



### **SPECIAL TRIBUTE ISSUE**

**Remembering River Bend Astronomy Club Founder Kurt Sleeter**  
M42, The Orion Nebula, is the object that sparked Kurt's love for astronomy.  
Photo by Gary Kronk.

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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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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



Check out our online calendar on 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, September 24, 2011 • 7:00 PM
Saturday, October 22, 2011 • 7:00 PM
Saturday, November 19, 2011 • 7:00 PM

For meeting locations, please see our calendar at www.riverbendastro.org.

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.

## River Bend Astronomy Club Loses a Founder

By Gary Kronk

Kurt Sleeter, close friend and co-founder of the River Bend Astronomy Club, died on June 28, 2011. Many of the current members of RBAC did not know Kurt. I have put together a tribute to my friend in the hope that everyone will appreciate who he was as much as I did.

Kurt and I met because of my ex-wife...they were cousins. In 1985, Kurt was working in heating and cooling and was a maintenance worker at Anderson Hospital. One day our furnace went out and my father-in-law called Kurt. Kurt came over and I was introduced to him for the first time. He went to work on the furnace, and I sat at my computer in my living room working on my second book. Kurt came in to tell me what he had done. After doing so, he asked me about my computer. When I told him I was writing a book on one aspect of astronomy, he showed a curiosity about that as well. A couple of weeks later, Kurt came out specifically for me to show him objects in the night sky. One of these objects was M42, the Orion Nebula. It was obvious that he was hooked and this marked the first time of several dozen that Kurt and I would spend hours observing the night sky. The Orion Nebula so inspired Kurt, that he named a dog Orion and got personalized plates on his car that said...you guessed it...Orion.

### BAC Astronomy Club

Kurt went back to school in 1989, choosing to take classes at Belleville Area College (now Southwestern Illinois College) to get an associates degree. He got to know a science teacher there and suggested the creation of an astronomy club. The idea took off in 1992. The club enjoyed great success during the three years that Kurt was president. Most members were from

the surrounding community and the club worked with local schools, as well as the boy and girl scouts. The adventures of the BAC Astronomy Club were continually documented in the Belleville News Democrat. Kurt also regularly managed to get some interesting guest speakers. The day he got his associates degree was a happy one for Kurt, but, within a couple of months, BAC said the president of the club had to be a student. Kurt stepped down, a student took over, and the club greatly diminished in its activity. The most active members were not students and, with the club waning following the Kurt years, almost everyone went their own way. Kurt had put a lot of time and effort into that club and was saddened to see it basically fall apart.

### Lunches

Following the demise of the BAC group, Kurt, Eric Young, and I began meeting every Monday for lunch. We were all then working at Washington University. The topic was usually astronomy, although discussion did occasionally drift to other topics. Although we did not belong to any astronomy group, we were still doing plenty of outreach. Kurt had developed a rapport with the Girl Scouts while at BAC, and the three of us began giving talks at Camp Torqua (just outside Edwardsville) on a fairly regular basis to help the girls earn various astronomy and space exploration patches. This lasted from March 1995 To April 2001. We were busiest every spring, when we gave presentations almost every Saturday during March and April.

I moved to the medical school campus of Washington University in 1995 and met Ed Cunniss. I soon discovered Ed was also interested in astronomy and he began joining the rest of us for Monday lunches. Not long afterwards, we all joined the St. Louis Astronomical Society. Although the talks were always interesting, Kurt, Eric, and I missed the BAC club, and all of the observing that we did with a large group of

people. Yes, it was true that Kurt, Eric, Ed, and I would occasionally get together to observe, but we wanted to be part of something bigger.

