

COLOURFUL LUNAR ECLIPSE

During a lunar eclipse, the Moon passes deep inside the shadow of our planet, a location that bathes the face of the Moon in a coppery light. On 8 October sky watchers can expect to see the play of red and turquoise colours changing during the three hour eclipse from start to finish. **In Melbourne the Moon will rise in the East at 7:21pm**

- Partial eclipse begins at 8:15pm
- Total eclipse begins at 9:24pm
- Mid eclipse is at 9:55pm
- Total eclipse ends at 10:24pm
- Partial eclipse ends at 11:35pm

To explain why the Moon does not go totally dark in the shadow of the Earth, imagine yourself standing on a dusty lunar plain looking up at the sky. Overhead hangs Earth, nightside down, completely hiding the sun behind it. The eclipse is underway. You might expect Earth seen in this way to be utterly dark, but it's not. The rim of the planet is on fire! As you scan your eye around Earth's circumference, you're seeing every sunrise and every sunset in the world, all of them, all at once. This incredible light beams into the heart of Earth's shadow, filling it with a coppery glow and transforming the Moon into a great red orb. However, red is not the only colour. Many observers of lunar eclipses also report seeing a band of turquoise. The source of the turquoise is ozone in our upper atmosphere. here where it is reddened by scattering. However, light passing through the upper stratosphere penetrates the ozone layer, which absorbs red light and actually makes the passing light ray bluer. This can be seen as a soft blue fringe around the red core of

Earth's shadow. To catch this turquoise hue watch closely during the first and last minutes of totality. The turquoise rim is best seen in binoculars or a small telescope.

The depth and hue of lunar eclipse colours depends a lot on the dustiness of the Earth airy envelope. When volcanoes erupt and choke the atmosphere with dust particles, lunar eclipses can turn such a deep red that the Moon looks almost black. That should not be the case this time. Despite some recent eruptions that look spectacular from the ground, there have been no large injections of volcanic gases into the stratosphere, and a rather normal reddish-orange lunar eclipse similar in appearance to last April's eclipse is expected.

In other words, this is going to be good. The Moon will be slightly larger than usual as it is just two days after perigee (closest to Earth).

This total lunar eclipse is the second of four consecutive total lunar eclipses. Such a set of eclipses is known as a tetrad. The next eclipse in this tetrad is six months from now, in April 2015. **It will again be visible from Melbourne, but lasts for only five minutes, the shortest total lunar eclipse since 1529!**

The fourth and last in this tetrad is in September 2015 and then there will be a long wait. We will not see it again until 31 January 2018.

AK, from NASA Notes



Light passing through the Earth atmosphere is reddened by absorption. But the ozone layer in the stratosphere absorbs red light and actually makes the passing light ray bluer. Thus the blue fringe at the edges.

