Spring Blood Moon, 2025 September 07

On Sunday evening, September 07, soon after sunset, look in the east for the Full Moon, known as the Spring Moon. The Moon will be near the horizon, so it may be hidden behind trees, buildings, or mountains.

There's a Full Moon about once a month, but this evening, it is special. As the Moon rises, it is moving through the shadow of the Earth at the same time. We call this a lunar eclipse: the Moon is covered (eclipsed) by the shadow of our planet.

As the Moon begins to move into the Earth's shadow, a dark curve begins to cover it. This curve is the shadow of the edge of the Earth!

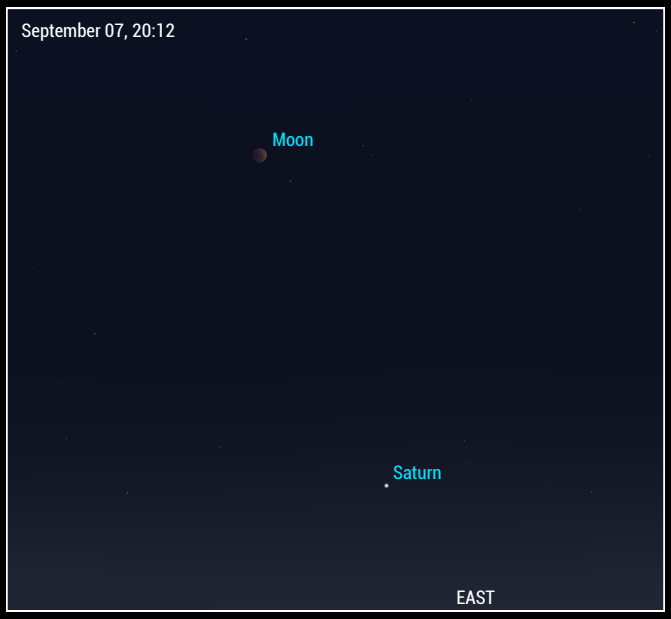
If you can see the Moon at around 19:15 from where you are, only a small piece of the Moon, near the top, is not in the shadow.

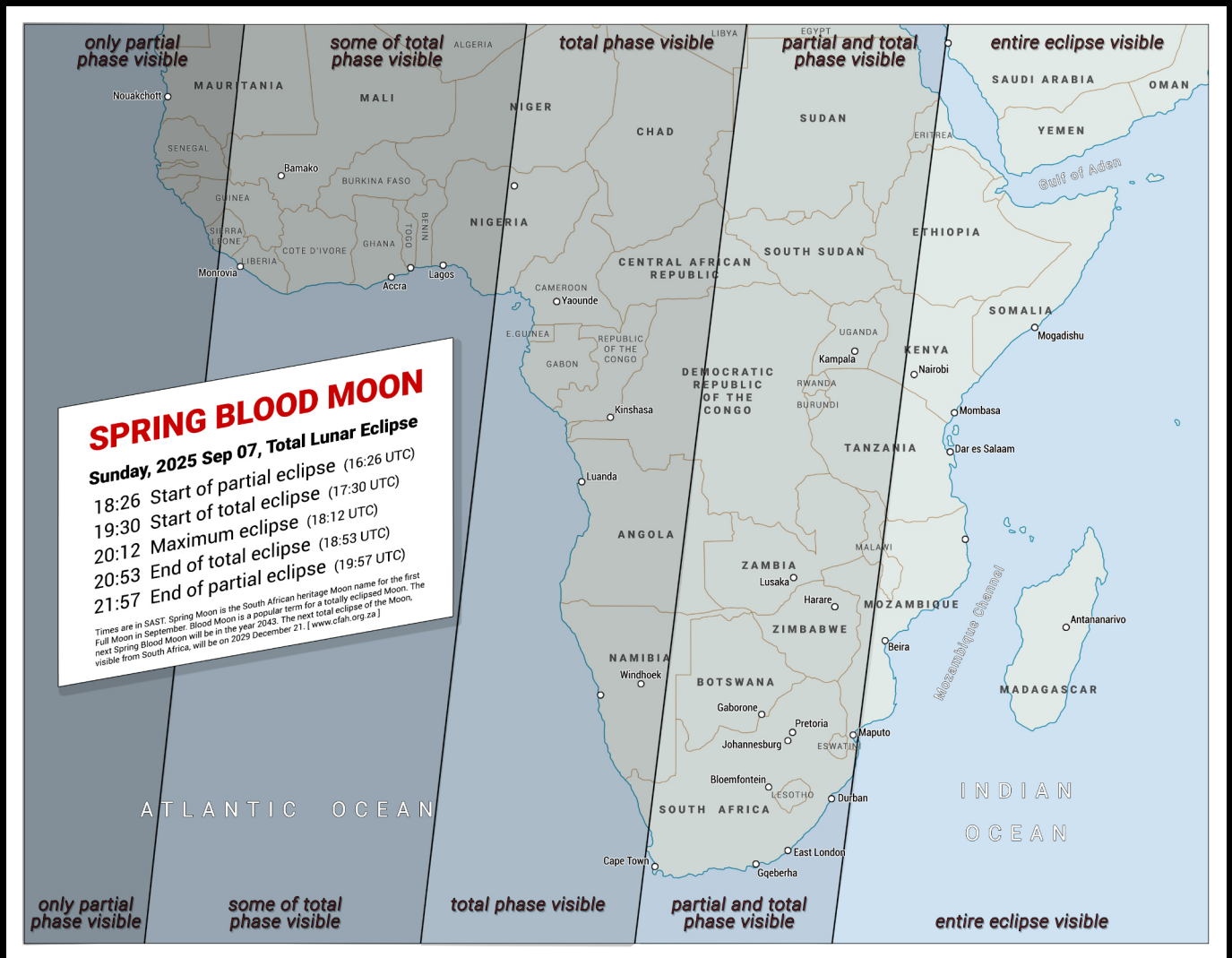
By 19:30, the entire Moon is covered; we say, "the total eclipse phase has started". The Moon is now travelling in space through the Earth's shadow, at an amazing 3,600 km/h!

