

"CLEAR SKIES"



NEWSLETTER of the CHAMPAIGN-URBANA ASTRONOMICAL SOCIETY, Inc.
An affiliate of the Champaign Park District

November, 2005

PRESIDENT'S MESSAGE

Well summer is out and fall is in. Seems like it was just 90 degrees the other day and now it is in the 50's. Not that I mind though. I wish everyone a great fall

This month brings elections to the club. So far (and Dave will repeat this later in the newsletter) we have the following people nominated for offices:

President:

Mike Lockwood

Vice President:

Guy Hampel

Jon Stone

Secretary:

Jeff Bryant

Treasurer:

Phil Wall

5th Director:

Dave Leake

The elections will take place at this month's meeting. There is still time to nominate someone or yourself. Mike Conron was nominated for President but had to decline the nomination for personal reasons.

In November (10-13) there will be a conference (SpaceVision 2005) at the UI hosted by the Students for the Exploration and Development of Space (SEDS – www.seds.org).

The following is from the conference website (www.space2005.org):

Many doors to the space industry will be open wide as the Apollo-era workforce begins to retire en masse. How do you get started? Which door should you choose? What awaits you in the industry? SEDS wants to help answer your questions about your future in space.

Some of the featured speakers are:

- Peter Diamandis, X PRIZE CEO
- Elon Musk, SpaceX CEO
- James Garvin, NASA Chief Scientist
- George Whitesides, National Space Society Executive Director
- Robert Farquhar, MESSENGER Mission Manager

Their website contains all the information about the



CUAS DIRECTORY:

Mike Matthews, President	586-5084
Mike Conron, Vice-pres.	355-5996
Guy Hampel, Secretary	352-3690
Phil Wall, Treasurer	352-5442
Jeff Bryant, 5 th Director	840-5251
Mike Rosenberger, Obs. Dir.	598-2254
Chris Pond, Webmaster	352-5426
Dave Leake, Newsletter Ed.	359-6644
Kevin Crump, CPD	398-2372

conference and registration.

The other night when I was coming home it was a very cloudy night and not much was visible. The only light that I could see was the light reflecting off of Mars. It was a beautiful sight. Have you been out to look it lately? With binoculars? With your telescope? With your kids? Your significant other? With the neighbor kids? If not get your scope out and see what you can see. The neighborhood kids take the first look through my scope and then go home to tell their parents. The parents happen to take a walk and just happen to pass my house. It is a lot of fun and you can help spread the fun of astronomy.

Clear Skies

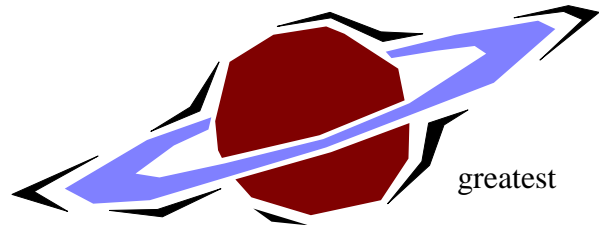
Mike

LOOKING UP THIS MONTH

This month (and last month) is Mars, Mars, and more Mars! Opposition is November 6, though, due to the elliptical-ness (is that a word?) of the Martian orbit, the date of closest approach was technically October 30. Still, if you haven't seen Mars through a telescope, *do it now!* We hope we can entice some of you to show up on November 6 at the Staerkel Planetarium to do some Mars viewing with telescopes. This is the best view of Mars we'll get until 2018! If you check out the table below, Mars will be nearly 20" (arc seconds) across at the beginning of the month. The south polar cap of Mars will be pointed towards us just a bit, but it won't be very large as it's summer in that hemisphere. And recall that a telescope will invert the image, so you'll be looking for the polar cap on "top" of the planet. The famous dark area called Syrtis Major should be facing us during the evening hours of the first week in November. Check it out! At opposition time, Mars will rise just north of east as the Sun sets and be up all night. The higher Mars is in our sky, the clearer the image will be.

Venus is still sticking around, too. It reaches its greatest angular separation from the Sun on November 3, though it still won't be too high above the horizon. A telescope should show just about a half-moon shape. Speaking of . . . a beautiful crescent Moon/Venus snapshot should be visible on the 5th. Venus isn't setting now until 7:30pm this month.

