

 **Current** FEBRUARY  
**Astronomy** 2004  
RIVER BEND ASTRONOMY CLUB NEWSLETTER

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**Orion the Hunter rises over the Children's Museum at Edwardsville as club members operate telescopes and binoculars during the Starry Night event January 10, 2004. Following days of wintry gray, the sky cleared for a chilly evening of celestial viewing. PHOTO BY ERIC YOUNG**

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# Digital planet portraits

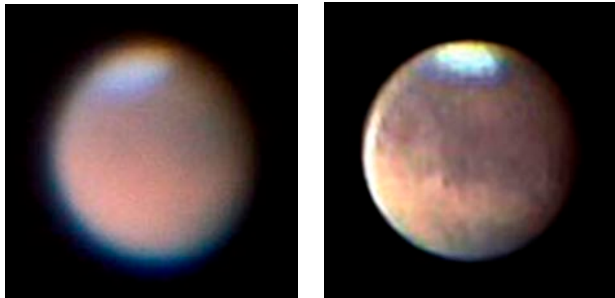
## Inexpensive camera gives Mars hound new inspiration

BY MARK BROWN

**T**his past summer I fulfilled a yearning to photograph Mars in a different way. For several years I photographed the planets using a film camera and achieved some good results, some mediocre results, and some not-so-good results. No matter how patient I was or how painstakingly long it took to obtain a perfect focus, I found many of my film images disappointing. It was time for a change: a change that came in a small egg-shaped package called the Philips ToUcam Pro. It's a "webcam."

A webcam can transmit digital images for viewing on the Internet. The camera takes a series of frames (i.e. photos) in a row called an AVI (audio/video interleave). But it can make a good planetary photograph, too. All that's needed is software to accumulate the frames, decide which ones are good, and "stack" them together, averaging the data for a better result.

The electronic age has made astrophotography easier than ever. A digital camera collects light and produces an image through a tiny chip that's more sensitive than conventional film emulsion. But who



**Images of Mare Eurythraeum, though taken nearly an hour apart, reveal a dramatic difference between film and digital imaging. The scanned single photograph, left, (Fuji 200 speed film, 5 second exposure, Celestron SCT 8" using eyepiece projection) barely hints at the planet's surface detail. Compare this to the image at right acquired with the ToUcam, composed of about 300 images aligned and stacked from a 30-second AVI, shot through the same Celestron SCT 8" with a 2x Barlow Lens.**

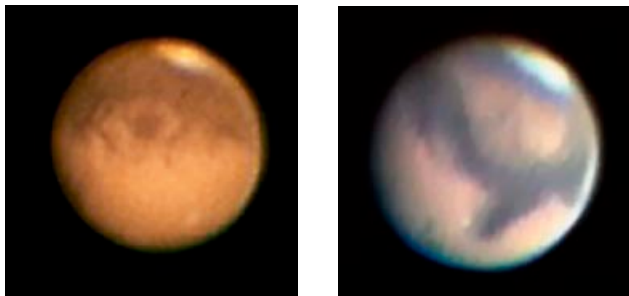
**...who would have thought capturing planetary images could be achieved with a cheap webcam? Digital astronomy cameras usually have astronomical price tags.**

would have thought capturing planetary images could be achieved with a cheap webcam? Digital astronomy cameras usually have astronomical price tags. However, for backyard planetary astrophotography, I found the less expensive ToUcam webcam (about \$100) sufficient for picturing the bright major planets, Sun and Moon.

Because of the close Mars apparition, it seemed truly fitting to set my sights on this planet. I will admit that my film images of Mars from 2003 were the best I had ever captured and did show detail. But little did I know how hooked I would be after achieving my first webcam image of the red planet, so amazing was the amount of detail resolved. In fact, my webcam pics surpassed all my previous Mars photos. I was impressed!

Photographing the night sky is an art. The satisfaction I gain from this art not only comes in creating the image, but also from using skills I've acquired over the years. With film photography, an astrophotographer must be familiar with film type, film speed, grain, sensitivity, and reciprocity failure. The focal length, f/ratios, exposure range, sky glow and seeing conditions are other factors to consider depending on the selected sky target.

