

## Our closest call, 100 Years Ago...

Story from [http://science.nasa.gov/headlines/y2008/30jun\\_tunguska.htm?176186](http://science.nasa.gov/headlines/y2008/30jun_tunguska.htm?176186)

The year is 1908, and it's just after seven in the morning. A man is sitting on the front porch of a



trading post at Vanavara in Siberia. Little does he know, in a few moments, he will be hurled from his chair and the heat will be so intense he will feel as though his shirt is on fire.

That's how the Tunguska event felt *40 miles* from ground zero.

June 30, 2008 marked the 100th anniversary of that ferocious impact near the Podkamennaya Tunguska River in remote Siberia—and after 100 years, scientists are still talking about it.

"If you want to start a conversation with anyone in the asteroid business all you have to say is Tunguska," says Don Yeomans, manager of the Near-Earth Object Office at NASA's Jet Propulsion Laboratory. "It is the only entry of a large meteoroid we have in the modern era with first-hand accounts."

While the impact occurred in '08, the first scientific expedition to the area would have to wait for 19 years. In 1921, Leonid Kulik, the chief curator for the meteorite collection of the St. Petersburg

museum led an expedition to Tunguska. But the harsh conditions of the Siberian outback thwarted his team's attempt to reach the area of the blast. In 1927, a new expedition, again lead by Kulik, reached its goal.

"At first, the locals were reluctant to tell Kulik about the event," said Yeomans. "They believed the blast was a visitation by the god Ogdy, who had cursed the area by smashing trees and killing animals." While testimonials may have at first been difficult to obtain, there was plenty of evidence lying around. Eight hundred square miles of remote forest had been ripped asunder. Eighty million trees were on their sides, lying in a radial pattern.

"Those trees acted as markers, pointing directly away from the blast's epicenter," said Yeomans. "Later, when the team arrived at ground zero, they found the trees there standing upright – but their limbs and bark had been stripped away. They looked like a forest of telephone poles."

Such debranching requires fast moving shock waves that break off a tree's branches before the branches can transfer the impact momentum to the tree's stem. Thirty seven years after the Tunguska blast, branchless trees would be found at the site of another massive explosion – Hiroshima, Japan.

Kulik's expeditions (he traveled to Tunguska on three separate occasions) did finally get some of the locals to talk. One was the man based at the Vanara trading post who witnessed the heat blast as he was launched from his chair. His account:

*Suddenly in the north sky... the sky was split in two, and high above the forest the whole northern part of the sky appeared covered with fire... At that moment there was a bang in the sky and a mighty crash... The crash was followed by a noise like stones falling from the sky, or of guns firing. The earth trembled.*

*Continued on page 3.*

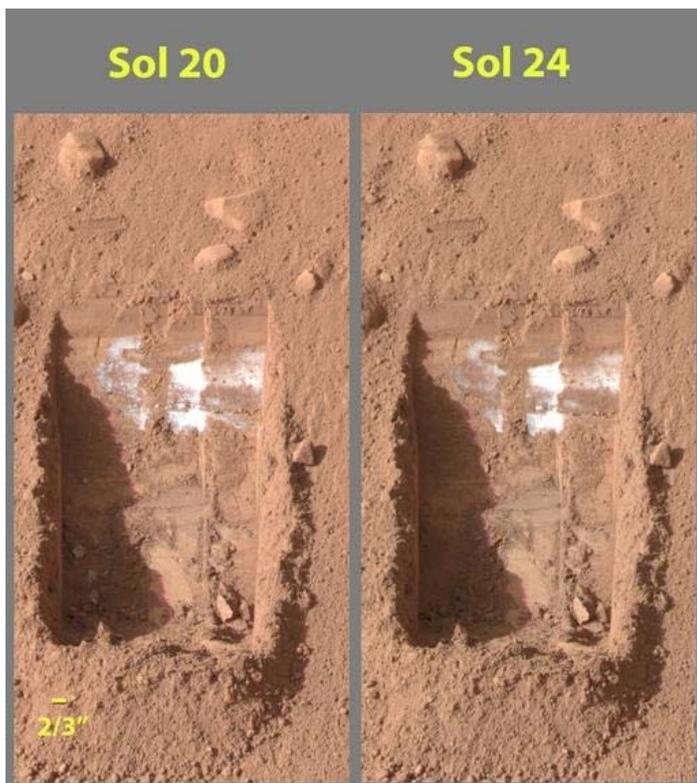
## Ice on Mars

From: [http://www.nasa.gov/mission\\_pages/phoenix/news/phoenix-20080620.html](http://www.nasa.gov/mission_pages/phoenix/news/phoenix-20080620.html)

Scientists relishing confirmation of water ice near the surface beside NASA's Phoenix Mars Lander anticipate even bigger discoveries from the robotic mission in the weeks ahead.

