



The Night Sky

A Publication of The Astronomy Club of Akron
Akron, OH USA

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2004 ACA Calendar	Summary
10/16/04 Sat 7:30 p.m.	ACA Observatory Open House—ACA Observatory
10/27/04 TBA	ACA Observatory Open House—Lunar Eclipse
10/22/04 Fri 8:00 p.m.	ACA General Membership Meeting—Kiwanis Club
11/6/04 Sat 7:30 p.m.	ACA Observatory Open House—ACA Observatory
12/11/04 Sat 7:30 p.m.	ACA Observatory Open House—ACA Observatory

2004 ACA Calendar-Detail

Saturday, October 16

Open House and Star Party begins at 7:30 pm with emphasis on Perseus, Auriga, Taurus and the Pleiades as they rise in the east. Bring your telescopes for the event.

Sunday, October 17

Training session on Club telescope, 6 pm.

Friday, October 22

General membership meeting beginning promptly at 8 pm at the Portage Lakes Kiwanis Club. Geoffrey Landis will be talking on "What's New on Mars: Exploring with Spirit and Opportunity." Be sure to mark your calendars for this talk!!

Saturday, October 23

Training session on Club telescope, 6 pm.

Saturday, November 6

Open House and Star Party begins at 7:30 pm with random observing two days after the Southern Taurid meteor shower. Please bring your telescopes for the event.

Friday, November 19

General membership meeting beginning promptly at 8 pm at the Portage Lakes Kiwanis Club. Speaker to be announced. Last meeting of the year.

Saturday, December 11

Open House and Star Party beginning at 7:30 pm. Bring your telescopes and mittens!!

Sky Events for October 2004

Oct 6	Last Quarter Moon at 10:12 UT.
Oct 14	Partial Eclipse of the Sun at 2:47 UT visible from parts of Asia (Japan, Korea, Manchuria), Siberia, and western Alaska (near sunset on the 13th).
Oct 14	New Moon at 2:48 UT.
Oct 20	First Quarter Moon at 21:59 UT
Oct 21	Orionid meteor shower peaks. Arises from the debris field of Comet Halley. Active from October 2 to November 7. Produces very fast (66 km/sec), generally faint meteors (20 per hour). Observe in the pre-dawn hours of 20-21 October; radiant is located near Orion's "club" asterism.

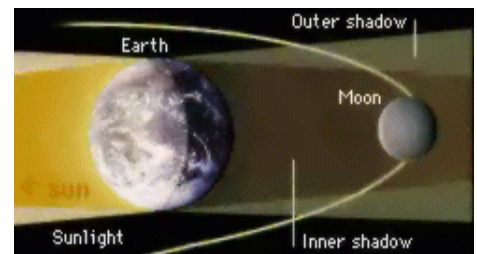
Oct 28 Total Eclipse of the Moon

begins at 2:23 UT and ends at 3:45 UT (mid-eclipse at 3:04 UT). Partial eclipse begins and ends at 1:14 and 4:54 UT, respectively. For skywatchers in North and South America the event begins early Wednesday evening, October 27th. Totality will also be visible from Europe, Iceland, and the western two-thirds of Africa. The Moon will appear red-orange in color (the Earth's shadow) during totality.

Oct 28	Full Moon at 3:07 UT. The full Moon of October, as the first full Moon after the Harvest Moon, is called the "Hunter's Moon".
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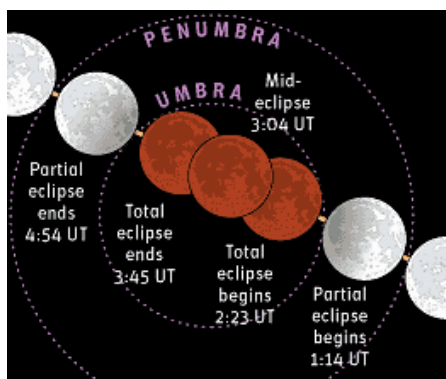
All times Universal Time (UT).
(USA Eastern Daylight Time = UT - 4 hours)

October Sky Events: Detail



From start to finish, October's lunar eclipse lasts about three hours and forty minutes (not including the penumbral phases which are very difficult to see). The partial eclipse begins as the Moon's

eastern edge slowly moves into the Earth's penumbral shadow. During the partial phases, it takes just over an hour for the Moon's orbital motion to carry it entirely within the Earth's dark umbra. The color and brightness of the totally eclipsed moon can vary considerably from one eclipse to another. Dark eclipses are caused by volcanic dust which filters and blocks much of the light reaching the Moon. But since no major volcanic eruptions have taken place recently, the Moon will probably take on a vivid red or orange color during the total phase. After the total phase ends, it is once again followed by a partial eclipse as the Moon gradually leaves the penumbral shadow.



The total phase of a lunar eclipse is called *totality*. At this time, the Moon is completely immersed within the Earth's dark umbral shadow. During the October 27-28 eclipse *totality* will last about 81 minutes. This is considerably shorter than the maximum duration possible of 1 hour and 47 minutes. During *totality*, the fall and winter constellations will be well placed for viewing. The Moon will be in southern Aries and crosses the ascending node of its orbit during the eclipse. The great square of Pegasus will be to the west of the Moon while Taurus and Orion lie to the east.

Although total eclipses of the Moon are of minor scientific value, they are remarkably beautiful events which do not require expensive equipment. They help to cultivate interest in science and astronomy in children and to provide a unique learning opportunity for families, students and teachers. To the nature lover and naturalist, the lunar eclipse can be appreciated and celebrated as an event which vividly illustrates our connection and place among the planets in the solar system. The three-dimensional reality of our universe comes alive in a graceful celestial ballet as the Moon swings through the Earth's shadow. Hope for clear skies, dress warmly and enjoy the show!

Frontiers of Astronomy Lecture Series



Frontiers of Astronomy is a free lecture series that offers those with an interest in astronomy the chance to learn about some of the latest research in the field. Presentations

are held at The Cleveland Museum of Natural History in Murch Auditorium on Thursdays at 8 pm. No tickets or reservations are required. On clear evenings, the Museum's Ralph Mueller Observatory will be open afterward. Selected Thursdays, 8 pm. No tickets or reservations required. For more information, call (216) 231-4600, ext. 3362 or 3253.

New Dreams in the Southern Skies: Large Telescopes and the Formation of Galaxies

Dr. Matthew Bershady, University of Wisconsin-Madison
Thursday, October 14, 8 pm

Matthew Bershady describes the current international effort to build one of the world's largest optical telescopes in South Africa. The Southern African Large Telescope, or SALT, will be used to peer deep into the southern skies and dissect the diffuse light from faint galaxies. Yet it is expected to cost one-fifth that of previous megascopes and represents a change in the paradigm for creating "large glass." Bershady explains how SALT will help us understand how and when galaxies form and where dark matter clusters in the Universe.

