

Mountaineer Skies

Volume 11, Issue 4

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

October - December, 2011

The **Orionids Meteor Shower** will be at its maximum on the night of **October 21/22**. You can expect as many as 20 per hour, though this prediction is not firm.

November 6: Daylight Saving Time ends, so set your clocks back 1 hour (fall back). This is also a good time to change the batteries in your smoke detectors.

On **November 8**, **Asteroid 2005 YU55** will pass within a 0.85 lunar distance of the Earth. The asteroid is thought to be about 1,300 feet in diameter. There does not seem to be any danger to the Earth.

On the night of **November 17/18**, the **Leonids Meteor Shower** will peak. As has been said, it is notoriously difficult to predict the exact number of incidences per hour, but around 40 per hour is a reasonable expectation.

There will be a **Total Lunar Eclipse** on the night of **December 10** beginning with the **Penumbral Eclipse at 6:33 AM** local time. Unfortunately, the moon will set less than an hour later, at **7:28 A.M.** This early setting of the Moon will, unfortunately, produce a very truncated event here.

The **Winter Solstice**, the shortest day of the year, will occur on **Thursday, December 22**, just three days short of Christmas. Always close, the two events never coincide.

In The Sky This Quarter Visible Planets in the Night Sky

Beginning of October, 2011

	Const	Rise	Transit	Set	Mag
Sun	Vir	07:17	13:09	19:03	-26.8
Mercury	Vir	07:31	13:20	19:12	-1.4
Venus	Vir	08:20	13:57	19:36	-3.9
Mars	Cnc	02:29	09:20	16:32	1.3
Jupiter	Ari	20:18	03:04	09:50	-2.9
Saturn	Vir	08:04	13:52	19:36	0.8

Beginning of November, 2011

	Const	Rise	Transit	Set	Mag
Sun	Lib	07:49	13:03	18:18	-26.8
Mercury	Lib	09:38	14:21	19:06	-0.3
Venus	Lib	09:35	14:25	19:17	-3.9
Mars	Leo	01:35	08:28	15:22	1.1
Jupiter	Ari	18:06	00:47	07:28	-2.9
Saturn	Vir	06:20	12:04	17:44	0.7

Beginning of December, 2011

	Const	Rise	Transit	Set	Mag
Sun	Oph	07:22	12:09	16:56	-26.8
Mercury	Oph	07:42	12:35	17:18	3.5
Venus	Sgr	09:35	14:07	18:42	-3.9
Mars	Leo	23:50	06:25	13:04	0.7
Jupiter	Ari	14:58	21:36	04:14	-2.6
Saturn	Vir	03:39	09:15	14:54	0.7

Oph	Ophiuchus, The Serpent Holder
Lib	Libra, The Scales
Sgr	Sagittarius, The Archer
Vir	Virgo, The Maid
Cnc	Cancer, The Crab
Ari	Aries, The Ram
Sgr	Sagittarius, The Archer
Leo	Leo, The Lion

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About: A Brief History of the Space Shuttle, Part 1

As the apparent end has come for the NASA Space Shuttle program, it is, perhaps, fitting to look back at this amazing machine and what it has accomplished.

There were five shuttle shuttles constructed: **Atlantis, Challenger, Columbia, Discovery, and Endeavour**. Both **Challenger** and **Columbia** were sadly lost with all hands. In addition, there was an earlier (1977) shuttle vehicle called **Enterprise** that was used only for testing. It never actually flew into space. This vehicle was named after the science fiction series *Star Trek*'s space ship **USS Enterprise (NCC-1701)**.

The space missions within NASA are called **STS (Space Transportation System)** followed by the number of that mission. Unfortunately they are not always sequential. The maiden flight of the space shuttle program, called **STS-1**, occurred on April 12, 1981, when **Space Shuttle Columbia** successfully lifted off from Cape Canaveral. It was in space just over two and a quarter days. This mission was simply a demonstration flight showing that the shuttle was safe to operate. Except for some lost tiles (16), the mission achieved all of its goals. That same year, but seven months later, on November 12, **Columbia** was once again rocketed into space as **STS-2**. This mission was to demonstrate its relatively short turnaround time. Again the mission was quite successful with no lost tiles.

