



Current Astronomy

SUMMER
2006

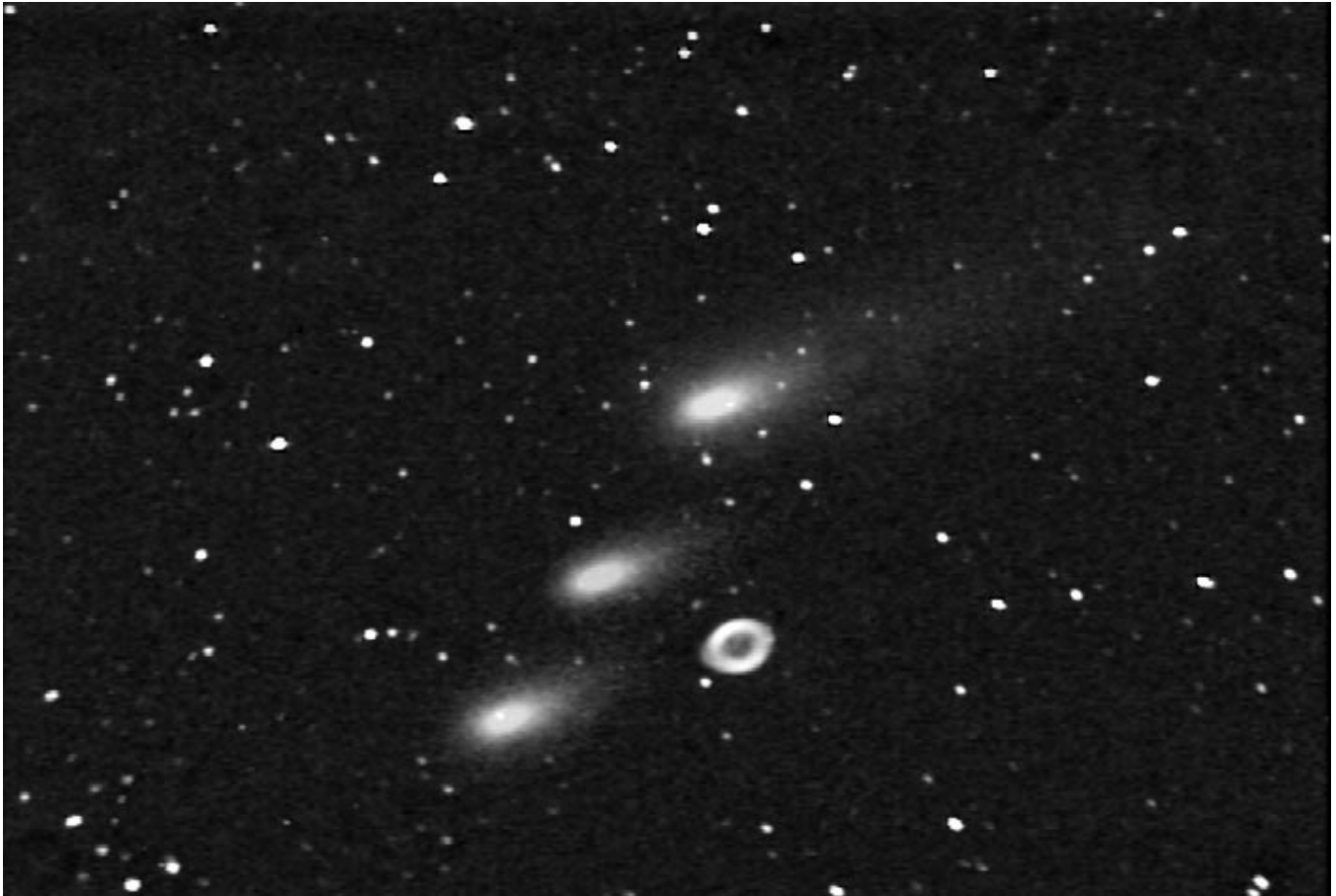
RIVER BEND ASTRONOMY CLUB NEWSLETTER



The cosmos comes within reach with the aid of a computer-controlled telescope. Actually, that's club member Lee Paul doing the controlling as his intelligent optics slew to his favorite astronomical sights at the Messier Marathon. PHOTO BY ERIC YOUNG