Black Holes in the Universe: From the Sublime to the Essential

Dr. Karl Gebhardt, University of Texas at Austin
Thursday, November 18, 8 pm

Black holes are among the most mysterious and important objects in the Universe. Once thought to be destructive forces, they may actually be creative ones. Black holes have been detected and measured at the centers of scores of galaxies, and a basic correlation exists between the evolution of their masses and those of their host galaxies. Karl Gebhardt highlights some of the more exciting recent observational discoveries in this field and describes their implications.

Light in the Darkness: The Role of Mass, Energy and Gravity in Modern Cosmology

Dr. Stacy McGaugh, University of Maryland

Thursday, December 9, 8 pm

We live in a vast, expanding Universe full of luminous wonders like stars, galaxies and quasars. These beacons of light are thought to be but a small part of a cosmos dominated by dark matter and dark energy. Stacy McGaugh describes why we think these invisible components are necessary, and examines the possibility that they may instead point to the need to extend Einstein's theory of gravity.

How the Milky Way Galaxy Changed with Time

Dr. Robert Zinn, Yale University
Thursday, March 24, 8 pm

The stars and star clusters of the Milky Way provide a "fossil record" of its evolution from what were probably several protogalactic fragments - huge gas clouds initially composed of only hydrogen and helium - to its current configuration, a typical spiral galaxy. Robert Zinn describes the techniques used to decipher this record, what has been learned and how well this information agrees with studies of distant galaxies, which offer "snapshots" of galaxy evolution as a function of look-back time.

The Evolution of Galaxies in Different Environments

Dr. Jacqueline van Gorkom, Columbia University
Thursday, April 14, 8 pm

The morphologies of galaxies vary from elliptical to spiral, depending on how densely clustered they are. We now know that this so-called density-morphology relationship differs with time. What causes this relationship and why does it change? Does it happen when galaxies are formed (nature), or does the environment affect the evolution of the galaxies (nurture)? Jacqueline van Gorkom presents the most recent data illustrating the density-morphology relationship and explores the various mechanisms that could affect the evolution of galaxies in different environments.

Focus Steering Committee Minutes

The Focus Steering Committee met in June and we have recommended that two committees be formed by the member-

ship at the September meeting. First, we would like a Member Involvement committee to form that would be tasked with getting more members, especially new members, involved with club activities. The Focus Committee has a few "starter" ideas, like creating a listing of new members that would like to be called when impromptu observing takes place, as well as reviving the observer's list, complete with a good prize for the person that observes the most objects in a year's time.

Also, the Focus Steering Committee believes that International Astronomy Day is a way to showcase the ACA as well being a prime fundraising opportunity. We recommend that an Astronomy Day committee be formed in the September meeting so that some really special events can be planned for the spring event.

So here's your chance to become involved in your club.

A couple of ideas that the Focus Committee had planned are already being acted upon by Focus members. Lynn Laux has created a "media guide" that can be given to the public as well as local groups. (I must say that it's beautiful, a big improvement over our old guide). Also, Lynn has been working on several "canned" programs that can be used in the Club's outreach programs. (If anyone else would like to help with an Astronomy presentation, please contact Lynn). Also, Jim Anderson has contacted area groups like the Scouts & Rotary, to let them know about using the ACA observatory for "special" group observing nights. Of course, a retrofit of the observatory telescope was one of the Focus Committee's core objectives and this has come to pass as evidenced in previous issues of The Night Sky.

—Tom Mino

Secretary's Minutes for 9/24/04

1. Guest speaker was **Alex Panzer** who spoke from 8:00pm until 8:50pm on his Solar observing for the past fifty years from his home in Parma, OH.
2. Business portion of meeting started at 9:10pm
3. Copies of the ACA Bylaws were made available to interested members.
4. Secretary's minutes from last meeting were not presented since **Secretary Pete Flohr** was absent. **Rosaelena Villaseñor, Assistant Secretary/Treasurer** acted as Secretary.

5. **Gary Smith, Treasurer**, expressed thanks for anonymous donation of \$1000.00. Since the Treasurer's Report summary is now included in each newsletter, no report was presented.

6. **Ray Paul** gave the Observatory Director's report and mentioned the successes of the summer's observing programs that included the public dedication of the new telescope. Ray asked members interested in instructions on using the new telescope to sign-up for a training date.

7. **Lynn Laux** (and others) encouraged members to sign-up for the online version of the newsletter. Ray Paul suggested making new members default to the online version and having to request a snail mail version if they require it that way. **Dave Jessie** decided to table the issue temporarily pending further discussion.

8. The membership was encouraged to purchase roses from the Kiwanis at a cost of \$15 per dozen, including delivery.

9. The ACA presented a 'thank you' card along with a \$40.00 gift certificate to 'The Olive Garden' restaurant to **Carl & Betti Hervol** for hosting the annual ACA picnic at their home.

10. Receipts were presented to the donors of the new 14" LX200GPS club telescope.

11. Members paid tribute to **Bill Karas**. **Dave Jessie, President**, read a card from Bill's family that thanked the membership for providing him years of joy. A sympathy card was signed by the membership and mailed to Bill's family.

12. The **November** ACA business meeting will be on **Friday, November 19th 2004**. This is the **THIRD Friday** of the month instead of the fourth. This is done to prevent interference with the Thanksgiving weekend.

13. **Mark Kochheiser** discussed the Environmental Expo to be held at Jackie Lee's on Saturday, Sept 25th 2004 and requested members to contribute their time and equipment for his display on light pollution.

14. The need to raise the dues by \$10.00 for all levels of membership, except for the Junior level, was discussed and unanimously accepted. All membership levels will increase by \$10.00, except for the Junior level which will remain at \$15.00. This increase will take place next May at membership renewal time.

15. **John Crilly** discussed the disposition of our old 12.5" Newtonian reflecting telescope. He's taking applications from area clubs.

16. John Crilly suggested the purchase of a Hydrogen-Alpha filter for the 14" club telescope. This was a timely suggestion since Al Panzer, our guest speaker, spoke on Solar observing.

17. Several members mentioned various observations made since our last meeting in May

18. \$34 was collected in the 50/50 raffle. Half (\$17) was won by the **North family** who kindly donated the winnings to the Kiwanis Rose fund.

