

Mountaineer Skies

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<http://www.as.wvu.edu/~planet/index.html>

July - September, 2007

From the Editor's Desk

The [Autumnal Equinox](#), the day when the periods of light and darkness are of equal lengths, occurs this year on September 23.

The [Perseid meteor shower](#), estimated to have between 50 and 75, even up to 100 incidences per hour, will best be seen on the nights of August 12 and 13. Viewing should be good as the moon will be new. The meteors themselves come from debris left behind by particular comets, in this case Tempel-Tuttle, when the Earth passes through their orbits. This happens at the same time each year.

Prominent Meteor Showers

Shower	Date	* per hour
Quadrantid	Jan 3	~ 85
Eta Aquarid	May 5	~ 30
Delta Aquarid	Jul 29	~ 20
Perseid	Aug 12	~ 100
Orionid	Oct 22	~ 20
Geminid	Dec 14	~ 100
Ursid	Dec 22	~ 45

* This is just an estimate. Unfortunately, predictions are notoriously unreliable.

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In The Sky This Month

Visible Planets in the Night Sky

Beginning of July, 2007

	Const	Rise	Transit	Set	Mag
Sun		05:56	13:24	20:51	-26.8
Mercury	Ori	05:51	13:03	20:10	4.4
Venus	Leo	09:29	16:22	23:14	-4.4
Mars	Ari	02:11	08:54	15:38	0.7
Jupiter	Oph	18:36	23:22	04:08	-2.6
Saturn	Leo	09:25	16:23	23:17	1.8

Beginning of August, 2007

	Const	Rise	Transit	Set	Mag
Sun		06:20	13:26	20:33	-26.8
Mercury	Gem	05:09	12:25	19:46	-1.1
Venus	Sex	08:29	14:50	21:11	-4.3
Mars	Tau	01:10	08:16	15:24	0.5
Jupiter	Oph	16:26	21:12	01:59	-2.4
Saturn	Leo	07:41	14:35	21:24	1.7

Beginning of September, 2007

	Const	Rise	Transit	Set	Mag
Sun		06:49	13:20	19:51	-26.8
Mercury	Vir	08:07	14:16	20:29	-0.5
Venus	Cnc	05:20	11:49	18:17	-4.3
Mars	Tau	00:14	07:35	14:57	0.3
Jupiter	Oph	14:29	19:15	00:00	-2.2
Saturn	Leo	05:59	12:48	19:33	1.5

Ori	Orion, The Hunter
Leo	Leo, The Lion
Ari	Aries, The Ram
Oph	Ophiuchus, The Serpent Holder
Gem	Gemini, The Twins
Sex	Sextans, The Sextant
Tau	Taurus, The Bull
Vir	Virgo, The Maid
Cnc	Cancer, The Crab

About – **Scaling the Solar System**

We know that compared to the Earth, the solar system is immense, but how immense is immense? To say that the Sun is 865,000 miles in diameter or that Neptune is nearly 3 billion miles from the Sun is really meaningless as we can not really understand numbers that large in any meaningful way. One way to help us better visualize the relative size of the various members of the Solar System is to reduce it to some sort of understandable scale, much as a map is a scale model of the Earth.

Let's put our model in a football stadium, 100 yards or 300 feet long. Let's use an 8" ball for the Sun at distance zero(0) and all of the other measurements will be relative to this. At a distance of 27 feet, 9 inches from the Sun we find **Mercury**. Here we put a small grain of sand. This is the relative size of the planet. The next planet, **Venus**, looking very much like a dirty tennis ball, will be at 51 feet, 9 inches from the Sun. This planet is much larger than Mercury, so here we will place a #2 pencil eraser to represent the correct scale of Venus. Next we come to the blue marble planet **Earth** at 71 feet, 8 inches. Since the Earth and Venus are about the same size, we will again use a #2 pencil eraser.

At 109 feet, 2 inches, we come to the Red Planet, **Mars**. Mars is a little larger than Mercury, but smaller than either Venus or Earth, so here we will place half a #2 pencil eraser on the field to represent the planet. We are now just a third of the way up the field.

Beyond Mars are the four gas giant planets — Jupiter, Saturn, Uranus, and Neptune.

At the largest planet in the Solar System, **Jupiter**, we run into a little problem. It is 372 feet from the Sun and outside of the stadium by 72 feet. So we will now have to imagine another stadium placed end to end giving us another 100 yards or 300 feet. We will represent the planet by a U.S. quarter.