It remains in the shadow until 20:53. Then, as it moves out, you will see, at the bottom-right edge of the Moon, sunlight returning.

By 21:15 about half of the Moon is in sunlight, and by 21:57 the Moon is again a bright round disk.

The next total eclipse of the Spring Moon will be in the year 2043.





The total eclipse phase

When the Moon is in the total eclipse phase, it is reasonable to think that it would disappear from sight completely, going black as the Earth blocks the Sun's light. Wouldn't that be cool?!

In reality, what happens is even cooler: the Moon turns red, hence the popular term "Blood Moon". Where does the red light come from?

The light you see still comes from the Sun, our nearest star. During an eclipse, the Sun's light is filtered through the Earth's atmosphere, with only the red light escaping (see below for details). It is this reddish glow, shining on the Moon and reflecting back to us, that gives the Moon its dramatic appearance.

By the way, during this period of totality, the Moon has moved about 5,000 km in space, following its orbit around the Earth.

Why is the Moon red?

White light consists of all the colours of the rainbow: red, orange, yellow, green, blue and so on. Our planet is wrapped in a thin blanket of gas (some of which we breathe!) called the atmosphere [from Greek words meaning "vapour" + "sphere", or "a ball of vapour"].

When light from the Sun (the only thing for billions of km around that actually makes light!) shines on the Earth, specific colours of light behave differently. Blue light has the most energy, and red has the least energy. Blue light is kinda like a hyperactive kid, running around and bumping into everything, and getting knocked off course. So the blue light bumps into gas molecules in the atmosphere, sending it all over the place. So, anywhere you look, you will see some blue light. On the other hand, red light is lower energy, it does not bump into things as much, and so continues happily on its way, and does not get into your eye. That's why the sky is blue: the gas in the atmosphere bounces some blue light into your eye but lets the red light get away.

Now, during a lunar eclipse, the Moon hides in Earth's shadow. You might think it would vanish completely, but it doesn't. Some sunlight sneaks around Earth. But remember our colours: the blue “hyperactive kids” scatter away, running off in all directions. The calm red kids don't bump into things so much, they stick together and slip right through Earth's air blanket. They're the ones who reach the Moon. That's why, instead of going dark, the Moon glows red.

