



Current SEPTEMBER
Astronomy 2004
RIVER BEND ASTRONOMY CLUB NEWSLETTER



**Twenty minutes-worth of Earth's rotation etched these starry light trails on film.
The Milky Way galaxy appears to rise like the smoke from a distant campfire.
Travel to a dark sky site to photograph celestial pictures like this. PHOTO BY DEB WAGNER**

RIVER BEND

ASTRONOMY CLUB

RIVERBENDASTRO.ORG

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

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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.
nightsky.jpl.nasa.gov

Current Astronomy CLUB NEWSLETTER

EDITOR Eric Young
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Submissions to the newsletter are encouraged.
Contact the editor for more information.

Events

September Meeting

Saturday, September 11th, 2004 • 8:00 p.m.

Kronk Observatory

132 Jessica Drive, St. Jacob, IL 62281

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 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 "Ed Cunnius, Treasurer RBAC."

Signature _____

Date _____



River Bend Astronomy Club

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SEPTEMBER 04

Warming to a Telrad

A little electronics will dew the trick

BY JAMIE GOGGIN

Ask anyone who owns a Telrad and they will tell you it's the best thing to happen to astronomy since bug spray. The device imposes red concentric circles like a bullseye on the sky to help you center telescopic targets. But the weak link in the Telrad design is its susceptibility to dew and frost. Once the dew hits, your observing session is over.

A little electronics 101 will fix that. In minutes you can build a simple heater which will run for hours on a 9V battery and keep you observing when the rest of your equipment is dripping with moisture.

Design

The amount of power you want to deliver to keep dew away is anywhere between 1.2 and 2 watts. For this Telrad the goal was to use a 9V battery so the power level was kept to a minimum. Three 22Ω resistors in series will deliver 1.23 watts and draw .136 Amps from the 9V battery (figure 1).


Installation

The Telrad unit has lots of unused space, ideal for storing the 9V battery and mounting the switch (figure 2).

The three resistors are soldered in series and mounted under the glass. Not wanting to carve up the Telrad more than necessary, the only thing holding the resistors in place is electrical tape on the lead wires to the resistors (figure 3).

Turn on your heater. In a few minutes it should be warm to the touch. You should get about 3.5 hours of continuous operation from one 9V battery. You may want to consider using re-chargeable batteries or experiment with turning it on just to burn off dew as it forms.

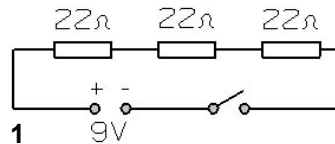
An additional dew prevention measure is to build a dew shield. This one is built from craft paper and held in place with electrical tape (figure 4).

Even if you do nothing else to battle dew, taking a few minutes to add a dew heater and shield to your Telrad will add hours to your observing sessions. 



IMAGES BY JAMIE GOGGIN

2



1



4



3

Parts and materials

This Telrad-warming project costs less than \$5.

9V battery snap connector

Radio Shack part number 270-325

Micromini toggle switch

Radio Shack part number 275-624

22 ohm resistors

Radio Shack part number 271-1103

22 gauge wire

Approximately 3 feet

Solder

When the sky cries

August's ancient tradition wows observers in 2004

BY GARY KRONK

As early as the 12th century, references appeared in Italian monastic histories describing a meteor shower seen during the Feast of St. Lawrence. The celebration occurs on August 10, the same date that large numbers of Perseids can be observed, and the shower was originally referred to as the “fiery tears of St. Lawrence.”

An unlucky archdeacon

After years of Roman persecution, things seemed to finally settle down for Christians around the middle of the 3rd century. Valerian I became emperor of Rome in AD 253 and was the first emperor to welcome Christians in his home. In fact, a writer of the time, Eusebius of Cæsarea, wrote, “not even those who were said openly to be Christians received them with such manifest hospitality and friendliness as [Valerian I] did at the beginning of his reign.”