The next planet, **Saturn**, is the second largest planet and known for its extensive ring system. Again we have a problem because this planet, using our scale, is 683 feet, 6 inches from the Sun. We will again need to imagine a third connected football field. Here we will place a U.S. penny to represent the planet. Only two gas giants to go. We next stop at 1374 feet, 9 inches and use a medium sized tack to stand for **Uranus**. At 2155 feet, 3 inches from the Sun we arrive at **Neptune**. This planet is about the same size as Uranus, so we will again use a medium size tack. We turn around to look at our eight inch Sun. It is too far away. We cannot see it. If it were the real Sun, it would be burning, and from this distance, it would look just like a very large, bright star.

Lastly, the non-planet **Pluto**, discovered in 1930 by Clyde Tombaugh and included here for historical reasons, is an astounding 2832 feet from the Sun. This solar system body is less than half the size of Mercury, so just make the smallest mark you can with your #2 pencil to represent it.

There you have it, a scale model of the Solar System, from the Sun at zero feet to Pluto at 2832 feet or nearly ten football fields.

Here is a table that shows the solar system bodies with their actual diameter and distance from the Sun in miles.

Solar System Body	Diameter in mi	Distance from Sun in mi
Sun	863,706	0
Mercury	3,032	35,983,606
Venus	7,521	67,232,363
Earth	7,926	92,957,130
Mars	4,222	141,635,350
Jupiter	88,846	483,631,840
Saturn	74,898	888,187,982
Uranus	31,763	1,783,950,479
Neptune	30,778	2,798,655,850
Pluto	1413	3,674,490,973

2007 – 2008 Planetarium Shows



August 24, 2007 <i>Oceans in Space</i>	September 14 & 28, 2007 <i>Oceans in Space</i>	October 12 & 26, 2007 <i>Oceans in Space</i>
November 9 & 16, 2007 <i>Oceans in Space</i>	Dec 7, 14, & 21, 2007 <i>'tis the Season</i>	January 11 & 25, 2008 <i>Oceans in Space</i>
February 8 & 22, 2008 <i>Oceans in Space</i>	March 14 & 28, 2008 <i>Oceans in Space</i>	April 11 & 25, 2008 <i>Oceans in Space</i>
May 9 & 23, 2008 <i>Oceans in Space</i>	June 13, 2008 <i>Oceans in Space</i>	July 2008 Closed

