

NASA's Mars Phoenix Lander can be seen parachuting down to Mars, in this image captured by the Mars Reconnaissance Orbiter. Image credit: NASA/JPL-Caltech/University of Arizona.

# The Skyscraper

Vol. 35 No. 6 June 2008

SKYSCRAPERS, INC · Amateur Astronomical Society Of Rhode Island · 47 Peepetoad Road North Scituate, RI 02857 · www.theSkyscrapers.org

## June Meeting with Gerry Dyck

**Astronomical Motifs in South-East Asian Bronze Drums**

Friday, June 6 at Seagrave Memorial Observatory

My talk will center on the symbolism found on the faces of S.E.Asian bronze drums - a central star figure radiating outward through a series of concentric circles containing figures of fish & fowl, flowers & grains, all flanked by four frogs at the cardinal points. The majority of scholars have seen in these drum faces a miniature picture of the life-giving nature of the sun. One modern researcher, however, suggests a simpler solution. The talk will show

the origins, method of casting, and the process of making art rubbings to document the variety of patterns found. I will also display some of my drum rubbings made from the drums of the Karen people of northwestern Thailand. The talk is not primarily astronomical, though it has some interesting astronomical features. Keep in mind the adage, "when correctly viewed, everything is astronomical."

### In This Issue

<b>June Meeting with Gerry Dyck</b>	<b>1</b>
<b>President's Message</b> <i>Glenn Jackson</i>	<b>2</b>
<b>The ISS, Space Shuttle &amp; Iridium Flares, Oh My!</b> <i>Dave Huestis</i>	<b>3</b>
<b>Ozone, the Greenhouse Gas</b> <i>Patrick L. Barry</i>	<b>4</b>
<b>June 2008 Celestial Events</b> <i>Craig Cortis</i>	<b>5</b>
<b>May Meeting Notes</b> <i>Joel Cohen, Acting Secretary</i>	<b>6</b>
<b>Treasurer's Report</b> <i>Jim Crawford</i>	<b>6</b>
<b>Phoenix on Mars</b>	<b>7</b>
Directions to Seagrave Memorial Observatory	<b>8</b>



## June 2008

**6**  
Friday

7:30 pm **June Meeting with Gerry Dyck**  
Seagrave Memorial Observatory

**7**  
Saturday

8:00 pm **Variable Star Workshop**  
(rain date, if cancelled on May 31)  
Seagrave Memorial Observatory, weather permitting, contact Gerry Dyck if interested:  
geraldpdyck@yahoo.com

9:00 pm **Public Observing Night**  
Seagrave Memorial Observatory, weather permitting

**14**  
Saturday

9:00 pm **Public Observing Night**  
Seagrave Memorial Observatory, weather permitting

**21**  
Saturday

9:00 pm **Public Observing Night**  
Seagrave Memorial Observatory, weather permitting

**28**  
Saturday

9:00 pm **Public Observing Night**  
Seagrave Memorial Observatory, weather permitting

# President's Message

Glenn Jackson

Welcome to summer at Seagrave Observatory. Here is hoping that the summer months bring clear skies, especially on those nights that we have star parties scheduled. The interest in star parties continue, but the weather and cloud cover is still an issue. I would like to remind everyone that we have a "Variable Star Workshop" scheduled for May 31st with a rain date of June 7th. Gerry Dyck and company have put together a great workshop. Weather permitting, I hope that we have a good turn out for this event. Mark your calendar.

I would like to take this opportunity to thank Jerry Jeffrey, who had to resign as trustee due to health problems, for all of the long hours he spent improving the viewing at Seagrave Observatory. His efforts are enjoyed by all with the increase in our viewing horizons. I would also like to thank Jim Brenek for his contributions as "Member at Large" for the past year, and also stepping up to the plate to take on the responsibilities of Trustee. Also welcome aboard to the 2008-2009 administration to Roger

Forsythe, Roger has agreed to coordinate the "Night Sky Program" we look forward to our opportunities to be a part of this nationally recognized program.

Looking ahead to the June 6th meeting. There is a special election in process for the replacement Trustee position vacated by Jerry Jeffrey. Joe Sarandrea and Steve Siok are on the ballot for this position. You should have received your "Special Ballot" via e-mail or snail mail. I encourage all to either mail you ballot or bring your ballot to the June meeting. No ballots will be available at the meeting. The nominating committee will have the results of the election before the end of the June meeting.

