"CLEAR SKIES"

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Newsletter of theChampaign Urbana Astronomical Society, c/o Staerkel Planetarium, 2400 W Bradley Ave Champaign, IL 61821
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CUAS OFFICERS MESSAGE

My goodness it is almost April. Have any of you spent much time out seriously viewing the night sky? We had one very good night that I remember, on Feb. 21 for the eclipse. Were there many more? Maybe it is global warming or maybe just a typically unpredictable central Illinois winter! Let us hope that spring will be better. Just last night, Saturday, the day and hopefully the evening started looking good. I loaded the van with equipment and was ready for sunset and yes, you guessed it, the clouds rolled in almost with a loud bang. Then again later about 9:00pm things looked good in the alley at home so I got the binoculars out and looked at the southern constellations from west to east, then back to Orion and, oops, where did it go and kaaabammm, the clouds are back. Oh well it was nice to see which constellations are in the southern sky and to my amazement they were what the charts, books, and Starry Night say should be there.

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If you were not at the meeting last month you missed it. This month's meeting should be entertaining and informative. Last month we talked about planets that orbit stars not our own. This subject has long been talked about and theorized and then, in the late 1980's and early 1990's, we started finding objects that appeared that they could be planets. These objects started to be confirmed as planets and to the amazement of some, these solar systems are not made up of planets that are like our system. The present size and makeup of planets seem to be more Jupiter-sized, with some very close to their star and thus quite hot. One lesson I learned at our last meeting was that the reason we are presently finding this kind of planet is that our present technology is limited in its resolution. Just like many years ago we started finding planets in our own solar system farther out than Saturn and now we seem to find more and more moons around our nearest neighbors. Just give us time and money and astronomers along with others with imaginations and the abilities to prove it and we will come up with the answers.

On a lighter note I was reading one of those astronomy books written for non-professionals and found some interesting definitions and information about the moon, the planets' 2008 locations, stars and their apparent and actual magnitudes, and facts and history of the constellations. One of the things that

interested me was that originally star magnitudes were simply relative and then later as technology caught up each star got a more accurate apparent magnitude number and then with more study we could figure out their actual magnitude more accurately.

I then started looking up the history of constellations and what interesting objects are in some of them. On nights out at the dome when the viewing is limited to just a few constellations, this kind of information actually comes in handy to view the night sky efficiently and with some interest. With some of the constellations the digital setting circles as well as those computer programs also have objects listed by constellation; of course this assumes that you know all the three letter abbreviations of those same constellations. Cetus (Cet) has a nickname, what is it? It also has the distinction of having the first found variable star, o Cet, that star baffled sky watchers for centuries before as a star that was there and then not, was it a nova or what, in 1596 Fabricius thought that, but then later in 1638 Holwarda realized that the star had a period of 330 days and was given the name of Mira (The Wonderful) and became the first M star or long period variable (LPV) star, the star varies from a very visible 3.5 mag star down to a dim 9.5 or less at its low point.

One other constellation alphabetically near Cepheus (Cep) an always visible constellation (circumpolar) looks like the gable end of the house, also has at least a couple of interesting stars. One of which is T Cep which is also a Mira style variable star that varies from a faintly visible 5.2 to 11.3 mag with a period of 388 days. Another is u (mu) Cep (I do not know how to make my computer speak greek), this star known commonly as the Garnet Star, maybe because it is a red super giant star, is a irregular variable star with a period that varies from 740 to 4400 days, changing from a 3.4 to a 5.1 mag star and then sometimes it does not change at all for a while. This star is so large that its diameter is measured in AU's, 22 of them to be exact and that its diameter is 2400 times as large as our own sun. Another way to compare how big this star is that Saturn orbits the sun at 9.5 AUs, wow that is big. This constellation also has more normal variable stars (Cepheid Variables) like delta Cet that varies from a 3.5 to 4.4 star in 5.366341 days like clockwork, knowing this information along with math helped astronomers figure out absolute magnitude and then its distance to us. Facts and history can be fun but only in small quantities so more maybe next month.

Guy

LOOKING UP THIS MONTH

The question now becomes . . . .how much observing will we get in in between April showers? Just in case there are a few nights, lets start in the evening sky.

Though it is not there yet, we have to mention the planet Mercury first. Mercury rounds the far side of the Sun on April 16 and then speeds into the evening sky. For the entire month of May, Mercury has its best evening view of the year. But you can start viewing in April. Towards the end of the month, keep checking the evening horizon in the west-northwest. By April 23rd, it sets at 8:30pm, right at the end of twilight. By the 30th, this time has increased to 9:15pm. And while we're at it, if you haven't seen them yet, check out the cool shots of Mercury from the Messenger mission at http://messenger.jhuapl.edu/.