19. Meeting was adjourned at 10:00pm

—Rosaelena Villaseñor

Treasurer's Report: 9/1/04—9/30/04

Total Beginning Assets	\$ 6,550.60
<i>Income</i>	
Donations	\$ 1,159.00
Dues	\$ 265.00
Interest Earned	\$ 4.39
50/50 Drawing	\$ 17.00
Merchandise Sales	\$ 44.00
Kiwanis Rose Sales (paid by members)	\$ 150.00
Magazine Subscription Paid to ACA	\$ 32.95
<i>Expenses</i>	
ACA Newsletter	\$ (41.69)
Brochure Printing	\$ (49.52)
Kiwanis Rose Sales (paid to Kiwanis)	\$ (150.00)
Magazine Subscription paid by ACA	\$ (32.95)
Star Chart Printing for handouts	\$ (24.50)
Speaker Dinner Reimbursement	\$ (17.38)
Gift Certificate	\$ (40.00)
Total Ending Assets	\$ 7,866.90

Submitted 10-06-2004 Gary Smith and Dave Jessie

**From the Veep:
The New Generation of
Computerized German EQ Mounts**



Left to right: CG-5GT, LX75, LX55

In the past decade there's been a tremendous surge in the availability of computerized telescopes. The earliest popular players were the LX200 by Meade and the Ultima 2000 by Celestron. Both consisted of Schmidt-Cassegrain optical tubes permanently attached to computerized fork mounts. Fork mounts and computers were an obvious marriage, as the computer permits the mount to track accurately in the very simple and inexpensive (and stable) altitude/azimuth configuration. To this date the fork mounted SCT as implemented in the current models by Meade and Celestron is still the most common portable computerized setup; a visit to the Club site on any public night will demonstrate that!

Those wishing for computerized equatorial operation have also had a variety of instruments from which to choose. One common EQ setup involves any of the above fork mounted instruments with the addition of a wedge. The other popular system is the German equatorial mount. The GEM has one important advantage; the optical tube is not permanently installed and a variety of different optical tubes may be used in turn on one mount. Because of the increased complexity and the greater difficulty in achieving mechanical stability in a GEM, these have tended to be much heavier and more expensive than their fork mounted brethren. Examples of not-very-portable computerized GEMs have included higher-end mounts by Losmandy (Titan), Takahashi (EM series), Astro-Physics (AP series), and Bisque (Paramount series). Somewhat lighter and less expensive computerized

GEMs have been offered by Losmandy (G-11, GM8), Celestron (CGE), Meade (LXD750), and Vixen (GP/DX). Of the above, only the Vixen is light enough to be easily portable, and the price to be paid for that is its reduced capacity; it will handle only 20 pounds or so of payload.

Meade shook things up a little when they introduced their LX55 GEM a couple of years ago. It was a clone of the Vixen, beefed up enough to (barely) handle 30 pounds of payload and equipped with the Autostar control system. Since they subsequently dropped the premium LX650/750 GEMs this became Meade's only presence in the computerized GEM market. Because of the flexibility of a GEM, it was offered with a variety of optical tubes, including a Schmidt-Cassegrain, several Schmidt-Newtonians, and a couple of midsized refractors. Selling for a fraction of the cost of a computerized Vixen mount, it immediately attracted plenty of market attention. Reliability issues and a flimsy tripod caused some concerns, but many users, including myself, reported fine performance from this bargain mount.

The Next Generation



Celestron's Advanced Series (CG5-GT)

More recently, three new computerized GEMs have been introduced and are the focus of this article. Celestron brought out their Advanced Series GEM in response to the LX55. It is also a beefed-up Vixen clone and is offered with a variety of optical tubes, including several Newtonians, a refractor, and a couple of SCT's. Responding to the one major weakness folks had found in the LX55, Celestron added a very sturdy, steel-legged tripod. Recognizing that a substantial portion of the GEM market consists of folks wanting

to do imaging, they also incorporated an autoguider input. For smoother tracking, they added bearings to the RA axis. The end result is a substantial improvement over the LX55. This model does not come with a polar alignment scope, relying instead on built-in polar alignment routines which use the main telescope. Smooth tracking, greater stability, and a more integrated look make this a more satisfying mount to set up and use than the LX55. Mine has worked very well out of the box, with no adjustments or fiddling required. It uses the same handbox hardware as the most expensive Celestron models, with firmware specific to this mount. Thus it offers all the same functionality of the higher-end telescopes plus the controls are familiar to anyone who uses other current Celestron models. The Advanced Series Mount (CG5-GT) sells for about \$750 with no optical tube.



LX75

Meade's response to the Advanced Series is their new LX75. This Vixen clone replaced the LX55 with several important upgrades. It includes a better tripod with steel legs which are smaller than those on Celestron's offering but a huge step up from what was supplied with the LX55. The new mount has bearings in both axes for smooth motion and reduced wear. It is equipped with both an illuminated polar alignment scope (with an illuminator much improved from the one supplied with the LX55) and with polar alignment routines in the firmware. This gives the operator the choice of which method to use. Although not equipped with a conventional

autoguider input, the LX D75s are supplied with Meade's LPI package. This consists of a webcam-like imaging camera and a software suite which can use the LPI camera to autoguide the LX D75. In another nod to the imaging market, Meade also added Periodic Error Correction to the system. Another change was a switch to the color white for the metal parts, probably in response to the next mount in the lineup - the Vixen Sphynx. Like the Celestron, my LX D75 worked fine from the beginning with no fiddling. The LX D75 mount isn't offered alone, but in bundles it is similar in price to the Celestron.



Sphynx, LX D75

Perhaps in response to the major American players, Vixen has recently added a new medium-weight GEM to their lineup. With the same capacity as the GP/DX, the new Sphynx mount is a complete redesign and is much more modern in both form and function than the earlier Vixen or its clones. It's very distinctive in appearance; the metal is white with blue trim, and both drive motors are enclosed within the mount in such a position as to act as counterweights. This permits a shorter counterweight shaft and lighter weights for the same payload than the earlier design. The real attention-getter is the handbox, though. Like the Sky Sensor 2000 supplied with the previous mounts, the handbox is much larger than those supplied with the clone mounts. Unlike the SS2K, however, the Sphynx handbox has a large color LCD screen which is used to display star charts! An object or location is chosen, and the mount is instructed to slew to that object. This has a very high "cool" factor, of course. The drives are much quieter than those in the clone mounts, making it seem even more sophisticated when compared to them. An autoguider input is provided but to this date the firmware necessary to implement this has not

been released by Vixen. Except for the nonfunctional autoguide port, my Sphynx has been flawless out of the box. The price of the Sphynx mount is about \$2300.