All missions were launched from the **Kennedy Space Center** in Florida and returned either to the Cape or Edwards Air Force Base in California. There was a single exception, **STS-3**, that landed at **White Sands Space Harbor** near Las Cruces, New Mexico. As of June 2011, 135 missions have been flown with the two tragic failures, **Challenger, STS-51-L**, on January 28, 1986, which broke up 73 seconds after ignition killing all on board, and the re-entry failure of **Columbia, STS-107**, almost exactly 17 years later on February 1, 2003; also killing the entire crew.

The other missions essentially have been, if not flawless, almost so.

April 12, 1981 launch (**Columbia**) **STS-1** This was the first space shuttle mission and was designed to demonstrate system viability.

June 10, 1983 launch (**Challenger**) **STS-7** **Sally Ride**, the first U.S. woman in space, was on board.

January 28, 1986 launch (**Challenger**) **STS-51-L** On this mission, the twenty-fifth flight, tragically, all hands were lost shortly after takeoff. Among those who were killed was **Christa McAuliffe**, NASA's first **Teacher in Space**. It was decided after an extensive investigation and testing that an O-ring seal on one of the solid fueled rocket boosters had failed.

September 29, 1988 launch (**Discovery**) **STS-26** After almost two years of assessment and reengineering, this flight proved that the flaws that caused the loss of the **Challenger STS-51-L**, crew had been fixed. This mission was successful, reestablishing that the shuttle was once again safe to fly.

April 24, 1990 launch (**Discovery**) **STS-31** This flight successfully deployed the **Hubble Space Telescope (HST)** with its 2.4 meter (about 7.9 feet) primary mirror. Although part of the **HST** was found to be defective, it was not related to its deployment. It would take several more missions to fix this problem which occurred during the telescope's construction.

December 2, 1993 launch (**Endeavour**) **STS-61** First Repair mission for the **HST**.

February 11, 1997 launch (**Discovery**) **STS-82** Servicing repair of the **HST**.

October 29, 1998 launch (**Discovery**) **STS-95** **John Glenn** at age 77 became the oldest astronaut to date to be a member of a shuttle crew.

2011 Planetarium Shows



October 14 & 28, 2011 7:00 P.M. Ultimate Universe 8:00 P.M. It's About Time	November 11 & 18, 2011 7:00 P.M. Ultimate Universe 8:00 P.M. It's About Time	December 2, 9, & 16, 2011 7:00, 8:00, and 9:00 P.M. 'TIS THE SEASON
January 13 & 27, 2012 7:00 P.M. Stars of the Pharaohs 8:00 P.M. Origins of Life	February 10 & 24, 2012 7:00 P.M. Stars of the Pharaohs 8:00 P.M. Origins of Life	March 9 & 23, 2012 7:00 P.M. Stars of the Pharaohs 8:00 P.M. Origins of Life