Higher in the sky is Mars in the constellation of Gemini. Though Mars is fading daily and shrinking in apparent size (6 arc seconds), April is a good month to watch its motion in the sky. Ancient civilizations called these bodies "wanderers," from which we derive our current word "planet." This month, Mars traverses Gemini from west to east, coming to within about five degrees (a "half of a fist" held at arm's length) of the star Pollux. Mars doesn't set until after 2am.

Saturn is now high in the southeast, closing on the star Regulus in the constellation Leo. The rings are nearly open 10 degrees now. Saturn will be *the* show object at this spring's observatory open houses. By the end of the month, Saturn is on the meridian, due south, and over halfway up in the sky by the end of the evening twilight.

Jupiter is next, rising in the southeast at about 2am (on "tax day"). It is situated just east of the Teapot of Sagittarius. The last quarter Moon is in this part of the sky, passing just beneath Jupiter on the 26th and 27th. Given the fact that Jupiter is so low in the sky, it's best to observe it just before sunrise, when it is highest in the sky.

Venus is nearly unobservable this month and next month, too, and even into June, but there is a challenge if you're up for it. Technically Venus is still in the morning sky but it rises just before the Sun. Can you still see it? You'll have a guide on the morning of the 14th as a thin crescent Moon sits just to the upper right of Venus.

On the evening of April 8th, be sure to notice the position of the Moon in the sky. It will be situated very close to the Pleiades star cluster. You can even use binoculars to see if you can see the cluster. In America's northwest, the Moon covers some of the stars in the Pleiades. Good hunting! -FSM

MEMBERS CORNER

Bob Rubendunst wrote

My wife (Karen Bojda) and I are considering taking a solar eclipse cruise from July 16th to July 29th. The ship departs from Beijing, stops briefly in South Korea, then Japan, then chases the eclipse at it's maximum point, then visits Kobe, Japan, then returns to Beijing.

This will be the longest total eclipse of the century.

Anyone interested?

Trivia Question

How big is our universe and how old is it?

The current, observable universe has been determined to have a width of 156 billion light years, with an error of less than 1%, by the latest deep-space telescope WMAP. At first, it might seem impossible that scientists are so sure of this astronomical measurement, but this figure has been narrowed by years of research and determined by several paths of inquiry. Also, the size of the universe is intimately dependent on its shape, age, acceleration, and total mass, so we are very confident in this figure.

For more info see http://www.wisegeek.com/how-big-is-the-universe.htm

Astronomers estimate the universe to be between 12 and 14 billion years old. To put this in perspective, our solar system is estimated to be about 4.5 billion years old and humans have existed for a paltry few million years. Makes us look kind of insignificant doesn't it? The age of the universe is usually determined in two ways. 1. By looking at the oldest stars. 2. By measuring

the rate of expansion of the universe and extrapolating back to the Big Bang. For more information go to http://map.gsfc.nasa.gov/universe/uni_age.html

Waxing Gibbous

Moon Phases

1st quarter	April 12 2:32 p.m..	May 11 11:47 p.m.
Full	April 20 6:25 a.m.	May 19 10:11 p.m.
Last quarter	April 28 10;12 a.m.	May 27 10:57 p.m.
New	April 5 11:55 p.m.	May 5 8:18 a.m.

CUAS NEWS

Someone doing some housecleaning donated a **homemade 4 ¼ inch f/10 reflector** to the planetarium a few weeks ago. It is on a homemade pipe mount. It is missing a flat diagonal mirror. If someone would like this instrument, please speak now as it cannot be stored where it is. At minimum, we'll salvage the mirror and dispose of the rest.

Some **dark sky observing** was tentatively planned at the March meeting. We're tentatively planning on observing from the water fowl area at the Middle Fork Forest Preserve on May 31 and August 30. Bob Rubendunst will confirm the dates for us. We also talked about a date or two at the meadow at Allerton Park. Dave Leake will check with Kim Petzing regarding September 20 and/or October 18 or 25.

Speaking of darker skies, it's not too early to start thinking about **local star parties**. Most have early registration deadlines, so get them on your calendar:

- Prairie Skies . . . .Sept. 25-28, northeast of Kankakee (http://www.prairieskies.org/) Aug. 11 pre-registration deadline.
- Illinois Dark Sky . . . Sept. 25-28, near Springfield (http://www.sas-sky.org/main.html, click on "star party 2008)
- Astrofest . . . .Sept. 5-7, at Vana's Farm (Kankakee) (http://www.chicagoastro.org/af/)

If you got any good photos of the lunar eclipse, send them to Phil Wall for inclusion on the **club web site**!

