frank, who works for the city of St. Jacob. Mr. Frank has reserved the pavilion at St. Jacob Township Park for members of River Bend Astronomy Club to use for astronomy outreach on June 19. This was changed from the previous date of June 12 due to a scheduling conflict. The schedule change actually works in our favor for an outreach event since we will now have a First Quarter Moon to show people. The Moon makes a spectacular first impression through a telescope.

Since we have the pavilion, we will meet rain or (Moon) shine. See you at 7:00PM on June 19! St. Jacob Township Park is located at:

239 West Main Street
St. Jacob, IL 62281



We are planning on holding more meetings and outreach events at St. Jacob Park. In fact, for months that we have no meeting place planned in advance, St. Jacob Park will be our home

away from home. At the time of this printing, the August through December meetings will be at St. Jacob Park. **If you would like to volunteer to host a meeting, please post a message on our Yahoo! Group message board. The remaining dates available are 8/7, 9/4, 10/9, 11/6, and 12/4. These are all Saturday evenings.** [RBAC](#)



A Rock Hound is Born

It's tough to be a geologist when you can't tell one rock from another. Is that a meteorite or a chunk of lava? A river rock or an impact fragment? Houston, we have a problem!

It's a problem Spirit and Opportunity have been dealing with for the past six years. The two rovers are on a mission to explore the geology of the Red Planet, yet for the longest time they couldn't recognize interesting rocks without help from humans back on Earth.

Fortunately, it is possible to teach old rovers new tricks. All you have to do is change their programming—and that's just what NASA has done.

"During the winter, we uploaded new software to Opportunity," says Tara Estlin, a rover driver, senior member of JPL's Artificial Intelligence Group, and the lead developer of AEGIS, short for Autonomous Exploration for Gathering Increased Science. "AEGIS allows the rover to make some decisions on its own."

Estlin and her team have been working for several years to develop and upload increasingly sophisticated software to the rovers. As a result, the twins have learned to avoid obstacles, identify dust devils, and calculate the distance to reach their arms to a rock.

With the latest upgrade, a rock hound is born.

Now, Opportunity's computer can examine images that the rover takes using its wide-angle navigation camera (NavCam) and pick out rocks with interesting colors or shapes. It can then center its narrower-angle panoramic camera (PanCam) on targets of interest for close-up shots through various color filters. All this happens without human intervention.

The system was recently put to the test; Opportunity performed splendidly. At the end of a drive on March 4th, the rover settled in for a bit of rock hunting. Opportunity surveyed the landscape and decided that one particular rock, out of more than 50 in the

NavCam photo, best met criteria that researchers had set for a target of interest: large and dark.

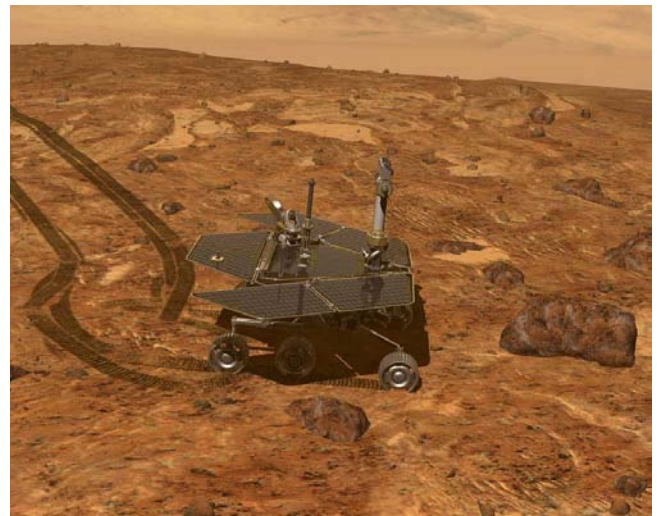
"It found exactly the target we would want it to find," Estlin says. "It appears to be one of the rocks tossed outward onto the surface when an impact dug a nearby crater."