And here's the cool part: that red light has passed through both sunsets and sunrises all around the edge of Earth. That's why the Moon glows red: it is being lit up by the colours of every sunrise and sunset!

Why is it called the Spring Moon?

During the course of a year, there are about 12 Full Moons. Every 29.5 days there is a Full Moon. Our word “month” comes from the word “Moon”, by the way.

The Full Moon is a striking sight: visible from sunset to sunrise, large, bright, easy to see, and somehow mysterious. Ancient people used the Moon as a calendar, and in some cultures, Full Moons were associated with seasons and activities carried out at those times.

In the northern hemisphere, particularly amongst indigenous First Peoples in North America, some customary names for specific Full Moons include Wolf Moon and Strawberry Moon. These names have no relevance in the South African context, not only because of cultural and seasonal differences, but also because wolves have never existed here.

Instead, we have Springbok, Dassie, Mantis, and Protea, amongst other things. Several years ago, the Centre for Astronomical Heritage suggested appropriate names for South African cultural Full Moons, with the September Full Moon coinciding with the start of spring in the southern hemisphere. After good winter rains, the Namaqualand and the Northern Cape put on their breathtaking display of flowers which produces the seed store for the next generation of plants. It is the time of ploughing, preparing gardens and sowing, the time when the first green grass begins to show, the cattle become fat and there is a promise of summer and a time of plenty to come.

For a full list of heritage moons, visit [https://cfah.org.za/fullmoon].

What else is there to see tonight?

Below the Moon, and a bit to the right, 13° away, is a bright star. This is the beautiful ringed planet Saturn.

Look 90° to the right and you will be facing South. At about the same height above the horizon as the Moon, you'll see the Southern Cross (see the diagram below). Tonight the Southern Cross is kinda pointing to the Moon! Above it are two bright stars pointing down at the Cross. These two stars are called the "Pointers" because, well, they point to the Cross. Take a second look at the brighter star (at the top): this is alpha Centauri, a very very special star. What makes it so special is that, of all stars in the Universe, it is the closest one to our solar system. (Remember that the Sun is also a star, so the Sun is the nearest star to the Earth, and Alpha Centauri is the nearest star to the Sun.) By "closest" we mean 41 trillion kilometres, which is a long road trip!

If you turn another 90° to your right, facing West, very low above the horizon is a brightish red "star" – actually the planet Mars. Look high above Mars and you'll see a bright star with a reddish colour. This is Antares. The name comes from Greek: "anti" + "Ares". "Anti" means 'rival', 'opposite', and "Ares" is the Ancient Greek name for the God of War. The Romans called the god "Mars", so "Antares" means "the rival of Mars". The ancients noticed that the star and Mars have a similar colour, hence the name. To the !Xu people, a subgroup of the Bushmen at home in what we call eastern Namibia/western Botswana/southern Angola, Antares was known as the "Fire-Finishing Star", not only because of the reddish colour, but at certain times of the year it sets very late at night, when camp fires have died down. In traditional Arabic cultures, the star was called the "Heart of the Scorpion", and modern astronomers refer to it as Alpha Scorpii. You can see the scorpion star pattern as a large, mirror-image question mark, shining above Antares.

Turn another 90° so that you're now facing North. There, you'll see a bright star near the horizon. This is Vega, the brightest star in Lyra (the Harp). Lyra is associated with the magical lyre of the mythological Greek musician Orpheus, a legendary singer/songwriter whose music had the power to charm and enchant all living things, including animals, trees, and even rocks. Think Beyoncé + Imagine Dragons + Twenty One Pilots.

If you are stargazing away from the city, where the sky is dark, **look directly overhead** to see the amazing Milky Way. You're looking at the millions and millions of stars that make up the body of our home galaxy. The nucleus of the Milky Way is overhead, visible as a large cloud of glowing light. We are, of course, inside the Milky Way, but our Sun lies on the outskirts (in the galactic suburbs, so to speak) and we see the city bowl in the distance.

