



THE NEKAAL OBSERVER

August 2004 VOLUME 12, ISSUE 7

PO BOX 951, TOPEKA KS 66601

(785) 806-1177 www.nekaal.org

The official newsletter of Farpoint Observatory and
the Northeast Kansas Amateur Astronomers' League

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Your articles and other contributions to this newsletter are welcome and encouraged. Please get them to the editor at least 6 days prior to the next scheduled meeting.

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FROM THE PREZ: By Graham Bell

Tombaugh Project: We are finally able to draw down money from NASA, and have really been spending on this project. So far, we have spent the following:

- ❑ \$2840.00 for the focal reducer. This came out of the existing NEKAAL Telescope Fund. The grant specified that NEKAAL would provide \$2500 in matching funds for the project. The additional \$340.00 spent on the focal reducer will be recovered from NASA.
- ❑ \$21,118.00 paid to ScopeCraft as the down payment on the telescope. NASA funds were used for this.
- ❑ \$8040.00 paid to SBIG for the camera from NASA funds. This is \$1000 less than our budget, and the camera has been improved beyond what was budgeted. Its nice to know that **some** prices are decreasing!

The Focal reducer has been shipped to ScopeCraft. The company which is doing the optics, Intermountain Optical, is ready for our mirrors. We need to find someone to drive the optics out in the next few weeks.

ScopeCraft's new timeline is a little disconcerting. It looks like it might not be operational before mid-January.

News Coverage: On Wednesday, July 14, WIBW-TV (channel 13) spent several hours at Farpoint. They interviewed several of us, and got some shots of Farpoint. A short segment (just under 3 minutes) aired on their

10:00 news on Tuesday, July 20. The editing did a pretty good job of preserving the FAST activities, but really cut short our discussions on Public Outreach. Bill Leifer can create CDs containing a Quicktime movie of the program.

Additional attempts to get the Topeka CJ to publish information, including our meeting announcement, have apparently met with failure again.

Cassini: This month's NASA article is on the Cassini mission. I have been fortunate in that Direct TV added the NASA channel just before the Cassini orbit insertion. I was able to monitor the live coverage of the Saturn Orbit Insertion, and view some of the images as they were being shown for the first time.

There are features visible in the photo on page 5 that are not discussed in the NASA article, but which I find quite interesting. Take a look at the two concentric ring structures in the outer ring which look like diffraction rings. There is a similar structure toward the left on the inner ring. You can see these better in the original image at http://spaceplace.nasa.gov/astro_clubs/encke_gap.jpg. These patterns were predicted by their models of the rings. In fact, the models predicted what was actually seen so well that Carolyn Porco, Imaging Manager, suspected a prank when she first saw the image. The sculptured appearance just inside the Encke gap was also predicted.

A special thanks goes to Marcia Saville, Walter Cole's sister. She has just made a sizable contribution to NEKAAL.

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SKY HIGHLIGHTS FOR AUGUST: *by Janelle Burgardt - Astronomy Program Director*

August 5	Neptune at opposition in Capricornus
August 7	Last quarter moon
August 11	Uranus Pluto at opposition in Aquarius
August 11-12	Peak of Perseid meteor shower
August 15	New moon
August 17	Venus at greatest elongation
August 23	First quarter moon
	Mercury at inferior conjunction
August 29	Full Moon Known as the Green Corn, Sturgeon or Grain Moon

Prominent Planets in August

Venus	Moves from Taurus into Gemini in the morning sky. Rising 3 hours before sunrise, it shines 35-40 degrees above the horizon
Jupiter	Still the brightest object in the night sky at -1.7 magnitude, Jupiter sets only 1 ¾ hours after sunset at the beginning of the month; it's lost in the sun's glare by the 31 st .
Saturn	Still in Gemini, Saturn shines in the morning sky at -0.2 magnitude. Rising higher throughout the month, Saturn climbs to within 2 degrees of Venus on August 31.

Meteor Shower

One of the best showers of the year is August's Perseids. This year, the moon is nearly new, making a dark background for the remnants of comet Swift-Tuttle to put on a show. Some predictions have marked this year's shower as the best in several years.

AFFILIATED ORGANIZATIONS:



International Dark-Sky Association

IDA

<http://www.darksky.org>



NASA's Night Sky Network.
<http://nightsky.jpl.nasa.gov/>



Astronomical League
<http://www.astroleague.org>

5 Events Logged

FASTTRACKS: *by Graham Bell, substituting for Gary Hug*

Training for the FAST team is progressing, but slower than preferred. Two members have progressed beyond the astrometry training, and have been involved in telescope operation and imaging.