The new software doesn't make humans obsolete. On the contrary, humans are very much "in the loop," setting criteria for what's interesting and evaluating Opportunity's discoveries. The main effect of the new software is to strengthen the rover-human partnership and boost their combined exploring prowess.

Mindful that Opportunity was only supposed to last about six months after it landed in 2004, Estlin says "it is amazing to see Opportunity performing a brand new autonomous activity six years later."

What will the rock hounds of Mars be up to six years from now? Stay tuned for future uploads!

Learn more about how the AEGIS software works at <http://scienceandtechnology.jpl.nasa.gov/newsandevents/newsdetails/?NewsID=677>. If you work with middle- or high-school kids, you'll find a fun way to explore another kind of robot software—the kind that enables "fuzzy thinking"—at http://spaceplace.nasa.gov/en/educators/teachers_page2.shtml#fuzzy.



Opportunity spots a rock with its NavCam that its AEGIS software says meets all the criteria for further investigation.

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

Looked Up Lately?



Observing is what we are about, so here are deep-sky observing lists for May and June for objects that transit around 10pm. Your observing sessions will be more fun if you are prepared with an observing plan. Prepare a list of your own, or print these and bring 'em to our next meeting/observing session.

May Observing List

Prepared by Bill Breeden

Double Stars

- _____ 24 Comae Berenices SAO 100160 Const. COM Type DS RA 12 35.1 Decl. +18° 23' Mag. 5.2 6.7
- _____ 32 Camelo- pardalis SAO 2101 Const. CAM Type DS RA 12 49.2 Decl. +83° 25' Mag. 5.3 5.8
- _____ Alpha Canum Venaticorum SAO 63256 Cor Caroli Const. CVN Type DS RA 12 56.0 Decl. +38° 19' Mag. 2.9 5.5
- _____ Delta Corvi SAO 157323 Algorah Const. CRB Type DS RA 12 29.9 Decl. -16° 31' Mag. 3.0 9.2
- _____ Gamma Virginis SAO 138917 Porrima Const. VIR Type DS RA 12 41.7 Decl. -01° 27' Mag. 3.5 3.5
- _____ Zeta Ursae Majoris SAO 28737 Mizar Const. UMA Type DS RA 13 23.9 Decl. +54° 56' Mag. 2.3 4.0 4.0