The same is true when using a webcam to photograph the planets. Now it is important to know terms  
*Continued on page 3*



**The author imaged Mars the day before its closest approach to Earth in 2003. The “Eye of Mars” — Solis Lacus — stares back from just above center (left), while the great volcano Olympus Mons appears as a pale white spot below and to the right. The dark triangle of Syrtis Major dangles (right) with the south polar cap prominent at the top.**

such as frame rate, gamma, gain, shutter speed, exposure, resolution, align, stack — and still consider the seeing conditions of the atmosphere. Whether using film emulsion or pixels, photography remains an art, although the quest for knowledge takes precedence over imagination. Digital imaging puts me more in control over the final product.

With film photography, I drop off and wait, while a film-processing lab develops the negatives and returns prints. Trouble begins in the lab, since most developers are not skilled in processing night-sky images and may over- or under-process the film and skew the colors. Out of a 24-exposure roll, I’m lucky to obtain two or three decent results.

Since the webcam captures AVI files and feeds them to a computer, the good news is that the user becomes the image processor without leaving the comfort of home. Using my webcam, I can capture nearly 300 individual frames in about 30 seconds and produce a single high-resolution image by merging the best frames. The final file is far better than the few “still” photos I would have obtained on film.

The imaging software used to accumulate and process an AVI stream is available free from software developers through the Internet. I use a program

**I was surprised to see some of my Mars shots rivaled those from expensive top-of-the-line CCD cameras.**

called Registax that automatically selects the best individual frames, aligns, and stacks them to produce a single high-resolution image. Photo-editing software like Adobe Photoshop, Images Plus, or ArcSoft Camera Studio offer unique features that help “clean up” the image, balance color, enhance contrast, and sharpen detail.

Go digital! The benefits are many. Webcams offer an inexpensive imaging option for amateur astronomers on a budget. Planetary pics can be obtained in minutes, and processing software gives you control over picture quality. And what quality: I was surprised to see some of my Mars shots rivaled those from expensive top-of-the-line CCD cameras.

Mars amazed me in 2003, but now I’m imaging another planet — spying the favorable tilt of Saturn’s rings through my telescope and webcam. I’m reminded once again that, digital or film, planetary photography requires careful study, practice, and patience — all reasons I enjoy this rewarding art form. [↗](#)

**This tiny, inexpensive webcam captures 60 frames per second at a resolution up to 640 by 480 for detailed planetary portraits.**



# Giving the gift of light

## Reliving that “first scope” feeling

BY ED CUNNIUS

**SkyQuest XT4.5 Dobsonian Telescope: \$199.00.**

**Call on New Year’s eve from your excited nephews saying they could see the rings of Saturn: priceless.**

**T**his year, John and I decided to get our computer-game-whiz nephews Karl, 15, and Paul, 12, a telescope for Christmas. It was a bit of a long shot — giving a chunk of 300-year-old technology to a couple of 21st century Game Boy champs — but we thought we’d give it a try. And since we would not be able to join them during the holiday this year, we had it sent to Houston where they were to celebrate Christmas with their grandparents.

I know, I know — this is a recipe for disaster. You have the ingredients for a perfect storm: (1) a new telescope, (2) a new telescope being given as a gift, and (3) a new telescope being given as a gift to a couple of kids. Telescope + gift + kids = ...Man, we were just asking for it. So it was no surprise when the sky gods Over and Cast whipped up a dense cloud layer for the event. The boys only had the scope for a few minutes and already they were being treated like real astronomers! But there would be no first look that night at Venus, or Saturn. No wild kid-quests to resolve the flag on the Apollo 11 landing site, or hunting planets around distant stars with a teensy telescope. Nope,

**I wanted to relive the memories**

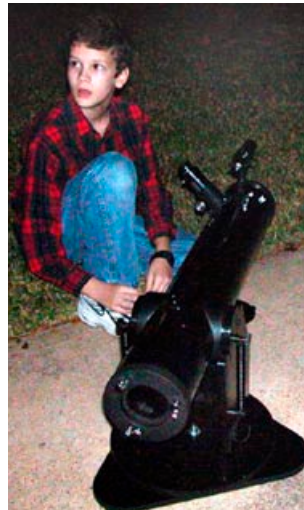
**I had with my first telescope**

**– like the time I took it outside**

**on a clear, Texas night and**

**“discovered” Jupiter,**

**moons and all. It was real!**



**First telescopes can change lives in memorable ways. Paul Schnase, age 12, poses with the kid-size scope he and his brother Karl, age 15, received as a Christmas gift. The optical quality of this instrument, sold through Orion Telescopes and Binoculars, makes it a popular choice for adults wanting a small Dobsonian reflector.**

none of that stuff: the clouds were packed shoulder to shoulder and weren’t going to surrender a single peek.

