

Mountaineer Skies

Volume 11, Issue 2

<http://planetarium.wvu.edu/>

April - June 2011

On **April 3**, **Saturn is at opposition**. This means that the ecliptic longitude between the Earth and Saturn is 180°.

On the night of **April 21/22**, the **Lyrids Meteor Shower** will peak. Rate estimates are notoriously inaccurate. Additionally, this is not a particularly strong shower as we might find with the Quadrantids at the beginning of each January.

On the night of **May 5/6**, the **Eta Aquarids Meteor Shower** will peak. Much like the **Lyrids Meteor Shower**, it is not an especially active shower with only 8 – 10 per hour expected.

The **Cassini Space Craft** will once again fly by Titan, Saturn's largest moon, on **May 8**.

The **Summer Solstice**, the first day of summer and the day with the longest period of daylight, will occur on **June 21**. After this, the days will become shorter and shorter until the **Winter Solstice**, **December 22**. This is the day when the Sun is above the horizon for the shortest period of time during the entire year.

In The Sky This Quarter

Visible Planets in the Night Sky

Beginning of April, 2011

	Const	Rise	Transit	Set	Mag
Sun		07:03	13:24	19:44	-26.8
Mercury	Psc	07:17	14:05	20:49	2.3
Venus	Aqr	05:45	11:16	16:45	-4.0
Mars	Psc	06:40	12:41	18:41	1.2
Jupiter	Psc	07:17	13:39	19:58	-2.1
Saturn	Vir	19:43	01:35	07:27	0.4

Beginning of May, 2011

	Const	Rise	Transit	Set	Mag
Sun		06:20	13:17	20:14	-26.8
Mercury	Psc	05:27	11:43	17:59	0.8
Venus	Psc	05:17	11:33	17:47	-3.9
Mars	Psc	05:36	12:08	18:38	1.2
Jupiter	Psc	05:36	12:08	18:36	-2.1
Saturn	Vir	17:34	23:29	05:23	0.5

Beginning of June, 2011

	Const	Rise	Transit	Set	Mag
Sun		05:54	13:18	20:41	-26.8
Mercury	Tau	05:17	12:23	19:33	-1.0
Venus	Ari	04:53	11:55	18:55	-3.9
Mars	Ari	04:35	11:34	18:34	1.3
Jupiter	Psc	03:52	10:29	17:08	-2.2
Saturn	Vir	15:26	21:22	03:18	0.7

Psc	Pisces, The Fishes
Aqr	Aquarius, The Water Bearer
Vir	Virgo, The Maiden
Tau	Taurus, The Bull
Ari	Aries, The Ram

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About: Planetary Retrograde Motion

It is well known that the closer we get to the Sun, the faster a planet goes around it. Mercury goes around the Sun in 88 Earth Days (ED), Venus in 225 ED, Earth, of course, goes around in 365 ED, Mars in 687 ED, all the way out to Pluto which goes around the Sun in 90,472 ED. As you can see, the inside planet is always faster than the outside planet.

Associated with this is a curious, illusionary phenomenon called **Retrograde Motion**. It has to do with how a planet appears to go first eastward in the sky, then seems to reverse itself and head westward, and then finally heads eastward again. Remember the planets all go around the Sun in one direction. Retrograde motion is simply the result of a faster planet passing a slower one.

Planetary Period of Revolution

Mercury = 88 ED	Saturn = 10,759 ED
Venus = 225 ED	Uranus = 30,707 ED
Earth = 365 ED	Neptune = 60,197 ED
Mars = 687 ED	Pluto = 90,472 ED
Jupiter = 4,333 ED	ED = Earth Days

Let's imagine an ovoid track with two parallel lanes and on those lanes are two cars, the one on the inner track is, say, a fast car like a Corvette, and on the outer lane is a slower car, say, a family sedan. At the beginning, the Corvette is behind the sedan. Now, from the perspective of the Corvette, both cars are going in the same direction around the track. As the faster car on the inside lane comes abreast of the sedan on the outside track, again from the point of view of the sports car, they are still going in the same direction. Now if the Corvette passes the sedan, something from the point of view of the passing car has happened. It appears that the sedan is backing up and going in the opposite direction. We know this is just an illusion, but that is how it appears. This illusion continues until the faster car is sufficiently ahead around the track that from its perspective, the slower car is once again going in the same direction as the Corvette.