This new openness toward Christians was a problem for Macrianus, the teacher and ruler of the synagogue of the Magi from Egypt. Macrianus was apparently a man of power and knew many people in high positions within the Roman government. Early

Roman history reveals that rulers who defied men of great power were usually murdered. Valerian, not ready to have his reign come to an end, abided with the demands of Macrianus and changed his ways. In AD 257, Christian men, women, and children were slain in great numbers. But Macrianus pointed out to Valerian that such persecutions of the past had failed to squash the advance of Christianity. So, a new strategy was developed: Go after the rulers of the church.

This change in the Roman attitude toward Christians came at a bad time for a young man named Lawrence. Pope Sixtus II had been very impressed by the wisdom of Lawrence and in AD 257 the Pope made him a deacon. A few months later, Lawrence was raised to the position of archdeacon and became the primary financial officer of the Catholic Church. He was also put in charge of providing help to the poor. On August 7, 258, Roman soldiers, following the orders of the prefect of Rome, arrested Pope Sixtus II and four deacons. Before the day had ended they were beheaded.

On this same date the prefect had Lawrence brought before him. Knowing that Lawrence was the financial officer, he ordered him to bring forth the treasures of the Church. Lawrence said he needed three days. On August, 10, 258, Lawrence returned. The prefect asked where the treasure was and Lawrence pointed to an assembly of the poor, sick, or orphaned, and replied, “These are the treasures of the Church.” The prefect ordered that Lawrence be roasted alive on a gridiron that day.

According to the 4th century writings of Ambrose, Lawrence showed great courage and just before his death he looked to heaven and prayed for the conversion of Rome. This courage left a great impression on the spectators, including many Roman senators. Thus, the martyrdom of Lawrence — an act intended to stamp out Christianity — is credited as a turning point for Christianity. A few decades later, Constantine became the first Christian emperor.

...the prefect had Lawrence brought before him. Knowing that Lawrence was the financial officer, he ordered him to bring forth the treasures of the Church. Lawrence said he needed three days.

