THE NEKAAL OBSERVER

October 2004 VOLUME 12, ISSUE 9

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

The *NEKAAL Observer* is the official publication of the Northeast Kansas Amateur Astronomers' League and Farpoint Observatory. NEKAAL, Inc. is an educational and scientific nonprofit corporation approved by the federal and state governments.

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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Member of the Astronomical League
www.astroleague.org

FROM THE PREZ: By Graham Bell

Tombaugh Project: This still appears to be on schedule for mid January. We are using the Holton High 16" Meade for NEO work until the Tombaugh arrives.

Neo Training: Bill Leifer is now doing solo NEO work. Russell Valentine, Janelle Burgardt and Dan Tibbets are trained for team work.

Brian Martin is the newest member of this team.

I encourage **all** team members who have not already done so to wrap up the astrometry training **ASAP**

E/PO Grant: We have the official paperwork from NASA announcing the award of this Grant. See Janelle's article for more details.

Genesis: I caught the crash of the Genesis probe on NASA TV, and have a tape of that event. Any member can borrow that tape by contacting me.

NEKAAL'S SECOND NASA GRANT: By Jan Burgardt

First question: WHY?
Answer: *Free Money!*

Shortly after being notified of the NEO research grant, NASA *asked us* to apply for more money! The idea was that the research provided a natural base for spreading the word about astronomy. Since one of NEKAAL's missions is to promote astronomy, it was logical to go for it.

Second question: What are we doing with the money?

The proposal had two main objectives: 1) create a portable outreach capability, and 2) expand the facilities at Farpoint for use by the general public and students. The portable outreach system consists of a laptop computer and projector, and an 8" GPS Schmidt-Cassegrain telescope. The facility expansion will include building a small observatory with roll-off roof and a 12" or 14" SC telescope permanently located in the new building.

Question #3: How are we going to use this stuff?

The laptop will be used for doing presentations at schools, groups and our own general meetings. We already have some ready-made

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Elections are approaching. It is time to nominate officers for 2005. For those getting the Observer online, the nomination form is in the files section. For those receiving hardcopy, the form is an insert into this copy of The Observer

In this issue...

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

October 3	Regulus and Venus ¼ ° apart in the morni ng sky
October 6	Last quarter moon
October 13	New moon
October 20	First quarter moon
October 21	Peak of the Orionid meteor shower
October 27	Full Moon This year's Hunter's Moon,. Total lunar eclipse in U.S. (details below)
October 31	Daylight Savings Time ends. Converting from Central Time to UT changes from +5 to +6.

Prominent Planets in the Morning Sky in October

Venus	Rises 3 hours before sunrise at magnitude -4
Saturn	Rises around midnight early in the month. The ring angle has near been near its maximum at 22°, but will now start to get smaller. Magnitude: +0.2.
Jupiter	Starts the month very low in the east, in Virgo, and gradually rises in the sky over the month. Magnitude -1.7.

Total Lunar Eclipse

This month's full moon on October 27th gives rise to a total lunar eclipse. Totality will last for 1 hour 22 minutes. Time for eclipse events is given below for Central Daylight Time.

Moon enters penumbra	**7:06 PM**		**Total eclipse ends**	**10:45 PM**
Partial eclipse begins	**8:14 PM**		**Partial eclipse ends**	**11:54 PM**
Total eclipse begins	**9:23 PM**		**Moon exits penumbra**	**1:03 AM**
Mideclipse	**10:04 PM**			

NEKAAL'S SECOND NASA GRANT:

(Continued from page 1)

presentations from NASA, and will be developing some of our own. The 8" GPS scope will make it MUCH easier to do star parties away from Farpoint. Having a GPS tracking scope will allow more people to look at more things through a telescope, thus increasing the *OOH-AHH* factor.

The building will be near the current observatory, at a yet-to-be determined place. It'll have a roll-off roof, a permanent telescope belonging to NEKAAL, and be wired for electricity, computer access, and maybe some other stuff. It can be used during Open Houses, for training by interns and FAST-NEO team members, and for other projects in the future.

