



FARPOINT OBSERVATORY

THE NEKAAL OBSERVER

March 2004 VOLUME 12, ISSUE 3

PO BOX 951, TOPEKA KS 66601

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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

The NASA grant money still has not arrived. Lindley Johnson, who is in charge of NEO activities for NASA is trying to expedite this, and hopes to have the grant within the next week or two. Until we get the paperwork, we are stymied with respect to starting work on the telescope or acquiring the new CCD camera.

A lot of activities related to this grant are underway, however. Janelle Burgardt is wrapping up another grant proposal, tied to this one. If approved, it would provide about \$15,000 to support our outreach activities. As part of this effort, Janelle has established a working relationship with both Holton High and Mission Valley. This is now a formal, written relationship, so we may finally have active participation from Mission Valley.

Once everyone who is currently working on it completes their training, we will have a core group of about 14 FAST members involved in the NEO research. Members of the expanded FAST group are studying astrometry now, and will soon be imaging NEOs

and doing their measurements at Farpoint.

Russell Valentine has nearly completed the activities to get us access to the MVHS high speed internet service. As soon as school is out, MVHS will let us connect to their server, and we will finally have contact with the outside world, particularly the Minor Planet Center and the Weather Satellite Service. We are also setting up communication with Powell Observatory, so that we can coordinate NEO activities with them. This will avoid, or at least mitigate, the duplication of efforts between these groups.

Efforts are under way to acquire a couple of new very fast (for FAST) computers at Farpoint. These, with some additional software, will make our NEO research much more productive.

Please take note of the announcements for the Ad Astra Conference (page 6) and MARAC (page 4). I attended the MARAC last year and found it quite enjoyable, though it was quite technical in nature.

OPEN HOUSE AND OBSERVING NOTES : *Janelle Burgardt*

Apology

A classroom group has been scheduled for a viewing session at Farpoint on Friday April 16—a club observing weekend. The Kansas spring monsoon season has required a lot of cancellations, making rescheduling just plain ridiculous. Due to other commitments at the

school, scheduling on this date became necessary. Sorry for the inconvenience

Additional Open House

An additional public open house has been scheduled at FPO for Friday, March 26, for the 5-planet window. Weather forecasts look like rain, but we have to try.

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

April 4	Daylight Savings Time begins. To convert from UT (Universal Time), subtract 5 hours instead of 6.
April 5	Full Moon Known as the Grass, Egg or Frog Moon.
April 11	Last quarter moon
April 15	Mercury at inferior conjunction
April 19	New moon
April 22	Peak of the Lyrid meteor shower.
April 27	First quarter moon.

Did you know?...that this moon's full moon sets the date for Easter? Easter is defined as the first Sunday after the first full moon after the vernal equinox. This month's full moon is the first since March 20, making April 11 Easter Sunday.

The Planets this month:

Mercury -- only visible the first week of the month.

Venus – as bright as it gets (-4.5) and as high as it gets (44 degrees) in the western sky

Mars – an orange dot at +1.5 magnitude in Taurus

Jupiter – beneath the body of Leo the Lion, shining at -2.3

Saturn – shining overhead at +0.1, on the Castor "leg" in Gemini

Uranus, Neptune, Pluto -- barely visible in morning twilight by the end of the month

FASTTRACKS: by Gary Hug

I recently called SBIG and talked with Alan Holmes about a problem with maintaining correct time using SBIG cameras. The problem has always been there but it is very noticeable (to the tune of 4 to 7 sec) after a long run of short exposures such as 30 images of 5 seconds each. In slow moving main-belt asteroids the problem is not severe and is unlikely to be the predominant error. However in fast moving NEOs the error is exasperated by the number of images (X no. of images = X times the error is added). Further, the objects with an apparent velocity of 60"/minute means that every 1 second error translates into 1 second of positional error. By the end of the series of 30 images the positional error can be as high as 10 seconds of arc. This is exactly when you need more accuracy and precision and it is the time both are

at there lowest.