But kids being kids, the boys hauled the scope out onto the front lawn and started fiddling with it. They looked at Christmas lights blocks away. They tried the different eyepieces and checked out the finder scope. They sent their dad off down the street with the manual and a flashlight and took turns reading the instructions from a quarter mile. What adult would have thought of that? (Okay, maybe Mark Brown, but you get my point.) So the scope *did* deliver a lot of fun — in a Christmas toy kind of way — but no astronomy. They had a good time, and called to thank us and let us know all the cool things you could do with it on a cloudy night, but I was still disappointed. I wanted more than kicks with a new gizmo — I wanted...

...what did I want?

I suppose I wanted to live it again. I wanted to relive the memories I had with my first telescope — like the time I took it outside on a clear, Texas night and “discovered” Jupiter, moons and all. It was real! I just about had a kiddie heart attack. I dragged my folks out for a look and proudly recited all the stats I had learned in school about the planet. I was so excited.

*Continued on page 5*

It was one of those sudden shifts in understanding when the world is at once a bit larger, and a bit more comprehensible — all at the same time. It was that little *thrum* of excitement in the chest that comes with discovery. And while I can get that feeling as an adult with my “grownup” telescope — I still come closest to reliving that first moment when I show someone else the stars for the first time...always waiting for the “Oh, wow!” that makes astronomy all worthwhile.

So when folks like us give telescopes to our kids, we’re doing more than giving them a toy. In our hearts we’re hoping they have the same response that we did. We want them to experience the same thrill of finding a planet on their own, of scanning craters on the moon, of seeing in real time a bit of the universe

that they’d only read about in books or saw on PBS. Experiences we had as kids, still cherish — and now want to pass on. By giving them a telescope, we are saying in effect: here is the Cosmos. It is boundless, and beautiful, and you can look at it any time you like. It can feed your imagination, and give you hope. It will be with you always.

Heavy stuff to lay on a couple of kids hoping for another Game Boy cartridge. And with the cloudy Christmas come and gone, we had begun to fear that the scope would wind up just another gee-gaw in the toy pile.

Then, on New Year’s Eve we get a call from Paul on his dad’s cell phone. He wanted to call and thank us again for “the Scope,” but more importantly he wanted to let us know at that very instant, he was looking at the rings of Saturn. He sounded excited, but somber as well — like a kid would sound who had just discovered a ringed planet all on his own.

Wow — there it was — *thrum*. The feeling. Paul and Karl had experienced just what we had hoped. And they in turn let us live it over again, but with an added twist: this time there was a feeling of happiness for them — a paternal satisfaction that they had, through our gift, realized just a little of the wonder life has in store for all of us.

Let’s see a Game Boy do that. 



### Why is this man smiling?

Great astrophotography requires perseverance, patience, and a whole lotta luck. Mark Brown has all three in abundance — plus a toothsome grin. Mark’s happy because one of his images landed in the pages of *Sky & Telescope*, a popular astronomy magazine. The February issue, page 136,



features Mark’s dramatic, colorful photo of auroral rays captured on October 29, 2003. This same picture appeared in newspapers throughout the St. Louis metro-east area, on local TV, and international Web sites.

Mark only recently subscribed to *Sky & Telescope*. After submitting three aurora images, he took it with a grain of salt when the photo editor contacted him about possible publication in the magazine’s gallery section. “I was both surprised and pleased they were looking at it, but didn’t get my hopes up.” Exhilaration overwhelmed him, though, when he learned their decision.

“Throughout this process,” recalls Mark, “S&T kept me well-informed about my photo submission, contacted me by phone, and showed an extreme interest in my photo.” In retrospect, Mark wishes he’d subscribed long ago.

# The Space Place

BY TONY PHILLIPS

## So little time, so many galaxies

**F**ourteen billion years ago, just after the Big Bang, the universe was an expanding fireball, white hot and nearly uniform. All of space was filled with elementary particles and radiation. “Soupy” is how some cosmologists describe it.

Today the universe is completely different. It’s still expanding — even accelerating — but there the resemblance ends. The universe we live in now is “lumpy.” Great cold voids are sprinkled with glowing galaxies. In galaxies, there are stars. Around stars, there are planets. On one planet, at least, there is life.

How we got from there to here is a mystery.