Mark your calendar for the July 12th Skyscraper Family cookout. We will be taking a head count at the June meeting so that we can better plan on the number attending. So if you could check you calendar before the meeting that would be appreciated.

Looking forward to seeing all at the June 6th meeting.



*The Skyscraper* is published monthly by Skyscrapers, Inc. Meetings are usually held on the first Friday of the month. Public observing is usually held every Saturday night at Seagrave Memorial Observatory, weather permitting.

### President

Glenn Jackson [skyscraperjglenn@aol.com](mailto:skyscraperjglenn@aol.com)

### 1st Vice President

Steve Hubbard [cstahs@yahoo.com](mailto:cstahs@yahoo.com)

### 2nd Vice President

Kathy Siok [kathys5@cox.net](mailto:kathys5@cox.net)

### Secretary

Nichole Mechnig [jrmnk1@cox.net](mailto:jrmnk1@cox.net)

### Treasurer

Jim Crawford [jrcrawford@cox.net](mailto:jrcrawford@cox.net)

### Members at Large

Joe Sarandrea [jboss2@cox.net](mailto:jboss2@cox.net)

Roger Forsythe [galaxy-77@cox.net](mailto:galaxy-77@cox.net)

### Trustees

Tracey Haley [mtk99h@cox.net](mailto:mtk99h@cox.net)

Jim Brenek [jbrenek@cox.net](mailto:jbrenek@cox.net)

### Star Party Coordinator

Bob Forgiel [bforgiel@cox.net](mailto:bforgiel@cox.net)

### Librarian

Tom Barbish [labtjb@verizon.net](mailto:labtjb@verizon.net)

### Historian

Dave Huestis [dhuestis@aol.com](mailto:dhuestis@aol.com)

### Editor

Jim Hendrickson [jim@distantgalaxy.com](mailto:jim@distantgalaxy.com)

### Directions

Directions to Seagrave Memorial Observatory are located on the back page of this newsletter.

### Submissions

Submissions to *The Skyscraper* are always welcome. Please submit items for the newsletter by June 15 to Jim Hendrickson, 1 Sunflower Circle, North Providence, RI 02911 or email to [jim@distantgalaxy.com](mailto:jim@distantgalaxy.com).

### Email subscriptions

To receive *The Skyscraper* by email, send email with your name and address to [jim@distantgalaxy.com](mailto:jim@distantgalaxy.com). Note that you will no longer receive the newsletter by postal mail.



**From the Archives:** From left to right, Albert Ingalls, Russell Porter, Charles Smiley - taken at Stellafane 1941.

# The ISS, Space Shuttle & Iridium Flares, Oh My!

Dave Huestis



ISS from Space Shuttle Endeavour (STS-123), 24 March 2008. NASA Photo.

Though the summer season unofficially begins with the Memorial Day weekend, astronomically speaking the summer solstice doesn't occur until June 20 at 7:59 pm. On that date the Earth's northern hemisphere is tilted at its maximum towards the Sun and at local noon the Sun reaches its highest point in our sky here in Southern New England.

With warm weather and longer days, many folks spend more time outdoors. And with gasoline prices skyrocketing I will bet families will opt for more local outings, perhaps camping at nearby campgrounds.

You don't have to know very much about astronomy to appreciate the beauty of the night sky. But while you are out there casually stargazing from a dark sky location, you might see some other interesting objects. You'll see some familiar constellations, and of course there are a few meteors on any clear night. And you might see the Moon and a naked-eye planet or two.

But every now and then some unknown object may traverse the sky. You might even see a brief, but bright flash.

The uninformed might think UFO, but more than likely there is an earthly explanation.

I am often amazed that folks forget that we earthlings have launched thousands of satellites into Earth orbit. In dark skies a keen eyed-observer can see several dozen satellites on a clear and moonless night. And the brightest of them all right now is the International Space Station (ISS).

This orbiting laboratory is so large and reflective that it can be easily seen when it makes a favorable pass over Rhode Island. Hey, if it can be seen

from Ladd Observatory on Providence's East Side then you shouldn't have any difficulty from elsewhere in Rhode Island.