### River Bend Astronomy Club

One thing this tight group of friends was never short of was ideas. It seemed that every lunch introduced some new scheme. Some of these brought the rest of the group to the point of laughter, but others were quite interesting. Eric and I really admired the work that Kurt had done at BAC and, during 2000, the idea of an astronomy club became the primary scheme of discussion. We would use the model Kurt used at BAC, but we wanted to step it up a notch. Ed began checking into the requirements for membership in the Astronomical League. Things moved relatively quickly and the River Bend Astronomy Club was ready to go by the spring of 2001. Before we were "official", we held an Astronomy Day event in St. Jacob Park. It was a beautiful day and several local people joined us in the afternoon and evening to see what we were looking at through our telescopes.



Members of the River Bend Astronomy Club display a new image of the Helix Nebula from the Hubble Space Telescope at the Edwardsville Children's Museum, in early 2003. Kurt Sleeter appears second from the right. Photo by Christy Tinney.

The River Bend Astronomy Club became official on July 1, 2001. We all felt like proud parents and, like parents, we were anxious to see how the club would grow.

Kurt was especially proud of the club. He was very active for several years until family matters began taking up the bulk of his time, but during our occasional phone calls and e-mail during the years since, he would always ask about the club and expressed great satisfaction that it was continuing to grow.

### The Telescope Incident

A particularly memorable event that epitomizes how fast Kurt embraced astronomy was the purchase of his Celestron. Boy, what a story that turned out to be.

Okay, so Kurt really wanted a nice telescope and he found out about a used one. It was a Celestron 8 and the owner wanted \$1100 for it. Kurt really wanted it. He told his wife, Amy, about this really good deal, but Amy pointed out that it really was not a good time to buy anything that expensive. Guess what Kurt did? He bought the telescope.

Kurt was able to spend a lot of time at my house using his new telescope during the next month to month and a half...mainly because Amy was not a happy camper and it took that long for her to cool down. Interestingly, the first night observing at my house with this telescope was almost the last.

My son, David, really liked Kurt and would hang around us when we were observing. David was quite young and was fascinated by Kurt's telescope. While we observed, David sat under Kurt's telescope, surrounded by the tripod legs and playing in the rocks. After a while, David was getting sleepy and decided to go to bed. Just moments after David left, one of the legs of Kurt's telescope began collapsing. We were looking at something through my telescope and Kurt ran over and stuck his hands under the tube just inches from the ground. Although it still hit the rocks, Kurt

had managed to slow it so that there were no scratches. We discovered that one of the wing nuts on the tripod was loose. I went in and talked to David, only to find out that he was playing with the wing nuts.



In this image, Kurt is taking a good look at Mark Brown's telescope. Photo by Gary Kronk.

### The Alpha Triangulids

Kurt and I were looking at deep sky objects during September of 1993. The routine was this: I would locate the object in my telescope while Kurt would watch the sky for meteors. Once I found the object, he would take a look through the telescope while I scanned the skies. On this particular night, we had each seen a couple of meteors and Kurt noted that a couple of his would actually intersect in the region around Aries. I then mentally noted that one of my meteors would also intersect in the same region. This was interesting because there was no known meteor shower in that location. We grabbed a couple of reclining lawn chairs and began watching for meteors. During the next hour, we ended up spotting several additional meteors...most coming from the region around the border of Aries and Triangulum. I reported the activity to the proper authorities the next morning and it turned out that an independent observation had also been reported from West Virginia. Kurt and I were pretty excited! A number of observations were made by observers around the world in 1994.

### Kurt the Person

Perhaps the most amazing thing about Kurt is that he was naturally curious. It was immediately apparent to me in the way he took to astronomy, but he jumped into computers the same way and eventually made it his profession.

This curiosity led Kurt to partake in many hobbies. Besides astronomy, Kurt was a photographer and used to photograph weddings using a large format camera. Kurt was an artist. He began drawing and working with water colors just about three years ago. Eric Young, our resident artist, was very impressed by Kurt's abilities, which had apparently lain dormant for years. Eric said of Kurt's most recent works that it looked like he had been painting for a decade. Kurt loved fishing. Some of his best times came in the final few years of his dad's life, when they went fishing almost every weekend.