Obvious question: *What does this do for me?*

First, the obvious answer. Becoming involved in research and outreach is something anyone in NEKAAL is encouraged to do, and the grant will make that easier. Having a program ready to go makes it simple for ANYONE to do a presentation to their own civic group, family gathering, PTA, bridge club, whatever. Having a portable telescope that belongs to NEKAAL means that more members can take the sky to more people. Having an education building provides a place tailored for use by the general public and students groups.

Now, the answer to the rest of the question: *What if I don't do outreach or NEOs???* Well, there will be a way to present more of the information available on the internet from NASA, JPL, PBS, other astronomers—you name it! There have been opportunities to present some really neat stuff, but we were limited by the lack of adequate technology. The General Meetings can get a lot more exciting! You can show your grandchild's class the Ring Nebula without bringing them to your house. You can impress the Benevolent Order of Buffaloes without having to say a word!

Ever head out for some quiet observing at Farpoint only to find 35 fifth-graders running around? They'll be somewhat corralled in the education building. Want to try astrophotography? There will be a video camera that can be set up on the NEKAAL 12" scope.

Last question: What do we have to do for all this?

NASA wants us to use the grant to do one of the things NEKAAL always has done: enjoy astronomy, and show others why we do. In particular, we try to reach the people in small towns around northeast Kansas, and let them see what we see. You can have some fun, learn some new things, and leave the paperwork to the two brave board members who volunteered!

Not a bad deal, is it?

THE SEXTANT: by Dr. Edwin Woerner

I follow activities and developments at Farpoint, just like everyone else. I've read about the 16-inch, as well as progress on the Tombaugh telescope project. By almost any standard, club members are adept at using many kinds of astronomical equipment.

But maybe a few pieces of hardware have been neglected.

When Helen and I left Riyadh, Saudi Arabia in the spring of 2003, we were well known as amateur astronomers. We had taken pictures, conducted public events, and shown the wonders of the sky to the neighborhood children. Our colleagues at the university thought we needed some kind of appropriate souvenir of our activities.

They came up with an antique sextant.

I do not know the history of our particular instrument, but the sextant was invented about 1730, by an American inventor named Thomas Godfrey and an English mathematician named John Hadley. A sextant is used to measure the angle between any two objects. They are used primarily for navigation.

Figure 1 shows the main parts of a sextant. There are two mirrors, one round and silvered, and the other half silvered and half unsilvered glass. The half silvered surface reflects on the right side (as seen from the eyepiece of the telescope).

Figure 2 shows the light paths for the sextant. The dark arrows demonstrate how sunlight or starlight is reflected off the silvered mirror, and again off the half silvered mirror into a small telescope. There are dark filters in two places in the optical path to ensure safety when looking at the sun.

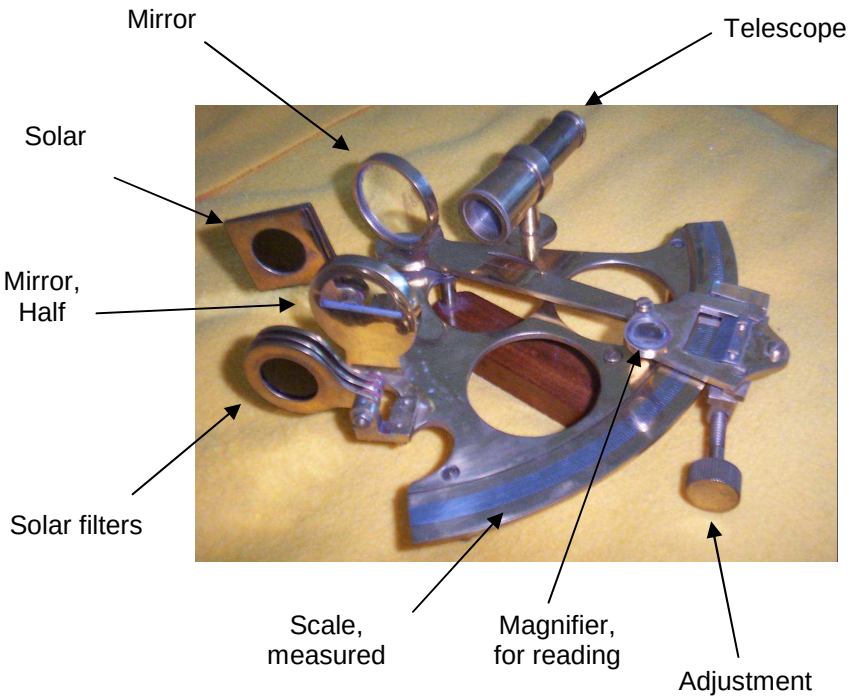

Figure 1, the main features of a sextant.

