

SANDRA F. PRITCHARD MATHER PLANETARIUM NEWS

2023-2024 Season

The Mather Planetarium at West Chester University



Contact Info:

Mather Planetarium
750 S. Church St.
West Chester, PA 19383

Dr. Karen Schwarz, Professor
Planetarium Director

planetarium@wcupa.edu
(610) 436-2788

SSI Ticket Office
(610) 436-2266

On-line Ticket Sales
<http://www.wcupatix.com>

<http://www.wcupa.edu/planetarium>

**** Follow us on Facebook ****

*"Equipped with his five senses, man
explores the universe around him and calls
the adventure Science."*

– Edwin Hubble

Greetings! We hope your new year is off to a good start. We're getting ready to start up our spring programs. The first live show is already sold out (some of you are FAST!) but don't worry - we've added movie shows to the schedule so there are more opportunities visit. You'll also want to be on the lookout for information on our solar eclipse event on April 8th. We're going to cross our fingers and toes that the skies cooperate! As always, we look forward to seeing you under the dome.

Remaining Shows for the 2023-2024 Season

January 26, 2024 – Fire in the Sky*

February 2, 2024 – Unseen Universe

February 23, 2024 – Raining Stars*

March 1, 2024 – Asteroid: Mission Extreme

March 22, 2024 – An Eclipse of the Sun*

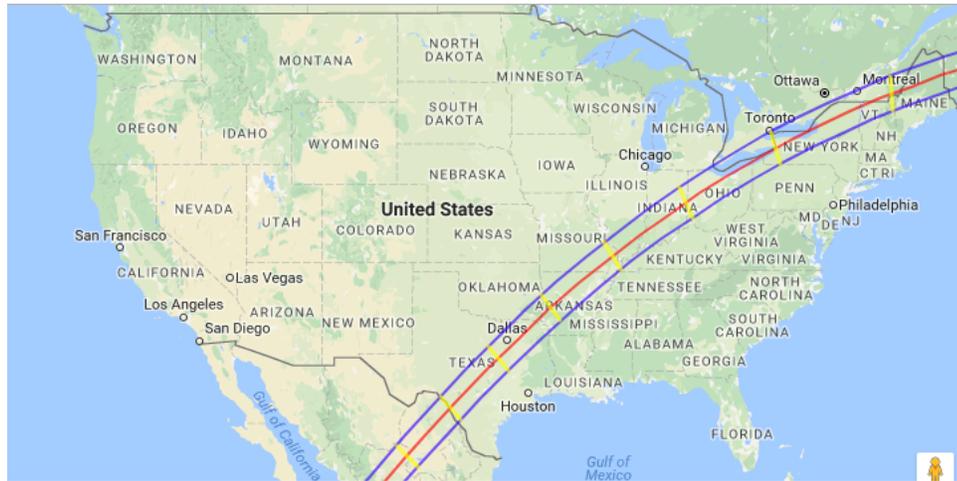
March 29, 2024 – Birth of Planet Earth

April 19, 2024 – Citizen Science*

April 26, 2024 – Phantom of the Universe

*Indicates a live show; others are movie presentations. Check our website for details about our shows.

Solar Eclipse 2024



Some of you may recall a lot of fuss back in 2017 over a solar eclipse. Yes, it was a big deal. We hadn't had a solar eclipse in the continental US since 1979. Thirty-eight years is a long time to wait! Now, here comes another one just 7 years later and this time we're even closer to totality.

A solar eclipse occurs when the Moon passes directly between the Earth and the Sun, temporarily blocking the Sun's light from reaching the surface of the Earth. The Moon and the Sun, while drastically different in physical size, are roughly the same *angular* size in our sky because the Moon is so much closer to us. If the Moon and the Sun happen to be perfectly aligned, the Moon will exactly block the Sun, resulting in a total solar eclipse. If the alignment is a bit off, then the Moon will only block part of the Sun, giving rise to a partial solar eclipse. And if the Moon and the Sun aren't aligned at all (like most days), then there's isn't any eclipse.

If we looked at the Earth from space, we'd see that during the eclipse, the Moon's shadow is covering some fraction of the Earth. As the Moon moves along its orbit, the Moon's shadow moves across the surface of the Earth creating a path of darkness. The center of the shadow (the umbra) is the darkest part. People in that part of the shadow are experiencing a total eclipse and this swath is known as the "path of totality". The umbra is only about 100-160km wide so you can see what not very many people get to have a total

eclipse. The map above shows the path of totality for the up-coming eclipse.

As we move out from the center of the shadow, we get into the penumbra. Anyone in this part of the shadow will experience a partial eclipse, with those farther from the center seeing less of the Sun blocked out. The penumbra is around 6400km wide, so it covers a lot more of the Earth than the umbra. However, the Earth is over 12,700km wide, which is why not everyone gets to see the eclipse.

Every year there are between 2-5 solar eclipses visible from various locations on the Earth. Since astronomers know the orbit of the Moon and the rotation of the Earth to high precision, they are able to predict the path of each eclipse very accurately many years in advance.

For the up-coming eclipse on April 8, 2024, the entire US will be able to see some part of it, weather permitting. Here in West Chester, the Moon will begin to move in front of the Sun at 2:06pm. At 3:22pm, the Sun will be 90% covered - as good as it's going to get for our location. The eclipse will end at 4:35pm. This will be the last total solar eclipse visible from the continental US until 2044.

We'll be hosting a public event at West Chester University on the day of the eclipse, assuming the weather cooperates. Stay tuned for more info!



Looking Up: The Winter Hexagon

You may be familiar with the asterism known as the Summer Triangle, but can you find the Winter Hexagon? We'll show you where it is but first, what the heck is an asterism? This requires a little background on constellations.

While the Greek constellations may be very well known, they didn't have a monopoly on imagination. All of the ancient cultures created pictures in the sky, and they're all wonderfully different! Where the Greeks saw Orion the Hunter, the SA people saw an alligator. But when modern astronomers went to make a map of the sky that could be used by everyone around the world, they had to make some choices. It's not very useful if scientists from one country refer to a region of the sky by a different name than everyone else. So, in 1928, the International Astronomical Union chose 88 official constellations that cover the entire sky.

Obviously, all those other pictures still exist in the various cultures, but they're not "official". Patterns of stars that aren't on the list are referred to as asterisms. A very well-known one is the Big Dipper. That region of sky is officially called Ursa Major (the Great Bear in ancient Greece) but most of us find the spoon-shaped dipper easier to see in our backyard.

Now, back to that hexagon. In the winter sky we have several nice bright stars, visible even in our not-so-dark modern skies. Six of them form an elongated hexagon in the SE sky this time of year.

We'll start with Rigel, the bright blue star marking Orion's left foot. Orion is one of those constellations that a lot of folks know so that makes it a good starting point. From there, we move SSE to the very bright star Sirius in the constellation Canis Major. Hard to miss this one as it's the brightest star in the night sky! Continuing clockwise (ENE), we find Procyon in Canis Minor. Heading NE from there, we come to Pollux – one of the Gemini twins. To be fair, we could just as easily use his brother, Castor, to mark this corner. Now we head up higher (N) to find Capella in the constellation Auriga. This marks the peak of the hexagon. From here, we move WSW to find Aldebaran, the eye of the bull named Taurus. To complete our trip, we head SW back to Rigel.

Since the Winter Hexagon is made of stars from 6 different constellations, it's a great way to star hop around the sky. Check it out one of these nights when it's not too cold!