—John Crilly

Ramblings from the President

The ACA comes through again! We are the fortunate recipients of the Kiwanis' generosity...for the past several years (I'm thinking eight or nine?), our monthly business meetings have taken place in the Portage Lakes Kiwanis Civic Center on Portage Lakes Drive. We owe a debt of thanks to honorary member **Millie Eaken** for originally contacting the Kiwanis when we had no place to meet. It is a beautiful facility in which to conduct our meetings. We being incorporated as a 501(c)3 non-profit group, the Kiwanis allows us to use their facility at absolute no charge. When the arrangements were made, the only stipulation for our continued use of this wonderful facility was that we support their once-a-year effort to sell roses, the proceeds of which go to charitable causes. This year, a concerted effort was made to fulfill our commitment...and we did! As an organization, the ACA purchased a total of 30 dozen roses. **Tom Mino** and **Peggy Stabholz** spent nearly 9 hours each delivering roses as volunteers toward the effort. Our collective hats are off to them! Thanks to all the members who either bought roses or simply donated money to the Kiwanis. Special thanks to you, Tom and Peggy; we owe a great deal to you and your dedication to the club.

On another note, the ACA needs your email addresses! If you have email and don't receive email notices from me, it indicates that the club does not have your email address! I personally guarantee that **ONLY** special club notices will be sent to you at the address you provide us...never anything else. PLEASE email me at DJessie@neo.rr.com and let me know if you have an email address you'd like us to use to contact you. Also, if your email address has changed, let me know. As always, it is a genuine pleasure to serve you.

—Dave Jessie



Observatory Director's Report

I would like to take one more opportunity to thank everyone that set up their telescope at the Uranus/Neptune program last month. I can't tell you how impressive it was to see all those scopes set up around the observatory. I think we had in excess of 100 visitors that night and I received many favorable comments from them about the club.

Also, many thanks to **John Crilly** for setting up the dedication ceremony for the new scope on that evening. Although the scope acted up for a while at first, we were able to get it working properly and everyone seemed thoroughly impressed with the views. Thanks to Dave Jessie's keen eye, we later spotted the problem we had that night, a self inflicted one, and we won't make that mistake again.

I had about fifteen people sign up for a **training session** on the use of the new scope. I am presently planning on having two sessions. The first on **Sunday, Oct 17 at 6:00 p.m.** and the second on **Saturday, Oct 23 at 6:00 p.m.** If you have signed up already, I'll be contacting you shortly about which night as I'll need to split up the crowd to keep the sessions manageable and to give everyone time for some hands on experience. We will do these sessions rain or shine, and if it happens to be clear we can do some observing.

If you have not already signed up for this training and wish to participate, please contact me promptly at home 330-658-3125 or by email at raymon-paul@brightdsl.net. I may have to set up a third session depending on how many more requests I get.

—Ray Paul

Preparation R: Asteroid Relief

By
Glenn R. Cameron

Astronomy is a fascinating hobby and science. I am repeatedly amazed at how the science can influence the hobby and how the hobby can contribute to the science. No other science can be so enriched by hobbyists and no other hobby can be so encouraged by scientists. The data for nearly all aspects of the science of astronomy can be gathered from virtually any point on the Earth. No other science can make that claim.

One aspect of the science of astronomy in which I one day hope to contribute is occultation timing. Amateurs throughout the world can contribute to this branch by recording the dimming of stars as they are occulted by a passing asteroid. A number of accurate recordings of a given occultation from different Earthly latitudes can reveal various data about the asteroid such as its size, shape, and whether or not it has any tenuously captured satellite asteroids.

Okay, so all of that sounds groovy. I've got the equipment, telescope, video camera, sky, desire, etc. H'm, it occurred to me that while I hope to make said contribution, I had not yet actually even seen an asteroid in my telescope. Well, maybe by accident but I sure have never knowingly seen an asteroid through any telescope. Baby steps. Hey, I was getting to it. So last Sunday evening, 9/5/2004, I decided to try to view the fast approaching and soon to be fast receding asteroid 4179 Toutatis. This guy is going to pass fairly close to us, about a million miles, on September 29th. My aim was to capture this guy on video tape. For this acquisition I wanted to use the video camera's built in frame integration feature. This feature would be useless for occultation timing but my goal this time out was simply to capture and record some of this guy's proper motion. I wanted to take enough video so that I could compare a frame at the beginning of the tape to a frame at the end of the tape and say, "Ah ha!"

So last Sunday evening I fired up my trusty copy of Starry Night Pro v3 and confidently downloaded the latest satellite, comet, and asteroid orbital

element data. Then I searched for and found my quarry. There it was, nestled up fairly close to Taurus the bull's left cheek. I noted its position at about 3 AM the next morning and went out to the backyard to determine my best vantage point. At 3 AM Taurus would be high enough to clear my neighbor's house and trees and also high enough where I wouldn't have to contend with too much atmospheric distortion. The weather forecast looked spiffy. I was ready. I went to bed.

At 3 AM (in military time we called that 0300 or, oh-three-hundred, or oh-my-God, or oh-three-oh-dark in the morning) I leaped out of bed. Okay, leaped is an exaggeration. I staggered out of bed looked out my window. There was the moon at third quarter, annoying but probably okay. There was Taurus. The sky looked swell. I fired up Starry Night Pro again to make sure I knew what right ascension and declination I was aiming for. Since this was such a fast moving booger, I decided to check again and see if there was an update to the asteroid orbital element data. There was! No doubt this was due to my fleet little quarry (little in astronomical terms but at 6+ kilometers in diameter it would ruin Earth's day if it chose to move in).

Something was wrong! I couldn't find Toutatis where I had left it! Could the orbital elements have been changed that much? No! Could the orbital elements have been just flat out wrong? Turns out, they could. The latest update I had just downloaded was the correct version and showed me that Toutatis was actually over at the tail end of that wacky goat-fish, Capricornus. I quickly confirmed this by looking at the Arkansas Sky Observatory web site, <http://www.arksky.org/>, where they're keeping pretty close tabs on this asteroid. Unfortunately, Capricornus was already low and getting lower in the southwest. I don't have a good view of the southwest from my backyard so I was skunked for the evening (morning). Dang! I'd have to stagger back to my bed and go to sleep again!

The next afternoon, Labor Day, as the day was wearing on, I noticed that the evening's forecast was improving greatly over its previously less than encouraging outlook. The problem was, it was a school night. The kids had to go to school in the morning and since I hadn't hit the lotto over the weekend, I

had to go to work. The other problem was, Toutatis was very quickly diving into the southern sky and will not actually be observable from the northern hemisphere on the 29th when it reaches perihelion. With Ohio weather being what it is, this might be my last good opportunity to view this hasty rock. The good news was, I could do my viewing much earlier than I was prepared to do the previous night. Capricornus would be at zenith at about 1 AM and I could certainly get a good view of it and its interloper at midnight.