Messier Objects

- _____ M3 NGC5272 Const. CVN Type GC RA 13 42.2 Decl. +28 23 Mag. 6.3
- _____ M40 WIC4 Const. UMA Type DS RA 12 22.4 Decl. +58 05 Mag. 9.1
- _____ M49 NGC4472 Const. VIR Type GAL RA 12 29.8 Decl. +08 00 Mag. 8.5
- _____ M51 NGC5194 Whirlpool Galaxy Const. CVN Type GAL RA 13 29.9 Decl. +47 12 Mag. 8.1
- _____ M53 NGC5024 Const. COM Type GC RA 13 12.9 Decl. +18 10 Mag. 7.6
- _____ M58 NGC4579 Const. VIR Type GAL RA 12 37.7 Decl. +11 49 Mag. 9.2
- _____ M59 NGC4621 Const. VIR Type GAL RA 12 42.0 Decl. +11 39 Mag. 9.6
- _____ M60 NGC4649 Const. VIR Type GAL RA 12 43.7 Decl. +11 33 Mag. 8.9
- _____ M61 NGC4303 Const. VIR Type GAL RA 12 21.9 Decl. +04 28 Mag. 10.1
- _____ M63 NGC5055 Const. CVN Type GAL RA 13 15.8 Decl. +42 02 Mag. 9.5
- _____ M64 NGC4826 Black Eye Galaxy Const. COM Type GAL RA 12 56.7 Decl. +21 41 Mag. 8.8
- _____ M68 NGC4590 Const. HYA Type GC RA 12 39.5 Decl. -26 45 Mag. 8
- _____ M83 NGC5236 Const. HYA Type GAL RA 13 37.0 Decl. -29 52 Mag. 7.6
- _____ M84 NGC4374 Const. VIR Type GAL RA 12 25.1 Decl. +12 53 Mag. 9.3
- _____ M85 NGC4382 Const. COM Type GAL RA 12 25.4 Decl. +18 11 Mag. 9.3
- _____ M86 NGC4406 Const. VIR Type GAL RA 12 26.2 Decl. +12 57 Mag. 9.7
- _____ M87 NGC4486 Const. VIR Type GAL RA 12 30.8 Decl. +12 24 Mag. 9.2
- _____ M88 NGC4501 Const. COM Type GAL RA 12 32.0 Decl. +14 25 Mag. 10.2
- _____ M89 NGC4552 Const. VIR Type GAL RA 12 35.7 Decl. +12 33 Mag. 9.5
- _____ M90 NGC4569 Const. VIR Type GAL RA 12 36.8 Decl. +13 10 Mag. 10
- _____ M91 NGC4548 Const. COM Type GAL RA 12 35.4 Decl. +14 30 Mag. 9.5
- _____ M94 NGC4736 Const. CVN Type GAL RA 12 50.9 Decl. +41 07 Mag. 7.9
- _____ M98 NGC4192 Const. COM Type GAL RA 12 13.8 Decl. +14 54 Mag. 11.7
- _____ M99 NGC4254 Const. COM Type GAL RA 12 18.8 Decl. +14 25 Mag. 10.1
- _____ M100 NGC4321 Const. COM Type GAL RA 12 22.9 Decl. +15 49 Mag. 10.6
- _____ M104 NGC4594 Sombrero Galaxy Const. VIR Type GAL RA 12 40.0 Decl. -11 37 Mag. 8.7
- _____ M106 NGC4258 Const. CVN Type GAL RA 12 19.0 Decl. +47 18 Mag. 8.6

Caldwell Objects

- _____ C003 NGC4236 Const. DRA Type SG RA 12 16 42.00 Decl. +69 28 00.0 Mag. 9.7

_____ C021 NGC4449 Const. CVN Type IG RA 12 28 12.00 Decl. +44 06 00.0 Mag. 9.4
 _____ C026 NGC4244 Const. CVN Type SG RA 12 17 30.00 Decl. +37 49 00.0 Mag. 10.6
 _____ C029 NGC5005 Const. CVN Type SG RA 13 10 54.00 Decl. +37 03 00.0 Mag. 9.8
 _____ C032 NGC4631 Const. CVN Type SG RA 12 42 06.00 Decl. +32 32 00.0 Mag. 9.3
 _____ C035 NGC4889 Const. COM Type EG RA 13 00 06.00 Decl. +27 59 00.0 Mag. 11.4
 _____ C036 NGC4559 Const. COM Type SG RA 12 36 00.00 Decl. +27 58 00.0 Mag. 9.8
 _____ C038 NGC4565 Const. COM Type SG RA 12 36 18.00 Decl. +25 59 00.0 Mag. 9.6
 _____ C045 NGC5248 Const. BOO Type SG RA 13 37 30.00 Decl. +08 53 00.0 Mag. 10.2
 _____ C052 NGC4697 Const. VIR Type EG RA 12 48 36.00 Decl. -05 48 00.0 Mag. 9.3
 _____ C060 NGC4038 The Antennae Const. CRV Type SG RA 12 01 54.00 Decl. -18 52 00.0 Mag. 11.3
 _____ C061 NGC4039 The Antennae Const. CRV Type SG RA 12 01 54.00 Decl. -18 53 00.0 Mag. 13
 _____ C077 NGC5128 Cen A Radio Source Const. CEN Type EG RA 13 25 30.00 Decl. -43 01 00.0 Mag. 7
 _____ C080 NGC5139 Omega Centauri Const. CEN Type GC RA 13 26 48.00 Decl. -47 29 00.0 Mag. 3.6
 _____ C083 NGC4945 Const. CEN Type SG RA 13 05 24.00 Decl. -49 28 00.0 Mag. 9.5
 _____ C084 NGC5286 Const. CEN Type GC RA 13 46 24.00 Decl. -51 22 00.0 Mag. 7.6
 _____ C094 NGC4755 Jewel Box Cluster Const. CRU Type OC RA 12 53 36.00 Decl. -60 20 00.0 Mag. 4.2
 _____ C098 NGC4609 Const. CRU Type OC RA 12 42 18.00 Decl. -62 58 00.0 Mag. 6.9
 _____ C099 Coal Sack Const. CRU Type DN RA 12 53 00.00 Decl. -63 00 00.0 Mag.
 _____ C105 NGC4833 Const. MUS Type GC RA 12 59 36.00 Decl. -70 53 00.0 Mag. 7.3
 _____ C108 NGC4372 Const. MUS Type GC RA 12 25 48.00 Decl. -72 40 00.0 Mag. 7.8