However, please note the most egregious timing errors are a result of using **parallel** cameras. Apparently (and I'm no Russ Valentine on this:-)), parallel cameras shut the timing sequence down when it reads out the ccd chip. So every time it reads there is a few tenths of a second loss. Of course using a time system like Farpoint has installed on its imaging computer eliminates the need to manually correct. And it does update frequently so that the timing errors don't accumulate more than a few minutes. The **newer SBIG** cameras utilize **USB** connections and a read-out buffer to all but eliminate timing errors. There is still some residual error in the delay between when the clock starts and the shutter is actually out of the way of the chip to allow an

image to accumulate. Alan mentioned this may become a project for their software engineers. They could possibly measure the delay and give you the option of resetting the time to compensate for an average delay at least minimizing the error.

Fortunately our proposed new camera the STL1001E is a USB connected camera and the main timing error is likely to be from the shutter but its not cumulative and is likely a tenth to several tenths long. Who knows, maybe by the time we're using the STL1001E the software will already compensate for this shutter delay and our images and Astrometry will be the more accurate for it...

cheers,
Gary

NASA NIGHT SKY NETWORK: by Janelle Burgardt

NEKAAL has been accepted as a member of the NASA Night Sky Network. A new program supported by NASA, JPL and the Astronomical Society of the Pacific (ASP), NSN was formed to assist amateur astronomy clubs with their education and outreach

programs. Membership was awarded based on past education and public outreach efforts, and commitment to space science and astronomy education. Participating clubs receive materials and demonstration resources for use at club meetings, schools and

youth and community group events. The cost to NEKAAL: use the materials five times in the next year, and report those activities to NSN. That's it—*just use it 5 times!*

We've received the first Out-

(Continued on page 3)

(Continued from page 2)

reach Toolkit, "Planetquest". There hasn't been time to review the materials thoroughly, but on initial review, it is **loaded!** Besides all sorts of "toys" for demonstrations, it contains a training video, a CD containing a manual and

resource information, pictures, post-cards – *fun stuff!*

What does this mean for NE-KAAL? It's a chance to have professionally prepared materials for outreach activities. This will make it easier for more people to make better

presentations, increasing our visibility in the community and maybe even getting some more members!

Stay tuned—more information to come!

SCIENCECRAFT: by Patrick L. Barry and Tony Phillips

Probes that can distinguish between "interesting" things and "boring" things are vital for deep space exploration, say JPL scientists.

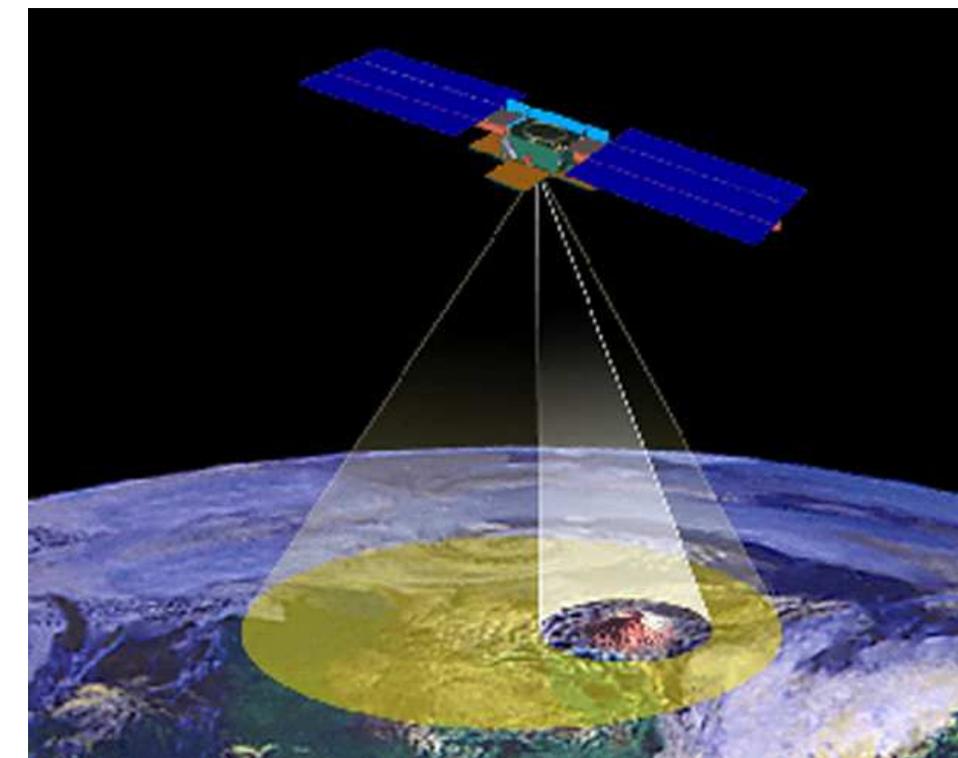
Along with his colleagues in NASA's Space Technology 6 Project (ST6), JPL's Steven Chien is working to develop an artificial intelligence technology that does just that. They call it the Autonomous Sciencecraft Experiment, and it's one of many next-generation satellite technologies emerging from NASA's New Millennium Program.