And when the Space Shuttle is in orbit you can see it as well. In addition, if the shuttle docks with the ISS, the then combined spacecraft is even brighter still. But how does one know when these vehicles will pass through our skies? There's a great website called Heavens Above (<http://www.heavens-above.com/>) That provides this information. After inputting your geographic location you can obtain a schedule of ISS/Space Shuttle flyovers. You can also find the passages of other satellites as well.

The Heavens Above site also provides other information. And one of my favorites, and that of many of our guests at Seagrave and Ladd observatories, is predictions for events known as Iridium flares.

Iridium satellites are low Earth orbit communications satellites designed to be the "cell phone" technology of their day (1997). The service was too expensive for the general public, so the business venture went bankrupt. Lucky for us, in 2001 the satellites were bought by private investors and spared a fiery re-entry into Earth's atmosphere.

Here's what we regularly observe. Each Iridium has three main mission antennas which are highly reflective. The orbit of each satellite is precisely known, as is its orientation to the earth. Therefore, for any location on the ground, it is possible to calculate the angle between the satellite, the sun and an observer. When you get a perfect reflection of the sun off one of the antennae, the observer gets flashed by the satellite.

The brightness of the flash or flare depends on how perfect that angle is. From one location the flash may appear 30 times brighter than Venus, while at a location just 27 miles away the same satellite may flash no brighter than Sirius, the brightest star seen in our nighttime sky!

It's incredible when you get flashed! You can usually spot the satellite just a few seconds before a flare occurs. The satellite will first appear dim, then all of a sudden it dramatically increases in brightness. It then fades just as quickly. It's exciting to watch and makes the experience a little more interactive. An Iridium flare's visibility ranges from five to as long as twenty seconds. On average I'd say most of the flares are of short to medium duration.

How can you know when an Iridium flare will be visible from your (or any) location? As with the predictions for ISS and Space Shuttle flyovers, you must input your geographic location to facilitate the calculation of satellite viewing opportunities over your airspace. You can ask for Iridium predictions for the next 24 hours, as well as for the next 7 days. The predictions are usually quite accurate.

So keep informed about what is happening in the sky, and you will certainly see evidence of humankind's presence in low Earth orbit. Hopefully you will no longer be surprised when you get flashed by an Iridium satellite!

Don't forget to visit Seagrave Memorial Observatory on any clear Saturday night for a tour of the heavens. Visit our website for additional information: [www.theskyscrapers.org](http://www.theskyscrapers.org)

# Ozone, the Greenhouse Gas

Patrick L. Barry



We all know that ozone in the stratosphere blocks harmful ultraviolet sunlight, and perhaps some people know that ozone at the Earth's surface is itself harmful, damaging people's lungs and contributing to smog.

But did you know that ozone also acts as a potent greenhouse gas? At middle altitudes between the ground and the stratosphere, ozone captures heat much as carbon dioxide does.

In fact, pound for pound, ozone is about 3000 times stronger as a greenhouse gas than CO<sub>2</sub>. So even though there's much less ozone at middle altitudes than CO<sub>2</sub>, it still packs a considerable punch. Ozone traps up to one-third as much heat as the better known culprit in climate change.