At about 11 PM I went out to the backyard and set up my telescope and video equipment. At nearly midnight I began taping. I can always see far more stars on the video monitor than I can on the representative display of my planetarium software. So it is usually difficult to pinpoint my quarry with much certainty. I say that like I have done it many times before. The reality is, I've done it once before when my target was Pluto. At magnitude 13.9, Pluto was a tough nut to crack. At magnitude 11.5 Toutatis should be much easier. It was. The video frame seemed to closely match my planetarium software's preview. I took about 50 minutes of video and I kept saying to myself, "Has it moved? I'm sure it has moved." At the end of my recording I was certain of my target's movement.

Woo hoo! I had done it! I had endured some kids lighting off firecrackers on the next block and my neighbor's falsely activated car alarm but I was relieved that my goal had been reached. After putting all of my equipment away, I quickly reviewed my video tape at high speed. Sure enough! That "star" had moved! As I dropped into bed at 2:15 AM (I was going to be a zombie the next day at work) I reminded myself that a little more thorough Preparation R (research) could have provided me with Asteroid Relief last night instead of tonight. Nonetheless, I was thrilled!

Hyer Perspectives
by
Ray Hyer

Of Sputnik, Ham Radio and Celestial Magic

One of my favorite activities with ham radio is chasing (and usually not catching) Special Event stations. These are stations set up to commemorate

special world class events, like the annual Toilet Seat Toss or the Jackass Mail Run. These amusements usually only stay on the air for a Saturday, then float up beyond the ionized atmosphere, never to be heard from again.

So I was especially delighted to find the first weekend of October offer a special event station from Coalwood, West Virginia, home of the Rocket Boys, which became a movie named October Sky. I've read the book a couple of times, the story of Homer Hickam and his friends who built rockets and won the national science fair. Homer had a wonderful career with NASA and now writes books.

Homer was an ordinary coal mine town kid until October 4, 1957 when Sputnik gave him some much needed inspiration. After witnessing Sputnik float silently overhead he was able to see beyond the coal dusted mountains that had kept his family captive for generations.

I, too, had my Sputnik experience. My dad did not take me outside to see it go over. As I recall I tugged at him with my tiny seven year old hand and dragged him outside. He was a war veteran and had no interest in anything the Russians did.

My young mind, however, did not know about the Russians. I just knew that Sputnik was the start of something big, and, as somebody already interested in the night sky, was eager to embrace anything that would add fuel to the excitement I tried to contain.

So October has always held a special magical place in my astronomy. For many people October nights conjure up thoughts of ghosts and goblins wandering the neighborhood in search of a sugar high.

To the astronomer, October's magic is more real, because observing during October is pure enchantment. The air is cool, dry and more transparent than during the summer. Leaves, which just weeks before obscured the horizon, now crunch beneath your feet. And you can see stars before 9 pm. This year's October will perform a real magic act as the full moon will disappear slowly, only to reappear an hour later.

So find that hat that disappeared last spring and get out to enjoy the celestial magic show. Because once October is over we may not see the stars again for several months!

Catching Jovian Waves

By
Jason Shinn

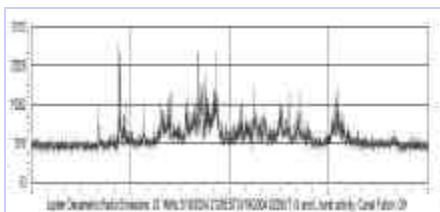


Photo: First light Jovian radio emissions at 20.1MHz.

Many of you may remember that about a year or two ago I wrote an article for the newsletter concerning my first experience in astronomy. The article related the account of how I learned about the stars through radio, rather than the usual optical wavelengths. Here I am now, 15 years or so later, and I am finally realizing a childhood dream that, one day, I too, might be able to listen to the faint whispers of the heavens. The next paragraphs detail the beginning of my voyage into the mysterious universe of that part of the electromagnetic spectrum we call radio.

It is March 18, 2004 and I am sitting at a small portable table anxiously awaiting the hour of 8 pm. A small aluminum box with two knobs and a single glowing red LED sits before me. Another much larger box, an old karaoke machine, also sits before me along side a cardboard box used to store my equipment. All of this is covered by a trash bag with two of its sides slit to maximize shielding from falling snow. The sky is heavily clouded and there is no sign of any stars or planets peeping through. My jacket is beginning to get soaked as the snow accumulates and melts on my shoulders and back.

In the previous hours I had checked and rechecked my bearings and online star charts to predict where Jupiter would be in the sky. Still I had some doubts about my success. After all the trouble, money, and time spent constructing my first radio telescope, would I be able to catch the faint whispers of a planet 500 million miles away? Eight o'clock came and, gently, I pressed the record button on the karaoke machine, listening to the loud hiss of the galactic background blare through the speakers. It was 15 minutes too early for the radio storms from

Jupiter. The prediction tables called for an Io-B storm to begin at 0130 UT (8:30 pm EST) that evening. However my computer software predicted the storm would begin at 0115 UT (8:15 pm EST). Not wanting to take a chance at missing a single wave I started early.

0115 UT (8:15 pm EST). The tape is rolling and the galactic background is hissing with no sign of Jupiter. By this time my winter jacket is getting so wet that I have to leave my post to get a rain coat out of my car. I am also beginning to feel the temperature, which is about 32 degrees. After running to my car and putting the rain coat on over my winter jacket I return to my post just in time to hear what I thought was the faint sound of Jovian S (short) bursts. S bursts are soft millisecond pops that usually come in groups and sound like popcorn. Not sure if this was indeed the first activity I noted it on my log as possible S bursts and settled back at my post to listen for more.

Having only a general idea where Jupiter would be at that time I used online data and charts to point the beam of my twin dipole radio antennas in the direction of Jupiter's predicted position. This maximized my chance of catching any radio emissions. The next night was as clear a night as any astronomer could ask for here in Ohio. I went outside at the appropriate time to see just how accurate my blind pointing was the previous night. I must congratulate myself, because at the time I received the strongest radio emissions from the planet the beam pattern in the sky, formed by the antenna, was dead on.

0130 UT (8:30 pm EST). Still no sign of Jupiter and I am beginning to have second thoughts about why I am sitting out here in the middle of a snow storm listening to nothing but static. Needless to say the average person would have thought I'd lost my marbles and maybe even some astronomers too! Not since 8:15 pm had the galactic background audibly varied in intensity or even hinted at a Jovian wave, aside from the occasional terrestrial pop and a strange intermittent chirp. I later found out that the strange chirping sound was produced by an ionosonde, a radio transmission used to probe the properties of the ionosphere.