Royal Astronomical Society of Canada Objects

_____ RASC46 NGC4088 Const. UMA Type G-Sc RA 12 05.6 Decl. +50 33 Mag. 10.5
 _____ RASC47 NGC4157 Const. UMA Type G-Sb RA 12 11.1 Decl. +50 29 Mag. 11.9
 _____ RASC48 NGC4605 Const. UMA Type G-SBcp RA 12 40.0 Decl. +61 37 Mag. 9.6
 _____ RASC59 NGC4111 Const. CVN Type G-S0 RA 12 07.1 Decl. +43 04 Mag. 10.8
 _____ RASC60 NGC4214 Const. CVN Type G-Irr RA 12 15.6 Decl. +36 20 Mag. 9.7
 _____ RASC61 NGC4244 Const. CVN Type G-S RA 12 17.5 Decl. +37 49 Mag. 10.2
 _____ RASC62 NGC4449 Const. CVN Type G-Irr RA 12 28.2 Decl. +44 06 Mag. 9.4
 _____ RASC63 NGC4490 Const. CVN Type G-Sc RA 12 30.6 Decl. +41 38 Mag. 9.8
 _____ RASC64 NGC4631 Const. CVN Type G-Sc RA 12 42.1 Decl. +32 32 Mag. 9.3
 _____ RASC65 NGC4656/7 Const. CVN Type G-Sc RA 12 44.0 Decl. +32 10 Mag. 10.4
 _____ RASC66 NGC5005 Const. CVN Type G-Sb RA 13 10.9 Decl. +37 03 Mag. 9.8
 _____ RASC67 NGC5033 Const. CVN Type G-Sb RA 13 13.4 Decl. +36 36 Mag. 10.1
 _____ RASC68 NGC4274 Const. COM Type G-Sb RA 12 19.8 Decl. +29 37 Mag. 10.4
 _____ RASC69 NGC4414 Const. COM Type G-Sc RA 12 26.4 Decl. +31 13 Mag. 10.2
 _____ RASC70 NGC4494 Const. COM Type G-E1 RA 12 31.4 Decl. +25 47 Mag. 9.8
 _____ RASC71 NGC4559 Const. COM Type G-Sc RA 12 36.0 Decl. +27 58 Mag. 9.8
 _____ RASC72 NGC4565 Const. COM Type G-Sb RA 12 36.3 Decl. +25 59 Mag. 9.6
 _____ RASC73 NGC4725 Const. COM Type G-Sb RA 12 50.4 Decl. +25 30 Mag. 9.2
 _____ RASC74 NGC4038/9 Antennae Galaxies Const. CRV Type G-Sc RA 12 01.9 Decl. -18 52 Mag. 10.7
 _____ RASC75 NGC4361 Const. CRV Type PN RA 12 24.5 Decl. -18 48 Mag. 10.3
 _____ RASC76 NGC4216 Const. VIR Type G-Sb RA 12 15.9 Decl. +13 09 Mag. 9.9
 _____ RASC77 NGC4388 Const. VIR Type G-Sb RA 12 25.8 Decl. +12 40 Mag. 11
 _____ RASC78 NGC4438 Const. VIR Type G-Sap RA 12 27.8 Decl. +13 01 Mag. 10.1
 _____ RASC79 NGC4517 Const. VIR Type G-Sc RA 12 32.8 Decl. +00 07 Mag. 10.5
 _____ RASC80 NGC4526 Const. VIR Type G-E7 RA 12 34.0 Decl. +07 42 Mag. 9.6
 _____ RASC81 NGC4535 Const. VIR Type G-Sc RA 12 34.3 Decl. +08 12 Mag. 9.8
 _____ RASC82 NGC4567/8 Const. VIR Type G-Sc RA 12 36.5 Decl. +11 15 Mag. ~11
 _____ RASC83 NGC4699 Const. VIR Type G-Sa RA 12 49.0 Decl. -08 40 Mag. 9.6
 _____ RASC84 NGC4762 Const. VIR Type G-SB0 RA 12 52.9 Decl. +11 14 Mag. 10.2