Tears of today

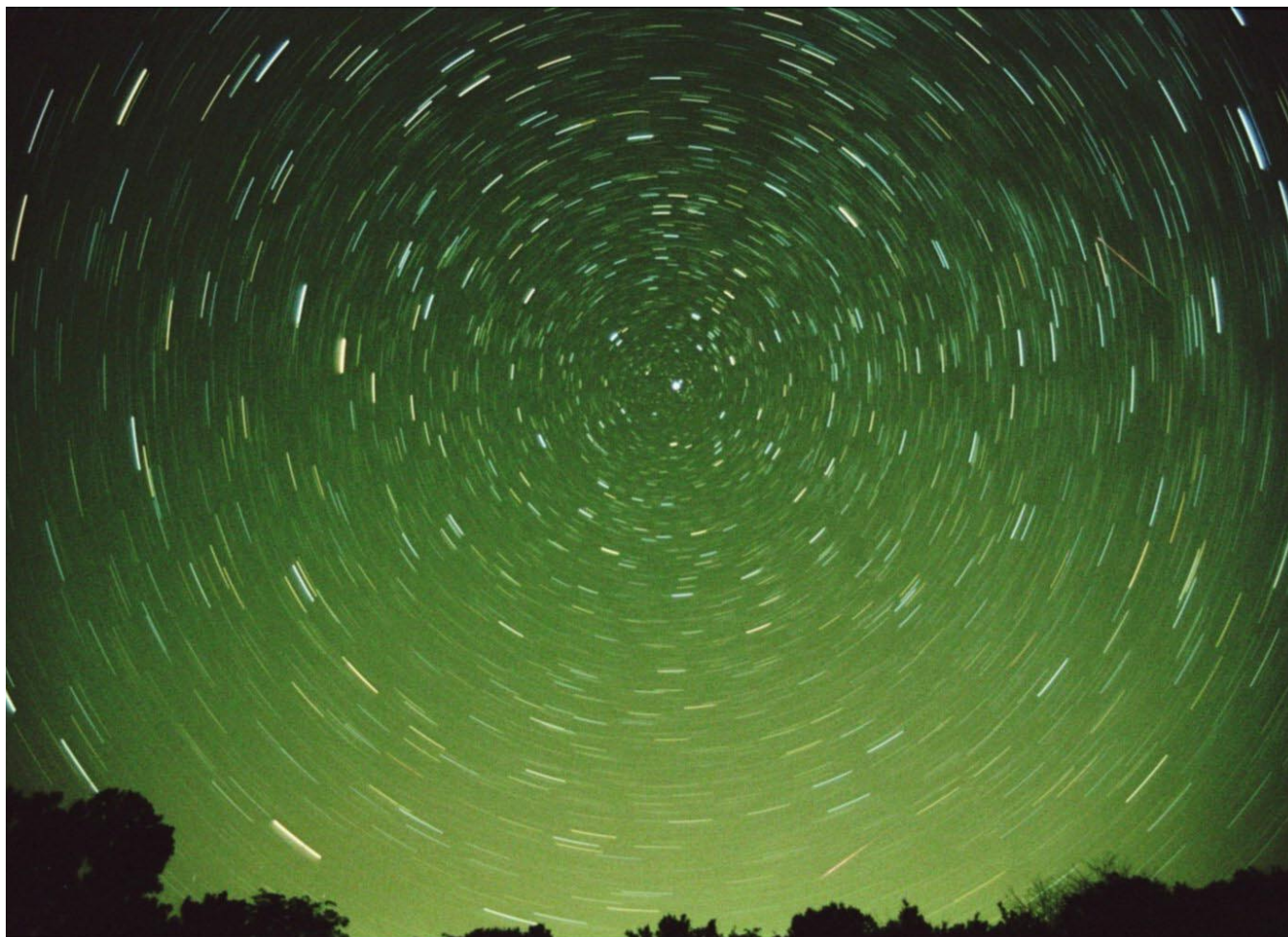
The Perseid meteor shower comes from the remnants of periodic comet Swift-Tuttle. With an orbital period of about 130 years, records of this comet have been uncovered in Chinese dynastic histories, with the oldest appearance in 69 BC. The earliest record of the Perseids is also found in these dynastic histories and occurred in AD 36. Although further records are found in the historical texts of China, Japan, and Korea, the first recognition that this was an annual meteor shower was made by Adolphe Quételet of Belgium in 1835. The meteor shower has been observed nearly every year since that time.

The 2004 display was eagerly awaited after two teams of astronomers independently predicted the Perseids would experience an outburst in activity levels, because Earth would encounter dust ejected

by Swift-Tuttle in 1862. Plus, a favorable moon phase would have little effect on observations — moonlight having been a major hindrance in 2000, 2001, and 2003, and guaranteed to diminish the Perseid displays during the next two years. So, we had an astronomical rarity: a predicted outburst and no moonlight.

Unfortunately for us, the outburst was predicted for a time favorable to Europeans. Fortunately for astronomers, the prediction came true. According to the most recent analysis of the International Meteor Organization (IMO), the Zenithal Hourly Rates (ZHR) attained a maximum of 196 on August 11.86 (Universal Time). This was the time of the outburst. The traditional

Watching from Jim Edgar Panther Creek State Park, Deb Wagner caught two Perseid meteors on film: upper right and just right of center near the bottom. Visually, Deb and Lois Butler saw many more.



Perseid display produced a peak ZHR of 146 on August 12.10 (UT). (Please keep in mind that these rates have been adjusted for the radiant's changing altitude above the horizon.) The visual observer would have seen between one-third and one-half less meteors under the best of conditions. Nevertheless, excluding the outburst, the 2004 peak marks the best Perseid display in well over a decade.

Club meteor watch

As it turns out, members of River Bend Astronomy Club (RBAC) missed both the outburst and the traditional peak this year. The outburst occurred in daylight at 3:38 p.m. (CDT), while the traditional peak occurred at 9:24 p.m., when the radiant was very low over the horizon. But the meteor gods smiled upon us because the Perseids did something that is very unusual: they continued to produce between 90 and 110 meteors per hour for the next 17 hours!