BY GARY KRONK

Saga of the Ring



On the night of 2006 May 7/8, the periodic comet 73P/Schwassmann-Wachmann 3 passed very close to M57, the Ring Nebula. Amateur astronomers around the world were waiting for this event, which some described as “once in a lifetime.” Two exciting things happened during this close encounter, as far as I was concerned. First, the event was favored for the United States. Second, it was clear! I hooked up the MallinCam to my 8-inch Meade LX200 and began imaging at 9:30 p.m. on the 7th. I moved the telescope to the west side of my yard for this event to get further away from my neighbor’s house, because the comet would rise from behind it shortly after 10 p.m. I spent the first half hour tweaking the focus.

This comet is unusual as it began breaking up at its 1995 apparition, then additional pieces appeared when it returned in 2000. The pieces were designated alphabetically in the order of their discovery. In 1995, component “C” had been identified as being the main comet.

When the comet first cleared the roof of my neighbor’s house, I quickly imaged component “B”, “C”, “G”, and “R”. During the next hour, I exclusively imaged component “C” as it glided past M57. This photograph is a composite of three images and shows the comet’s positions in the course of 38 minutes. The top image of the comet was obtained at 10:06 p.m., the middle image was obtained at 10:24 p.m., and the bottom image was obtained at 10:44 p.m. [↗](#)

Northern lights

Report from the NCRAL 2006 Convention

BY BILL BREEDEN

The 60th annual convention of the North Central Region Astronomical League was hosted by the Northeast Wisconsin Stargazers (NEWSTAR) in Appleton, Wisconsin. This convention also commemorated the 20th anniversary of NEWSTAR. Ty Westbrook did an excellent job of coordinating and organizing the event. My wife, Rita, and I went to represent River Bend Astronomy Club.

We left Saint Louis on Friday morning, April 21, for the eight hour drive to Appleton. Road trip — woo-hoo! The weather was spectacular for the drive up there — sunshine and temperatures in the 70s. Who could ask for a better road trip? We arrived in Appleton at 4:30 p.m., checked into the Radisson Paper Valley hotel where the convention was to be held, and registered.

Friday night at 8:30 p.m., convention attendees were treated to a private screening of the IMAX movie “Solar Max” at the Big Picture Theater of Adventure and Discovery. This film looked fantastic on the 6-story-tall screen. It was about the 11-year cycle of the Sun’s activity, and every 11 years, the Sun’s activity reaches maximum — a time called “solar max.” During this time, the solar winds are at their peak, and disruption of communication satellites is very possible. The film also showed the historical significance of the Sun to various past civilizations.

Each person at this convention probably represents at least 30 others in a club. In addition, many clubs were not represented this year by an attendee. What this means is that there are many thousands of amateur astronomers and stargazers out there!



On Saturday the convention had a wonderful lineup of speakers. First up was Ron Dantowitz, an aeronautical engineer, astronomer, and educator. His talk on Saturday was “Adventures in High Resolution Imaging.” He presented many fascinating photographs and information for amateur astronomers.

Next, Andrew Ingersoll presented “Cassini Looks at Saturn.” Ingersoll showed us many wonderful photographs of Saturn, Titan, Iapetus and Enceladus. Especially interesting was Ingersoll’s views on Enceladus, and the possibility of this moon supporting life. Enceladus is just as intriguing as Titan, and Jupiter’s moon Europa.

The authors of *Turn Left At Orion*, Guy Consolmagno and Dan Davis, discussed their book and how it came to be written. Their intention was to make stargazing accessible to anyone using simple drawings showing each area of the sky as it appears to the unaided eye, the finderscope, and finally a telescope view through a modest instrument of just 2.5 inches of aperture.