Finding out is the goal of the Galaxy Evolution Explorer, “GALEX” for short, a small NASA spacecraft launched into Earth orbit on April 28, 2003. GALEX carries an ultraviolet (UV) telescope for studying galaxies as far away as 10 billion light years.

“GALEX is a time machine,” says astronomer Peter Friedman of Caltech. Because light takes time to travel from place to place, pictures of distant galaxies reveal them as they were in the past. “GALEX is investigating the evolution of galaxies over 80% of the history of our universe.”

The Hubble Space Telescope can see faraway galaxies, too, but GALEX has an advantage: While Hubble looks in great detail at very small regions of the sky, GALEX is surveying the entire sky, cataloging millions of galaxies during its 2-year mission.

GALEX is a UV mission for a reason. Friedman explains: “UV radiation is a telltale sign of star birth.” Stars are born when knots of gas condense in interstellar clouds. The ones we see best are the big ones — massive stars that burn hot and emit lots of UV radiation. “These stars are short-lived, so they trace recent star formation.”

Understanding star formation is crucial to studies of galaxy evolution. When galaxies collide, star formation surges. When galaxies run out of interstellar gas, star formation wanes. In galaxies like the Milky Way, spiral arms are outlined by star-forming clouds. The




**This image of Messier 101, also known as the “Pinwheel Galaxy,” was taken in two orbits of GALEX on June 20, 2003. M101 is 20 million light years away.**

shapes of galaxies, their history and fate — they’re all connected by star formation.

Even life hinges on star formation, because stars make heavy elements for planets and organic molecules.

“Our measurements of UV radiation will tell us both the rate at which stars are forming in galaxies and the distances of the galaxies,” says Friedman.

How did we get here? GALEX will show the way.

Find out more about GALEX at [www.galex.caltech.edu](http://www.galex.caltech.edu). For children, visit The Space Place at [spaceplace.nasa.gov/galex\\_make1.htm](http://spaceplace.nasa.gov/galex_make1.htm) and make a beautiful galactic mobile while learning about some of the different shapes galaxies can take. 

*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.*

# River Review

BY DEB WAGNER

## Watching cosmic timepieces

**W**illiam H. Calvin, Ph.D., a neurobiologist at the University of Washington, has a passion for archaeoastronomy. In *How the Shaman Stole the Moon*, Calvin takes us on a journey back to a time when astronomy and religion were still intertwined and the ancient Shaman—as healer, priest, and astronomer — was vital to the community.

As we know, archaeologists have discovered ancient astronomical “calendars” in many locations around the world — Stonehenge, Woodhenge, Chaco Canyon. These cosmic timepieces were obviously important for agricultural and religious purposes. An ancient community needed to know the proper times to plant and harvest crops, when to pray for rain, when to move to and from seasonal lodging, and when

**A Shaman...  
would have been  
responsible  
for “reading”  
the calendar  
based on its  
orientation  
to the Sun.**

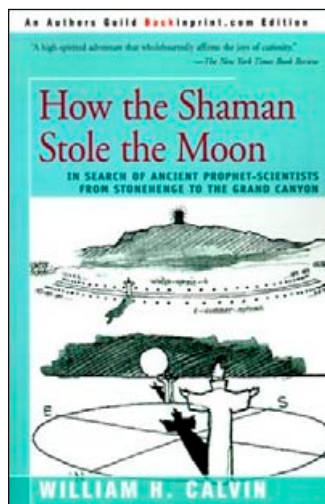
the Shaman would also have soon discovered the authority and power that came with the ability to predict the eclipses. Just imagine this scenario:

There is an ancient tribe with a powerful Shaman who tells them when to plant corn, when to harvest, and when to pray. He or she is probably also the tribe’s healer. One evening, the Shaman gathers the tribe

to hunt and gather.

The calendars probably served as a type of ancient *Farmer’s Almanac*.

A Shaman in the ancient society would have been responsible for “reading” the calendar based on its orientation to the Sun. Calvin theorizes that as the Shaman studied the movement of the Sun and Moon, he or she would have discovered eclipses. It stands to reason that



### **How the Shaman Stole the Moon: In Search of Ancient Prophet-Scientists from Stonehenge to the Grand Canyon**

William H. Calvin  
244 pages, \$21.95  
Backinprint.com  
ISBN: 0595166938

**RBAC RATING  
(1-5 TELESCOPES)**



together and instructs them to pray or the Moon will “go away.” As the tribe prays, they notice the Moon start to disappear (a partial eclipse) so they pray louder. Soon, the Moon starts to reappear. It worked! The Shaman saved the tribe from some horrible fate!