Retrograde Motion Diagram

Using the included diagram provided by NASA and entitled **Retrograde Motion**, we will see why this is what happens when a faster planet, in this case the Earth, overtakes and passes another planet, in this case Mars.

Position 1: Here the Earth is approaching Mars. They are both going easterly.

Position 2: Here the Earth is catching up with Mars. They are both going easterly.

Position 3: Here the Earth is essentially abreast of Mars making it appear that Mars has come to a standstill.

Position 4: The Earth has now passed Mars making it **appear** that Mars is going westerly. This is **Retrograde Motion** which is an illusion.

Position 5: As the Earth continues to pull farther ahead of Mars, the Red planet begins again to move toward the east.

Position 6: The Earth has passed Mars enough that both planets appear to (and are) going easterly.

Position 7: The Earth has passed Mars and both planets appear to (and are) going easterly.

Although we used the example of Earth and Mars, the same phenomenon exists between any other two planets.

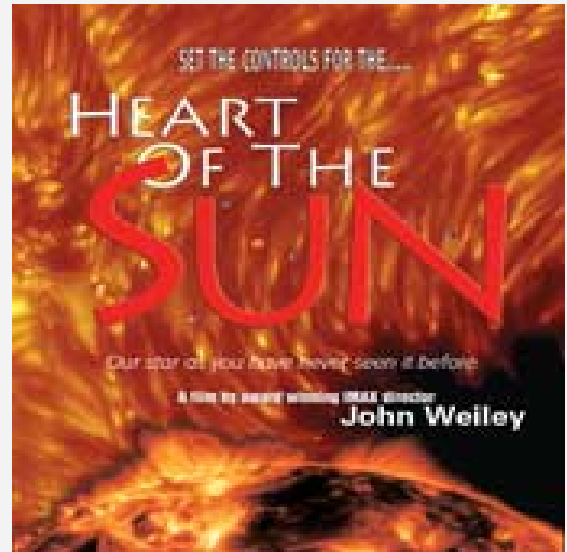
An excellent animation of Retrograde Motion can be seen at either:

<http://astro.unl.edu/classaction/animations/renaissance/retrograde.html>

or

<http://mars.jpl.nasa.gov/allaboutmars/nightsky/nightsky04/>

2011 Planetarium Shows



April 8 & 22, 2011 8:00 P.M. – <i>Heart of the Sun</i> 9:00 P.M. - <i>Amazing Astronomers of Antiquity</i>	May 13 & 27, 2011 8:00 P.M. – <i>Heart of the Sun</i> 9:00 P.M. - <i>Amazing Astronomers of Antiquity</i>	June 10, 2011 8:00 P.M. – <i>Heart of the Sun</i> 9:00 P.M. - <i>Amazing Astronomers of Antiquity</i>
	July, 2011 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