Kurt enjoyed many hobbies, including caving. In this image, he is exploring Illinois Caverns. Photo by Gary Kronk.

Despite all of these great hobbies, the love of Kurt's life was certainly his wife, Amy. I saw this demonstrated on several occasions. Kurt, Eric, and I drove to Yerkes Observatory and then to Chicago for a weekend trip during June 1994. Eric and I kept giving Kurt a hard time, because he called Amy almost every hour. During nights when we were observing the sky with our telescopes, it was not unusual for

Kurt to give Amy a call to let her know if he was running late.

Kurt would help you at the drop of a hat. I am not particularly "handy," but Kurt could fix anything. He repaired several plumbing issues my homes experienced over the years and he and I (mainly he) even remodeled the bathroom in my previous house. He helped many other friends and family as well. I remember a time when Amy once called me and asked me to ask Kurt to fix a problem in their bathroom. She said she had asked Kurt a couple of times, but Kurt seemed to respond better to my requests.

Kurt had a boisterous laugh that was contagious. I remember a number of times when he busted out laughing for one reason or another and I started laughing as well. We couldn't stop and we would both have tears in our eyes from laughing so hard. Sometimes the laughing would start because we were up too late looking at the stars or playing video games. Sometimes nothing funny was really said, but it struck one of us strangely and things spiraled out of control from there. Kurt also had a great sense of humor and you never knew when he would say something crazy or silly.

Back on August 14, 2002, when the River Bend Astronomy Club was still young, Kurt, Eric, Ed, and I were sending e-mails back and forth concerning possible fund raising ideas. Although serious ideas were being tossed about, Kurt suddenly shot an e-mail to the three of us saying, "I found a rock in my driveway this morning... I am sure it's a meteor...any offers?? :D" The emoticon says it all.

Eric Young, another founder of the River Bend Astronomy Club, had this to say about his friend, Kurt:

"You, Ed, me and Kurt were very different personalities. You were the astronomy "expert" who had a lot to teach us. Ed was the brainy standard-bearer, the one who sought the best

quality equipment along with optimal observing experiences. I was the artsy type who felt the wonder of astronomy and saw a potential for us to spark that passion in others. But Kurt was the true enthusiast, through-and-through. He was the spirit, the driving force, the energetic evangelist that made it fun and exciting to bring people together and observe, or just to get together and laugh the clouds away. Kurt put the "fun" in the club, starting at BAC, and during those early days when our fledgling club was first registered with the Astronomical League.

Without Kurt, there would be no RBAC. It is with the deepest appreciation that we fondly remember all he did to create the club and to share his passion for astronomy with other people. "

Eric

Indeed, it was not until I read Eric's e-mail that I realized just how much of a role Kurt played in the formation of the River Bend Astronomy Club. Who would have thought back in 1985 that the spark ignited one day while working on a furnace would have led to the formation of an astronomy club? Kurt will definitely be missed by all who knew him, but the continuation of RBAC is quite a legacy to this man. RBAC



This photo was taken in 1999, two years before the formation of River Bend Astronomy Club. Pictured, left to right, are Kurt Sleeter, Gary Kronk, Eric Young, Ed Cunniss, and John Schnase. Photo by Lizanne Young.

## Observe Open Cluster M29 in Cygnus

By Bill Breedon

For a real eyepiece treat, point your telescope at M29 in the constellation Cygnus. This bright open cluster is a perennial favorite with amateur astronomers in the Northern Hemisphere. To find it, point your telescope in the direction of Cygnus, the Swan. In late summer, look for Cygnus to appear way up high in the sky, as if the Swan is flying overhead. Cygnus is also known as the Northern Cross. Look for the star that forms the very center of the cross. This is Gamma Cygni, and also carries the proper name of Sadr. M29 is located less than 1° south of Sadr.



M29, an open cluster in Cygnus, makes a fine target for backyard telescopes. Photo by Gary Kronk.