As you can see, the ability to predict eclipses could definitely contribute to a Shaman’s job security. But, how could an ancient Shaman have known how to predict eclipses thousands of years before the discovery of how the Earth, Sun, and Moon move in relation to one another? To answer that question, you will have to join William H. Calvin on his journey of discovery as he explores ancient Anasazi ruins and unearths the origins of modern science.

**“Put three grains of sand inside a vast cathedral, and the cathedral will be more closely packed with sand than space is with stars.”**

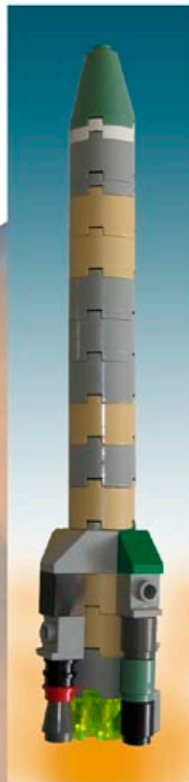
Sir James Jeans, F.R.S. (1877–1946)  
British astronomer and writer

# Modeling Mars

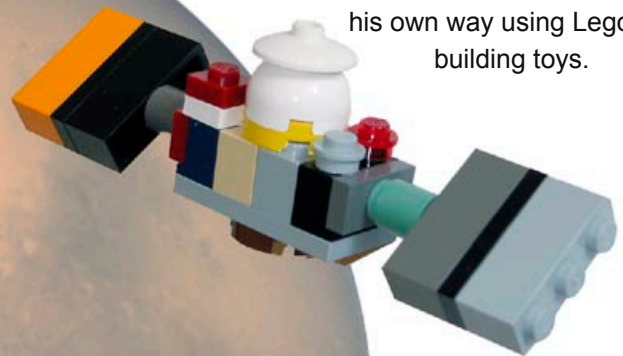
MODELS BY MARK YOUNG

## Mars exploration stirs the imagination

**Mars Express was launched on board a Soyuz-Fregat rocket from the Baikonur Cosmodrome in Kazakhstan.**



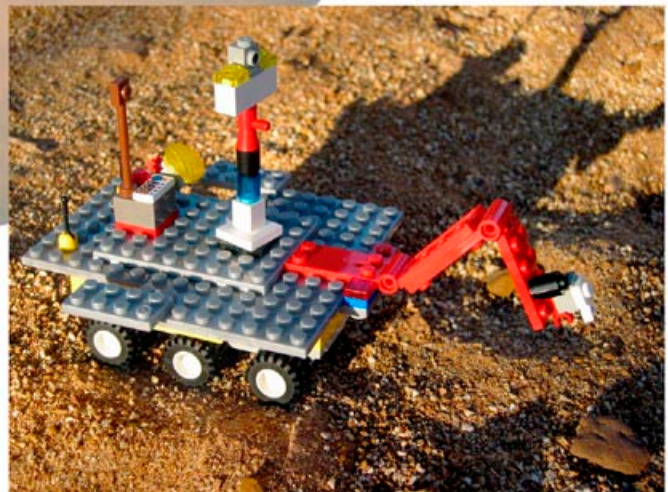
**A** fleet of Mars probes descended on the Red Planet in early 2004, heralding a new era of discovery. River Bend Astronomy Club members closely followed news of the missions. The excitement spurred club member Mark Young, age 7, to commemorate the spacecraft in his own way using Lego building toys.



**The European Space Agency's Mars Express will study the planet from orbit.**

**Mars: Hubble Space Telescope, NASA.**

**NASA landed two identical rovers on opposite sides of Mars. The robots will photograph the landing sites and conduct experiments to see if Mars was once wet enough to support life.**





## Astronomy Day, the solar system and beyond

### JANUARY 17, 2004, ATTENDEES

Mark Brown, Lois Butler, Tom Foster, Jamie Goggin, Gary Kronk, Bruce Kryfka, Mike Veith, Deb Wagner, Eric Young, Mark Young,

**GOOD CONVERSATION** 2004 started off with a “big bang,” astronomy-wise. We’ve enjoyed the success of the comet-imaging and sampling mission, Stardust, and the nail-biting excitement of several Mars landings. Day-to-day, there’s nary a dull moment, and much for space enthusiasts to discuss. Along came a proposal from President George W. Bush to send people back to the Moon — and on to Mars. Grand vision, or politics as usual? Where do you stand? After all, how else can America keep a good budget deficit going...? Even so, some RBAC’ers passionately support the science — and adventures — of tomorrow.