The observer sees the horizon directly, through the unsilvered part of the second mirror, as represented by the dotted arrow. Using the adjustment at the bottom, the observer changes the position and orientation of the second mirror so that the reflected image of the sun or star coincides with the horizon.

When the two images align exactly, the observer reads the angle between them off the scale along the bottom. There is a small magnifier to help, along with a vernier scale. This is necessary for accuracy. Since light from the sky is reflected twice, each degree on the scale equals two degrees of actual separation. The actual altitude of the sun or star would be twice the reading on the scale.

The scale along the bottom measures 60° total, so observers can measure angles of up to 120°. This is the source for the name of the sextant, that is, 60° equals one-sixth of the sky. An octant is a similar instrument, but with a scale of only 45°.

At sea it is easy to hold the sextant level. The horizon is perfectly flat and usually easy to identify. On land this may not be the case. For observations made on land, observers sometimes use an artificial horizon, often a pool of mercury. Since mercury is reflective, the observer can line up the image of the sun or star with its reflection in the mercury.

(Continued on page 5)

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.

FASTTRACKS: by Gary Hug

September's howling success
The dog days of summer had a few of us ' whimpering ' about the lack of good skies. We were able to 'scratch' out a few meager 'bones' to add to the collection of observations but in general we were 'buried' in the summer haze. Ah, but then came September, with so many very clear nights around a new moon! FAST's total NEO observations since the beginning of 1998 until August of this year was 976 observations. Granted in a lot of those years prior to receiving the NASA grant our main interest was in discovering main belt asteroids, but along the way we also sent in a few NEO observations to make the nearly one thousand observations.

Starting on the 9th of September until the 18th, 113 observations were added in the tally. We now have 1089 NEO data points, which is an 11.6 percent increase in just ten days! Add the fact its still just a few days past new moon (at the time of this writing) so it is likely more observations will be added this lunation. The use of a larger telescope and the wider FOV coupled with a slight increase in CCD sensitivity afforded by our new STL1001E camera has definitely helped. Neither of these improvements, however, were of much value without the clear skies we had this September. I now have a fresh enthusiasm for the return of the dog star and the cold crisp skies of winter where some of us old dogs will be under the night skies.

FAST Training Status

Students	**13**
Level 1 Certificate	**4**
Fully Cerfitied	**1**

AFFILIATED ORGANIZATIONS:

International Dark-Sky Association
IDA
http://www.darksky.org

Astronomical League
http://www.astroleague.org

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

6 Events Logged

OPEN HOUSE SATURDAY, OCTOBER 23, 2004

Please assist with the Open House on Saturday, October 23, 2004. It begins at 8:00, so it would help to get there around 7:30 to help set up and make coffee. Junk food is considered essential.

And don't forget member viewing on October 15-16.

: THE SEXTANT

(Continued from page 3)

Once the altitude of the sun or a star has been measured, the captain uses this information to determine the position. For example, if the sun has just reached its maximum altitude for the day, and the clock in the captain's cabin says that it's 8 a.m. back home, the captain knows the ship has traveled one-sixth the circumference of the Earth to the east.