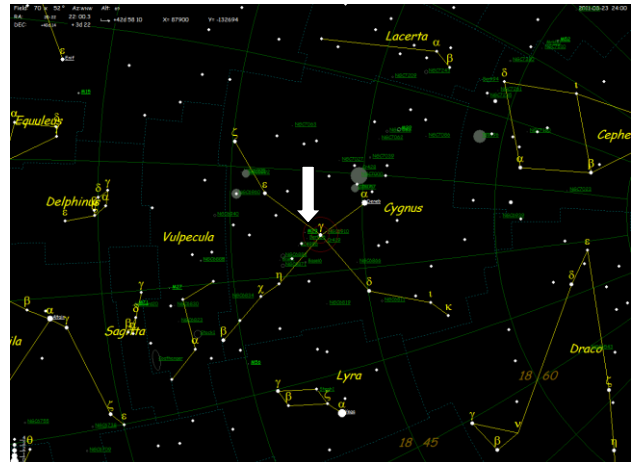
M29 is a small open cluster, appearing about 7 arc-minutes in diameter on the sky. This means that it spans about one-fourth of the apparent diameter of the full Moon. This is one object that appears nicely under just about any amount of power, or telescope and eyepiece combination.

Using low power, such as a 24mm wide angle eyepiece, M29 will be visible as a tight cluster of stars surrounded by the beauty of many stars in the rich Milky Way region of Cygnus. I like to observe M29 with

my Televue Panoptic 24mm eyepiece. The view is spectacular!

Also try medium power by using an eyepiece in the 13mm to 18mm range, and the open cluster will dominate the view. You will still see many background Milky Way stars, but the cluster will be magnified just enough to stand out in the eyepiece. This will probably be your best view, but of course this is only subjective! I really enjoy the view of M29 through my 13mm Televue Nagler.

Finally, try observing M29 under higher power, using an eyepiece with a focal length of 10mm or less. You will find yourself immersed in the center of M29, its many stars surrounding your view! Your view will certainly vary depending upon your telescope type and focal length. In my 8 inch Schmidt-Cassegrain (SCT), for example, a 9mm eyepiece gives me a power of 222x. Dobsonian owners will find their eyepieces give them lower powers than the same eyepieces in an SCT. Don't hesitate to try different eyepieces when observing M29.



M29 is located at the center of this star chart, less than 1° south of the star Gamma Cygni. Image from *Hallo Northern Sky*, © Han Kleijn.

Get your telescopes out late this summer (or early fall) and give M29 a look! **RBAC**



## New GOES-R to Give More Tornado Warning Time

by Dauna Coulter and Dr. Tony Phillips

So far this spring, more than 1,400 tornadoes have struck the U.S. Some of them have cut jaw-dropping trails of destruction across the countryside and, tragically, across inhabited communities, too. Hundreds of lives have been lost in the onslaught.

Throughout the season, the National Weather Service has routinely issued tornado alerts. In the case of the Alabama tornadoes of April 27th, forecasters warned of severe weather five full days before the twisters struck. Because they couldn't say precisely where the twisters would strike, however, many of their warnings went unheeded.

"If people get a hurricane warning, they often evacuate the area," notes NOAA's Steve Goodman. "But we react differently to tornado warnings."

Perhaps it's because tornadoes are smaller than hurricanes, and the odds of a direct hit seem so remote. Recent pictures from Tuscaloosa, Alabama, and Joplin, Missouri, however, show the perils of playing those odds. Goodman believes that more precise warnings could save lives.

To fine-tune tornado warnings, NOAA will soon launch the first in a series of next-generation weather satellites - GOES-R (Geostationary Operational Environmental Satellites-R series). The spacecraft is brimming with advanced sensors for measuring key ingredients of severe weather including winds, cloud growth, and lightning.

"GOES-R will be the first geostationary spacecraft to carry a lightning sensor," says Goodman, the GOES-R Program Senior Scientist. "Studies show that sudden changes in the total lightning activity correlate with storm intensity—and with tornadoes."