There has been a little (perhaps a lot) of confusion as to what is expected from the team training efforts. Russell and I worked on this last week, and I believe I

have clarified the expectations to his satisfaction. There are a few key things to consider:

- This is not being run as a normal class, but more as an independent studies class. Reference material is provided and objectives stated, the rest is up to the student.
- Gary and Graham are always avail-

able to answer questions and help in any way possible, but don't expect them to take the initiative to help you. You must call on them

- **Goal:** To have each FAST member doing the full process unassisted and do it in a manner that reflects positively on NEKAAL.

(Continued on page 3)

FASTTRACKS (continued)

(Continued from page 2)

- There is no grading. When you are ready, in the opinion of Gary and Graham, you become certified. You are either certified, or you are not yet certified. There are no failures, only some who have not yet finished the process.
- There are two levels of certification
 - ◊ Provisional Certification: At this stage you will be expected to not work solo, but to work with at least one other person who is at least provisionally certified.
 - ◊ Full Certification. Fully qualified. You are able to work solo, and

you can work with non-certified students to train them.

- I expect that we will establish a process whereby all MPC reports will be available for all FAST members to view. This includes the reports that Gary and I submit.
- Gary and I are considered to be fully certified. So far, no one else is, but several are getting close to provisional certification.
- I have quit publishing the document which compares results of individual students. Instead, I will provide individual feedback on each stage of the training. If you don't see the feed-

back in a reasonable amount of time, ask for it!

As soon as I complete the Observer, I'll start putting together a more definitive document, describing the learning processes, the expectations, and my rationale for the processes and expectations. That document will be posted to the FAST files section.

FAST Training Status

Students	13
Partially Certified	0
Fully Certified	0

EGYPTIAN ASTRONOMY: by Dr. Edwin Woerner

During February 2003, Helen, her daughter Eva, and I spent two weeks exploring Egypt. In particular, we saw some of the sights we had missed during the year that Helen and I had worked in Cairo.

The ancient Egyptians were intent stargazers. They timed the beginning of their year with the flooding of the Nile River. The annual floods covered the land along each side with rich soil, which sustained their agriculture. Therefore, they were not as dependent on irrigation as other early civilizations such as Mesopotamia, India, China, or Central America.

However, it did mean that their calendar had to be good. Until the Aswan High Dam was finished in the 1960s, the Nile flooded every September. At the latitude of Egypt the brightest of nighttime stars, Sirius, is just becoming visible in the early September morning sky. The common belief was that Sirius



(and Arcturus also according to some accounts) added its heat to that of the sun, resulting in the extreme summer

temperatures. In later times, after the Greeks had established a royal dynasty in Egypt, and Alexandria, named for and founded by Alexander the Great, became the intellectual center of the Mediterranean world, astronomers like Ptolemy, Hypatia, Hipparchus, and Euclid would refer to these as the Dog Days of summer. Sirius is the brightest star in the constellation of the Big Dog, Canis Major, and the name *Sirius* is Greek, meaning *scorcher*.

The Egyptians also surveyed accurately. It is well documented that the Great Pyramids on the Giza Plateau, about 25 miles from modern Cairo, display 90° corner angles and sides laid out along the north-south and east-west directions accurate to a fraction of an inch over distances of more than one hundred yards. How they did this remains a mystery, although ar-

(Continued on page 4)

HERE ARE SOME PRICES FROM THE NEKAAL STORE:

Periodicals
S&T \$32.95
Astronomy \$29.00

Merchandise
hats \$8.00 marked down

Tshirts \$8.00 marked down
Sweatshirt \$10.00 marked down
Name tags *free*
Tote bags \$8.00
Coffee Mugs \$10.00

Please contact Walter or Nancy Cole to acquire any of these items.