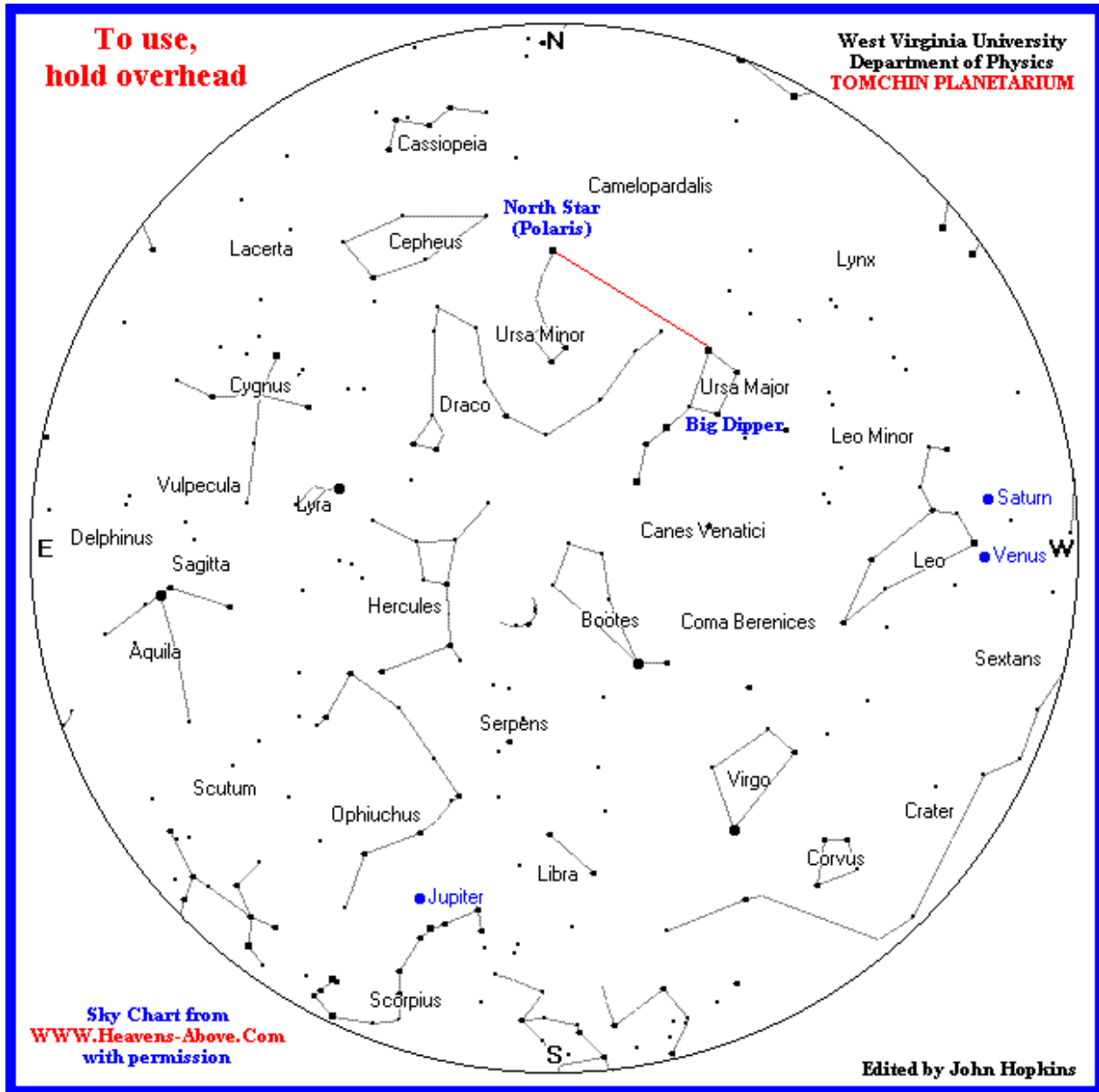
For those who are interested in bringing a group, such as schools or scouts, during the day, please call for more information. These shows are usually given on Tuesday or Thursday mornings.

For further information or reservations, please call John Hopkins at (304)293-3422, extension 1443 or by email at: jhopkins@mail.wvu.edu

Selected Sunrise/Sunset and Moon Rise/Moon Set Times

Date	Sunrise	Sunset	Moon Rise	Moon Set	Moon Phase
July 7	6:03 A.M.	8:48 P.M.	12:31 A.M.	1:42 P.M.	Last Qtr.
July 14	6:08 A.M.	8:46 P.M.	5:56 A.M.	9:20 P.M.	New Moon
July 22	6:14 A.M.	8:41 P.M.	2:23 P.M.	12:14 A.M.	First Qtr.
July 29	6:20 A.M.	8:35 P.M.	8:44 P.M.	5:35 A.M.	Full Moon
Aug 5	6:26 A.M.	8:29 P.M.	none	2:00 P.M.	Last Qtr.
Aug 12	6:32 A.M.	8:21 P.M.	6:00 A.M.	8:24 P.M.	New Moon
Aug 20	6:39 A.M.	8:10 P.M.	2:14 P.M.	11:42 P.M.	First Qtr.
Aug 28	6:46 A.M.	7:59 P.M.	8:12 P.M.	6:51 A.M.	Full Moon
Sept 3	6:51 A.M.	7:50 P.M.	11:31 P.M.	2:18 P.M.	Last Qtr.
Sept 11	6:58 A.M.	7:38 P.M.	7:01 A.M.	7:37 P.M.	New Moon
Sept 19	7:05 A.M.	7:25 P.M.	3:00 P.M.	11:55 P.M.	First Qtr.
Sept 26	7:12 A.M.	7:14 P.M.	7:03 P.M.	6:52 A.M.	Full Moon

July 2007 Sky Chart* for:
 10:00 P.M at the beginning of the month
 9:00 P.M in the middle of the month
 8:00 P.M at the end of the month



*Sky Chart used with the kind permission of Heavens-Above at <http://www.heavens-above.com/>

The TOMCHIN PLANETARIUM is named in honor of the late Harold Tomchin, of Princeton, W.Va., who made a generous donation to ensure its continuing operation, and whose family continues to support the planetarium for the educational benefit of WVU students, staff, and faculty members, as well as the local community. Contributions can be made in support of the planetarium through the WVU Planetarium Project at the WVU Foundation, Inc., phone (304)284-4000. Thank You.



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