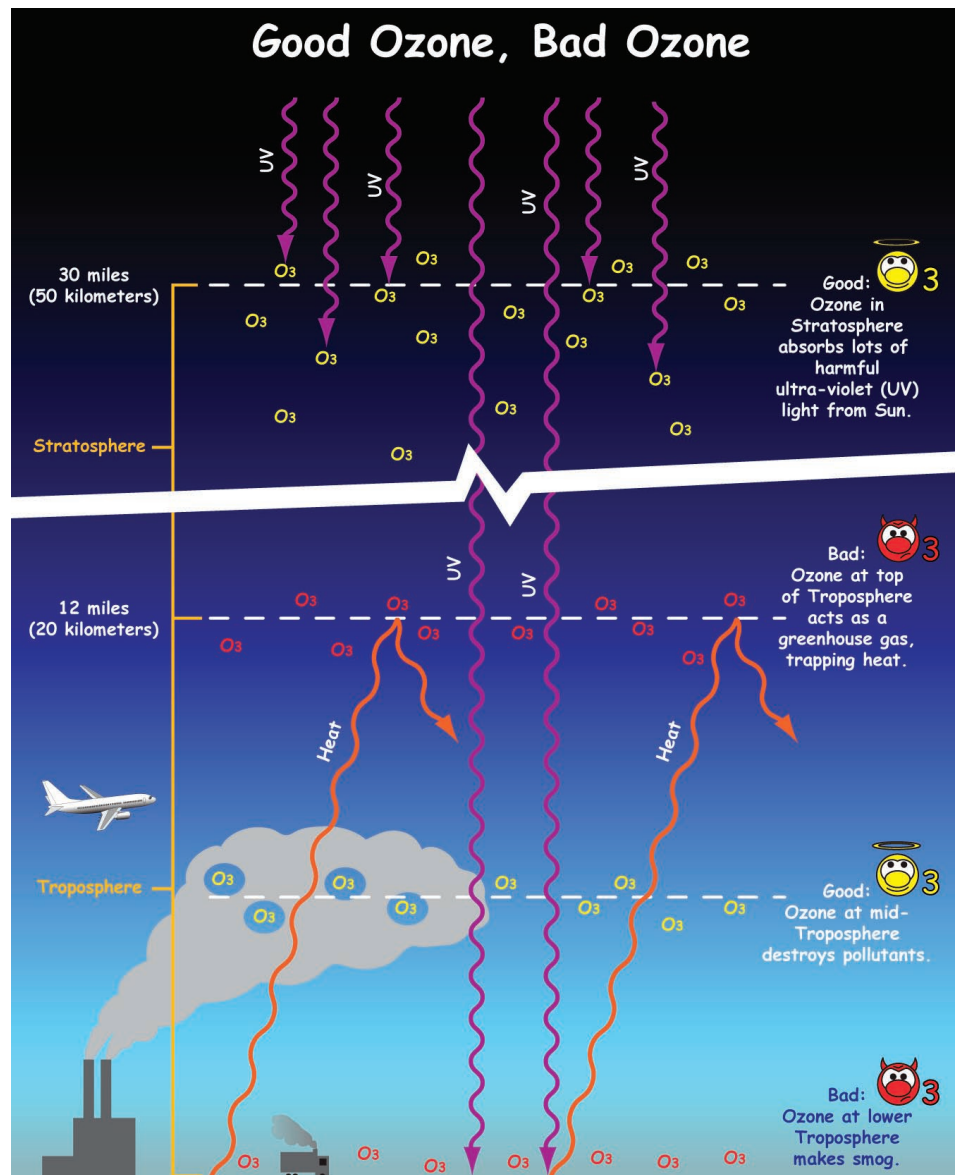
Scientists now have an unprecedented view of this mid-altitude ozone thanks to an instrument aboard NASA's Aura satellite called the Tropospheric Emission Spectrometer—"TES" for short.

Most satellites can measure only the total amount of ozone in a vertical column of air. They can't distinguish between helpful ozone in the stratosphere, harmful ozone at the ground, and heat-trapping ozone in between. By looking sideways toward Earth's horizon, a few satellites have managed to probe the vertical distribution of ozone, but only to the bottom of the stratosphere.

Unlike the others, TES can measure the distribution of ozone all the way down to the heat-trapping middle altitudes. "We see vertical information in ozone that nobody else has measured before from space," says Annmarie Eldering, Deputy Principal Investigator for TES.

The global perspective offered by an orbiting satellite is especially important for ozone. Ozone is highly reactive. It is constantly being created and destroyed by photochemical reactions in the atmosphere and by lightning. So its concentration varies from region to region, from season to season, and as the wind blows.

Data from TES show that ozone's heat-trapping effect is greatest in the spring, when intensifying sunlight



Ozone behaves differently at different altitudes in the atmosphere. High in the stratosphere and at mid-troposphere it has positive effects on life at the surface. At the top of the troposphere ozone is a greenhouse gas and at the surface it makes smog.

and warming temperatures fuel the reactions that generate ozone. Most of ozone's contribution to the greenhouse effect occurs within 45 degrees latitude from the equator.