I took some time to browse the many displays that other astronomy clubs had made and set up. Displays from the Northwest Suburban Astronomers, Rockford Amateur Astronomers, Skokie Valley Astronomers, Marquette Astronomical Society, Northeast Wisconsin Stargazers, and many others were set up along with our River Bend Astronomy Club display.

I attended the NCRAL business meeting at 3:00 p.m., where head counts were conducted and representatives from each astronomy club were acknowledged. I indicated that I was representing the River Bend Astronomy Club in Saint Jacob, Illinois, and that my wife and I are also members of the Saint Louis Astronomical Society in Saint Louis, Missouri. (Missouri is part of MSRAL — the Mid States Region Astronomical League.) Secretary treasurer Jim Fox gave the financial report. Clubs were sought to host the 2008, 2009 and 2010 NCRAL conventions.

At 6:30 p.m., Rita and I went to the banquet in the Radisson's Empire Room, where Harrison Schmitt would give his presentation "Return To The Moon." Rita and I sat with eight members of the Twin City Amateur Astronomers, a club based in Bloomington–Normal, Illinois. This club was formed 46 years ago and has built it's own observatory. This was a great group of people, and they invited us to come observe with them at an upcoming star party. It's a three hour drive for us, but we just may make a weekend trip of it this summer.

Keynote speaker Harrison Schmitt was the only scientist to land in the valley of Taurus-Littrow on the Moon during the Apollo XXVII mission. His presentation was about the requirements of returning humans to the Moon, and on to Mars. Mission planners must find a way to reduce the cost by a factor of twenty as compared to the Apollo program, and find a cheap and efficient means of producing energy once we are there. Ultimately, he said, our goal should be Mars, with the Moon as a sort of "stepping stone."

Finally, the raffle prize of a Meade 10-inch Light Bridge Dobsonian telescope was awarded (we didn't win), and the convention was concluded.

This was a terrific event, and we learned a lot. One thing that I was astounded by was the sheer number of people at this event — 210! Each person at this convention probably represents at least 30 others in a club. In addition, many clubs were not represented this year by an attendee. What this means is that there are many thousands of amateur astronomers and stargazers out there! I always knew this, but it was really wonderful to see it and spend some time with so many people with an interest in the sky.

We left Appleton, Wisconsin, on Sunday morning under a cloudy, rainy sky. Just fifty miles south of Appleton, approaching Madison, the sky cleared up and we drove home the rest of the trip with beautiful, sunny, 70-degree weather. We stopped at a cheese shop and picked up some Wisconsin cheese curds

to pig out on during our trip home.

This was a very nice weekend trip, and we hope to visit the Twin City Amateur Astronomers this year.

Ty Westbrook, the NEWSTAR astronomy club, and the rest of the NCRAL 2006 Convention Committee did an excellent job hosting this convention. It was truly a memorable event. 📷

See photos of the NCRAL 2006 Convention at www.geocities.com/fomalhautnights/ncral2006.

Bill and Rita Breeden represented RBAC at the NCRAL 2006 Convention in Appleton, Wisconsin.



Don't leave home without..

A handy packing list for those overnight star parties

BY BILL BREEDEN

Telescope Equipment

- Telescope(s)
- Tripod
- Battery
- Binoculars
- Accessory kit
(Eyepieces, star charts, red lights, etc.)
- Extra AA, C, D, and 9-volt batteries
- Stepladder
- Directions to your observing site

Creature Comforts

- Chairs
- Table
- Blankets
- Pillows
- Tent and stakes (if camping)
- Food
- Cooler
- Soda
- Water
- Artificial ice
- Sandwiches
- Fruit
- Chocolate
- Snacks
- Thermos of coffee
- Thermos of hot chocolate
- Money