The lightning mapper will detect and map not only cloud-to-ground lightning, but also bolts within and between clouds. The kind of cloud-to-ground lightning we see from our front yards accounts for only 15-20 percent of total lightning. To get a clear

idea of a storm's intensity, meteorologists need to know about all the lightning—a view GOES-R can provide.

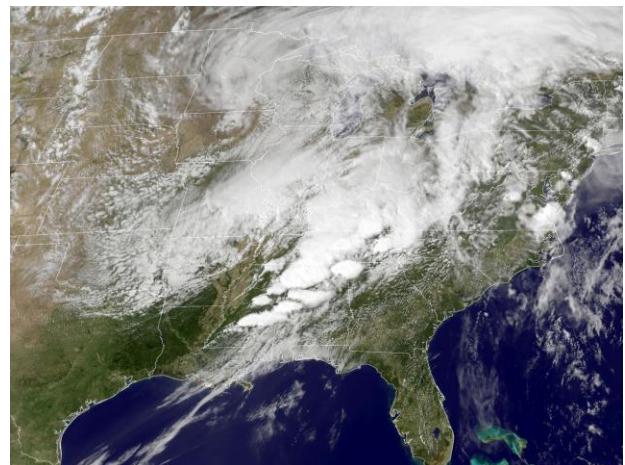
All by itself, the lightning mapper will provide 7 minutes more lead time in tornado warnings, according to Goodman. GOES-R's state-of-the-art instruments will also improve long-range forecasts.

"The satellite's Advanced Baseline Imager (ABI), for instance, will provide a much clearer picture of clouds," says NOAA research meteorologist Tim Schmit. Compared to lesser instruments already in orbit, ABI can better detect super-cold "overshooting tops," evidence of enormous energy and upward velocity that correlate with subsequent severe weather.

"Accurate advanced notice of high-risk tornadic conditions can cue officials to close schools and businesses even before tornadoes are actually detected," says Schmit.

Forecasters doubt tornadoes can ever be predicted with 100% accuracy. The twisters are just too capricious. GOES-R, however, is a step in the right direction.

Find out more about GOES-R's unprecedented capabilities at <http://www.goes-r.gov>. Young people can learn more about tornadoes and all kinds of other weather at <http://scijinks.gov>.



This GOES image shows the storms that spurred the intense April 27 tornado outbreak in the southern U.S. Animation showing the development of weather can be seen at

<http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=50347>.

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



# RBAC's Monthly Observing Lists

These lists include brighter deep-sky objects that transit near 10:00 PM each month.



## September Observing List

Prepared by Bill Breeden

### Double Stars

\_\_\_\_\_ 31 Cygni SAO 49337 Const. CYG Type DS RA 20 13.6  
Decl. +46° 44' Mag. 3.8 6.7 4.8

\_\_\_\_\_ 61 Cygni SAO 70919 Const. CYG Type DS RA 21 06.9

Decl. +38° 45' Mag. 5.2 6.0

\_\_\_\_\_ Alpha Capricorni SAO 163422 Al Giedi Const. CAP Type DS RA 20 18.1 Decl. -12° 33' Mag. 3.6 4.2

\_\_\_\_\_ Beta Capricorni SAO 163481 Dabih Const. CAP Type DS RA 20 21.0 Decl. -14° 47' Mag. 3.4 6.2

\_\_\_\_\_ Beta Cephei SAO 10057 Alfirk Const. CEP Type DS RA 21 28.7 Decl. +70° 34' Mag. 3.2 7.9

\_\_\_\_\_ Epsilon Pegasi SAO 127029 Enif Const. PEG Type DS RA 21 44.2 Decl. +09° 52' Mag. 2.4 8.4

\_\_\_\_\_ Gamma Delphini SAO 106475 Const. DEL Type DS RA 20 46.7 Decl. +16° 07' Mag. 4.5 5.5