"It is with great pride and a lot of joy that I announce ... that we have found proof that this hard bright material is really water ice and not some other substance," said Phoenix Principal Investigator Peter Smith of the University of Arizona, Tucson, during a Friday news briefing to announce the confirmation of water ice.

The mission has the right instruments for analyzing soil



*A view of the ice uncovered by Phoenix's scoop.*

and ice to determine whether the local environment just below the surface of far-northern Mars has ever been favorable for microbial life. Key factors are whether the water ever becomes available as a liquid and whether organic compounds are present that could provide chemical building blocks and energy for life. Phoenix landed on May 25 for a Mars surface mission planned to last for three months.

"These latest developments are a major accomplishment and validation of the Mars Program's 'follow-the-water' exploration framework," said Doug McCuistion at NASA Headquarters, Washington, director of the space agency's Mars Program.

The key new evidence is that chunks of bright material exposed by digging on June 15 and still present on June 16 had vaporized by June 19. The disappearing chunks could not have been carbon-dioxide ice at the local temperatures because that material would not have been stable for even one day as a solid.

The disappearing chunks were in a trench to the northwest of the lander. A hard material, possibly more ice, but darker than the bright material in the first trench, has been detected in a second trench, to the northeast of the lander. Scientists plan next to have Phoenix collect and analyze surface soil from a third trench near the second one, and later to mechanically probe and sample the hard layer.

For more about Phoenix, visit: <http://www.nasa.gov/phoenix> and <http://phoenix.lpl.arizona.edu>.

## Did you know?

Mars Exploration Rovers "Spirit" and "Opportunity" were hoped to last 90 "sols" on Mars. They landed in January, 2004 and are still both working, over 1500 sols each!

See: <http://marsrovers.nasa.gov/home/>

# Tunguska - 100 Years Later

*Continued from page 1.*

The massive explosion packed a wallop. The resulting seismic shockwave registered with sensitive barometers as far away as England. Dense clouds formed over the region at high altitudes which reflected sunlight from beyond the horizon. Night skies glowed, and reports came in that people who lived as far away as Asia could read newspapers outdoors as late as midnight. Locally, hundreds of reindeer, the livelihood of local herders, were killed, but there was no direct evidence that any person



perished in the blast.

"A century later some still debate the cause and come up with different scenarios that could have caused the explosion," said Yeomans. "But the generally agreed upon theory is that on the morning of June 30, 1908, a large space rock, about 120 feet across, entered the atmosphere of Siberia and then detonated in the sky."

It is estimated the asteroid entered Earth's atmosphere traveling at a speed of about 33,500 miles per hour. During its quick plunge, the 220-million-pound space rock heated the air surrounding it to 44,500 degrees Fahrenheit. At 7:17 a.m. (local Siberia time), at a height of about 28,000 feet, the combination of pressure and heat caused the asteroid to fragment and annihilate itself, producing a fireball and releasing energy equivalent to about 185 Hiroshima bombs.

"That is why there is no impact crater," said Yeomans. "The great majority of the asteroid is consumed in the explosion."

Yeomans and his colleagues at JPL's Near-Earth Object Office are tasked with plotting the orbits of present-day comets and asteroids that cross Earth's path, and could be potentially hazardous to our planet. Yeomans estimates that, on average, a Tunguska-sized asteroid will enter Earth's atmosphere once every 300 years.

"From a scientific point of view, I think about Tunguska all the time," he admits. Putting it all in perspective, however, "the thought of another Tunguska does not keep me up at night."