Emergency Preparedness

- Cell phone, car adaptor cable
- Jumper cables
- Oil, antifreeze, water
- Spare tire (check it!)
- Starter battery
- Radio
- Other astronomers (don't observe alone)
- Fill gas tank up on the way out

Cold Weather Gear

- Heavy coat
- Gloves
- Hat
- Long johns
- Thick boots
- Ear muffs
- Hand warmers

Personal Needs

- Eyeglasses
- Medicine you may need
- Sugary snacks or non-diet soda (for diabetics)
- Toilet paper and Wet-Ones
- Feminine needs
- Insect repellent
- Sunscreen
- Band-Aids

Miscellaneous

- _____
- _____
- _____
- _____
- _____



BY TONY PHILLIPS

Not a moment wasted

The Ring Nebula...Check. M13...Check. Next up: The Whirlpool galaxy. You punch in the coordinates and your telescope takes off, slewing across the sky. You tap your feet and stare at the stars. These Messier marathons would go much faster if the telescope didn't take so long to slew.

What a waste of time!

Don't tell that to the x-ray astronomers.

"We're putting our slew time to good use," explains Norbert Schartel, project scientist for the European Space Agency's XMM-Newton x-ray telescope. The telescope, named for Sir Isaac Newton, was launched into Earth orbit in 1999. It's now midway through an 11-year mission to study black holes, neutron stars, active galaxies and other violent denizens of the universe that show particularly well at x-ray wavelengths.

For the past four years, whenever XMM-Newton slewed from one object to another, astronomers kept the telescope's cameras running, recording whatever might drift through the field of view. The result is a stunning survey of the heavens covering 15% of the sky.


Sifting through the data, ESA astronomers have found entire clusters of galaxies unknown before anyone started paying attention to "slew time." Some already-known galaxies have been caught in

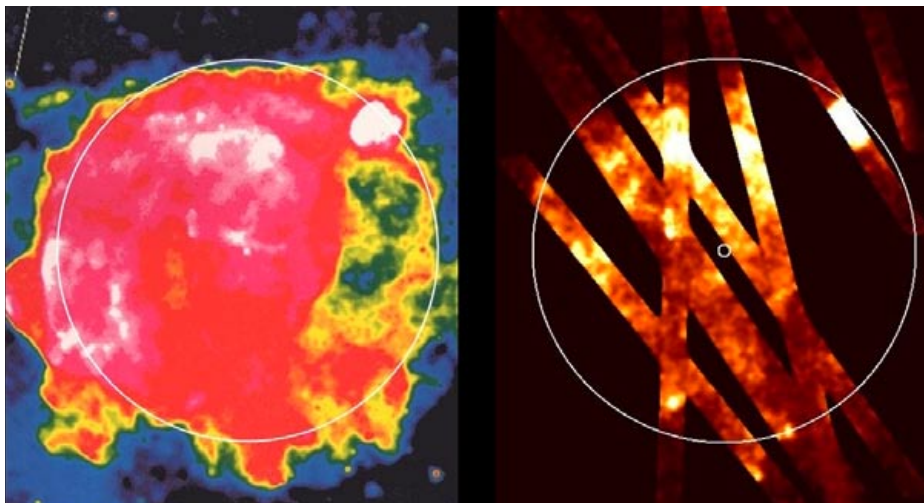
the act of flaring — a sign, researchers believe, of a central black hole gobbling matter from nearby stars and interstellar clouds. Here in our own galaxy, the 20,000 year old Vela supernova remnant has been expanding. XMM-Newton has slewed across it many times, tracing its changing contours in exquisite detail.

The slew technique works because of XMM-Newton's great sensitivity. It has more collecting area than any other x-ray telescope in the history of astronomy. Sources flit through the field of view in only 10 seconds, but that's plenty of time in most cases to gather valuable data.

The work is just beginning. Astronomers plan to continue the slew survey, eventually mapping as much as 80% of the entire sky. No one knows how many new clusters will be found or how many black holes might be caught gobbling their neighbors. One thing's for sure: "There will be new discoveries," says Schartel.