Increasing industrialization, particularly in the developing world, could lead to an increase in mid-altitude ozone, Eldering says. Cars and coal-fired power plants release air pollutants that later react to produce more ozone.

"There's concern that overall background levels are slowly increasing over time," Eldering says. TES will continue to monitor these trends, she





says, keeping a careful eye on ozone, the greenhouse gas.

Learn more about TES and the science of ozone at [tes.jpl.nasa.gov/](http://tes.jpl.nasa.gov/). Kids can get a great introduction to good ozone and bad ozone at [spaceplace.nasa.gov/en/kids/tes/gases](http://spaceplace.nasa.gov/en/kids/tes/gases).

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

# June 2008 Celestial Events

Craig Cortis

	<b>3</b>	3:23pm	New Moon
	<b>7</b>	11:00am	Mercury at inferior conjunction
	<b>7</b>	9:00pm	Moon 1.1° SSW of Mars (mag +1.5)
	<b>8</b>	10:00pm	Moon 1.3° SSW of Regulus (mag +1.4) Saturn nearby (mag +0.7)
	<b>9</b>	12:01am	Venus at superior conjunction
	<b>10</b>	11:02am	First Quarter Moon
	<b>12</b>	9:00am	Asteroid 3 Juno at opposition (mag 10.0) in Ophiuchus, approximately 2.0° SW of globular cluster M14 (mag 7.7) at RA 17h 28m 54s, dec -4° 31'. Juno is moving westward.
	<b>12</b>	4:00pm	"Equation of Time" is zero
	<b>13</b>	1:00am	Uranus at western quadrature in far northeastern Aquarius, near border with Pisces, mag 5.8
	<b>14</b>	5:11am	Earliest sunrise
	<b>15</b>	12:00am	June Lyrids meteor shower
	<b>17</b>	1:00am	Moon 0.31° SW of Antares (mag 1.0)
	<b>18</b>	1:30pm	Full Moon
	<b>20</b>	12:01pm	Pluto at opposition (mag 13.9, diameter 0.1") in Sagittarius at RA 17h 58m 47s -17° 1' at a distance of 30.47 AU.
	<b>20</b>	7:59pm	Summer Solstice
	<b>23</b>	4:00am	Moon 0.78° NW of Neptune (mag 7.9) in northeastern Capricornus
	<b>24</b>	6:00pm	Martian summer solstice
	<b>26</b>	8:10am	Last Quarter Moon
	<b>27</b>	12:00am	June Boötids meteor shower
	<b>27</b>	8:27pm	Latest sunset
	<b>30</b>	2:07am	Slim waning crescent Moon rises while transiting the Pleiades for parts of northeastern North America
	<b>30</b>	7:15am	100th anniversary of the Tunguska explosion
	<b>30</b>	10:00pm	Mars (mag 1.6) is approximately 0.75° from Regulus (mag 1.4). Note the color contrast; see Saturn (mag 0.8) 5° E of the pair, it forms a very narrow, elongated "spear tip" triangle with Mars and Regulus at the base.

**Mercury** is visible in the morning sky, low in the ENE; June 27 - July 20, with maximum western elongation on July 1. At the end of June, Aldeberan (mag 0.9) is visible to the upper right of Mercury. Mercury is at mag 0.2 on June 24 and mag 1.3 on July 2.

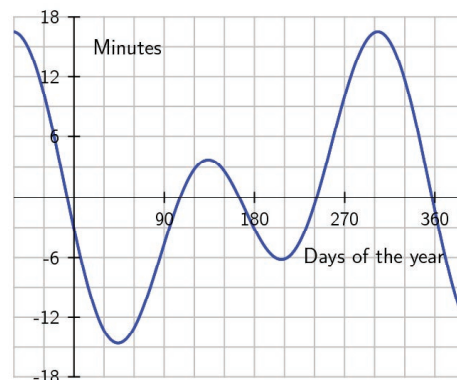
**Venus** is not visible until the end of July, very low in the WNW evening sky.

**Mars** sets roughly 2.5 hours past sunset by the end of June, mag 1.6.

**Jupiter**, in Sagittarius, rises roughly 11:00pm on June 1 (mag -2.6); 9:00pm on June 30, mag -2.7. Watch Jupiter's moons for a double shadow transit on June 22 starting at 10:40pm. Note that a 5.7 mag star becomes an "extra moon" close to Jupiter on June 26 & 27.