FACILITIES REPORT—JULY 2004: by Bill Leifer

- Preventive maintenance and supplies were performed for July. There were no issues discovered. Supplies are up to date, and Gary added some junk food.
- The protective pipes around the vents on the East side have been replaced.
- A strip of runner carpet has been placed to cover the rip in the carpeting in the meeting room.
- A problem report has mentioned an intermittent leaky sink faucet. This has been added to the work list.
- The antenna for wireless internet has been installed on the mast by Russ.
- The new sign for Farpoint has been on hold due to a miscommunication, but work is resuming.
- The lawnmower blade has been removed, and Gary Hug will be sharpening it. In the meantime, USD 330 has been fulfilling its agreement to mow the main front part of the grounds, which is much appreciated. Russ reports from the emergency care clinic that chiggers have reached cataclysmic proportions due to the wet summer, and that any observers standing in the grass who value their ankles are advised to soak them in DEET.
- Users of the observatory are asked to follow the checklist mounted on the inside of the door when you are the last to leave. In particular, please note the last item and return the thermostat to 80 degrees, so that we do not have to rely on mid-east oil any more than necessary. Another problem has been the failure by some to lock both of the locks on both of the doors. (The checklist is also available on the member Yahoo Group site, under the files section).
- Unfinished projects include priming and painting the shed door trim, obtaining an entranceway shoe mat, fixing the leaky faucet, and shampooing the carpet.
- One other reminder to those with Hymenoptera allergy, Please familiarize yourself with the use of the epinephrine syringe sitting on the stand in the bathroom. Instructions are in the box with the syringe. Your life could depend on it. (Wow. Two items on bugs. Hopefully, this is not a trend).

Egyptian Astronomy (continued)

(Continued from page 3)

cheologists suggest several plausible theories. Most involve determining direction from the position of the celestial north pole at night. A bright star like Polaris did not mark the pole when the pyramids were built, about 2600 BC. The third magnitude star Thuban in Draco, or the second magnitude star Kokab at the end of the tail of the Little Dipper were each sometimes used as a north star. Archeologists have pointed out that during the Pyramid building age, the pole was actually along a line between Thuban and Mizar in the handle of the Big Dipper. Observers could determine a north-south direction exactly by observing

when one of these stars appeared directly above the other.

Some of the Egyptian zodiac other constellations have not been determined yet. From Middle Kingdom times, 1500 BC and later, the constellation Orion was the god Osiris. I have often thought that this shape strongly suggests a human figure, although I am aware of some cultures that have not identified it as a person. The Egyptians often painted constellations and stars -- at random, to my eyes -- on the ceilings of tombs. It seems strange to look upwards at thousands of tons of rock and see an imitation of the night sky.

As a final example, the picture

shows a temple originally dedicated to the goddess Isis on the small island Phylae in the Nile during Greek times. Modern engineers dismantled, moved and then reassembled this temple to save it from rising waters after building the Aswan dam. Pictures, carvings and writing in hieroglyphics and Greek cover the temple walls. Among the writings is the story of an Egyptian queen who cut her hair as an offering to the gods. Apparently, the gods found the offering acceptable because the hair promptly disappeared from the altar. Where did the hair go? It is visible every clear evening this time of year as the constellation Coma Berenices.

OPEN HOUSE—FRIDAY, JULY 23, 2004

Please assist with the Open House on Friday, July 23, 2004. It begins at 9:30, so it would help to get there around 9:00 to help set up and make coffee. Junk food is always welcome.