Tap, tap, tap. The next time you're in the backyard with your telescope, and it takes off for the Whirlpool galaxy, don't just stand there. Try to keep up with the moving eyepiece, because you never know what might drift by.

See some of the other XMM-Newton images at <http://sci.esa.int>. 



The image on the left is the Vela Supernova Remnant as imaged in X-rays by ROSAT. On the right are some of the slew images obtained by XMM-Newton in its "spare" time.

BY MOON DOG

Getting to know the southern sky

MARATHON FUN Among the satisfied customers of the RBAC Messier Marathon on April 1st was Bill Breeden. "I just want to say 'Thank You' to Jamie Goggin for all your work coordinating the event at Greenville Observatory. Rita and I really enjoyed it, and I'm sure everyone else did also. The "Star Potty" was a nice convenience. Thanks also for the coffee, cocoa, and snacks. We always enjoy observing the night sky with good company."

SKYLIGHT At the Messier Marathon, some folks talked about the need to push for dark sky legislation in our urban areas, said Jeff Menz. "Mother Nature today took a bite out of the light dome over Highland. Approximately the southern third of the town is currently

without electricity. Trees and power lines are down from Broadway south and from Poplar Street east. The Barker and Menz homes were without power during the storm but have since had it restored. I would take advantage of the beautifully clear skies tonight but I have to get up early for work (not dedicated enough to stargazing, I guess)."

REACH OUT Bill Breeden recommends a free online resource, highlighted on page 88 of the June 2006 issue of *Sky & Telescope*, for those interested in astronomy outreach. (It is a 401-page PDF file, coming in at 17MB.) Point your browser to: www.spacetelescope.org/about/further_information/books/pdf/cap2005_proceedings.pdf



RBAC members and guests prepare for an evening of stargazing at the Messier Marathon, Saturday, April 1st at Greenville College Observatory.

Learn about the League

Amateur astronomers from across the country benefit from perusing the many pages of the Astronomical League's website, www.astroleague.org. Naturally, this is the place to go if you're looking for information about upcoming events and League news. But there is so much more...

Want to learn all about one of the great League observing programs? Go to www.astroleague.org/observing.html.

Do you know of a worthy candidate for one of the many League awards? Look at www.astroleague.org/al/awards/awards.html.

Are you interested in buying a particular book about our fascinating hobby? Then go to www.astroleague.org/al/bookserv/bookserv.html.

There is even something to help your club function better. Try www.astroleague.org/al/soc aids/socaidid.html

Make the most of your Astronomical League membership! To find out more about what the Astronomical League offers you, why not log on to www.astroleague.org today?

PRESIDENTIAL PHOTOS If you're looking for club president Gary Kronk, you can probably find him hunched over his laptop processing images from his MallinCam. This highly sensitive astronomical video CCD camera hooks up to a telescope to record a universe of detail. Gary's been slowly working his way through the Messier objects as he captures a gallery of glorious astrophotos. If you have the time, just ask him about Omega Centauri — a far southern-sky object he thought he couldn't see, until he tried...

HOT AND COOL What should you try and observe when Astronomy Day gets clouded out? Instead of gazing at glowing gas in outer space, the telescope of Jeff Menz provided great views of the gas flame at a distant oil well. And this time the tracking was noooo problem. Speaking of Astro Day, we had a planet walk again this year, and planet Pluto was located at a convenience store in Highland. Anyone who walked that far got a free Slushie.



Byron Barker and son Tenor viewed astronomical treasures at the Messier Marathon on April 1st. They're probably smiling because the hot chocolate is almost ready inside the observatory.

APERTURE DISEASE During his trip to Hamilton State Park in Illinois last fall, Jace Perham finally witnessed the true capabilities of his 15" Obsession telescope. "All I can say is wow!" reports Jace. "Almost like looking through it again for the first time. It was so dark and the stars looked like spotlights instead of these barely visible dim objects that kinda look like stars.