### CALLING ALL DESK POTATOES

Say, if couch potatoes watch TV, do desk potatoes watch NASA TV? Jamie Goggin, who bears no resemblance to a potato, cooked or raw, recommends this Web-based multimedia source for up-to-the-minute video and audio feeds from the space agency.

**SHHHHHHHH!** Lois Butler always wanted to have a chance to say that. Now she’s overseeing the new RBAC resource library. The first addition is a multi-volume video set on the planets, donated by Ed Cunnius. Contact Lois if you’d like to “check out” this or other future resources. And consider making a donation yourself for the benefit of the club. We armchair astronomers need more books and videos!

**STAR PARTY** The 11th annual Nebraska Star Party will be held July 18–23, 2004. From the brochure: “One of the premier attractions of the NSP is the fantastic view of the summer Milky Way...[which] looks like an edge-on spiral galaxy and the central bulge is clearly visible.” [www.NebraskaStarParty.org](http://www.NebraskaStarParty.org)



**Gary Kronk eyes an unidentified flying object.**

### Deeeeep Impact

Finally, he’s a bona-fide member of the solar system! RBAC president Gary Kronk received a far-out honor in January when an asteroid was named for him, as announced by the International Astronomical Union: Minor Planet Center. The “first-ever, high-resolution” image of the minor planet, above, revealed many anomalies, including a discarded Coke can and a large boot print. Seriously, though, folks, Gary is pleased as punch, and RBAC presented him with an “official” certificate commemorating the occasion. A full story will appear in the next newsletter. *(No, you can’t see the tiny, distant asteroid through your own telescope. Rather, like the tooth fairy and the Easter bunny, ya just gotta believe.)*

**MESSIER MADNESS** Keen-eyed observers are salivating at the prospect of an all-night Messier Marathon. Jamie Goggin promised to investigate whether or not there are any “rules” governing proper conduct of such an event. (Like not salivating on your fellow members.) Deb Wagner recommended the following Web site for happy hunting tips: [www.astro-tom.com/messier/marathon\\_order/marathon\\_tips.htm](http://www.astro-tom.com/messier/marathon_order/marathon_tips.htm)



**An ill-fated Rams football playoff game that went overtime the evening of January 10, 2004, kept St. Louis area residents glued to their TV sets, and thinned the Starry Night crowd compared to last year's showing at the Edwardsville Children's Museum. Even so, several dozen hearty souls braved frigid temperatures for a cup of hot chocolate and a chance to "meet" the stars. RBAC member Lois Butler, above, offers a young visitor a look through binoculars on a parallelogram mount — an affordable contrast to telescopes large and small in operation on the ballfield west of the museum. The club thanks the other RBAC'ers who participated: Mark Brown, Tom Foster, Jamie Goggin, Gary Kronk, Jace Perham, Tom Schalk, Deb Wagner, and Eric Young.**

**ASTRONOMY DAY** Event coordinator Mark Brown detailed the activities for last year's Astronomy Day event and asked for input in planning the 2004 festivities. The world-wide Astronomy Day theme is "bringing astronomy to the people." Last year, we did that through telescope exhibits, a mega-sun dial, planet walk, planet coloring station for the kids, a small mountain of free promotional material, a computerized exhibit and quiz, and door prize drawings. Most of which went over well with the nearly 100 people who attended. We're tweaking the recipe to make the day even better. Mark has begun soliciting organizations and businesses both local and national for donations to give away this year. He'll follow up with more information at the February meeting. Astronomy Day is scheduled at the Edwardsville Children's Museum for Saturday, April 24. Got any long-range forecasts?

**FREE THE PEOPLE** Mark Brown feels very strongly that Astronomy Day admission should, ideally, be free to everyone, as with past events he's managed. Jamie Goggin voiced the same concern. Other members agree but are unsure how to reconcile this with the Edwardsville Children's Museum's admission fee of \$3.00. Perhaps the only way to guarantee a free admission would be for the club to sponsor the event itself. This sticky issue — a bother to other small astronomy clubs who likewise wrestle with the question of where to stage safe, convenient public events — resurfaces every time we plan one ourselves.