As humanity expands its exploration of the outer solar system-or even neighboring solar systems!-the probes we send suffer from two unavoidable handicaps. First, commands radioed by mission scientists on Earth take a long time to reach the probe: six hours for the planned New Horizons mission to Pluto, for example

Second, the great distance also means that data beamed back by the probe trickles to Earth at a lower bandwidth-often much less than an old 28.8 kbps modem. Waiting for hundreds or thousands of multi-megabyte scientific images to download could take weeks. And often many of those images will be "boring," that is, they won't contain anything new or important for scientists to puzzle over. That's certainly not the most efficient way of using a multi-million dollar probe.

Even worse, what if one of those images showed something extremely "interesting"-a rare event like a volcanic eruption or an unexpected feature like glaciers of methane ice? By the time scientists see the images, hours or days would have passed, and it may be too late to tell the probe to take a closer look

But how can a probe's computer brain possibly decide what's "interesting" to scientists and what's



The Autonomous Sciencecraft technology that will be tested as part of NASA's Space Technology 6 mission will use artificial intelligence to select and transmit only the scientifically significant images.

not?

"What you really want is a probe that can identify changes or unique features and focus on those things on its own, rather than just taking images indiscriminately," says Arthur Chmielewski, one of Chien's colleagues at JPL.

Indeed, that's what Chien's software does. It looks for things that change. A mission to Jupiter's icy moon Europa, for instance, might zero in on newly-formed cracks in the ice. Using artificial intelligence to set priorities, the probe could capture a complete movie of growing fractures rather than a single haphazard snapshot.

Until scientists can actually travel to deep space and explore distant worlds in person, they'll need spacecraft "out there" that can do some of the thinking for them. Sciencecraft is leading the way.

Learn more about Sciencecraft at nmp.nasa.gov/st6. Kids can make a "Star Finder" for this month and learn about another of the ST6 technologies at spaceplace.nasa.gov/st6starfinder/st6starfinder.htm.

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

SOME SOUTHERN OBJECTS IN THE WINTER-SPRING SKY by Dr. Edwin Woerner

The winter Milky Way is one of the skies less known regions. Maybe that's because of cold temperatures, maybe because it isn't as flashy as its summer counterpart, and maybe because the winter season offers so many other bright objects. East of Orion, it flows south, past Sirius and Procyon, through the constellations of Monoceros and Puppis. From there it turns eastward, passing through Carina, Vela, and into Centaurus. Then it starts wandering back north, eventually becoming the summer Milky Way. There are some well-known objects here – the Rosette Nebula and M93 for example. But farther south are several others I'd like to mention.

Helen and I observe from a desert location about 60 kilometers from Dubai. Low along the northern horizon are lights from the cities along the Gulf coast. But our southern view is excellent.