"The highlight of the evening was while we were waiting for it to get dark, somebody showed up with a pick up truck hauling a trailer. When he opened the door there sat a 30" Obsession! I about tripped over my jaw when I saw it! The same goes for when I was looking through it. Believe it or not, the view of the Orion Nebula through the 30" was better than the recent photo of the Nebula from the Hubble. I'm not kidding. We counted 7 stars (I counted only six but I have bad eyes) in the Trapezium and the dust lanes and wisps of clouds were in 3-D to where you could actually make out some real depth. It was amazing!

"Looking through the 30" was actually a big mistake. Not only did they have to drag me off the ladder after each new object but now, just when I thought I was over being sick, the aperture fever is back...with a vengeance! Someday!"

GOIN' BUGGY Summer got off to an early start at the home of Jeff and Terry Menz on Saturday, May 27th. "Thanks for inviting us out to your place for a wonderful night to star gaze," wrote Bruce Kryfka.




Among the guests at the Messier Marathon was St. Louis Astronomical Society member Jerry Loethen, who brought his homemade reflector — a stellar example of fine craftsmanship.

"I had considerable success with my scope with this being the first night out after getting it repaired. I was amazed at what I can see. Even though the June bugs were targeting us it was still a memorable night."

HEAVYWEIGHT The repair Bruce mentioned was a trip back to Meade earlier this year for further adjustment. The fix was free, but the shipping was an ouchie: \$150. Then again, what can you expect from a telescope so heavy that Bruce wears a weight belt to safely lift it. Even so, he says astronomy is doing great

things for his glutes and abs. Watch for Bruce on the cover of the next *Cosmic Muscle* magazine. He'll be posing with M13, which looks great through his tuned-up scope. You can count all the stars...

CELEBRATION The club celebrates its fifth anniversary in July. Stay tuned for party plans.

CHANGES As we reach this milestone we bid a sad farewell. One of the first people to extend the club beyond the original founding members is leaving the area for greener pastures in Florida. Mark Brown, known and loved for his passionate enthusiasm for astronomy and educational outreach, worked very hard for several years building the club into what it is today. It would not be the same without Mark — as a matter of fact, it *won't* be the same without Mark. Mark, you showed us how fun astronomy can be, and what a difference one "loneastronomer" can make. Please keep in touch across the cosmos. We'll ponder Omega Centauri, and other southern sky sights... and think of you. 

Astronomy Day 2006

Gray with intermittent laughter

The weather gods did not smile upon us for Astronomy Day, which was held May 6 in St. Jacob Township Park: the cloud cover never let up. Even so, our enthusiasm never wavered, either, and we turned on the charm for our guests. Club members chatted and enjoyed a dinner buffet as the evening became a good excuse for a party if not a star party.



Jamie Goggin and Bruce Kryfka — probably up to no good.



Terry Menz, right, explains a Night Sky Network presentation to Chas Maloch and Nicole Ocheltree. Far left: Gary Kronk, center, keys in astronomical images on a laptop computer to show Warren Holloway and Glenis Pino.

The Skies Ahead

WRITTEN BY ED CUNNIUS • PHOTOS BY GARY KRONK

Astronomer's midsummer night's dream

Summer's here and the great birds are back to rule the evening sky. Cygnus and Aquila will circle overhead well into fall, while the Milky Way glows, languid and at full stretch, across the short humid nights. Such power and beauty...it's a shame the reality is often more about fighting dew and mosquitoes — and mosquitoes and dew — than simply enjoying it. But that's part of the game: we stargazers think it's worth all the work and blood-loss to see such wonderful things. We'll gladly hold an ice pack to the bug-bite on our temple at work the next day knowing that we finally, after years of observing, got a glimpse of the central star in the Ring. A glint of light from a dying dwarf thousands of light years away is all the payback we need. And our spouses will have to understand that the laptop will probably boot once it dries out — it did last time — and even if it doesn't it was worth it because we got to see something elusive and rare, a thing that few people alive even know about, and even fewer have actually seen.