Technically, Mercury joins Venus in the evening sky, though it appears very low and far to the right of Venus. In fact, Mercury's



separation from the Sun occurs on the same day as Venus! With the angle of the ecliptic being what it is, it's not a great view. If you do look, don't confuse Mercury with the star Antares. The crescent Moon is just below Mercury on November 3. By the end of the month, Mercury will have come to conjunction with the Sun where it will swing into the morning sky for a very favorable December view.

Next on the list is Saturn in the star-poor region of Cancer. Saturn rises at 10pm at mid-month in the east-northeast. It's just a few degrees from the Beehive cluster, which you can probably see with binoculars. Saturn is at the point in its orbit (called "quadrature") where you can see the shadow of the rings on the planet pretty easily.

For the early-risers, Jupiter rises at 5am, about an hour before the start of the morning twilight. The Moon is in this part of the sky on the 29th.

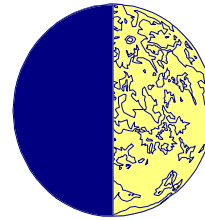
The Leonid meteor shower peaks every year on November 17. This year isn't too good, however, as the presence of a nearly full Moon will drown out any faint meteors. Now . . . get out and see Mars, OK? -DCL

Planet	Date	Constellation	Magnitude	Distance*	Apparent Diameter
Mercury	11/11	Scorpius	0.0	80.6	7.8"
Venus	11/15	Sagittarius	- 4.5	53.4	29.1
Mars	11/15	Aries	- 2.1	45.5	19.1
Jupiter	11/15	Virgo	- 1.7	590.5	31.0
Saturn	11/15	Cancer	- 0.2	823.0	18.7
Uranus	11/15	Aquarius	+5.8	1843.7	3.5
Neptune	11/15	Capricornus	+7.9	2808.0	2.2
Pluto	11/15	Serpens	14.0	2964.9	0.1

* in millions of miles from Earth

Moon Phases:

New	November 1	December 1, 30
1 st Quarter	November 8	December 8
Full	November 15	December 15
3 rd Quarter	November 23	December 23



CUAS NEWS

Mars Observing . . . CUAS will hold observing Sunday night, **November 6th**, outside the Staerkel Planetarium. We can use the planetarium lobby as a warm room, have restroom facilities, and can even sell Mars shirts and hot chocolate (if you want). This does not mean this has to be the only Mars observing, but this is one we're going to freely publicize.

SEDS conference As our president mentioned in his message, the Students for the Exploration & Development of Space will be meeting on the UI campus during the second week of November. The editor of this newsletter has emailed a couple of people asking which events (if any) are public. For example, there's a weekend "Space Fair" at the Illini Union. Unfortunately, no one returned any of the messages.

Officer nominations were taken in October and voting will occur at the November meeting. Nominations can be taken up to the time of the election. If you can't be present at the meeting and want to cast your vote, use the absentee ballot in this newsletter. Might you serve the club next year? We have five elected officials that serve a calendar year. Current nominees appear in Mike's president's message. Duties include:

President = runs the meetings and acts as the club spokesperson

Vice-president = stands in for the president when appropriate and handles club publicity (press releases)

Secretary = handles the meeting minutes and club correspondence

Treasurer = handles club finances, including dues, calendars, T-shirts, and magazine subscriptions.

Fifth Director = the proverbial "other duties as assigned."

Each year this executive committee appoints a newsletter editor, observatory director, and webmaster.

Consider serving your club in 2006!

Eagle Creek Observing? We've been contacted by one of the managers of Eagle Creek (basically Lake Shelbyville) about doing some observing down there. The theme for 2006 is "ecotourism" and they'd like to include some dark sky viewing. Before anything gets set, we are welcome to visit and scope out a good, accessible dark-sky site. Is anyone interested?

"Einstein's Miracle Year" Dr. Paul Kwiat's lecture at the planetarium on November 4 might be of special interest to CUAS members. Dr. Kwiat (UIUC physics) will talk about Einstein's legacy and how it relates to us today . . . and he'll be using many hands-on activities during the talk. He can really bring something like the Theory of Relativity down to the layperson's level. Tickets are only a buck at the door.

2006 Calendars We still have 15 or so Astronomy magazine 2006 calendars for sale, first come, first served. They'll retail for \$12 to non-members and \$10 to club members. Perfect for the holidays!!