Although sometimes called the Southern Hemisphere's answer to the Veil Nebula, the Vela Supernova Remnant is much fainter, and its detailed structure is harder to observe in a small telescope. It covers several square degrees of the sky and contains many bright stars and several open clusters within its borders. In my 6-inch Newtonian, without any sort of nebula filter, I see two disconnected components to the nebula. The northern part appears brighter and better defined, especially on its western edge. The southern piece is fainter and smaller. References give various lengths of time since the original supernova, usually

stating a figure of between 5 and 15 thousand years. Some suggest that more than one supernova was originally involved.

Vela is also home to a 7th magnitude globular cluster – NGC 3201. At higher power the 6-inch shows a large, bright disk with some granularity but no real resolution. Lacking an extremely prominent central core, the cluster gradually fades into nothingness. At about 47° South declination, the globular barely rises in Kansas.

Moving eastward into Carina we come to one of the night sky's showpiece deep sky objects – the Eta Carinae Nebula and associated open clusters. Despite being low in UAE skies, this object is easily visible with the naked eye, looking like a glowing thumbprint in the sky. Our 7x50 binoculars show a dark lane, known as the Keyhole. The 6-inch reveals complicated structure in the Keyhole and throughout the entire nebula. At right angles to the Keyhole, like a backbone, is a long crescent of bright stars.

About three degrees east of the nebula is an open cluster that would attract much more attention if Eta Carinae weren't so near. NGC 3532 consists of a fine mist of tiny stars spread evenly over an area more than 1° across. Reminding me of M46, this cluster appears elliptical in 7x50 binoculars, and resolves into stars like sparkling diamonds at low powers, revealing ever more as the magnification is increased.

Continuing eastward the famous Omega Centauri globular cluster appears

as an obvious fuzzy disk to the naked eye. In binoculars it is clearly elliptical in shape, and even low powers in the 6-inch resolve many stars. At higher powers the scope resolves stars to the core. Far from symmetrical, the bright center is nowhere near the middle of the elliptical shape. Omega is a very loose globular, much like M22 in Sagittarius but appearing several times larger and two magnitudes brighter.

Moving about 5 degrees north from Omega is NGC 5766, the often photographed Centaurus A galaxy. This object was one of the first galaxies discovered to have an active nucleus, and it is easy to see that something serious is happening here. The giant elliptical galaxy shows its circular disk in 7x50 binoculars, and the telescope shows a dark lane across it. But the lane is different from those across spirals like M104. At higher power the lane itself shows structure. In the past this galaxy apparently swallowed another, smaller galaxy, and this is the source of radio emissions. This is the brightest galaxy in the sky after M33 (M81 is about equally bright) and some claim to see it with the naked eye. I have never done so, but I plan to keep trying.

Both NGC 5766 and Omega Centauri rise at Farpont. They are directly south of M83, a large bright galaxy in Hydra, by about 12° for NGC 5766 and by 17° for Omega. So next time you're in that neighborhood, keep going south.

HERE ARE SOME PRICES:

S&T	\$32.95		Sweatshirt	\$10.00	marked down
Astronomy	\$29.00		Name tags	free	
hats	\$8.00	marked down	Tote bags and cups	in the process of ordering. Prices not sure yet.	
Tshirts	\$8.00	marked down			

NEXT BOARD MEETING—EARLY

Please note that the April NEKAAL Board Meeting will be on April 4, 2004 instead of April 11. April 11 is Easter Sunday.

MARAC CONFERENCE

The Mid-American Regional Astrophysics Conference will be held at Linda Hall Library in Kansas City on April 15 and April 17. See <http://www.physics.ku.edu/marac/announcement.html> for details. Also note the enclosed poster pertaining to the featured speaker for this conference.