June Observing List

Prepared by Bill Breeden

Double Stars

- _____ Alpha Librae SAO 158836 Zuben El Genubi Const. LIB Type DS RA 14 50.9 Decl. $-16^{\circ} 02'$ Mag. 2.8 5.2
- _____ Delta Bootis SAO 64589 Alrakis Const. BOO Type DS RA 15 15.5 Decl. $+33^{\circ} 19'$ Mag. 3.5 8.7
- _____ Delta Serpentis SAO 101623 Const. SER Type DS RA 15 34.5 Decl. $+10^{\circ} 32'$ Mag. 4.2 5.2
- _____ Epsilon Bootis SAO 83500 Izar Const. BOO Type DS RA 14 45.0 Decl. $+27^{\circ} 04'$ Mag. 2.5 4.9
- _____ Iota Bootis SAO 29071 Const. BOO Type DS RA 14 16.2 Decl. $+51^{\circ} 22'$ Mag. 4.9 7.5
- _____ Kappa Bootis SAO 29045 Const. BOO Type DS RA 14 13.5 Decl. $+51^{\circ} 47'$ Mag. 4.6 6.6
- _____ Mu Bootis SAO 64686 Const. BOO Type DS RA 15 24.5 Decl. $+37^{\circ} 23'$ Mag. 4.3 7.0
- _____ Pi Bootis SAO 101138 Const. BOO Type DS RA 14 40.7 Decl. $+16^{\circ} 25'$ Mag. 4.9 5.8
- _____ Xi Bootis SAO 101250 Const. BOO Type DS RA 14 51.4 Decl. $+19^{\circ} 06'$ Mag. 4.7 7.0
- _____ Zeta Coronae Borealis SAO 64833 Const. CRB Type DS RA 15 39.4 Decl. $+36^{\circ} 38'$ Mag. 5.1 6.0

Messier Objects

- _____ M5 NGC5904 Const. SER Type GC RA 15 18.6 Decl. $+02 05$ Mag. 6.2
- _____ M101 NGC5457 Pinwheel Galaxy Const. UMA Type GAL RA 14 03.2 Decl. $+54 21$ Mag. 9.6
- _____ M102 NGC? 5866 Const. DRA Type GAL RA 15 06.5 Decl. $+55 46$ Mag. 10

Caldwell Objects

- _____ C066 NGC5694 Const. HYA Type GC RA 14 39 36.00 Decl. $-26 32 00.0$ Mag. 10.2
- _____ C088 NGC5823 Const. CIR Type OC RA 15 05 42.00 Decl. $-55 36 00.0$ Mag. 7.9

Royal Astronomical Society of Canada Objects

- _____ RASC85 NGC5746 Const. VIR Type G-Sb RA 14 44.9 Decl. $+01 57$ Mag. 10.6
- _____ RASC86 NGC5466 Const. BOO Type GC RA 14 05.5 Decl. $+28 32$ Mag. 9.1
- _____ RASC87 NGC5907 Const. DRA Type G-Sb RA 15 15.9 Decl. $+56 19$ Mag. 10.4