CUAS Treasurer's Report

As of 30 Aug 2005, no income last 30 days; no outgo last 30 days.

Money assets:

\$2268.76 - checking account balance

\$ 101.00 - petty cash envelope

\$2369.76 - total

Philip J. Wall

Light Pollution Report The Champaign lighting code has been distributed to interested parties in an effort to look at and amend the code and take those amendments to the Zoning Board of Appeals. The goals of the code are excellent, but the actual ordinance stops short of where it needs to go. If you're interested in being part of this (and the more, the merrier!), contact Dave at dleake@parkland.edu or 359-6644.

If you want to get your club news fast, please subscribe to the **Cuas-l email list**. Sometimes people will email and say they will be observing that night and will ask for people to join them. There is also news of new comets and possible auroral displays. To subscribe, just go to the Cuas-l web page at <https://mail.prairienet.org/mailman/listinfo/cuas-l> and follow the subscription directions. Email cuas-l@lists.prairienet.org to post.

OBSERVATORY NEWS!

Given the number of telescopes at the dome site, the thought was entertained of getting rid of some of them through either a silent auction or even some sort of "garage sale" with proceeds going to the club. IF this happens, club members would get first choice. There's a nice Criterion 6-inch reflector out there that doesn't get used much.

The mowing appears to be done for the year, but we should give some thought as to what we want to do about mowers for next spring. Do we buy another? Pay to have the one currently at the dome fixed?





LOOKING AHEAD

November 4 “World of Science” talk 7pm Staerkel Planetarium
Physicist Dr. Paul Kwait will go through “Einstein’s Miracle Year” and how his famous papers of 1905 have changed our lives.

November 5 CUAS Family Skywatch 7-9pm Observatory
Join us at our public dome open house of the month, weather permitting, of course. Take I-57 to the south to the Monticello Exit. Turn right (west) and go 1.4 miles to a cross-street labeled 700E. Turn left (south) here and the dome is 0.8 miles down this road on your left. Dress warm as the dome isn’t heated!

November 6 Mars Observing 7-9pm Staerkel Planetarium
Bring a telescope and set it up west of the planetarium, weather permitting, and we’ll show the public what Mars looks like through a telescope. We can sell T-shirts inside the lobby at the counter if desired.

November 10 CUAS Club Meeting 7-8:30pm Staerkel Planetarium
We’ll take further nominations and then do officer elections, plus hear about our first Night Sky Network kit. All attendees will receive a 8 ½ by 11 fall sky chart with locations for some of the extra-solar planetary systems labeled.

November 10-12 SEDS at the University of Illinois ?

December 2 “World of Science” talk 7pm Staerkel Planetarium
Meteorologists Ed Kieser will discuss this year’s hurricane events in the Atlantic and the Gulf. Why all the destruction lately?

December 3 New Moon Observing 7-?pm Observatory
Our members-only viewing session for the month. Bring a friend, dress up warm and lets look for some faint fuzzies! All CUAS observing sessions are weather permitting!

December 8 CUAS Club Meeting 7-8:30pm Staerkel Planetarium
Typically our December meeting has been more of a social event, though it doesn’t need to be. If we keep tradition, bring some goodies to share and lets chat . . . which is usually what happens after club meetings anyway, right?

December 9 “Dusk to Dawn” 7pm Staerkel Planetarium
Another storytelling gem by Kim Petzing (Allerton Park) and Kim Sheahan (Spurlock Museum). Don’t miss it! This hour-long program is very appropriate for families with kids.

December 10 CUAS Family Skywatch 7-9pm Observatory

CHECK OUT ALL CLUB EVENTS ON THE CUAS HOME PAGE:

<http://www.prairienet.org/cuas> or <http://www.cuas.org>



A Wrinkle in Space-Time

By Trudy E. Bell

When a massive star reaches the end of its life, it can explode into a supernova rivaling the brilliance of an entire galaxy. What's left of the star fades in weeks, but its outer layers expand through space as a turbulent cloud of gases. Astronomers see beautiful remnants from past supernovas all around the sky, one of the most famous being the Crab Nebula in Taurus.

When a star throws off nine-tenths of its mass in a supernova, however, it also throws off nine-tenths of its gravitational field.

Astronomers see the light from supernovas. Can they also somehow sense the sudden and dramatic change in the exploding star's *gravitational field*?