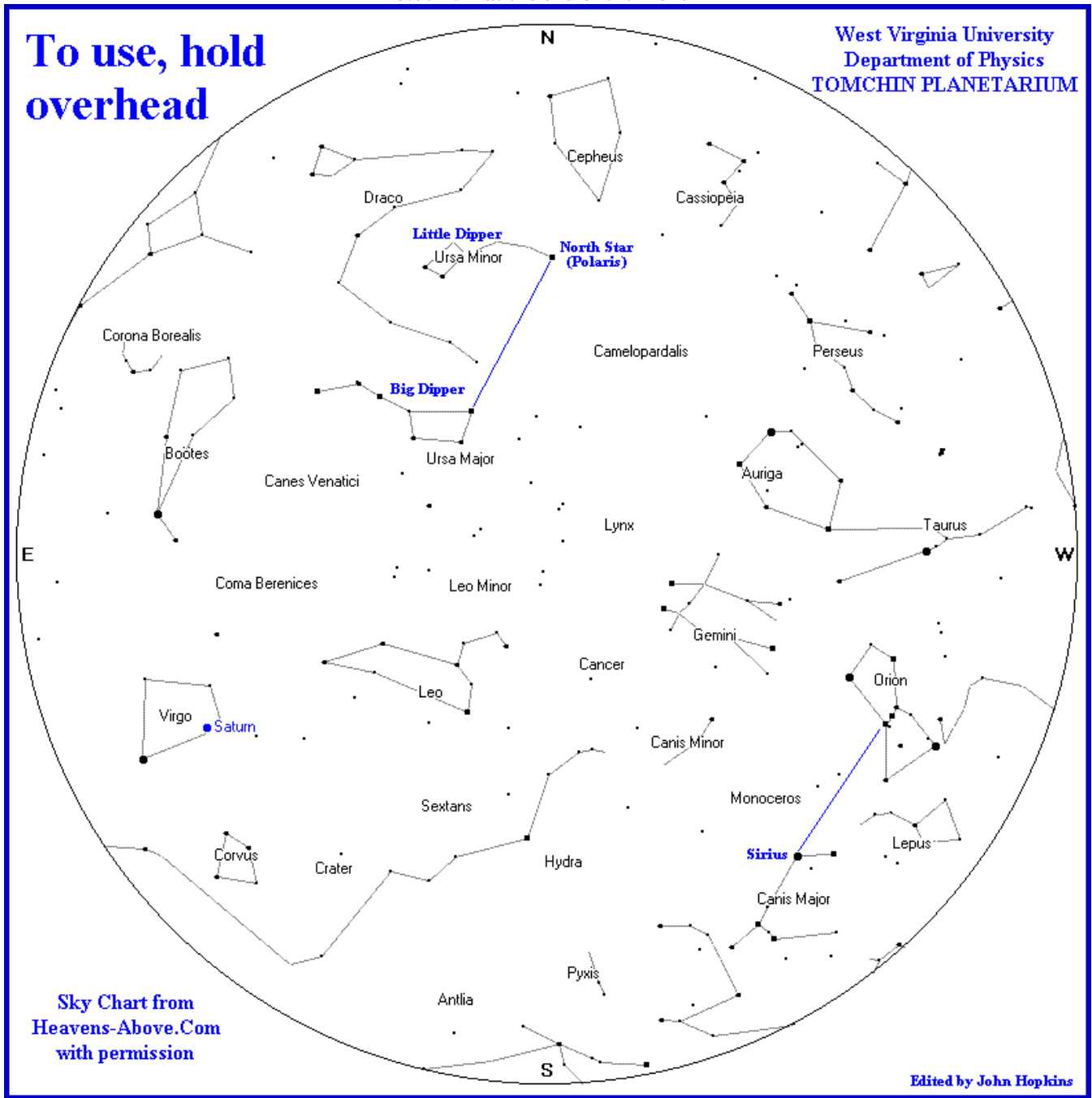
Selected Sunrise/Sunset and Moon Rise/Moon Set Times

Date	Sunrise	Sunset	Moon Rise	Moon Set	Moon Phase
Apr 03	7:02 A.M.	7:44 P.M.	6:39 A.M.	8:10 P.M.	New Moon
Apr 11	6:49 A.M.	7:52 P.M.	12:38 P.M.	2:32 A.M.	First Qtr
Apr 17	6:40 A.M.	7:58 P.M.	7:56 P.M.	5:57 A.M.	Full Moon
Apr 24	6:30 A.M.	8:05 P.M.	1:59 A.M.	12:11 P.M.	Last Qtr
May 03	6:19 A.M.	8:14 P.M.	6:12 A.M.	9:01 P.M.	New Moon
May 10	6:11 A.M.	8:21 P.M.	12:45 P.M.	1:46 A.M.	First Qtr
May 17	6:04 A.M.	8:28 P.M.	9:10 P.M.	5:54 A.M.	Full Moon
May 24	5:59 A.M.	8:34 P.M.	1:31 A.M.	1:02 P.M.	Last Qtr
Jun 1	5:54 A.M.	8:40 P.M.	5:32 A.M.	8:48 P.M.	New Moon
Jun 8	5:52 A.M.	8:45 P.M.	12:55 P.M.	12:52 A.M.	First Qtr
Jun 15	5:51 A.M.	8:48 P.M.	8:55 P.M.	5:31 A.M.	Full Moon
Jun 23	5:53 A.M.	8:51 P.M.	12:48 A.M.	1:44 P.M.	Last Qtr

April, 2011 Sky Chart
 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

To use, hold
 overhead

West Virginia University
 Department of Physics
 TOMCHIN PLANETARIUM



Sky Chart from
 Heavens-Above.Com
 with permission

Edited by John Hopkins

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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