Watch for Earth's shadow and the Belt of Venus

In both the evening and morning sky, try watching for Earth's shadow, a blue-grey darkness in the direction opposite the Sun, darker than the twilight sky.

Like all worlds orbiting a Sun, Earth casts a shadow. Earth's shadow extends about 1.4 million km into space. You might not realize it, but, from Earth's surface, you can see the shadow. In fact, it's easy to see, and you've probably already seen it, many times, as day changes to night.

That's because night itself is a shadow. When night falls, you're standing within the shadow of Earth.

The best time to watch for Earth's shadow is when it's creeping up on your part of Earth …

The pink band above the shadow – in the east after sunset, or west before dawn – is called the Belt of Venus.

Image taken at the Woomera missile range in Australia

The Moon phase shifts throughout the month, and sometimes you won't find the Moon in the night sky. Earth's shadow, on the other hand, is more reliable. It can be seen any clear evening, ascending in the eastern sky at the same rate that the Sun sets below the western horizon.

The shadow of the Earth is big. You might have to turn your head to see the whole thing. And the shadow is curved, just as the shadow of any round object is curved. Earth's shadow extends hundreds of thousands of miles into space, so far that it can touch the Moon. Whenever that happens, we see an eclipse of the Moon.

Full moon and Earth's shadow on the morning of March 2, 2018, in Tucson, Arizona.

In this photo taken in January 2018 Earth's shadow is the dark blue area above the line of the horizon, the pink coloration above the shadow is called the Belt of Venus.

When and where can you see the shadow of Earth? Like all shadows, the shadow of Earth is always opposite the Sun. So you'll want to look eastward after sunset for the shadow (or westward before sunrise). The shadow is a deep blue-grey, darker than the blue of the twilight sky. And remember, the pink band above the shadow is called the Belt of Venus.

And, just so you'll recognize it more easily, remember also that the shadow is curved, in exactly the same way that the whole Earth is curved. And, once you spot it, don't go back inside just yet. Wait awhile, and watch Earth's shadow ascending in the east at exactly the same rate that the Sun is setting below the western horizon.

When the Sun, the Earth and the Moon are aligned in space, the Earth's shadow falls on the Moon's face. Then people on Earth see the shadow gradually turn a bright full Moon dark in a lunar eclipse. That's what a lunar eclipse is. It's the Moon within Earth's shadow.

During a lunar eclipse, a very small amount of light from the Sun filters through Earth's atmosphere onto Earth's shadow on the Moon. That's why – at the middle part of a total lunar eclipse – the shadow on the Moon looks reddish.

AK, with EarthSky and Wikipedia Notes