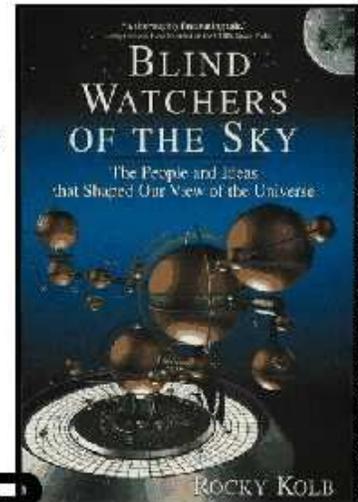
FINANCES:

Your Editor messed up again—there is no financial statement in The Observer this month.

AAS 2nd Century Lecture



Dr. Rocky Kolb
Fermilab/Univ. of
Chicago



COSMIC
QUESTIONS?

FRIDAY, APRIL 16, 2004

8:00 PM

Royall Hall

UMKC

Free and Open to the Public

in conjunction with the

34th annual

MidAmerican Regional Astrophysics
Conference

see www.physics.ku.edu/marac/marac.html for more info

ABBREVIATED BOARD MINUTES by Russell Valentine (substituting for Bill Leifer)

03-14-2004 board meeting

- o In Attendance: Gary, Graham, Russell, Julee, Janelle, Dan, Walt, Jerry
- o Minutes approved
- o Finances - reported finance statements
- o Facilities - Using power from school. There are some holes in the outside back wall from holding up a pole that will have a antenna for internet access. Sometime they need to be filled.
- o 2004 Goals:
 - Night Sky network
 - New Computer - try to get 2 new computers plus software ACP2 for remote sessions ~ \$7500.
 - 27" Telescope - get the scope built
 - Internet up - get internet access from the school through wireless connection.
 - Fundraising
 - Astrometry program going
 - EPO grant
- o Mail Box - Looks ok for now, it will be replaced later from construction company.
- o Position descriptions - More people need to send position descriptions to Janelle
- o Night Sky Network - First kit came, will use the kit for club presentations and classrooms.
- o EOP grant:
 - Getting letters of support
 - finalizing a few finishing touches, (buget figures, end dates)
 - propose money for facilities, scope, video camera, laptop, projector.
- o NASA Paperwork - No word from NASA yet
- o Scope redesign - Nothing new
- o Key Holder guidelines - Suggest in future for instructions about your responsibility to have keys to farpoint to be given with keys. (Assigned to Bill)
- o Misc
 - Calander to schedule FAST activity
 - Astronomy day - probably not going to plan something
 - Press release - get press release about grant and night sky network ready
 - Find a name for the 27" telescope

Russell Valentine

ASTRONAUT STEVE HAWLEY COMES TO WU

The Ad Astra Kansas Day! Conference is being held on April 24, noon to 5 (times may change). The main presenter this year is Astronaut Steve Hawley, a Kansan, who still works for NASA.

Other presenters include:

Randall Chambers, Ph.D, DABFM, DABPS, BCETS; Chambers spent over 25 years as a former NASA aerospace engineer and chief life scientist and a Department of Defense principal scientist doing research, engineering, technology, and astronaut and flight crew training in civilian and military space projects.

Dr. Kevin Price is the Associate Director of the Kansas Applied Remote Sensing Program (KARS) at the University of Kansas.

Daniel Bateman, B.A., community outreach manager of the Kansas Cosmosphere and Space Center is an authority on the Space Shuttle and International Space Station

Dr. Karen Camarda of Washburn University (topic to be announced)

Graham Bell, president of NEKAAL and co-discoverer of Comet Hug-Bell, will discuss the comet discovery and other minor planet research appropriate to amateur groups.

More presenters will be announced.

Crane Observatory will be open that night for viewing through the 115-year-old refracting telescope. The viewing session will be hosted by the Crane Observatory Crew.

The Ad Astra Kansas Day! Conference is sponsored by the Ad Astra Consortium and hosted by the Department of Physics and Astronomy of Washburn University.

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.

April General Meeting

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

Janelle Burgardt: *Night Sky Network*

Whom do you contact:

<u>Meetings, Speakers:</u>	Graham Bell
<u>Farpoint Functions:</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

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

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

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