0159 UT (8:59 pm EST). I am sitting very still listening intently to the galactic background. I look up to see snow collecting on the trash bag covering

my equipment. Oddly it appears heavier on one side, the side covering the cardboard box. Apparently the karaoke machine was generating enough heat to melt most of the snow falling on top of it. I bow my head against the cold and pull my hands back into my coat sleeves to keep them a bit warmer. By now I am telling myself that it's much to cold to be out here and that at 9 pm I would turn everything off, disconnect the equipment, and go inside.

Suddenly the galactic background was interrupted by distinct activity. I immediately sprang to life, lifting the trash bag covering my log, and reaching for my watch to note the time. The unmistakable rise of Jovian L (long) bursts reached the receiver and resounded through the speaker. L bursts sound like seconds long, subtle, and some not so subtle, increases in the background hiss one normally hears when tuning a radio to a clear frequency. It wasn't a very remarkable change in audio, but it was enough to give me a taste of what was soon to come and keep me waiting another half hour out in the cold. The L bursts did not last for more than one minute or so and no more activity came through the receiver for another 15 minutes. At this point I've decided that bursts or no bursts I am going inside at 9:30.

0218 UT (9:18pm EST). I am brought to attention from my cold, bored daze to hear fairly prominent S bursts. Few and far between at first, but becoming increasingly noisier and more frequent by the minute, this was the beginning of the radio storm in earnest. The radio storm was predicted to last until 10:30 that evening. I continued to monitor and record Jovian activity up until 9:30. One of the most powerful, and the noisiest of all the burst activity, was recorded just before I turned off the receiver, finally giving in to the elements, and ending a very long, cold, and wet observation.

RESOURCES

My personal radio astronomy web site: <http://pages.sssnet.com/starman444/astronomy/radio.html> A link to chart graph samples of my radio observations which include observations of solar radio bursts, the Milky Way, and an audio file of Jovian radio emissions. The Radio Jove web site: <http://radiojove.gsfc.nasa.gov/> Information on how you can become part of

the Radio Jove project by building your own decametric radio telescope.

The Society for Amateur Radio Astronomers: <http://www.qsl.net/SARA/> The club for amateur radio astronomers world wide.

Radio Sky Publishing:

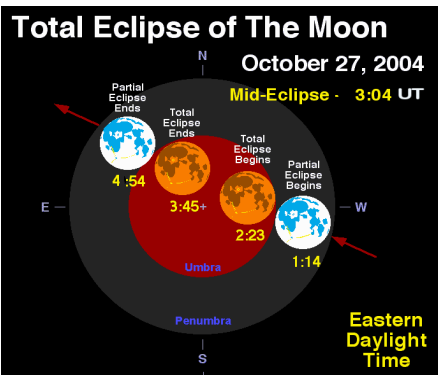
<http://www.radiosky.com/> Information and resources for the budding radio astronomer.

Questions? Comments?

E-mail Jason at truemartian@aol.com I am also a member of the ACA yahoo group under the screenname jovianradio.

<http://groups.yahoo.com/group/astronomyclubofakron/>

Did You Know?



The times for the eclipse, as seen locally from the Observatory at the ACA are as follows:

Eclipse stage	UT	Eastern Daylight Time	Local Time
Moon enters penumbra	0:06	8:06 p.m.	8:18 p.m.
Moon enters umbra	1:14	9:14 p.m.	9:22 p.m.
Total eclipse begins	2:23	10:23 p.m.	10:29 p.m.
Total eclipse ends	3:45	11:45 p.m.	11:58 p.m.
Moon leaves umbra	4:54	12:54 a.m.	1:06 a.m.
Moon leaves penumbra	6:03	2:03 a.m.	2:10 a.m.

Observing and Photographing the Lunar Eclipse

By
Lynn M. Laux

A lunar eclipse occurs when the Earth lies between the Sun and the Moon, so that Earth's shadow darkens the Moon. This can only happen at full Moon. The dark, central shadow is the *umbra*, while the lighter shadow that surrounds the umbra is the *penumbra*. The penumbral shadow is difficult to detect; for most observers a lunar eclipse really starts when the umbra first touches the lunar surface. Totality occurs when the Moon is completely immersed in the Earth's umbral shadow.

Lunar eclipses get their colorful red-orange hues from sunlight that is filtered and bent by the Earth's atmosphere before it reaches the Moon. Bright and colorful eclipses occur when our planet's upper atmosphere is transparent. Major volcanic eruptions that spew dust and aerosols skyward often result in darker lunar eclipses. The Moon's brightness varies greatly from eclipse to eclipse, which would tell a lot about the state of the Earth's upper atmosphere if only we understood it better.



Using Film

The best advice for photographing a lunar eclipse with a film camera is to take lots of pictures at many different exposures and throw most of them away. You never know just how bright your subject is going to be. Most importantly, you'll need a telescope or telephoto lens that enlarges the Moon to a good size.

For a typical lunar eclipse the size of the Moon's image on film equals the focal length divided by 110, with the result in the same units as the focal length. Thus an 8-inch f/10 telescope, with a focal length of 80 inches (2,030 millimeters), will produce a Moon image 0.73 inch (18.5 millimeters) across, easily fitting on a frame of 35-mm film, which measures 24 by 36 mm.

But an ordinary point-and-shoot camera with a lens of about 40-mm focal length will produce an image of the Moon barely 0.4 mm across, probably not large enough to record even as much detail as you can see with your unaided eye. If you have a point-and-shoot camera with a zoom lens, zoom the lens out as far as you can to get the highest possible magnification.

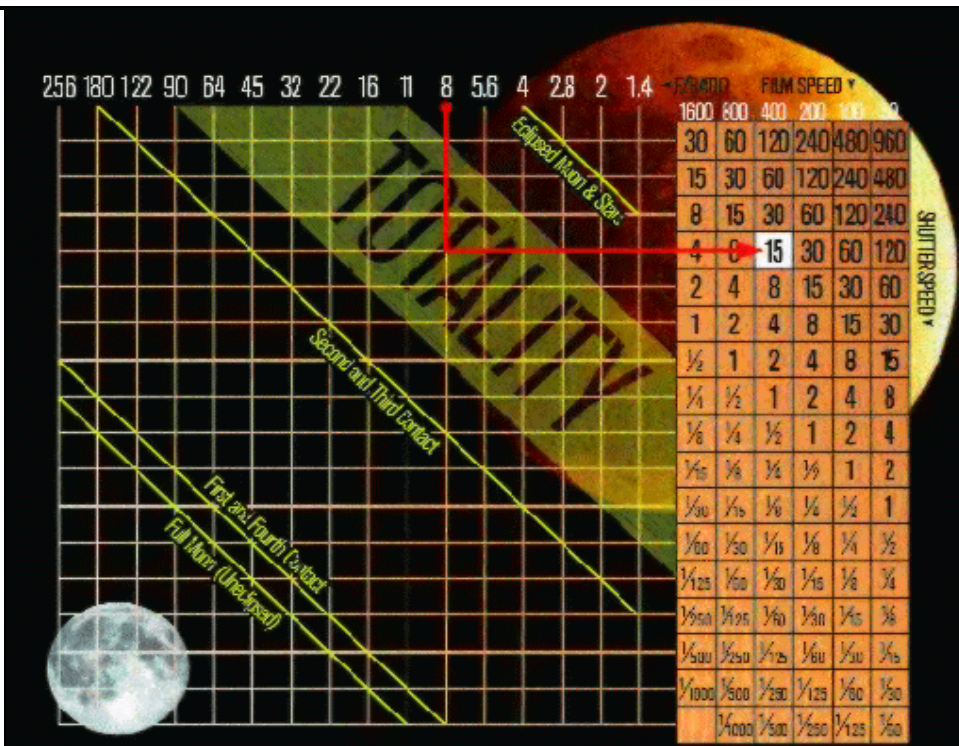
The minimum focal length for getting a good-looking Moon is about 300 mm. With a 500-mm lens and a 2-second exposure you can probably get away with a camera on a fixed tripod, but longer exposures or focal lengths will require a tracking mount to prevent blurring due to the turning of the Earth.