So grab your hair-dryers, and insect repellent, and iron pills. Summer's here and it's bound to be clear at least once between now and the fall — you'll want to be ready for your midsummer night's dream.



The Lagoon Nebula, M8, was discovered by Guillaume Le Gentil in 1747. The nebula is a stellar nursery which has produced the young stars of the enclosed star cluster NGC 6530. The nebula is about 5,000 light years away.

JULY

- 1 Smithsonian National Air & Space Museum's 30th anniversary (1976).**
- 2 Venus** is 4 degrees north of Aldebaran.
- 3 Aphelion:** at 6 p.m. CDT, Earth is 94,507,915 miles from the Sun.
- 5 Happy 5th Birthday RBAC!** We were officially accepted as a member society of the Astronomical League on this date in 2001.
- 10 Full Moon.** Called the Hay Moon or the Thunder Moon by colonial Americans.
- 18 40th anniversary (1966), Gemini 10 launch** with John Young & Michael Collins. Gemini 10 completed a dual rendezvous with two separate Agena target vehicles. Michael Collins would go on to man the command module of Apollo 11 during Neil Armstrong and Buzz Aldrin's moon landing in 1969.
- 21 Mars** is 0.7 degrees above Regulus this evening. **45th Anniversary (1961), Mercury 4 launch** (Gus Grissom, Liberty Bell 7). This was the infamous flight where the capsule sank after splashdown due to a malfunctioning explosive hatch mechanism. Grissom survived, but spent 3 or 4 minutes in the water before he was rescued.



Discovered by Edmund Halley in 1714, the globular cluster M13 is nearly 25,000 light years away and is believed to contain close to one million stars. In 1974, Frank Drake and Carl Sagan sent a message toward this cluster using the Arecibo Radio Telescope.

- 22** RBAC general meeting at 7 p.m., Kronk residence.
- 26** 35th Anniversary (1971), Apollo 15 launch (4th Manned Moon Landing). David Scott, Alfred Worden, and James Irwin. First use of the Lunar Roving Vehicle (LRV) or the “Moon Rover” as it was nicknamed by the press.
- 28** Southern Delta Aquarids peak. The radiant for this shower does not attain a high altitude for Northern Hemisphere observers, but it is visible and can produce a consistent show each year.

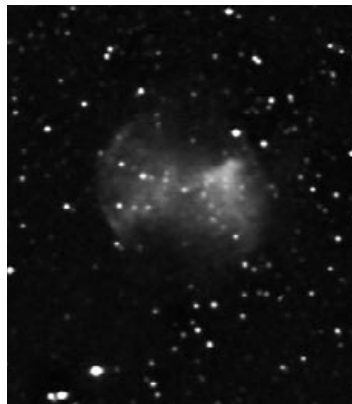
AUGUST

- 7** Mercury at greatest western elongation.
- 9** Full Moon. Known as the Women’s Moon by the Choctaw Indians.
- 10** Mercury passes 2.2 degrees from Venus. Neptune at opposition.
- 11** Ceres closest approach to Earth (1.984 AU)
- 16** Ceres at opposition (Magnitude 7.6).
- 17** 40th anniversary of Pioneer 7 launch (1966). Pioneer 7’s primary mission was to study the solar wind and its interaction with the Earth’s magnetosphere. It monitored the sun for flares during the Apollo missions. It is still active, along with Pioneers 6 and 8, but rarely tracked since newer missions take up time on the Deep Space Network’s antennas.

- 12** Perseids Peak. The maximum hourly rate for this shower is usually around 80.
- 19** RBAC general meeting at 7 p.m., Kronk residence.
- 20** Mercury passes within a degree of Saturn just before dawn. Venus is hovering closeby and just above it will be the crescent moon. A nice reward for you early risers.
- 26** Venus and Saturn are very close in the dawn sky (about 1/2 degree separation).