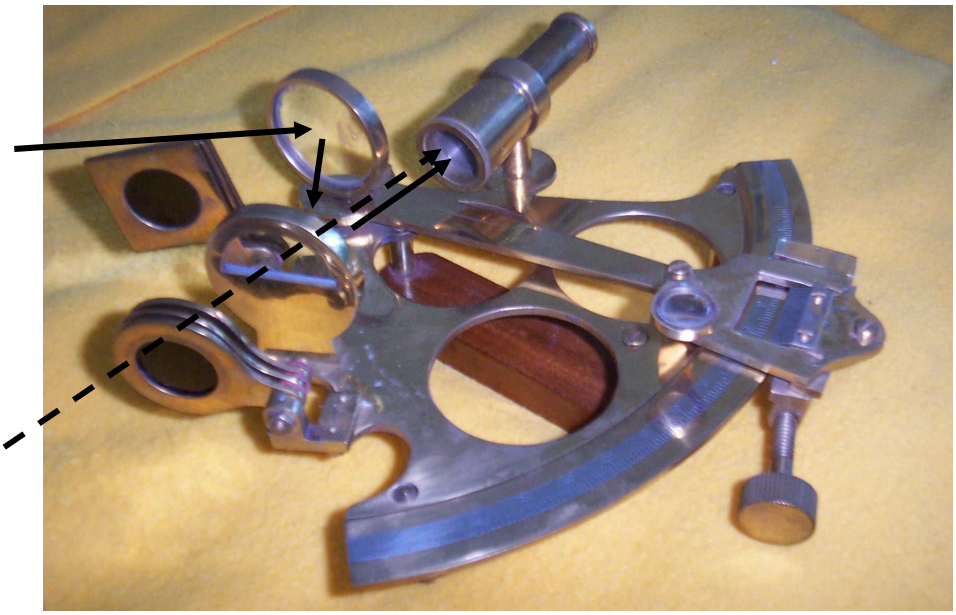

Figure 2, the optical paths in a sextant.

: BOARD MINUTES

September 12, 2004—by Bill Leifer (Unabbreviated version available in members Yahoo group)

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

The meeting was called to order by the Chairman, Graham Bell, at 2:37 PM on Sept. 12, 2004.

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

Finances: NASA has a freeze on funds transfers until Oct 1. Financial statement is on page 6 of the Observer. Insurance will increase about $1000 annually with new telescope.

Facilities See page 6 of the Observer.

Night Sky Network Six activities are on the calendar. We will participate in an Oct. 9 star party in Manhattan in which Janelle plans to use some of the NSN material. Debbie Roberts will also be using some material for a project, and information about this has been sent to the Topeka Capital-Journal.

FAST/NEO Bill attempted solo work. Russ and Bill have achieved Level I certification. There has been a lot of work done during this last dark run. Prior to the meeting, 70 observations had been made over the preceding 10 days and turned into the MPC

The 16" scope tracks well but has pointing problems that may be software-based. Gary will investigate further.

Tombaugh Telescope The scope construction process and progress was discussed. The 5" diagonal has been ordered, and we are achieving a savings of $100 from the original estimate of $500. It is being obtained from Intermountain Optics. Jerry Foote has informed us that the camera will not be needed until November, so we can continue to use it on the 16" until then.

Internet Connectivity **Complete** thanks to great work on Russell's part. Thanks Russ.

E/PO Grant The actual grant papers were passed out. We graded very well in most categories thanks to Janelle's hard work. A proposed budget for the E/PO program was circulated. A major and pressing priority is a campus plan for approval, so that work can be bid out Janelle will bring a proposed plan to the next board meeting.

Computer Needs The recommendation was for two high speed computers with 17" flat screens or 19" CRT, a laptop with 15" screen, and a projector. The recommendation was accepted by consensus. Graham will be checking with Dell for education package pricing opportunities.

Web Service Design Gary will handle the FAST portion.

New Business

The problem of computer room lights interfering with dark adaptation of those involved in public presentations during nights when NEO work is going on at the same time was discussed. All agreed that, on those occasions, the computer room door would be kept closed and that red lights will be used, particularly when the door into the meeting room is opened.

Debbie Roberts may need observatory keys. As the first potential new keyholder since development of the keyholder guidelines, Debbie will need to go throught the orientation checklist. Bill agreed to contact her to make an appointment.

Gary discussed some points regarding how to use the 16" scope.

Graham presented a book that he had obtained, called "Quantum Universe" that he is donating to the FPO library.

There being no further business, the meeting was adjourned at 3:57 PM.