**Saturn**, sets roughly 2.5 - 3 hours after the sun by the end of June, mag 0.8.

## Equation of Time



Due to the Earth's elliptical orbit around the sun, over the course of a year the time as measured by the sun can be ahead (above) or behind (below) mean time, which is defined by our 24-hour clock. Image from Wikimedia Commons.

# May Meeting Notes

Friday, May 2, 2008; Seagrave Memorial Observatory  
 Joel Cohen, Acting Secretary

**Monthly Speaker: AAVSO Director Arne Henden**

**Meeting Start - 9:00 PM**

**Secretary's Report - Accepted as published**

**Treasurer's Report - Accepted as published**



**Trustee's Report -** Bob Horton reported issues with the Clark Dome. 12" Meade floor is getting worse. 16" Meade has intermittent issues in operation.

**Nominating Committee -** Bob Horton, Rick Lynch, Joel Cohen recommended Steve Siok for the vacancy for the two year term as Trustee.

**Librarian/Historian's Report -** Dave Huestis reported only two copies of the 75th Anniversary Book are left.

**New Business -** none

**Old Business -** Norman and Iyawata Schneider were unanimously accepted as new members

**Financial Audit Committee -** Bob Napier and Dave Huestis reported all was in order with accounts and they recommended making more defined categories to ease the chore.

**Good of the Organization -** Bob Horton asked those interested in a trip to Washington to sign up with e-mail addresses. Trip will include US Naval Observatory July 18.

Dave Huestis asked for web sites to be published for Astronomy Day. North Scituate Library asked for a book list with recommendations for both children and adults.

Gerry Dyck Invited members to an instructional session on May 3 to learn how to observe and record data on variable stars.

