

Fact over fiction on the 'apocalyptic' super blood moon

September 25 2015, by Alan Duffy



Dramatic, but not apocalyptic. Credit: Stanimir G Stoev

For many people, the sight of the moon turning deep red – some would say blood red – during a lunar eclipse is a wonderful sight. And that's precisely what many millions of sky gazers will be able to see this Sunday or Monday, depending on their location on Earth.

But for a dedicated few, this is a sign of something [much more terrifying](#) : nothing less than [the apocalypse itself](#).

Lunar eclipses are an impressive and visible reminder that the [night sky](#) isn't a static backdrop but a dynamic show filled with worlds that move and interact. In this case, the moon's orbit will take it directly behind the Earth, opposite the sun and into our shadow, which will carve out evermore of the moon's face until it's entirely dark.

Or, at least, it would be if the Earth's atmosphere wasn't bending (refracting) light into that shadow region, known as the [umbra](#). After passing through so much air, the bluer colours are scattered out and all that remains is red. We see this effect in the reddening of the sunlight every sunrise and sunset.

In other words, this blood moon is nothing less than all the sunrises and sunsets of the Earth, reflected back at us from the surface of the moon. Sadly, this romanticism will be lost on a dedicated few who will instead greet it with fear as a portent of terrible events.

Enter the tetrad: a rare event?

This latest event marks the fourth lunar eclipse in a row with no partial eclipses to spoil the run. Such a run of eclipses is known as a [tetrad](#). While not uncommon – there have been [eight](#) such tetrad eclipses in the 21st century – they are unusual, with none between 1400 to 1900.

What makes this final of the four a little different is that it's during a super moon. This is when the full moon occurs when the moon is closest to the Earth in its orbit, thereby appearing about 14% bigger and 30% brighter than when furthest from us.

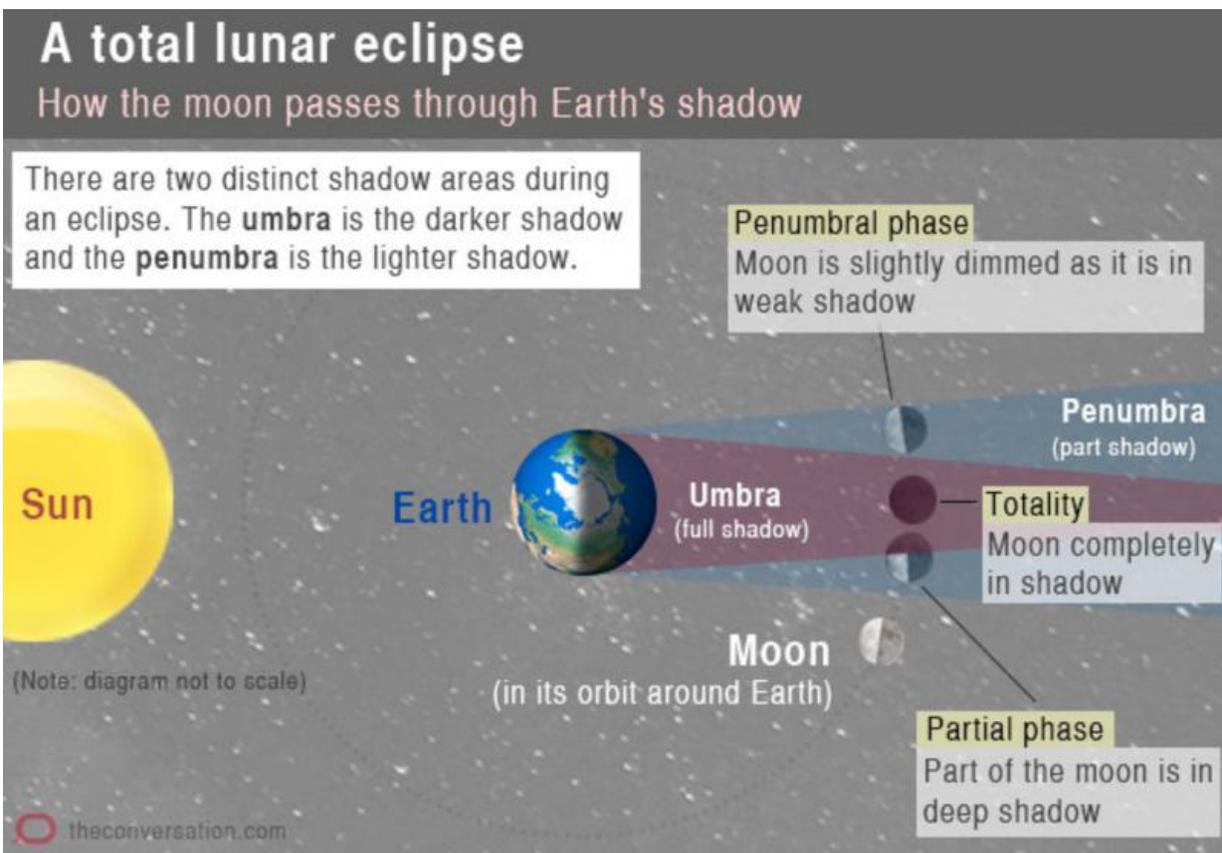
The last time there was a [blood super moon](#) (or less poetically: a perigee lunar eclipse) was in 1982, with the next not until 2033.

