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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.

From the Prez: By Graham Bell

2004 NEKAAL Officers
President Graham Bell
Vice-president Jerry Majers
Secretary Bill Leifer

Board of Directors
Chair Graham Bell
Treasurer Walter Cole

At Large
Janelle Burgardt David Ryan
David Costales Dan Tibbets
Julee Fisher Russell Valentine
Gary Hug

Advisory Board
Dr Steven Black (WU)
Dr Karen Camarda (WU)
Dr Darrell Parnell (WU Retired)
Dr. Bruce Twarog (KU)

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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.

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 (Continued on page 2)

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

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

October 3  Regulus and Venus ¼ ° apart in the morning 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.

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moon enters penumbra</td>
<td>7:06 PM</td>
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<tr>
<td>Partial eclipse begins</td>
<td>8:14 PM</td>
</tr>
<tr>
<td>Total eclipse begins</td>
<td>9:23 PM</td>
</tr>
<tr>
<td>Mideclipse</td>
<td>10:04 PM</td>
</tr>
<tr>
<td>Total eclipse ends</td>
<td>10:45 PM</td>
</tr>
<tr>
<td>Partial eclipse ends</td>
<td>11:54 PM</td>
</tr>
<tr>
<td>Moon exits penumbra</td>
<td>1:03 AM</td>
</tr>
</tbody>
</table>

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:

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<thead>
<tr>
<th>Periodicals</th>
<th>T-shirts</th>
<th>Sweats</th>
<th>Name Tags</th>
<th>Tote Bags</th>
<th>Coffee Mugs</th>
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<td>$10.00</td>
<td>free</td>
<td>$8.00</td>
<td>$10.00</td>
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<td></td>
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</tr>
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Merchandise

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<tbody>
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<td>$8.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
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<tr>
<td>Level 1 Certificate</td>
<td>4</td>
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<tr>
<td>Fully Certified</td>
<td>1</td>
</tr>
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</table>

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/

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)


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

<table>
<thead>
<tr>
<th>Category</th>
<th>INFLOWS</th>
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<tr>
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<td>Contributions-In Kind</td>
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<td>TOTAL Net Sales</td>
<td>-256.66</td>
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<tr>
<td>TOTAL INFLOWS</td>
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<td>32,972.91</td>
</tr>
</tbody>
</table>

| | NET SALES | | |
| | Cost of Mdse | -392.66 | FPO Utilities | 379.73 |
| | Sale of Mdse | 136.00 | Office-Office Expenses | 42.15 |
| | TOTAL Net Sales | -256.66 | Repair & Maint | 57.33 |
| | TOTAL OUTFLOW | 35,148.17 | Subscriptions: | |
| | | | Magazine Subs | 131.80 |
| | | | Subs.payment 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

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<th>Assets</th>
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<td>Total Assets</td>
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<tr>
<td>Overall Total</td>
<td>3,137.16</td>
</tr>
</tbody>
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M42 Taken by Gary Hug with the 16” Meade and the new STL1001E SBIG Camera.
### October 2004 Calendar

**Weekdays:** Sun, Mon, Tue, Wed, Thu, Fri, Sat  
**Days:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31

**Notable Events:**  
- 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 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
- [ ] 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

---

“The REAL MEETING” Gathering

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

Open House Dates for 2004

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Time</th>
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</thead>
<tbody>
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<td>March 26</td>
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<td>April 30</td>
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<td>May 28</td>
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Club Observing Dates for 2004

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<td>November</td>
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<tr>
<td>December</td>
<td>20-21</td>
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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

ADDRESS SERVICE REQUESTED