**WHAT'S ON THE NETWORK?** A new NASA/JPL outreach program called Night Sky Network promises to assist astronomy clubs in bringing the wonders of the universe to the public. According to its home page, the network, founded in 2003 by the Jet Propulsion Laboratory's PlanetQuest program, is a nationwide coalition of amateur astronomy clubs bringing the science, technology and inspiration of NASA's missions to the general public. RBAC members voted to give it a whirl so Mark Brown is submitting the paperwork. If accepted, the club will receive a multimedia packet of educational materials, that, we hope, will prove beneficial for public events, star parties and school talks.



**RIVER BEND**  
ASTRONOMY CLUB  
RIVERBENDASTRO.ORG

*River Bend Astronomy Club serves amateur astronomers of the American Bottom region, the Mississippi River bluffs and beyond, fostering observation, education and a spirit of camaraderie.*

**Officers**  
**PRESIDENT** Gary Kronk  
**VICE-PRESIDENT** Kurt Sleeter  
**TREASURER** Ed Cunnius  
**LEAGUE CORRESPONDENT** Jamie Goggin  
**SECRETARY** Eric Young

**Membership**  
**ADULT** \$10.00/year (18 years or older)  
**YOUTH** \$8.00/year (under 18)

**Contacts**  
**MAIL** 132 Jessica Drive, St. Jacob, IL 62281  
**WEB** riverbendastro.org  
**E-MAIL** riverbendastro@att.net

**Astronomical League**  
Members of the world's largest amateur astronomical organization.  
**WEB** www.astroleague.org

**Current Astronomy CLUB NEWSLETTER**  
**EDITOR** Eric Young  
**E-MAIL** younger@wustl.edu  
Submissions to the newsletter are encouraged. Contact the editor for more information.

**SPOT A COMET** Two comets hold great promise for 2004, C/2002 T7 (LINEAR), now visible, and C/2001 Q4 (NEAT), coming this spring. Gary Kronk, who's spent his life chasing comet tails and comet tales, so to speak, through his observations and research, addressed the members regarding how best to observe comets — tricky business at best. Gary talked of estimating the brightness, measuring the diameter, measuring the tail, noting the direction the tail is pointing, as well as considering the degree of condensation. He will assist anyone interested in practicing these techniques at the next meeting. For more information, Gary recommends an out-of-print book, the *International Comet Quarterly Guide to Observing Comets*. A revised edition is in the works and due to be released in late 2004.

**THE ART OF ASTRONOMY** Long before the invention of astrophotography, astronomers drew with their hands what they saw with their eyes. Galileo's drawings of lunar craters and his recorded observations of Jupiter's moon dance forever changed humankind's perception of the universe. To see and make a mental note is to savor the moment personally, but to see and write or draw an observation is to record the moment for posterity. Drawing has been called a kind of "intense" seeing, and a skilled visual artist might say that, through the process of drawing, one sees even better. Still, sketching at the eyepiece challenges both artists and astronomers. It's tricky to shift from the view through the eyepiece to focus on a sketchpad — in dim light, no less. "How-to" articles and resources are available if you wish to try your hand (and eyes) at this time-honored skill. With Saturn showing off its rings this year, what have you got to lose?

## Next Meeting

**Saturday, February 21, 2004 • 7:00 p.m. • Kronk Observatory**

**Get ready to run the  
Messier Marathon**



**Mark Young shows first-graders the way to Mars.**

### Mark on Mars

The first grade class of Immaculate Conception School in Columbia, Illinois, received a presentation on NASA's Mars exploration program from Mark Young, RBAC member and first-grader. Mark showed images of the Spirit rover and sketched how balloons broke the impact of the space craft landing (above).

During a class discussion of *Weekly Reader* magazine's coverage of the Mars missions, Mark had a lot to contribute, so teacher Marilyn Lynn invited him to return the next day with a full report. The lecture lasted three periods, "before music, after music, and a little bit more after lunch," according to Lynn, who was impressed by Mark's use of the board and even pantomime gestures while telling his fellow students about the robotic missions. Lynn recalls her favorite Mark quote during the talk: "Listen, guys, you won't believe this..."

**HELPFUL HINT** For you reflector owners, Jamie Goggin recommends cleaning your primary mirrors with a dirty dishrag. At least that's what I think he said... When you're done, he swears you'll better appreciate the view through his telescope.