So this larger and more noticeably red moon will be the best for a

generation or more, for those lucky enough to be able to see it.

Apocalypse when?

But not everyone is looking forward to the event. There are [reports](#) from stores in the United States of panic buying in anticipation of the coming lunar eclipse, [stockpiling supplies](#) in the fear that this is the apocalypse.



So what is driving this fear of an otherwise natural, albeit particularly

uncommon, lunar eclipse?

It seems to come from the fact that the previous [lunar eclipses](#) of the tetrad have fallen on dates of significance in the Jewish calendar. But that's [happened before](#) and the world didn't end then.

Fuelling all this are two Christian ministers: Mark Blitz, who wrote the bestseller [Blood Moons: Decoding the Imminent Heavenly Signs](#); and John Hagee, who wrote his own bestseller, [Four Blood Moons](#).

NASA scientists say there have been a number of recent blogs and posts online claiming the Earth will be hit by an asteroid between September 15 and 28, the date of the lunar eclipse.

But Paul Chodas, manager of NASA's Near-Earth Object office at the Jet Propulsion Laboratory, said there was "[no existing evidence](#)" that an asteroid or any other celestial object would hit Earth anytime "over the next century".

Now the asteroid claim has been dismissed, Blitz has reportedly turned his [attention to earthquakes](#).

High tides and earthquakes

These rumours have clearly frightened some believers, but how much truth is there that a lunar eclipse will trigger a devastating earthquake?

According to the evidence, a categorical "none", says the [British Geological Society](#), with studies showing the coincidence of earthquakes and the phases of the moon were entirely random.

That the moon has an effect on the Earth is undeniable; we can see that every day with the tides. The Earth itself will be squeezed in the same

way, although with a barely noticeable rise as solid rock is less malleable than water.



Various stages of a blood moon in April 2014. Credit: R E Barber Photography, CC BY-ND

Along with this Earth-tide, the seabed will also experience changing pressure from the weight of all the water above as the tides rise and fall. That this might be a trigger of earthquakes seems reasonable, and was thought to be so for a century, but the numbers just don't add up.

For starters, the difference in the pressure on the rock caused by the tides is less than the normal tectonic forces that the plates experience in their slow migration around the Earth. More definitively, there's simply no observed link between earthquake severity and the tide maximum.