Respectfully submitted:
Bill Leifer, Secretary
9/22/04

FINANCES: by Walter & Nancy Cole

Nekaal-Bank, Cash,CC Accounts 9/1204

NEKAAL Cash Flow Report
1/1/04 Through 9/12/04

Category	
INFLOWS	
Contributions	1,926.00
Contributions-In Kind	558.42
Dues 2004	845.00
Int Inc-Interest Income	2.15
NASA Grant	29,898.00
Net Sales:	
Cost of Mdse	-392.66
Sale of Mdse	136.00
TOTAL Net Sales	-256.66
TOTAL INFLOWS	**32,972.91**
OUTFLOWS	
Annual Report	40.00
Computer:	
Computer Equip.	500.00
Internet access-dial up on line	438.27
TOTAL Computer	938.27
Dues	250.00
Equipment-astronomy Scope	22,184.65
Equipment-astronomy-Other	10,880.00
TOTAL Equipment-astronomy	**32,664.65**
FPO Utilities	379.73
Office-Office Expenses	42.15
Repair & Maint	57.33
Subscriptions:	
Magazine Subs	131.80
Subs.payments recd	-131.80
TOTAL Subscriptions	0.00
Supplies-Supplies	84.28
Telephone-Telephone Expense	291.76
TOTAL OUTFLOW	**35,148.17**
OVERALL TOTAL	**-2,175.26**
1/01/04 Beginning Cash	$5,312.42
Net outflow	2,175.26
8/08/04 Ending Balance	**$3,137.16**

Cash Account Balances– Assets and Liabilities 9/12/04

Assets	
Cash and Bank Accounts	
Money Market 1	1,571.58
Money Market 2 (Telescope)	698.00
NEKAAL—Checking	867.58
Total Cash and Bank Accounts	3,137.16
Total Assets	**3,137.16**
Liabilities	**0.00**
Overall Total	**3,137.16**

FACILITIES—SEPT 2004: by Bill Leifer

- September supplies and preventive maintenance were performed.
- The 16" scope on loan from Mike Ford was installed on its pier. Some additional holes were drilled in the pier base to mount on the existing floor supports. It was then polar aligned.
- A perforated rubber mat was placed under the big camera to cushion it from any drops.
- The shear pin to the roof mechanism was found broken and replaced.
- The mast holding the antenna for wireless internet connection to the high school was raised to minimize interference from the metal roof when the roof has been retracted.
- The construction of the new FPO sign remains pending.
- Printing supplies were purchased.
- A circulation fan and desk light will be purchased for the computer room.
- Janelle Burgardt is designing a campus plan to use E/PO grant money to build other structures to provide telescope storage and observatory space for members that will be needed when the Tombaugh telescope is installed in January.
- No one has shampooed the meeting room carpet, including me. I am not kidding.
- Two trucks with roof lights were seen one night racing in circles on the observatory grounds potentially tearing up the grass and raising concerns about valdalism, particularly after the vandalism event at the school. This was reported to the sheriff, who raced to respond after a couple of hours. The vehicles were later spotted by Gary parked on the school grounds. Walt and Graham promised never to do that again while Gary is observing.

M42 Taken by Gary Hug with the 16" Meade and the new STL1001E SBIG Camera.

October 2004

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6 Last Qtr	7	8	9
10 Nomination Deadline	11	12	13 New	14	15	16
17 Board Meeting 3:30	18	19	20 1st Qtr	21 **Orionid** meteor shower peak	22	23 Observer articles due
24	25	26	27 Full **Lunar Eclipse**	28 NEKAAL Meeting 7:30	29	30
31 DST ends 						

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 CONTRIBUTERS

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
☐ General fund ☐ Telescope fund
☐ Education/Outreach 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.

September General Meeting
Thursday, October 28, 2004, 7:30 pm
Stoffer Science Hall, Room 103
To be announced

Who to contact:

Meetings, Speakers:	Graham Bell
Farpoint Functions, Scheduling:	Janelle Burgardt
Farpoint Maintenance:	Bill Leifer
Special Presentations, Groups:	Janelle Burgardt
Dues, Donations, Merchandise:	Walter Cole
FAST:	Gary Hug, Graham Bell
Web Content	Janelle Burgardt
Observer Articles	Graham Bell
Other Web Issues:	Russell Valentine
General Questions:	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 Wanamaker. 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
PO BOX 951
TOPEKA, KS 66601

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