Three RBAC members began watching at 9:00 p.m., shortly after the end of nautical twilight. Deb Wagner and Lois Butler (Troy) were located in Jim Edgar Panther Creek State Park, while Jamie Goggin (Edwardsville) took his kids and their friends to Southern Illinois University at Edwardsville. Deb saw a constant stream of meteors begin shortly thereafter that persisted into early morning twilight. Jamie says that his crew, observing from the model airplane field, were greeted with about a 70% cloud cover. Conditions improved by 10:30 p.m. and Jamie remarks that "several bright meteors were seen." Although he notes these were not the best of conditions, "four kids, ages 5–8, got to see their first meteors."

The display improved as the Perseid radiant climbed higher into the sky. Deb reports 122 Perseids and 2 sporadics were seen during the period of 11:20 p.m. and 2:32 a.m. Mark Brown (O'Fallon) drove to St. Jacob Park and not long after stepping out of his car he noted two late earthgrazers, one at 11:25 and the other at 11:27. "Earthgrazer" is the term given to a meteor that does not dive straight down through the atmosphere, but passes through the upper reaches in a path tangential to Earth's surface. These meteors can travel long distances across the sky and

often display a reddish-orange color. Mike Veith (Edwardsville) stepped outside his home at 11:30 p.m. With light pollution and lots of trees, he saw one very bright Perseid during the 15 minutes he stood outside.

David Carson, a photographer for the St. Louis Post-Dispatch, joined Mark at 12:30 a.m. Both Mark and David spent the remainder of the night shooting pictures of the sky hoping to capture a few Perseids.

The next RBAC members to venture outside were Eric and Mark Young. Heading out at 2:00 a.m., they counted 10 Perseids during the next half hour, "before drowsiness and the chill air overcame us."


The final RBAC members to venture outside were Dennis Rippelmeyer (Waterloo) and myself (St. Jacob). Dennis traveled to a nearby athletic field. He began observing at 4:00 a.m. and noticed 40 Perseids and 7 sporadics during the next hour.

Although I had eagerly awaited the Perseids this year, I actually overslept. I did not make it to my backyard until 4:15 a.m. but still managed to see 17 Perseids during the next 15 minutes before I had to get ready for work.

Mark, Deb, and Lois all ceased observing at 5:00 a.m., but even in strong twilight, found the Perseids were still active. I was driving to work, when I noticed a bright Perseid to the southwest around 5:15 a.m. Mark reported two very bright meteors of magnitude –4 as he arrived home in O'Fallon around 5:30 a.m.

Both Mark and Deb saw an interesting — although common — phenomenon of the Perseids, occasionally referred to as the clustering effect. Mark remembers short bursts of 5 or 6 meteors in about 10-second intervals, while Deb reports periods where 3 or 4 meteors would appear within a few seconds.

Observing meteor showers has long been a favorite pastime of many RBAC members and overall this was a good night. Only three of us, Deb, Lois, and Mark, stayed out most of the night, but everyone else seems satisfied with what they were able to get out and see.

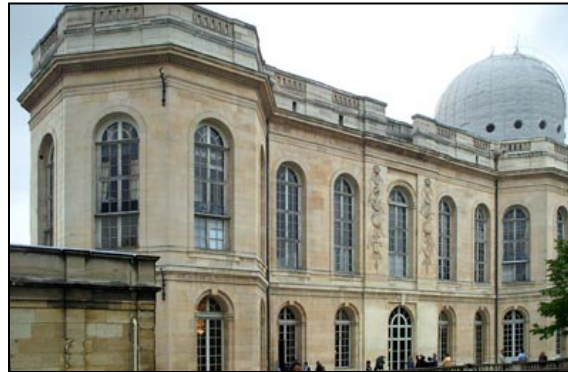
Deb perhaps summed up the event best when she wrote, "What a wonderful way to spend the night: relaxing under the stars in a reclining lawn chair, sipping hot tea, listening to the howling coyotes, and watching mother nature's pyrotechnics." 