Yes, they believe they can. According to Einstein's general theory of relativity, changes in the star's gravitational field should propagate outward, just like light—indeed, at the speed of light.

Those propagating changes would be a gravitational wave.

Einstein said what we feel as a gravitational field arises from the fact that huge masses curve space and time. The more massive an object, the more it bends the three dimensions of space and the fourth dimension of time. And if a massive object's gravitational field changes suddenly—say, when a star explodes—it should kink or wrinkle the very geometry of space-time. Moreover, that wrinkle should propagate outward like ripples radiating outward in a pond from a thrown stone.

The frequency and timing of gravitational waves should reveal what's happening deep inside a supernova, in contrast to light, which is radiated from the surface. Thus, gravitational waves allow astronomers to peer inside the universe's most violent events—like doctors peer at patients' internal organs using CAT scans. The technique is not limited to supernovas: colliding neutron stars, black holes and other exotic objects may be revealed, too.

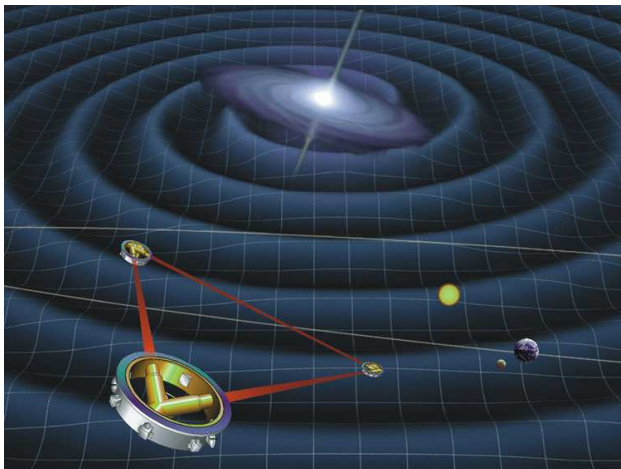
NASA and the European Space Agency are now building prototype equipment for the first space experiment to measure gravitational waves: the Laser Interferometer Space Antenna, or LISA.

LISA will look for patterns of compression and stretching in space-time that signal the passage of a gravitational wave. Three small spacecraft will fly in a triangular formation behind the Earth, each beaming a laser at the other two, continuously measuring their mutual separation. Although the three 'craft will be 5 million kilometers apart, they will monitor their separation to one *billionth* of a centimeter, smaller than an atom's diameter, which is the kind of precision needed to sense these elusive waves.

LISA is slated for launch around 2015.

To learn more about LISA, go to <http://lisa.jpl.nasa.gov>. Kids can learn about LISA and do a gravitational wave interactive crossword at <http://spaceplace.nasa.gov/en/kids/lisaxword/lisaxword.shtml>.

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



LISA's three spacecraft will be positioned at the corners of a triangle 5 million kilometers on a side and will be able to detect gravitational wave induced changes in their separation distance of as little as one billionth of a centimeter.

CUAS Absentee Ballot

One vote per paying membership

Votes must be received by November 10 to be valid. Mail to the return address on this newsletter.

Circle one name in each group, or write in a name.

President:	Mike Lockwood	Write-in _____
Vice President:	Guy Hampel Jon Stone	Write-in _____
Secretary:	Jeff Bryant	Write-in _____
Treasurer:	Phil Wall	Write-in _____
5th Director:	Dave Leake	Write-in _____

MEMBERSHIP FORM

- Enroll me as a new member!
 Membership renewal [attach mailing label]
 Change of address only

Name _____
Address _____
Phone # _____
Email address: _____

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

Circle all that apply:

Basic membership	\$15
Observatory key fee	\$10
<i>Astronomy</i> magazine renewal*	\$34
<i>Sky & Telescope</i> renewal*	\$33
Donation	\$ _____
Total Enclosed	\$ _____

*enclose mailing label

Detach and mail to:

C.U.A.S.
C/o Phil Wall
607 West Healey #11
Champaign, IL 61820

"Clear Skies" is published twelve times per year for its membership. [Circulation: 78]

The Champaign-Urbana Astronomical Society is an affiliate group of the **Champaign Park District**. <http://www.champaignparkdistrict.com>

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>



**Champaign-Urbana Astronomical Society
C/O William M. Staerke Planetarium
Parkland College
2400 West Bradley Avenue
Champaign, IL 61821**