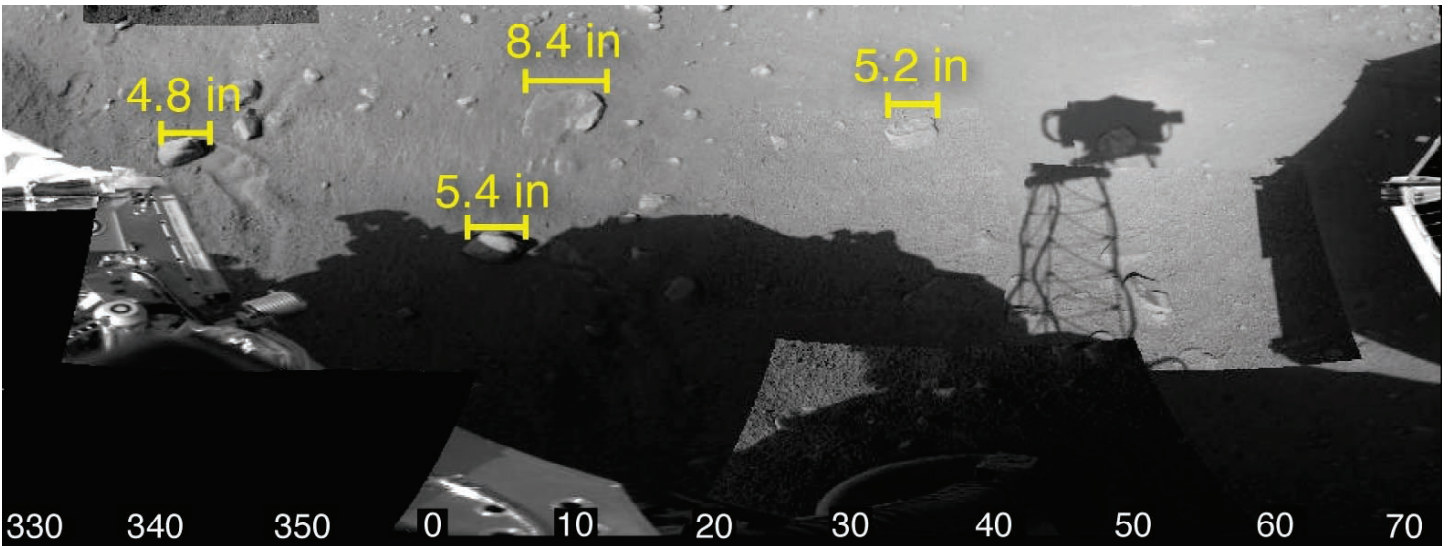
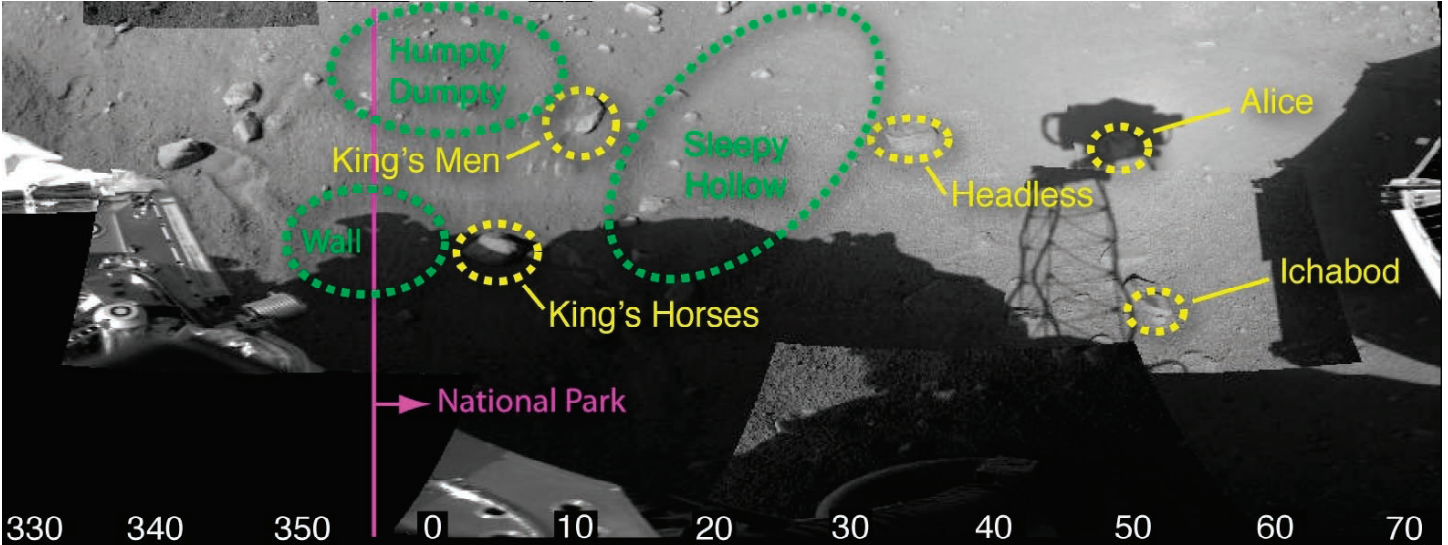
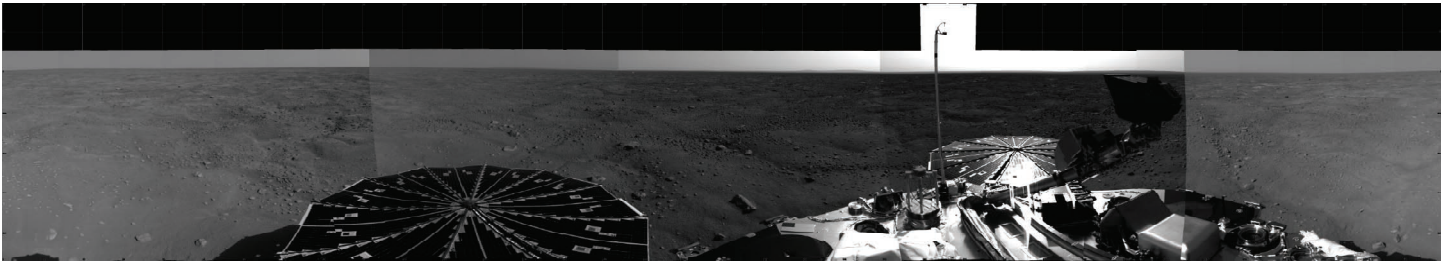
**Adjournment - 9:45 PM**