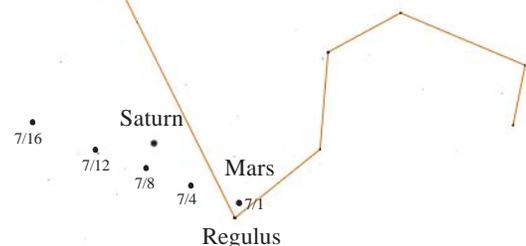
## Solar System in Motion

We all know that the planets move around the Sun, but did you ever try to see the Solar System in motion? Try this:

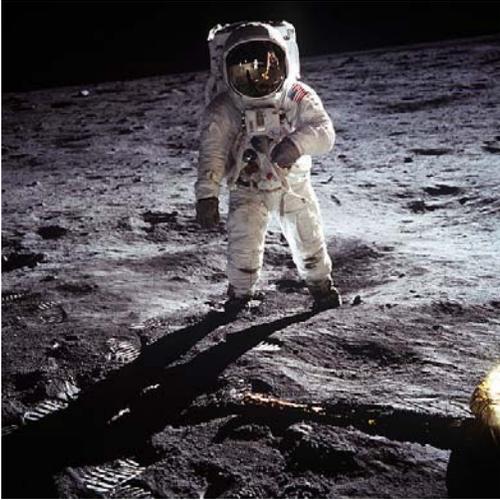
Go out as soon as it gets dark and look for Leo towards the western part of the sky. Identify Saturn and Mars near Regulus. Note the positions of the planets. Go and look again every few nights. You should see Mars approaching, then passing Saturn!

What's happening? Planets that are closer to the Sun move faster than planets further away. Since Mars is closer to Saturn, it periodically will pass the further planet.

Why not look for yourself? Use the guide below to help you.



# Apollo 11 Celebration - July 19



In the U.S. July 20 marks the anniversary of one of the most memorable events in history, the landing of astronauts on the Moon and their walking on its surface.

The National Space Society (NSS) of North Texas traditionally has an event sometime during the time of the Apollo 11 mission (July 16-24). This year the event will be held at the Planetarium at UT Arlington.

The 2008 Apollo 11 Anniversary Event will take place on the afternoon of July 19, starting around 12:30 P.M. NSS will have information tables with displays and information for the public. Representatives will also be on hand to talk with interested planetarium visitors about Apollo 11 and planned future NASA missions to the Moon and Mars.

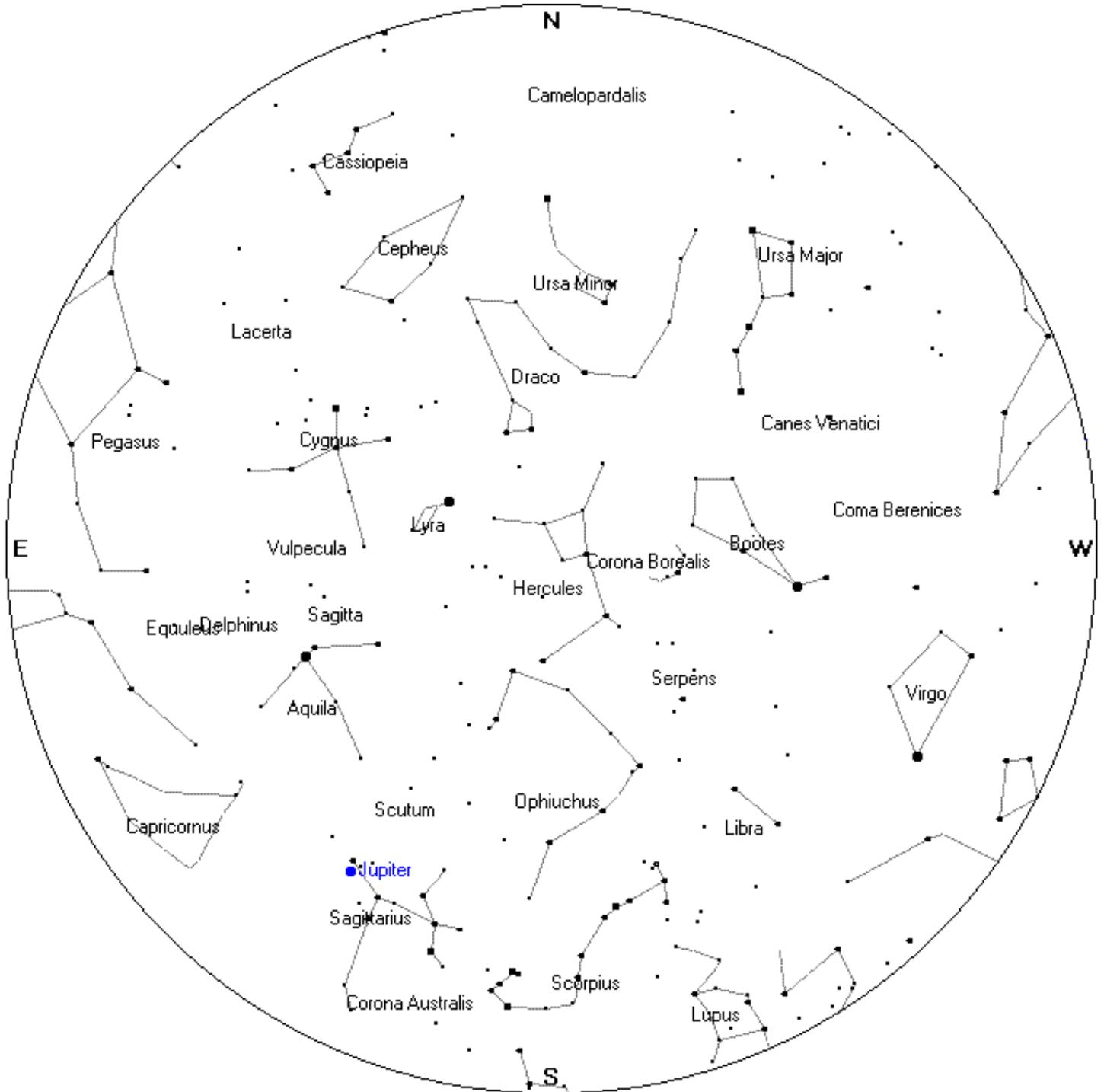
A special screening of the planetarium show “TimeSpace” will take place at 3:30 P.M. The show includes a reenactment of the first lunar landing by Neil Armstrong and Buzz Aldrin. The price for this show will be \$3 per person.