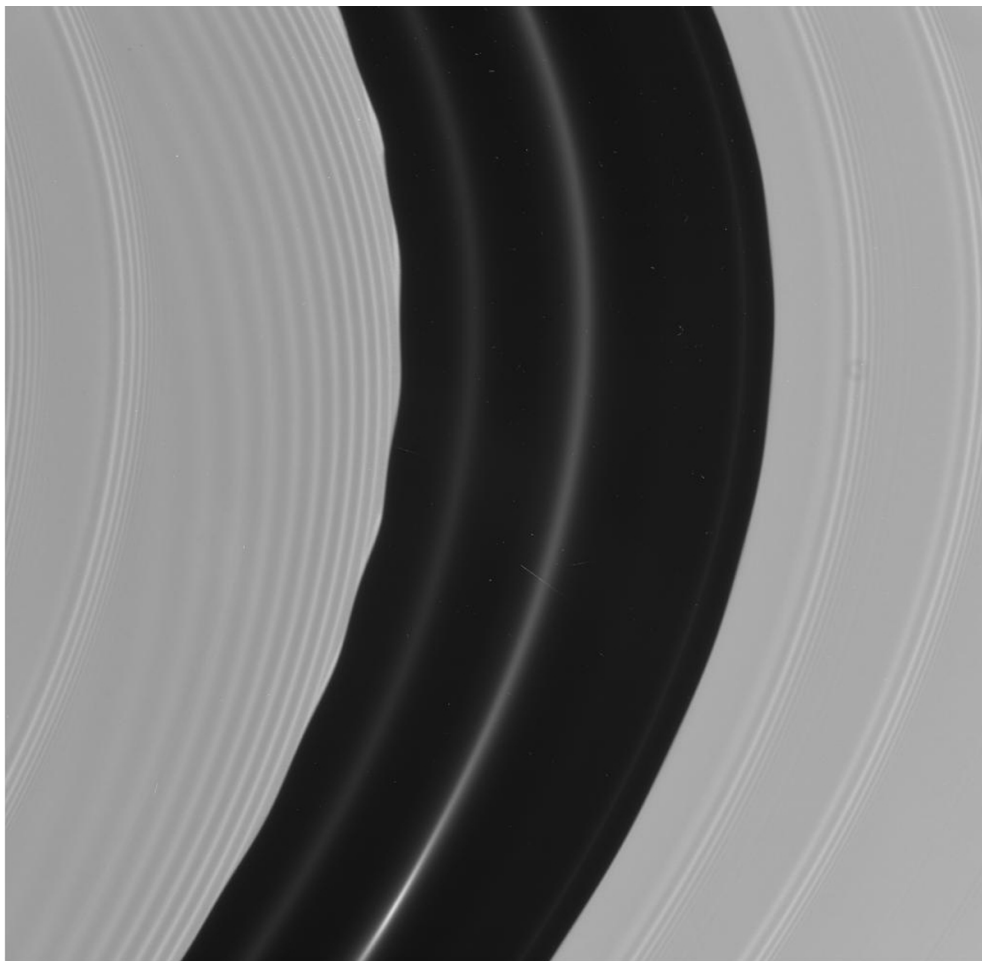
WAITING FOR CASSINI'S "SAFE ARRIVAL" CALL: by Diane K. Fisher

The evening of June 30, 2004, was nail-biting time at Cassini Mission Control. After a seven-year journey that included gravity assist flybys of Venus, Earth, and Jupiter, Cassini had finally arrived at Saturn. A 96-minute burn of its main engine would slow it down enough to be captured into orbit by Saturn's powerful gravitational field. Too short a burn and Cassini would keep going toward the outer reaches of the solar system. Too long a burn and the orbit would be too close and fuel reserves exhausted.

According to Dave Doody, a Cassini Mission Controller at the Jet Propulsion Laboratory (JPL) in Pasadena, California, there was a good chance the Earth-bound Cassini crew would have to wait hours to learn whether or not the burn was successful. Of the three spacecraft-tracking Deep Space Network (DSN) complexes around the globe, the complex in Canberra, Australia, was in line to receive Cassini's signal shortly after the beginning of the burn. However, winds of up to 90 kilometers per hour had been forecast. In such winds, the DSN's huge dish antennas must be locked into position pointed straight up and cannot be used to track a tiny spacecraft a billion miles away as Earth turns on its axis. "The winds never came," notes Doody.

The DSN complex at Goldstone, California, was tracking the carrier signal from Cassini's low-gain antenna (LGA) when the telltale Doppler shift in the LGA signal was seen, indicating the sudden deceleration of the spacecraft from the successful ignition of the main engine. Soon thereafter, however, Goldstone rotated out of range and Canberra took the watch.

After completion of the burn, Cassini was programmed to make a 20-second "call home" using its high-gain antenna (HGA). Although this HGA signal would contain detailed data on the health of the spacecraft, mission controllers would consider it a bonus if any of that data were actually captured. Mostly, they just wanted to see the increase in signal strength to show the HGA was



Right after entering Saturn orbit, Cassini sent this image of the part of the Encke Gap in Saturn's rings. Image credit NASA/JPL/Space Science Institute.

pointed toward Earth and be able to determine the spacecraft's speed from the Doppler data. If possible, they also wanted to try to lock onto the signal with DSN's closed-loop receiver, a necessary step for extracting engineering data.

Normally it takes around one minute to establish a lock on the HGA signal once a DSN station rotates into range. Having only 20 seconds' worth of signal to work with, the DSN not only established a lock within just a few seconds, but extracted a considerable amount of telemetry during the remaining seconds.

"The DSN people bent over backwards to get a lock on that telemetry signal. And they weren't just depending on the technology. They really know how to get flawless performance out of

it. They were awesome," remarks Doody.

Find out more about the DSN from JPL's popular training document for mission controllers, Basics of Space Flight (www.jpl.nasa.gov/basics) and the DSN website at deep-space.jpl.nasa.gov/dsn. For details of the Cassini Saturn orbit insertion, see www.jpl.nasa.gov/basics/soi. Kids can check out The Space Place at spaceplace.nasa.gov/en/kids/dsn_fact1.shtml to learn about the amazing ability of the DSN antennas to detect the tiniest spacecraft signals.