\_\_\_\_\_ Struve 2816 SAO 33626 - Const. Type DS RA 21 39.0 Decl. +57° 29' Mag. 5.6 7.7 7.8

### Messier Objects

\_\_\_\_\_ M2 NGC7089 Const. AQR Type GC RA 21 33.5 Decl. -00 49 Mag. 6.3

\_\_\_\_\_ M15 NGC7078 Const. PEG Type GC RA 21 30.0 Decl. +12 10 Mag. 6

\_\_\_\_\_ M29 NGC6913 Const. CYG Type OC RA 20 23.9 Decl. +38 32 Mag. 7.1

\_\_\_\_\_ M30 NGC7099 Const. CAP Type GC RA 21 40.4 Decl. -23 11 Mag. 8.4

\_\_\_\_\_ M39 NGC7092 Const. CYG Type OC RA 21 32.2 Decl. +48 26 Mag. 5.2

\_\_\_\_\_ M72 NGC6981 Const. AQR Type GC RA 20 53.5 Decl. -12 32 Mag. 9.8

\_\_\_\_\_ M73 NGC6994 Const. AQR Type A RA 20 58.9 Decl. -12 38 Mag. 9

\_\_\_\_\_ M75 NGC6864 Const. SGR Type GC RA 20 06.1 Decl. -21 55 Mag. 8

### Caldwell Objects

\_\_\_\_\_ C004 NGC7023 Const. CEP Type BN RA 21 01 48.00 Decl. +68 12 00.0 Mag. 6.8

\_\_\_\_\_ C012 NGC6946 Const. CEP Type SG RA 20 34 48.00 Decl. +60 09 00.0 Mag. 9.7

\_\_\_\_\_ C019 IC5146 Cocoon Nebula Const. CYG Type BN RA 21 53 30.00 Decl. +47 16 00.0 Mag. 10

\_\_\_\_\_ C020 NGC7000 North America Nebula Const. CYG Type BN RA 20 58 48.00 Decl. +44 20 00.0 Mag. 6

\_\_\_\_\_ C027 NGC6888 Crescent Nebula Const. CYG Type BN RA 20 12 00.00 Decl. +38 21 00.0 Mag. 7.5

\_\_\_\_\_ C033 NGC6992/5 East Veil Nebula Const. CYG Type SN RA 20 56 24.00 Decl. +31 43 00.0 Mag.

\_\_\_\_\_ C034 NGC6960 West Veil Nebula Const. CYG Type SN RA 20 45 42.00 Decl. +30 43 00.0 Mag.

\_\_\_\_\_ C037 NGC6885 Const. VUL Type OC RA 20 12 00.00 Decl. +26 29 00.0 Mag. 5.7

\_\_\_\_\_ C042 NGC7006 Const. DEL Type GC RA 21 01 30.00 Decl. +16 11 00.0 Mag. 10.6

\_\_\_\_\_ C047 NGC6934 Const. DEL Type GC RA 20 34 12.00 Decl. +07 24 00.0 Mag. 8.9

\_\_\_\_\_ C055 NGC7009 Saturn Nebula Const. AQR Type PN RA 21 04 12.00 Decl. -11 22 00.0 Mag. 8.3

### Royal Astronomical Society of Canada Objects

\_\_\_\_\_ RASC1 NGC7009 Saturn Nebula Const. AQR Type PN RA 21 04.2 Decl. -11 02 Mag. 8.3

\_\_\_\_\_ RASC98 NGC6888 Const. CYG Type SNR? RA 20 12.0 Decl. +38 21 Mag.

\_\_\_\_\_ RASC99a NGC6960 West Veil Nebula Const. CYG Type SNR RA 20 45.7 Decl. +30 43 Mag.

\_\_\_\_\_ RASC99b NGC6992/5 East Veil Nebula Const. CYG Type SNR RA 20 56.4 Decl. +31 43 Mag.