SEPTEMBER

- 3** SMART-1 moon impact. It is the first space probe the ESA has ever sent to the moon.
- 5** Uranus at opposition.
- 7** Full Moon. Known as the Harvest Moon. Partial lunar eclipse — that is, if you live on the other side of the Earth (just wanted to see if you were paying attention). India and the Middle East will have front row seats. Unfortunately we’re on the wrong side of the ball for this one.
- 12** 40th anniversary of Gemini 11 launch (1966) with Charles Conrad and Richard Gordon. Neil Armstrong was part of the backup crew.
- 23** RBAC general meeting at 7 p.m., Kronk residence. Autumnal Equinox at 4:03 UT. It is also the 160th anniversary of Johann Galle’s discovery of Neptune. In celebration, ice cream cake with blue frosting will be served at –353 degrees F. Bring your own Trident.
- 28** Start of Prairie Skies Star Party. The event will run through October 1st near Kankakee, Illinois. See prairieskies.org for details.



The Dumbbell Nebula, M27, was discovered by Charles Messier in 1764. It is located about 1000 light years away and is the remnant of a nova that flared 3 to 4 thousand years ago.

**All meteor shower information drawn from Gary Kronk’s Comets and Meteor Showers website. Photos of Messier objects and caption information courtesy of Gary Kronk.*

RIVER BEND ASTRONOMY CLUB

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.

Officers and administrators

PRESIDENT	Gary Kronk kronk@amsmeteors.org
VICE-PRESIDENT	Jamie Goggin jgoggin@charter.net
TREASURER	Mike Veith veith@wustl.edu
LEAGUE CORRESPONDENT SECRETARY	Bill Breeden williambreeden@sbcglobal.net
	Eric Young younger@wustl.edu
OUTREACH COORDINATORS	Jeff & Terry Menz jmenz@fgi.net
LIBRARIAN	Kathy Kronk davisk@wustl.edu
FOUNDING MEMBERS	Ed Cunnius ecunnius@att.net
	Kurt Sleeter sleeterk@pathology.wustl.edu

Contacts

MAIL 132 Jessica Drive, St. Jacob, IL 62281

WEB riverbendastro.org

E-MAIL riverbendastro@charter.net



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.
nightsky.jpl.nasa.gov

Current Astronomy CLUB NEWSLETTER

EDITOR Eric Young
younger@wustl.edu

2006 Meetings

March 4	June 3	Sept. 23
March 25	June 24	Oct. 21
April 1	July 22	Nov. 18
May 6	Aug. 19	Dec. 16

132 Jessica Drive, St. Jacob, IL 62281 Phone 618/644-2308

Looked up lately?

Join River Bend Astronomy Club

Want to learn more about astronomy? 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 members-only web site and discussion group.
- Borrow from the club's multimedia library.
- And that's not all! Through club membership you also join the Astronomical League, with its special programs and a colorful quarterly newsletter to enrich your hobby.

We meet monthly, observe regularly, e-mail news and quips constantly, and generally have a good time. Won't you join us?

Name(s) _____

Address _____

City _____ State _____ Zip _____

Phone (Day) _____ (Evening) _____

Email address (to receive club news and information):

Where did you hear of our club?

How long have you been interested in astronomy? _____

Do you have optical equipment? ___ Telescope ___ Binoculars

Are you afraid of the dark? ___ Yes ___ No (just kidding)

I am submitting my application for:

_____ Adult membership(s) _____ Youth membership(s)
@ \$20.00/year @ \$15.00/year
(18 years or older) (under 18)

I enclose a check for a total of \$ _____
made out to "Mike Veith, Treasurer, RBAC."

Signature _____

Date _____



River Bend Astronomy Club

c/o Gary Kronk, 132 Jessica Drive, St. Jacob, IL 62281

web: riverbendastro.org e-mail: riverbendastro@charter.net

AUGUST 05