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

BOARD MINUTES, JUNE 13, 2004: by Bill Leifer,

Members present: Gary Hug, Graham Bell, Bill Leifer, Janelle Burgardt, Russell Valentine, Walter Cole. Members Absent: Jerry Majers, Dan Tibbetts, David Costales, David Ryan, Julee Fisher

The meeting was called to order by the Chairman, Graham Bell, at 3:32 PM on July 11, 2004.

Previous Minutes - The minutes of the previous meeting were accepted.

FINANCIAL REPORT – Walter Cole:

The previous financial statement was posted on the NEKAAL members Yahoo group. The current statement has not been posted, yet. Due to the expense for the focal reducer for the Tombaugh Telescope, current cash balance is approx. \$1800. Walt reported that he was recently approached by one of the original contributors to building Farpoint, and this individual has expressed an interest in making a new contribution. It was decided that all board members would make a prioritized list of current needs for capital equipment, so that a final wish list can be compiled to provide to this individual. The E/PO grant status is uncertain, so the list at this point should include items not likely to be covered by awarding of that grant. Various specific needs were discussed.

Walt also announced that the payment system for transfer of grant money from NASA-Goddard has been completed successfully, and the initial funds needed to make the first transfer for the building of the Tombaugh Telescope (approx. \$21,000) has been received. The board was reminded that we might only receive funds that will be immediately paid out for the project within 24 hours, since the government will not allow the earning of any interest on those funds. Any interest would have to be returned to the federal government. Consequently, the first check for that amount has been sent to ScopeCraft.

FPO Facilities Report – Bill Leifer:

Preventive maintenance and supplies were performed for June. Someone has observed that the sink faucet occasionally leaks. This will be added to the projects list. Gary added some snacks to the junk food supply. Bill purchased a 9 ft. strip of runner carpeting to cover the rip in the main carpet and will determine a method to tack it down effectively. The primer and paint for the shed door trim is ready to apply, but a brush was missing, so another attempt will be made to complete this. Bill replaced the steel pipes around the vents on the East side of the building. USD 330 has continued to mow the main area around the observatory fairly regularly. A foot mat for the entranceway is not yet purchased. The selection was too limited at one vendor. Bill promised to try again. The mower blade has been removed, and Gary will be sharpening it. The new sign for Farpoint is not ready, and the vendor was apparently waiting for the go ahead following some confusion caused by Bill's involvement with design ideas. Bill will contact the vendor and clarify, so that the project can proceed.

ADDITIONAL OLD BUSINESS/PREVIOUS ASSIGNMENTS:

Wireless internet installation is still pending. Russ has installed the antenna on the mast, but MVHS has not worked on wiring the media center as promised. Graham will talk to Chuck Schmidt to clarify plans.

Janelle has uploaded the final job descriptions document to the Yahoo site.

Janelle provided a Night Sky Network update. A total of five events for public outreach have been completed. All apparently went very well except for the event at K-State. All our requirements for 2004 have already been fulfilled, and the year is only half over. Thank you to Janelle for the great work vital to our mission.

The final keyholder training guidelines are still holding for the procedure on Mission Valley High School parking lights. The box is located at the Northeast corner of the old building. Keys for our use and access issues remain to be resolved.

Graham provided a FAST training update. There has not been much activity in the last month, but he will be providing coordinates to work on the astrometry of some additional objects in the Gary's images that are already on file.

The scope redesign and schedule was briefly discussed. Gary mentioned again the upgrade in the camera. The telescope financials and grant availability have been discussed under financial report.

The consortium idea will be explored and expanded in a special meeting arranged by Bruce Twarog to be held at KU on August 7th, 1-5PM. A special invitation was sent and is posted on the Yahoo Group. There will be many attendees from throughout the region. Gary and Graham will be attending and urged all board members to make arrangements to be there. The current attendees list is shown on the web site and will be updated.

IDA – Janelle: Nothing new to report on this. Gary has a lighting issue at Sandlot cause by an advertising beacon. Several ideas were explored, both violent and non-violent.

The Web Services design team (IT committee) has met twice and gave its interim report, showing the basic outline of a plan. Many of the requirements of FAST were explored, and Gary and Russ discussed image format and compression alternatives for storage. The current basic plan will be expanded in additional meetings.