**RODENTIA** If the groundhog sees his shadow on February 2nd, then Ed Cunniss will spend six more weeks working on his house instead of observing, and we might as well remain in hibernation. [↗](#)

# February 2004



January 2004

S	M	T	W	T	F	S
28	29	30	31	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

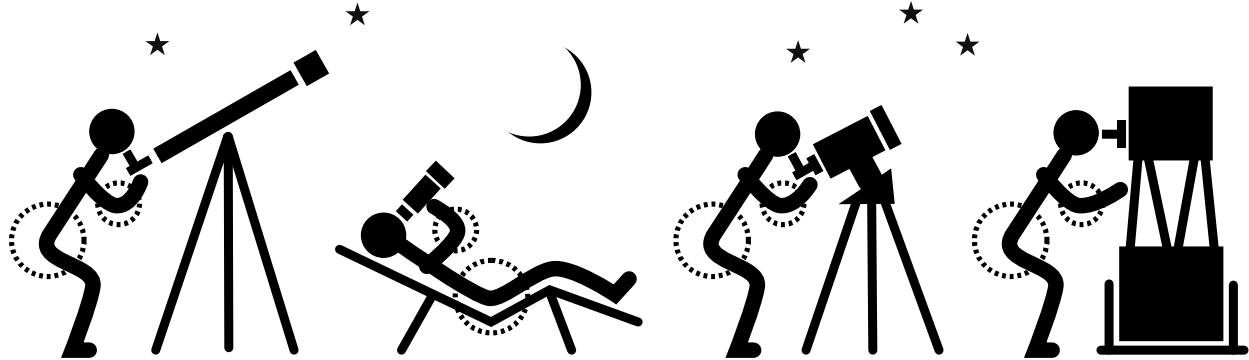
March 2004

S	M	T	W	T	F	S
29	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

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

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 ■ Saturn bright all night ● Shuttle accident 03	2 ■ Moon near Saturn @ dusk ■ Will Ed see his shadow?	3	4	5 ● 30th anniv. Mariner 10 Venus flyby	6 ■ Full Moon	7
8	9	10	11 ■ Lepus leaping in south	12	13 ■ Last Quarter Moon	14 ● Valentine's Day – Starlight is romantic
15 ■ Galilean moons group tight at midnight	16 ■ Asteroid 6 Hebe near 41 Gem	17	18	19	20 ■ New Moon	21 ● RBAC meeting @ 7 pm
22	23 ■ Moon near Venus @ dusk	24	25 ■ Moon near Mars @ dusk	26 ● ESA Rosetta comet mission launch	27 ■ First Quarter Moon	28
29	1	2 ■ Observe M41	3	4	5	6 ■ Full Moon

# We recommend light bending nightly.



Exercise your sense of wonder — join the River Bend Astronomy Club.

**M**eteors explode high above the Earth. Comets exhale dusty, million-mile-long tails while hurtling towards the Sun. Galactic collisions rip stellar systems to shreds of stardust. Oh, and don't forget the Big Bang...

These aren't scenes from Hollywood's latest action flick. The drama of the universe plays nightly over your backyard. All it takes to enjoy the show is a little know-how and maybe some modest optical equipment. Popcorn is optional.

While often exciting, astronomy is also a peaceful, deeply meaningful, and some might say spiritual pursuit, a search for a "cosmic connection"—reaching out from our tiny blue world to try and grasp our place in the universe.

The thrilling WOW! of a child's first glimpse of Saturn through a telescope as well as quiet, personal moments are among the many rewards of amateur astronomy. The River Bend Astronomy Club aims high to make your pursuit as rewarding as possible.

Anyone interested in learning more about astronomy may join. Expensive tools or special skills are unnecessary. But space is a big place—it helps to know someone with a road map. Members have maps, and they'll gladly show you around the sky—plus you'll enjoy sharing great sky views using quality astronomical telescopes. Besides, it's more fun to share the night together (and having a friend close by helps ward off night-feeding hungry bears, surprise alien attacks, etc.).

Through club membership, you join the Astronomical League, a national federation of over 240 local astronomy societies. The League's many special programs and quarterly newsletter will 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?



## River Bend Astronomy Club Membership Application

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)  
@ \$10.00/year @ \$8.00/year  
(18 years or older) (under 18)

I enclose a check for a total of \$ \_\_\_\_\_  
made out to "Ed Cunniss, 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@att.net