A reminder that CUAS is a part of the **Night Sky Network.** As a member, we are to use their materials to conduct several events over the calendar year. If anyone has been asked to do a talk or some other presentation, we have the materials! The latest is the "Shadows and Silhouettes" toolkit which just arrived! The web site for the network is http://nightsky.jpl.nasa.gov/.

Consider taking your **CUAS newsletter** by email only and save the club some money. By your request, we can email you a pdf file monthly instead of spending money on stamps.

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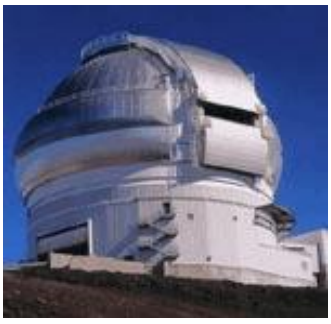
Late news . . . . . recall we have two community events in the works . . . . . one you should know about occurs this month, Tuesday, April 22 at the planetarium. **"Rocket Into Space!"** is a night of continuous activities for the kids, sponsored by WILL Channel 12 and the planetarium. Groups scheduled to participate include the Champaign Public Library, the Urbana Free Library, Chanute Aerospace Museum, Orpheum Children's Science Museum, Central Illinois Aerospace, Illinois Space Society, Center for the Simulation for Advanced Rockets, and the Challenger Center out of Bloomington. CUAS can have a table if it wants one. Molly Delaney from WILL is the coordinator. Dave Leake will be in the dome the entire time, so IF CUAS wants to participate, we'll need a few bodies to staff the table.

Also, CUAS telescopes have been requested to be at a **Summer Solstice Celebration** at the Krannert Center for the Performing Arts. The first event (last year) went so well, that they are planning another one. Hopefully the StarLab portable planetarium will be back and we'll have some clear skies to do some observing. The date is Friday, June 20 and Jim Kaler is the coordinator.

OBSERVATORY NEWS



It's a bit early for the **mow list,** but just in case it warms up. This is basically last year's list. If you'd like to be added (or deleted), let Dave Leake know. When you mow, let the next person know immediately. If you'll be out of town or can't mow, let the next person know ASAP so we don't lose control of the lawn out there. Thank you!

1) Mike Rosenberger	4) Audrey Ishii	7) Mike Lockwood	10) Dick Robrock
2) Dave Leake	5) Willard Brinegar	8) Mike Matthews	11) Bob Rubendunst
3) Mark Prather	6) Guy Hampel	9) Wayne James	12) John Stone
13) Bill Marble			

As the snow melts, be *very careful* about parking at the observatory site. Some of the grounds are very soft from the rain and snow melt. ***Don't get stuck!*** It is unfortunate that someone decided to have some fun and leave us with ruts in the dirt – be careful of these as well.

Spring projects . . . . . we probably need to **scrape paint** again, both inside and outside. The inside looks pretty bad in the daylight! Thank goodness it's used in the dark! Also, new **tarp** for the 16-inch, cooling **fans** in the telescope, and a **vent** for the shed. If you're returning the 8-inch red Dobsonian telescopes to the dome, remember to try to store them horizontally to help protect the mirror coatings.

A **work day** will be planned for the end of April, though, as of this printing, no date has been set. We need to do some cleaning for the observing season, ready the mowers, and start and run the generator. We also need to strip the paint on the inside but, given the dust that would be created, it might be best to wait until the telescope is removed.

Thanks to Williard Brinegar for donating the new 2-inch diagonal for the dome scope!

Mike Lockwood and John Pratte will be looking at the dome-mounted **16-inch scope's mount,** which is very tight in right ascension. The plan is to turn the shaft to a smaller diameter and then replace the two large bearings with five smaller ones. We'll be discussing this at an upcoming meeting. The project could cost $1,000. It may be awhile before they get to it though. Both have been and continue to be very busy, professionally.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

The following article reprinted in its entirety.

Tracking Wildlife from Space

by Patrick Barry

It's 10 o'clock, and do you know where your Oriental Honey Buzzard is?

Tracking the whereabouts of birds and other migrating wildlife across thousands of miles of land, air, and sea is no easy feat. Yet to protect the habitats of endangered species, scientists need to know where these roving animals go during their seasonal travels.

Rather than chasing these animals around the globe, a growing number of scientists are leveraging the bird's-eye view of orbiting satellites to easily monitor animals' movements anywhere in the world.