NEW BUSINESS

New Computer Status:

The possibility of obtaining new computers from a donation from the casinos has apparently died. No follow-up on this has been forthcoming from Mike Ford, and he is currently involved in other projects. The computers will be prioritized in the list for the prospective donor to consider.

WIBW-TV feature:

WIBW-TV will be doing a feature on NEKAAL, the NASA grant, and the Tombaugh Telescope. Lindsay Patterson will do the interviews at FPO on July 13 for prospective showing on Aug. 20th or Aug. 27th.

There being no further business, the meeting was adjourned at 5:22 PM.

August 2004

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7 Last Consortium KU 1:00 
8	9	10	11 Perseids	12 Perseids	13 Perseids -Club Observing	14 Perseids -Club Observing
15 New Board 3:30 FPO 	16	17	18	19	20 Open House	21
22	23 First 	24	25	26 General Meet- ing 7:30PM	27	28
29 Full 	30	31				

2004 NEKAAL MEMBERSHIP FORM

Please check appropriate membership type:

- ☐ Individual \$30
 ☐ Family \$35
☐ Student \$10 for first year, \$15 each succeeding yr

Name:

Address:

City

State:

Zip:

Phone Numbers:

E-mail:

Mail form and check to NEKAAL
PO BOX 951, TOPEKA, KS 66601

FARPOINT CONTRIBUTORS

Help us improve and maintain Farpoint Observatory. A \$50 donation (membership dues not included) gets your name on a plaque on Farpoint's *Wall of Fame*.

- ☐ I am including an extra \$10 for a one year subscription to the Observer

Contributer Name:

Address:

City:

State:

Zip:

Name on Plaque:

- Donation is for
 ☐ Farpoint operating fund
☐ Telescope fund

Mail form and check to NEKAAL
PO BOX 951, TOPEKA, KS 66601

Meeting Schedule

NEKAAL meets monthly on the fourth Thursday, January through October, at Washburn's Stoffer Hall. The meetings are at 7:30 pm.

Guests are always welcome to join us for the General Meetings and/or observing at Farpoint.

July General Meeting

Thursday, July 22, 2004, 7:30 pm
Stoffer Science Hall, Room 103

Graham Bell: Recent Thinking on Cosmology

Who to contact:

<u>Meetings, Speakers:</u>	Graham Bell
<u>Farpoint Functions, Scheduling:</u>	Janelle Burgardt
<u>Farpoint Maintenance:</u>	Bill Leifer
<u>Special Presentations, Groups:</u>	Janelle Burgardt
<u>Dues, Donations, Merchandise:</u>	Walter Cole
<u>FAST:</u>	Gary Hug, Graham Bell
<u>Web Content</u>	Janelle Burgardt
<u>Observer Articles</u>	Graham Bell
<u>Other Web Issues:</u>	Russell Valentine
<u>General Questions:</u>	Any board member

Graham Bell	256-6281	gebell@mindspring.com
Janelle Burgardt	266-5624	sky_liebe@yahoo.com
Walter Cole	266-4911	w.i.cole@worldnet.att.net
David Costales	256-2327	dcostales@bigfoot.com
Julee Fisher	234-2826	
Gary Hug	836-7828	frogstar@intergate.com
Bill Leifer	478-4249	williamleifer@usa.net
Jerry Majers	862-8869	jmajers@cox.net
David Ryan	272-0177	dlryan@cox.net
Dan Tibbets		Ddtfp@aol.com
Russell Valentine	862-5046	russ@coldstonelabs.org

**These numbers and email addresses are not to be shared with others.
They are to be used by members only!**

"The REAL MEETING" Gathering



Please join us for post-meeting eats at Perkins Restaurant, 1720 SW Wana-maker. Some members refer to this as "the real meeting" which follows our general meeting each month.

Open House Dates for 2004

February 13	7:30	July 23	9:30
March 12	7:30	August 20	9:00
March 26	7:30	September 18	8:30
April 30	9:00	October 23	8:00
May 28	9:00	November 20	7:30
June 25	9:30		

Club Observing Dates for 2004

January 23-24	July 16-17
February 20-21	August 13-14
March 19-20	September 10-11
April 16-17	October 15-16
May 21-22	November 12-13
June 18-19	December 20-21

Farpoint Observatory

W. Long. 96°00'08.6" Elevation = 406 m
N. Lat. 38°53'24.9" = 1320 Ft.



The NEKAAL OBSERVER

NEKAAL

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TOPEKA, KS 66601

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