Americans in Paris

Mr. and Mrs. Kronk take a European vacation

BY ERIC YOUNG

What did you do last summer? While some of us were blow-drying dew from our Telrads, cursing St. Louis humidity and inclement skies, Gary Kronk and his wife, Karen, flew to France. There Kronk spoke at the third International Workshop on Cometary Astronomy, held at Meudon and Paris Observatories from June 4th through June 6th, 2004. The conference brought amateur and professional astronomers face-to-face to share ideas and spur observation. "So many amateurs are following comets," said Kronk. "We're getting months of good data with nice long observation arcs and precise positions thanks to their efforts." Such commitment deeply impressed Kronk, who has devoted his life to studying the history of comet observation. [fb](#)



Paris Observatory was built in 1667. Here Jean-Dominique Cassini mapped the Moon and discovered the motion of Arcturus. Modern research initiatives include stellar physics, compact objects and gravitational waves. PHOTOS BY GARY KRONK



The Space Place

BY PATRICK L. BARRY

Resisting retirement: Earth Observing 1

The Hubble Space Telescope isn't the only satellite that scientists have fought to keep alive beyond its scheduled retirement. Scientists also went to bat for a satellite called EO-1, short for Earth Observing 1, back in 2001 when the end of its one-year mission was looming.

The motivation in both cases was similar: like Hubble, EO-1 represents a "quantum leap" over its predecessors. Losing EO-1 would have been a great loss for the scientific community. EO-1, which gazes back at Earth's surface instead of out at the stars, provides about 20 times more detail about the spectrum of light reflecting from the landscape below than other Earth-watching satellites, such as Landsat 7.

That spectral information is important, because as sunlight reflects off forests and crops and waterways, the caldron of chemicals within these objects leave their "fingerprints" in the light's spectrum of colors. Analyzing that spectrum is a powerful way for scientists to study the environment and assess its health, whether it's measuring nitrate fertilizers polluting a lake or a calcium deficiency stressing acres of wheat fields.

Landsat 7 measures only 8 points along the spectrum; in contrast, EO-1 measures 220 points (with wavelengths between 0.4 to 2.5 μm) thanks to the prototype Hyperion "hyperspectral" sensor onboard. That means that EO-1 can detect much more subtle fingerprints than Landsat and reveal a more complete picture of the chemicals that comprise the environment.

As a NASA New Millennium Program mission, the original purpose for EO-1 was just to "test drive" this next-generation Hyperion sensor and other cutting-edge satellite technologies, so that future satellites could use the technologies without the risk of flying them for the first time. It was never meant to be a science data-gathering mission.

But it has become one. "We were the only hyperspectral sensor flying in space, so it was advantageous to keep us up there," says Dr. Thomas Brakke, EO-1 Mission Deputy Scientist at NASA's Goddard Space



These images, made from EO-1 data, are of La Plata, Maryland, before and after a tornado swept through on May 1, 2002.

Flight Center. Now, almost three years after it was scheduled to be de-orbited, EO-1 is still collecting valuable data about our planet's natural ecosystems. Scientists have begun more than a dozen environmental studies to take advantage of EO-1's extended mission. Topics range from mapping harmful invasive plant species to documenting the impacts of cattle grazing in Argentina to monitoring bush fires in Australia.

Not bad for a satellite in retirement. 

Read about EO1 at eo1.gsfc.nasa.gov. See sample EO-1 images at <http://eo1.usgs.gov/samples.php>. Budding young astronomers can learn more at spaceplace.nasa.gov/eo1_1.htm.

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

BY ERIC YOUNG

A board meeting and a backyard gathering

BOARD MEETING: AUGUST 10th

History was made on a Tuesday night when the administration convened for the first time in the club's history. While there have been countless informal discussions, phone calls, e-mails, rocks tossed through windows and other forms of communications through the years, never before was a formal meeting held to review the issues and make decisions.