\_\_\_\_\_ RASC100 NGC7000 North America Nebula Const. CYG Type EN RA 20 58.8 Decl. +44 20 Mag. 6

- \_\_\_\_\_ RASC101 NGC7027 Const. CYG Type PN? RA 21 07.1 Decl. +42 14 Mag. 10.4
- \_\_\_\_\_ RASC106 NGC6940 Const. VUL Type OC RA 20 34.6 Decl. +28 18 Mag. 6.3
- \_\_\_\_\_ RASC107 NGC6939 Const. CEP Type OC RA 20 31.4 Decl. +60 38 Mag. 7.8
- \_\_\_\_\_ RASC108 NGC6946 Const. CEP Type G-Sc RA 20 34.8 Decl. +60 09 Mag. 8.9
- \_\_\_\_\_ RASC109 NGC7129 Const. CEP Type RN RA 21 44.4 Decl. +66 10 Mag.



**October Observing List**  
**Prepared by Bill Breeden**

Double Stars

- \_\_\_\_\_ Xi Cephei SAO 19827 Kurhah Const. CEP Type DS RA 22 03.8 Decl. +64° 38' Mag. 4.4 6.5
- \_\_\_\_\_ 8 Lacertae SAO 72509 - Const. LAC Type DS RA 22 35.9 Decl. +39° 38' Mag. 5.7 6.5
- \_\_\_\_\_ 94 Aquarii SAO 165625 - Const. AQR Type DS RA 23 19.1 Decl. -13° 28' Mag. 5.3 7.3
- \_\_\_\_\_ Delta Cephei SAO 34508 - Const. CEP Type DS RA 22 29.2 Decl. +58° 25' Mag. 3.9 6.3
- \_\_\_\_\_ Zeta Aquarii SAO 146107 - Const. AQR Type DS RA 22 28.8 Decl. -00° 01' Mag. 4.3 4.5

Caldwell Objects

- \_\_\_\_\_ C009 Sh2-155 Cave Nebula Const. CEP Type BN RA 22 56 48.00 Decl. +62 37 00.0 Mag. 7.7
- \_\_\_\_\_ C011 NGC7635 Bubble Nebula Const. CAS Type BN RA 23 20 42.00 Decl. +61 12 00.0 Mag. 7
- \_\_\_\_\_ C016 NGC7243 Const. LAC Type OC RA 22 15 18.00 Decl. +49 53 00.0 Mag. 6.4
- \_\_\_\_\_ C022 NGC7662 Const. AND Type PN RA 23 25 54.00 Decl. +42 33 00.0 Mag. 9.2
- \_\_\_\_\_ C030 NGC7331 Const. PEG Type SG RA 22 37 06.00 Decl. +34 25 00.0 Mag. 9.5
- \_\_\_\_\_ C044 NGC7479 Const. PEG Type SG RA 23 04 54.00 Decl. +12 19 00.0 Mag. 11
- \_\_\_\_\_ C063 NGC7293 Helix Nebula Const. AQR Type PN RA 22 29 36.00 Decl. -20 48 00.0 Mag. 6.5

Messier Objects

- \_\_\_\_\_ M52 NGC7654 Const. CAS Type OC RA 23 24.2 Decl. +61 35 Mag. 7.3

Royal Astronomical Society of Canada Objects

- \_\_\_\_\_ RASC2 NGC7293 Const. AQR Type PN RA 22 29.6 Decl. -20 48 Mag. 6.5
- \_\_\_\_\_ RASC3 NGC7331 Const. PEG Type G-Sb RA 22 37.1 Decl. +34 25 Mag. 9.5
- \_\_\_\_\_ RASC4 NGC7635 Const. CAS Type EN RA 23 20.7 Decl. +61 12 Mag. -
- \_\_\_\_\_ RASC5 NGC7789 Const. CAS Type OC RA 23 57.0 Decl. +56 44 Mag. 6.7
- \_\_\_\_\_ RASC11 NGC7662 Blue Snowball Const. AND Type PN RA 23 25.9 Decl. +42 33 Mag. 9.2