Going Digital

If you are using a digital camera to photograph the eclipse, the only way to take images through a telescope is with the *afocal* method, whereby the camera's lens is aimed directly into the telescope's eyepiece. You can hold the camera by hand, mount it on a separate tripod, make or buy a bracket, or use an adaptor to attach the camera directly to the eyepiece.

For recording the partial phases of a lunar eclipse, the digital camera mounted behind a telescope's eyepiece can produce fine close-ups. After overriding the camera's automatic metering system you should be able to capture the entire disk of the Moon — the part immersed in the deep shadow core, or umbra, together with that in the vastly brighter penumbra (the shadow's outer fringe).

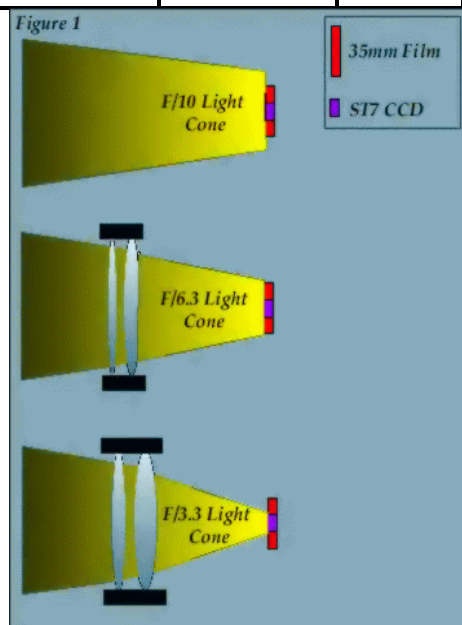
If you are using a CCD camera or modified webcam, you might need a focal reducer so that the entire globe of the Moon can fit on the chip. Typically using a 0.5/0.3 focal reducer should do the trick. A f/10 Schmidt-Cassegrain telescope can be reduced from f/10 to f/6.3 and even f/3.3 by using a focal reducer. A focal reducer works by concentrating the light cone produced by the scope into a smaller, yet brighter circle. Because the light cone at focus is actually smaller and the detector stays the same size, the field of view also increases. As one shrinks the light cone it inevitably reaches a point where the edges of the light cone are no longer hitting the detector, which causes vignetting. This is why f/3.3 focal reducers do not work with 35mm film. The light cone is shrunk so small that it would produce only a small illu-



Event	ASA 100	ASA 200	ASA 400	ASA 800
Full Moon	1/250 s @ f/11	1/250 s @ f/16	1/250 s @ f/22	1/500 s @ f/22
Penumbra Shadow	1/60s @ f/11	1/60 s @ f/16	1/125 s @ f/16	1/250 s @ f/16
2 nd and 3 rd contact	1 s @ f/2.8	1s @ f/4	1/4 s @ f/2.8	1/8 s @ f/2.8
Totality	2s @ f/2	2s @ f/2.8	1s @ f/2.8	1/2s @ f/2.8

minated circle in the center of the film, but would not illuminate the edges of the film at all. Most CCD cameras have much smaller detectors than 35mm film, and so one is able to use a very powerful focal reducer. Vignetting still occurs, but due to the small size of the CCD chip the images are still useable.

When digitally imaging a lunar eclipse, the key is to shoot, shoot, and shoot some more. The beauty of going digital is the immediacy with which the effect of various exposure settings can be seen — and changed! Since a lunar eclipse is a leisurely affair, you can keep on trying until you acquire a good image.



Daylight Savings Time: Its History and Why We Use It

By
Lynn M. Laux

The Earth is divided into 24 time zones so that everyone in the world can be on roughly similar schedules (like noon being roughly when the sun is highest in the sky). The idea to divide the Earth into time zones was proposed by the Canadian railway planner and engineer Sir Sandford Fleming (1827 - 1915) in the late 1870s. Time zones were first used in 1883 by railroads in order to standardize their schedules. World time zones were determined in 1884, at an international conference in Washington, D.C. Each of the 24 world time zones are about 15 degrees wide and differ by one hour.



Early Time Keeping:

Until about 100 years ago, each city set its clocks to local time—noon was the time when the Sun was at its highest in the sky, as viewed from that city. Even neighboring cities needed to set their clocks differently to make this happen. For example, when it was 8:00 in New York City, it was 8:12 in Boston (because Boston is about 3 degrees east of New York). Before modern transportation and communication, this difference didn't really matter.

A Need for Synchronized Schedules:

Once railroads were built, this became very awkward. Train schedules needed to be written using common time settings that everybody agreed to, so the U.S. railroad companies adopted

the idea of time zones. This was soon extended internationally, with the world being divided into 24 time zones, each one a long strip from North Pole to South Pole, about 15 degrees of longitude wide. All the people in one time zone would set their clock the same way (to the local time in the center of the time zone). The continental US has 4 main time zones—eastern, central, mountain and western, plus several more for Alaska, the Aleut islands and Hawaii. Canadian provinces east of Maine observe Atlantic time; you may find those zones outlined in your telephone book, on the map giving area codes. Other countries of the world have their own time zones; only Saudi Arabia uses local times, because of religious considerations.