After all — RBAC began not as an excuse to sit around a table but rather as an excuse to stand around a telescope. That we love. We get together to observe, but paradoxically the defining moment for RBAC is when just one eye meets an eyepiece. Funny how we *gather* to be *alone* — to *share* magical, private moments.

Sure, star parties are fun. But recent meetings had too much “party” for comfort: property of club president Gary Kronk received minor damage...then kids-will-be-kids behavior at Greenville College Observatory knocked over a tripod. Fun that *ain't*.

We want a club that's big enough to share an array of interests, personalities and equipment. We also want a club where that diverse group feels happy and comfortable together, confident that their little patch of backyard — which may contain goodies totaling the worth of a good used car — will be treated with respect by members and guests.

To this end the administration decided:

Observers belong outside. Members can still enjoy the dark skies over the backyard “observatory,” then retreat to the garage illuminated by red light.

Club dues now \$20 for adults; \$15 for kids.

This will allow us to meet our expenses and then some, and better reflects the value of membership.

Focus public outreach. The Astronomy Day celebration makes science approachable for all ages. We also want to stage events like viewing Mars or a bright comet. However, publicity should reinforce how serious we are about having fun: play nice and we'll all have a better time. Which leads us to...

Adopt club rules. Rules will be posted and given to members; those who fail to heed the rules will be asked to leave. (Any similarity to a well-known set of ten rules is purely coincidental...)

1. Use red-filtered flashlights and shield other light sources.
2. Aim laser pointers only at the sky; adult use only.
3. Children must be supervised at all times.
4. No running; no horseplay.
5. Be quiet.
6. Be aware of your surroundings and respectful of others' activities.
7. Ask permission to use others' equipment.
8. Do not spray aerosols near equipment.
9. No smoking.
10. No alcohol.

Small groups may meet and follow more rules.

That is, members can do their own things, too. For example, astrophotographers might meet at a dark site and say no laser pointers and no country line dancing, while country line dancers could plan their own gathering and dance the night away.

Observation, Education, Camaraderie.

It's your River Bend Astronomy Club. Please follow the rules and enjoy yourself.

GENERAL MEETING: AUGUST 14th

The regulars and some new faces met in the Kronk's backyard on August 14th. The stars of the show, so to speak, were straggling Perseid meteors that whooshed overhead throughout the evening. While the usual array of telescopes and binoculars pointed every which way, those armchair astronomers with a preference for poolside furniture clustered near the deck. These folks used their full fields of vision to soak up starlight, ogle constellations and spy satellites. Tele-scopists hunted Uranus and Neptune, by go-to or by golly. With warm red light glowing in the garage and a chill in the air it was almost like a night on Palomar Mountain.

Almost. 

September 2004



August 2004

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

October 2004

S	M	T	W	T	F	S
26	27	28	29	30	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

■ Holidays
 ■ Moon Phases
 ■ RBAC
 ■ Space Mission
 ■ Observing
 ■ Trivia

Sun	Mon	Tue	Wed	Thu	Fri	Sat
29 ● Full Moon 9:22 p.m. CDT	30	31 ■ Saturn within 2 degrees of Venus	1 ■ 25th ann. of Pioneer 11 Saturn flyby	2	3	4
5	6 ■ Labor Day ● Last Quarter 10:11 a.m. CDT	7	8	9 ■ Mercury at greatest elongation ■ Prairie Skies Star Party	10 ■ Mercury close to Regulus ■ Prairie Skies Star Party	11 ■ RBAC Meeting 8:00 p.m. ■ Prairie Skies Star Party
12	13	14 ● New Moon 9:29 a.m. CDT	15	16 ■ Illinois Dark Skies Star Party	17 ■ Mercury at greatest illumination ■ Illinois Dark Skies Star Party	18 ■ Illinois Dark Skies Star Party
19	20	21 ● First Quarter 10:54 a.m. CDT	22 ■ Autumnal Equinox	23	24	25 ■ Comet P/ 1998 X1 closest to Earth
26	27	28 ● Full Moon 8:09 a.m. CDT	29 ■ Schwassma nn- Wachmann 1 closest to Earth	30	1	2