For more information contact Marc Rouleau at [marcrouleau@uta.edu](mailto:marcrouleau@uta.edu) or Carol Johnson at [in2space@ix.netcom.com](mailto:in2space@ix.netcom.com)



# July Skymap

July 1 - 12:00 A.M.  
July 15 - 11:00 P.M.  
July 31 - 10:00 P.M.



Skymap from [www.heavens-above.com](http://www.heavens-above.com)

# In the Sky this Month

# Planetarium this Month

## The Sun

	Sunrise:	Sunset:
July 1	6:24 A.M.	8:40 P.M.
July 15	6:32 A.M.	8:37 P.M.
July 31	6:42 A.M.	8:27 P.M.

## Moon

New Moon	July 2
First Quarter	July 9
Full Moon	July 18
Last Quarter	July 25

## Planets

Find Saturn towards the West-Southwest in the constellation Leo, near the nearly equally bright star Regulus, the brightest star in Leo.

Mars is also in Leo and quickly approaches, then passes Saturn this month. Mars and Saturn will be closest together on July 10/11.

See page 3 for a close-up map of Mars and Saturn in Leo.

Jupiter is at opposition on July 9, when it will rise at sundown. At opposition the planet is closest to Earth and it is the best time to look with a telescope. At mid-evening Jupiter will be about one-third of the way from the horizon to the zenith.

Venus starts to creep out of the Sun's glare this month, look for it starting around mid-month in the west after sundown, when it will set 40 minutes after the Sun. Venus will set later each evening and will be a feature of our early evening skies this Summer and Fall.

Look for Mercury before sunrise during the first half of July. Mercury is at greatest elongation west (22 degrees) on July 1. The speedy planet then falls to superior conjunction on July 29.

Tuesdays

2:30 Stars of the Pharaohs

Wednesdays

2:30 Astronaut

Thursdays

2:30 Stars of the Pharaohs

Fridays:

2:30 Astronaut

7:00 Astronaut

8:00 Rock Hall of Fame

Saturdays:

1:00 Astronaut

2:30 Stars of the Pharaohs

Sundays:

1:00 Astronaut

2:30 Stars of the Pharaohs

4:00 Pharaohs (en espanol)



## Prices:

- \$5 - adults
- \$4 - Kids (18 & under), Seniors, Non-UTA students
- \$3 - UTA Faculty/Staff/Alumni (with ID)
- \$2 - UTA students
- \$3 - Groups of 10 or more with reservation