24 Hours in a Day and 24 Time Zones:

Since there are 24 hours in a day, dividing the Earth into 24 time zones meant that everybody was using a time setting very close to their local time—there's at most about a half-hour difference. So 7:00 am was still in the morning, 12 noon was still in the middle of the day, and 7:00 pm was still in the evening. But this was much more convenient than the older system of using local time. Most neighboring cities use the same time zone settings. Even if two cities are in different time zones, the time settings always differ by a whole number of hours (1 hour, 2 hours, 3 hours, etc.), making it easy to convert from the time in one time zone to the time in the other. Today, most countries use this time zone system. (In a few places, clocks are set to be 15 minutes or 30 minutes different from the time according to the standardized time zone system.)

The International Date Line:

The prime meridian (zero-degrees longitude) passes through Greenwich, England. Halfway around the world in the middle of the Pacific Ocean (180 degrees from Greenwich) is the International Date Line (IDL), where the date changes across the boundary of the time zone. The entire world is on the same date only at the instant when it is noon in Greenwich, England, and midnight at the IDL. At all other times, there are different dates on each side of the IDL.

Daylight Saving Time:

The idea of Daylight Saving Time (DST) was first proposed by Benjamin

Franklin in 1784 in an essay called "An Economical Project," which he wrote during time he spent in France (Franklin was the first US ambassador to France, serving from 1776 until 1885). In 1918, Congress made the U.S. rail zones official under federal law and gave the responsibility to make any changes to the Interstate Commerce Commission, the only federal transportation regulatory agency at the time. When Congress created the Department of Transportation in 1966, it transferred the responsibility for the time laws to the new department.

The American law by which we turn our clock forward in the spring and back in the fall is known as the Uniform Time Act of 1966. The law does not require that anyone observe Daylight Saving Time; all the law says is that if we are going to observe Daylight Saving Time, it must be done uniformly.

Daylight Saving Time has been around for most of this century. In 1918, in order to conserve resources for the war effort, Congress placed the country on Daylight Saving Time for the remainder of WW I. It was observed for seven months in 1918 and 1919. The law, however, proved so unpopular (mostly because people rose earlier and went to bed earlier than we do today) that the law was later repealed. When the country went to war again, Congress reinstated Daylight Saving Time on February 2, 1942. Time in the U.S. was advanced one hour to save energy. It remained advanced one hour forward year-round until September 30, 1945. From 1945 to 1966, there was no federal law about Daylight Saving Time. So, states and localities were free to observe Daylight Saving Time or not. This, however, caused confusion—especially for the broadcasting industry, and for trains and buses. Because of the different local customs and laws, radio and TV stations and the transportation companies had to publish new schedules every time a state or town began or ended Daylight Saving Time. By 1966, some 100 million Americans were observing Daylight Saving Time through their own local laws and customs. Congress decided to step in and end the confusion and establish one pattern across the country. The Uniform Time Act of 1966 (15 U.S. Code Section 260a) created Daylight Saving Time to begin on the last Sunday of April and to end on the last Sunday of October. Any area that wanted to be exempt from Daylight Saving Time could do so by passing

a local ordinance. The law was amended in 1986 to begin Daylight Saving Time on the first Sunday in April.



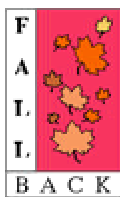
Indiana and Arizona are special cases. Most of Indiana is in the Eastern Time Zone but does not utilize Daylight Saving Time. Arizona, while it is in the Mountain Time Zone, does not utilize Daylight Saving Time.

Why do we observe DST?

Daylight Saving Time is a way of getting more out of the summer days by advancing the clocks by one hour during the summer. Then, the sun will appear to rise one hour later in the morning when people are usually asleep anyway, at the benefit of one hour longer evenings when awake: The sunset and sunrise are one hour later than during normal time. DST saves energy (less artificial light is needed during the evening) and makes energy consumption more efficient in addition to the pleasing effect of lighter evenings. To make DST work, the clocks have to be adjusted one hour ahead when DST begins (during spring), and adjusted back one hour to standard time every autumn.

Spring Forward, Fall Back

Use this mnemonic to remember what to do when the last Sunday in October rolls around:



And when the first Sunday in April comes:



One question people always ask about Daylight Saving Time regards the time that restaurants and bars close. In many states, liquor cannot be served after 2 a.m. But at 2 a.m. in the fall, the time switches back one hour. So, why can't they serve for that additional hour in

October? **The answer:** the bars do not close at 2 a.m. but actually at 1:59 a.m. So, they are already closed when the time changes from Daylight Saving Time into Standard Time.

Planetarium Presenter Needed

The Hoover-Price Planetarium at the William McKinley Presidential Library & Museum in Canton has an immediate opening for a part-time planetarium presenter. Applicant must have knowledge of the Night Sky and basic astronomy. Presenter is needed during the day to present to school groups. There is a presentation stipend available for this position. Please call the Museum at 330-455-7043 or evenings at 330-966-3912.

—Submitted by Gregg Crenshaw

Welcome!

Welcome, new ACA Members!

The ACA wishes to extend a warm welcome to new members...

**Gordon 'Bud' Beals
Dwight Brown
Doug & Sholeh Dominick
Ken & Laura Fleeman
Jordan Kaufman
Jeff Kreidler
Joe & Dorothy Markulis
Jerry Modin
John & Patricia Phillips
Joseph Reid
Terry Taylor**

We look forward to seeing you at all club events!

A Special Thank You!

The ACA Treasurer and all ACA members wish to thank fellow ACA member Mrs. G. Comunale for her generous donation. In the month of August 2004, Mrs. Gertrude Comunale donated the amount of \$670 to the general treasury. This most substantial donation will be used to help the ACA meet its financial obligations and will place us in a good position to reach our goal of achieving a balanced budget for the 2004-05 membership year. The Astronomy Club of Akron is most appreciative and we sincerely thank Mrs. Comunale for her

very timely gift to all of us.

—Gary Smith, Treasurer

For Sale

Meade 8" f/5 Starfinder Dob. \$400.00

Orion XT6 Dob. with Tote Bag \$380.00

Seller lives in Orville. Please call seller at 330-683-6689

Article Submission

Please note the change in the deadline for article submission. All articles are due **the second Tuesday after the last meeting.** In the summer months, when there is no meeting, the deadline is **the second Tuesday after the fourth Friday (the day we would have met if there was a meeting) of the previous month.** This has been revised in order to get the newsletter into the mail **2 weeks after the last meeting or 4th Friday of the previous month.** All word processing files should be saved in any version of **Word** to minimize import problems. If you don't have access to a computer, don't hesitate to write something out long hand. Send in your articles, items for sale, and comments to:

**Lynn M. Laux
14274 Bridle Trail
Strongsville, OH 44136**

Or email:
gemmalady@msn.com



If you have any pictures of club events, astronomical images, rig pictures and the like, please submit them to:

<http://groups.yahoo.com/group/astronomyclubofakron>