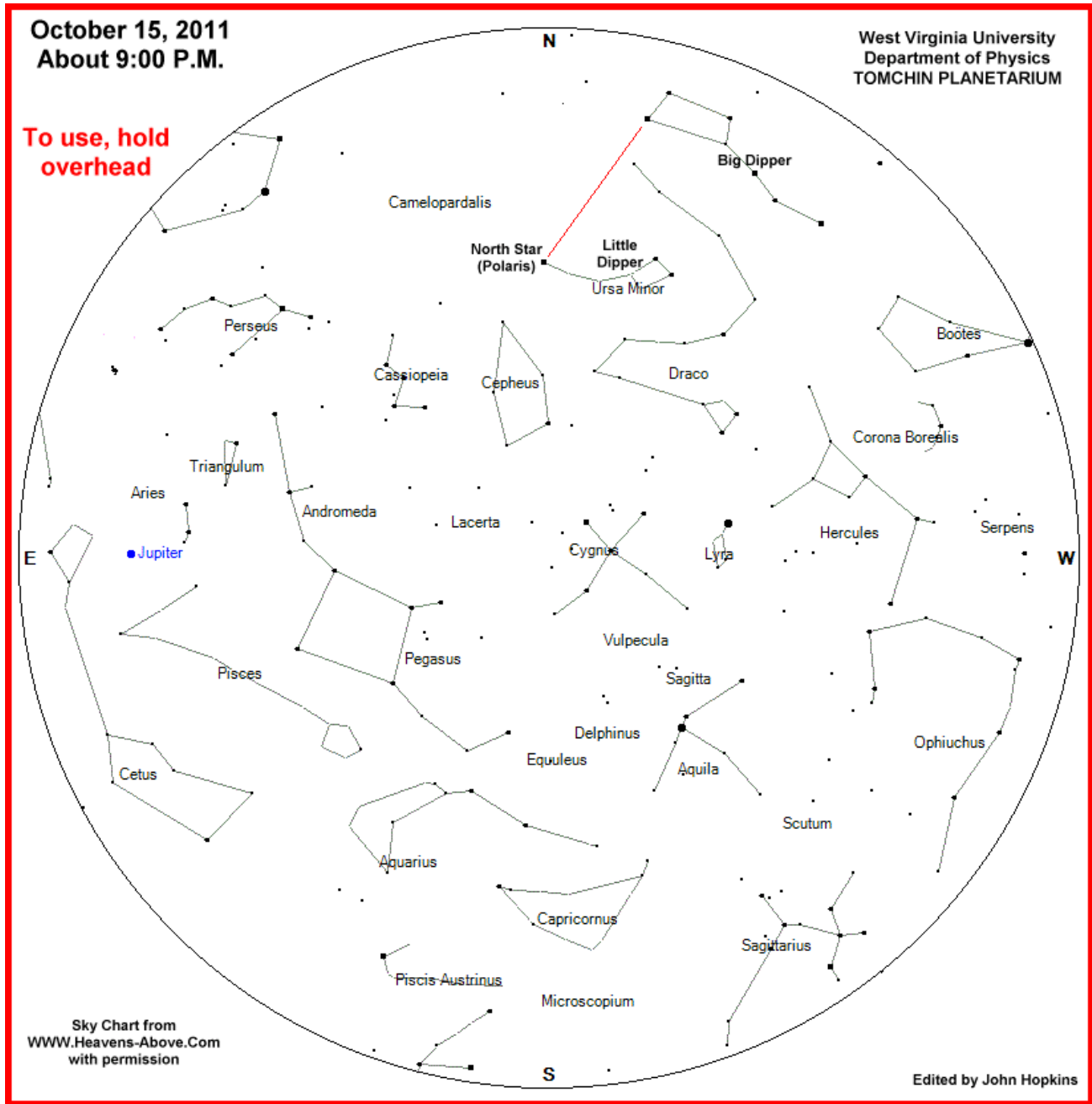
For those who are interested in bringing a group, such as schools or scouts, during the day, please call for more information. These shows are usually given on Tuesday or Thursday mornings.

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
Oct 3	7:17 A.M.	7:01 P.M.	2:14 P.M.	NA	First Qtr
Oct 11	7:25 A.M.	6:48 P.M.	6:19 P.M.	7:02 A.M.	Full Moon
Oct 19	7:33 A.M.	6:37 P.M.	NA	2:04 P.M.	Last Qtr
Oct 26	7:41 A.M.	6:27 P.M.	7:27 A.M.	6:08 P.M.	New Moon
Nov 2	7:49 A.M.	6:18 P.M.	2:08 P.M.	NA	First Qtr
Nov 10	6:58 A.M.	5:10 P.M.	4:56 P.M.	6:49 A.M.	Full Moon
Nov 18	7:07 A.M.	5:03 P.M.	NA	12:47 P.M.	Last Qtr
Nov 25	7:14 A.M.	4:59 P.M.	7:41 A.M.	5:25 p.m.	New Moon
Dec 2	7:22 A.M.	4:56 P.M.	12:34 P.M.	NA	First Qtr
Dec 10	7:29 A.M.	4:55 P.M.	5:09 P.M.	7:28 A.M.	Full Moon
Dec 17	7:34 A.M.	4:57 P.M.	NA	11:51 A.M.	Last Qtr
Dec 24	7:38 A.M.	5:00 P.M.	7:25 A.M.	5:12 P.M.	New Moon

October 2011 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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