The system piggybacks on weather satellites called Polar Operational Environmental Satellites, which are operated by the National Oceanic and Atmospheric Administration (NOAA), as well as a European satellite called MetOp. Sensors aboard these satellites pick up signals beamed from portable transmitters on the Earth's surface, 850 kilometers below. NOAA began the project—called Argos—in cooperation with NASA and the French space agency (CNES) in 1974. At that time, scientists placed these transmitters primarily on buoys and balloons to study the oceans and atmosphere. As electronics shrank and new satellites' sensors became more sensitive, the transmitters became small and light enough by the

1990s that scientists could mount them safely on animals. Yes, even on birds like the Oriental Honey Buzzard.

“Scientists just never had the capability of doing this before,” says Christopher O'Connors, Program Manager for Argos at NOAA.

Today, transmitters weigh as little as 1/20th of a pound and require a fraction of a watt of power. The satellites can detect these feeble signals in part because the transmitters broadcast at frequencies between 401 and 403 MHz, a part of the spectrum reserved for environmental uses. That way there's very little interference from other sources of radio noise.

“Argos is being used more and more for animal tracking,” O’Connors says. More than 17,000 transmitters are currently being tracked by Argos, and almost 4,000 of them are on wildlife. “The animal research has been the most interesting area in terms of innovative science.”

For example, researchers in Japan used Argos to track endangered Grey-faced Buzzards and Oriental Honey Buzzards for thousands of kilometers along the birds' migrations through Japan and Southeast Asia. Scientists have also mapped the movements of loggerhead sea turtles off the west coast of Africa. Other studies have documented migrations of wood storks, Malaysian elephants, porcupine caribou, right whales, and walruses, to name a few.

LOOKING AHEAD

April 3 “Moonwalk 2008” kickoff 5-6:30pm Staerkel Planetarium
Champaign-Urbana is being challenged by Peoria to walk to the Moon and back . . .twice! That’s about 960,000 miles! More details will follow!

April 4 “World of Science” talk 7pm Staerkel Planetarium
Our last talk of the year features our Natural Sciences department chair and chemist, Ed O’Sullivan, speaking on a timely topic . . . . “Steroids in Sports.” Admission is $1.

April 4-5 ISAAPT meeting Loomis Lab
The Illinois Section of the American Association of Physics Teachers will meet on the UI campus. See www.isaapt.org for more information.

April 5	Members-Only Observing	7-?	Observatory
April 10	CUAS Club meeting	7-8:30pm	Staerkel Planetarium
April 12	CUAS Family Skywatch	7-9:30pm	Observatory
April 24	“Rocket into Space”	5:30-8:30pm	Staerkel Planetarium

CUAS teams up with the planetarium, WILL TV, both Champaign and Urbana Libraries, the Krannert Art Museum, Central Illinois Aerospace, and the Orpheum Children's Science Museum for a night of hands-on activities for the kids (aimed at grades K-2) at the planetarium. More details will be forthcoming, but CUAS will have a table and maybe do some solar observing outside. Put this Thursday evening on the calendar!

April 26	Science Olympiad State finals		University of Illinois
May 3	Members-only Viewing	8-? pm	Observatory
May 8	CUAS Club meeting	7-8:30pm	Staerkel Planetarium
May 10	GLPA State Planetarium meeting		Peoria
May 10	CUAS Family Skywatch	8-10pm	Observatory
May 31-April 4	ASP/AAS meeting		St. Louis
May 31	Dark Sky viewing	8-?	Middle Fork
June 7	CUAS Family Skywatch	8-10pm	Observatory
June 12	CUAS Club meeting	7-8:30pm	Staerkel Planetarium
June 20	Summer Solstice Celebration		Krannert Center

(see the "club news" section)

CHECK OUT ALL CLUB EVENTS ON THE CUAS HOME PAGE:
http://www.prairienet.org/cuas or http://www.cuas.org

"Clear Skies" is published twelve times per year for its membership.
The Champaign-Urbana Astronomical Society is an affiliate group of the **Champaign Park District.** http://www.champaignparkdistrict.com

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Address _____
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Make all checks payable to:
"*Champaign-Urbana Astronomical Society*"

Circle all that apply:

Basic membership	$15
Observatory key fee	$10
Astronomy magazine renewal*	$34
Sky & Telescope renewal*	$33
Donation	$ ____
Total Enclosed	$ ____

*enclose mailing label

Detach and mail to:
C.U.A.S. Treasurer
c/o Staerkel Planetarium/Parkland College
2400 West Bradley Avenue
Champaign, IL 61821

William M. Staerkel Planetarium has public shows on Friday evenings in August. Call 217/351-2446 for more information.
http://www.parkland.edu/coned/pla

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