## Treasurer's Report

4/1/2008 through 5/21/2008

Jim Crawford

INFLOWS	
75th Anniversary Bookincome	150.00
Other donation	354.80
dues	
Contributing	125.00
Family	650.00
Junior	10.00
Regular	1,520.00
Senior	280.00
TOTAL dues	2,585.00
Interest Inc, Capital One	24.90
Interest Inc, Savings Acct	1.90
Total Interest Inc.	26.80
Magincome	
Astronomymaginc	306.00
skytelmagincome	263.60
TOTAL magincome	569.60
Magsales	8.80
Starparty	200.00
TOTAL INFLOWS	3,895.90
OUTFLOWS	
Charity	25.00
collation	83.99
membersubscriptions	
Astronomymagexp	306.00
Skytelexp	263.60
TOTAL Membersubscriptions	569.60
Miscellaneous, Bus	10.16
Postage and Delivery	63.77
Trusteexp	285.00
Utilities	
Electric	16.74
TOTAL OUTFLOWS	1,054.26
OVERALL TOTAL	2,841.64
Bank Cash Flow Checking Acct:	\$5,461
Bank Savings Acct:	\$5,669.66
Capital One Acct:	\$10,183.48



## Phoenix on Mars

**Top:** This 360-degree view from NASA's Phoenix Mars Lander shows the spacecraft's solar arrays, lander deck and the Martian polar landscape beyond. The hummocky terrain has a network of troughs and very few rocks, typical of polar surfaces here on Earth. Phoenix's Surface Stereo Imager captured the images making up this mosaic on the first and third martian days, or sols, of the mission (May 26 and 28, 2008). The spacecraft is capable of taking color, high-resolution photos, but its first priority is to scan its surroundings with black-and-white, lower-resolution images like these. Image

**Middle:** Fun, fairy-tale nicknames have been assigned to features in this mosaic of images showing the workspace reachable by the robotic arm of NASA's Phoenix Mars Lander. For example, "Sleepy Hollow" denotes a trench and "Headless" designates a rock. A "National Park," marked by purple text and a purple arrow, has been set aside for protection until scientists and engineers have tested the operation of the robotic scoop. First touches with the scoop will be to the left of the "National Park" line. Scientists use such informal names for easy identification of features of interest during the mission. In this view, rocks are circled in yellow, other areas of interest in green.

The images were taken by the lander's 7-foot mast camera, called the Surface Stereo Imager.

**Bottom:** This image has been posted in connection with a Phoenix Mars Lander news briefing on May 29, 2008.

The Phoenix Mission is led by the University of Arizona, Tucson, on behalf of NASA. Project management of the mission is by NASA's Jet Propulsion Laboratory, Pasadena, Calif. Spacecraft development is by Lockheed Martin Space Systems, Denver. Credit: NASA/JPL-Caltech/University of Arizona.

# Directions to Seagrave Memorial Observatory

## From the Providence area:

Take Rt. 6 West to Interstate 295 in Johnston and proceed west on Rt. 6 to Scituate. In Scituate bear right off Rt. 6 onto Rt. 101. Turn right onto Rt. 116 North. Peeptoad Road is the first left off Rt. 116.

## From Coventry/West Warwick area:

Take Rt. 116 North. Peeptoad Road is the first left after crossing Rt. 101.

## From Southern Rhode Island:

Take Interstate 95 North. Exit onto Interstate 295 North in Warwick (left exit.) Exit to Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.

## From Northern Rhode Island:

Take Rt. 116 South. Follow Rt. 116 thru Greenville. Turn left at Knight's Farm intersection (Rt. 116 turns left) and follow Rt. 116. Watch for Peeptoad Road on the right.

## From Connecticut:

- Take Rt. 44 East to Greenville and turn right on Rt. 116 South. Turn left at Knight's Farm intersection (Rt. 116 turn left) and follow Rt. 116. Watch for Peeptoad Road on the right.
- Take Rt. 6 East toward Rhode Island; bear left on Rt. 101 East and continue to intersection with Rt. 116. Turn left; Peeptoad Road is the first left off Rt. 116.

## From Massachusetts:

Take Interstate 295 South (off Interstate 95 in Attleboro.) Exit onto Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.



47 Peeptoad Road  
North Scituate, RI 02857