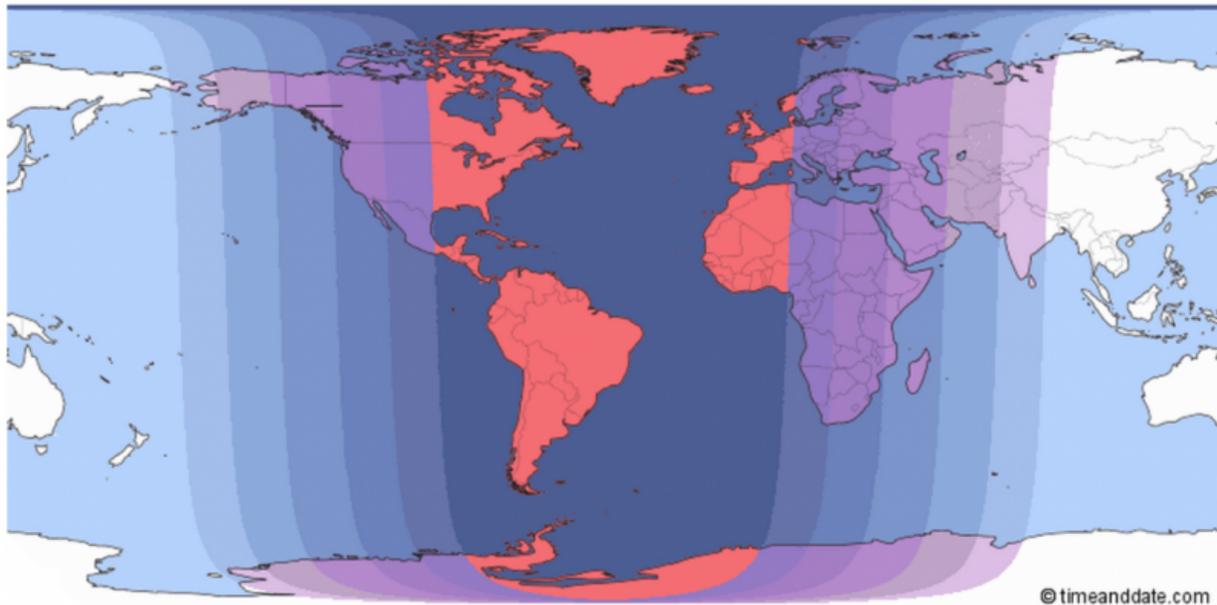
It's also worth keeping in mind that the only difference between a full moon and the blood moon is that the latter just happens to be passing through the Earth's shadow and hence turns a spooky colour. Its actual distance from us (and hence apocalypse-inducing force that it could apply) is be the same.

Even though this lunar eclipse is occurring during a super moon the [increase in tide height](#) from this closer moon is at most 10 centimetres so hardly an apocalyptic flood.

Enjoy the view

Thankfully it looks like the world isn't about to end, and those lucky enough to be in the right place can sit back, relax and enjoy the lunar eclipse.

The phase where the Earth's shadow begins to overlap the face of the moon will last three hours and 20 minutes. The blood moon will occur during totality, when the [moon](#) enters the deepest part of our shadow, the umbra, lasting one hour and 12 minutes.



-  Entire eclipse visible from start to end.
-  Entire partial and total phases visible. Misses part of penumbral phase.
-  Entire total phase visible. Misses part of partial & penumbral phases.
-  Some of the total phase visible. Misses part of total, partial & penumbral phases.
-  Some of the partial phase visible. Misses total phase and part of partial & penumbral phases.
-  Some of the penumbral phase visible. Misses total & partial phases.
-  Eclipse not visible at all.

Where the lunar eclipse will be visible from Earth. timeanddate.com

For Europe and Africa, this means a very early start. For eastern-seaboard US and Canada, it will be much more reasonable viewing time. Australia will miss out on seeing the event, sadly.

There are plenty more time and date details to view the lunar eclipse from other locations are available from the timeanddate.com website.

Location	Eclipse start*	Total eclipse*	Eclipse end*
Sunday September 27			
San Francisco, US	6.57pm	7.47pm	9.27pm
New York, US	9.07pm	10.47pm	0.27am [‡] (Sept 28)
Rio de Janeiro, Brazil	10.07pm	11.47pm	1.27am (Sep 28)
Monday September 28			
London, UK	2.07am	3.47am	5.27am
Paris, France	3.07am	4.47am	6.27am
Johannesburg, South Africa	3.07am	4.47am	5.56am
*All times are local times			

What time and date to see the lunar eclipse from various locations. Credit: The Conversation/timeanddate.com

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