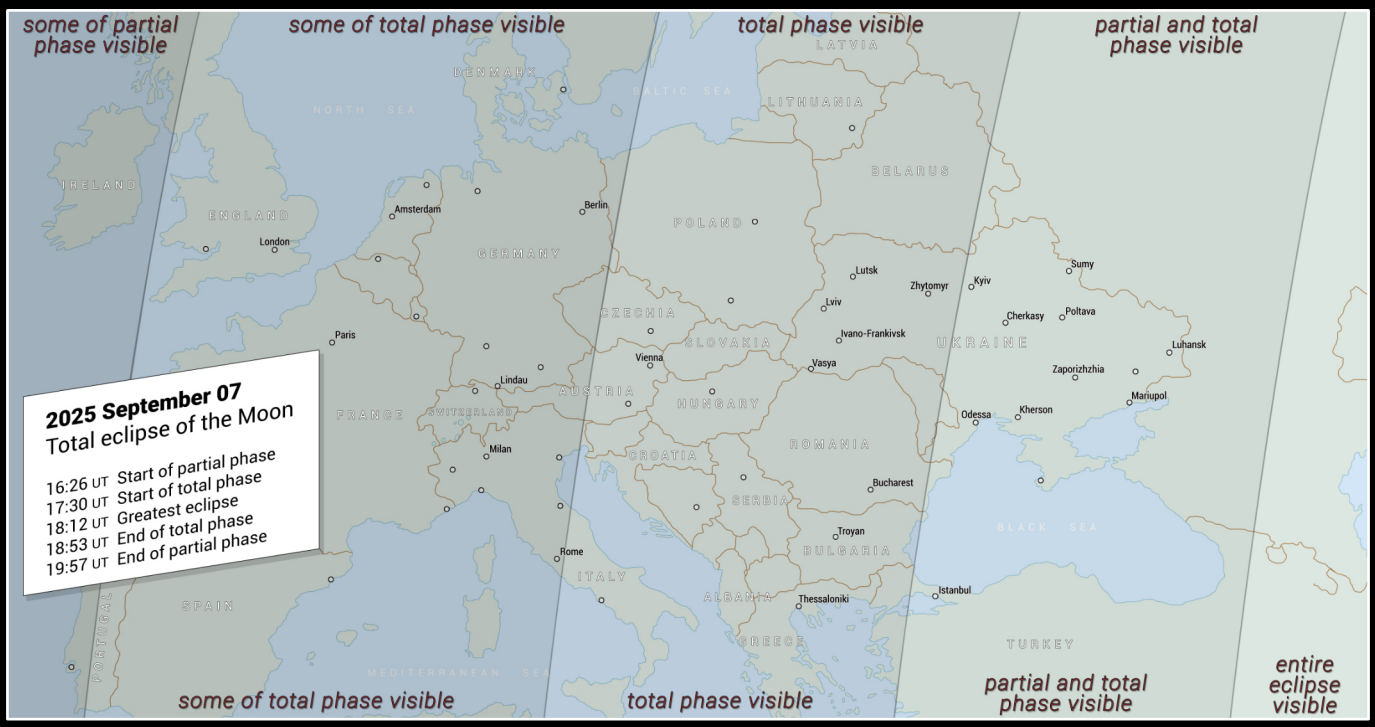
What does it look like from the Northern Hemisphere?

The eclipse can be seen from across most of Europe: from Spain and England in the west, to Ukraine in the east and beyond, into Asia and Australia.

The entire total phase of the eclipse can be seen from eastern Italy, Austria and Czechia, and further eastward. Spain, France, England, Germany, Switzerland, Denmark, and western Italy and Austria, will only witness a part of the total phase, as the Moon will not have risen in time.

While the phases of the eclipse all happen at the same time everywhere (you can phone-a-friend or watch a live stream) there is a big difference: the view in the northern hemisphere will be upside down! The dark and bright features of the Moon are flipped, and so is the movement of the Earth's shadow. This mirror image reversal is because we are looking at the Moon from opposite sides of the planet. Somebody is upside down! 😊

Progress of the eclipse across Europe



What would it look like from the Moon?

If you were standing on the Moon, you would see an amazing sight!

But only for a very short time - because soon you would be dead. That's because there is no air on the Moon, so in about 10 seconds you'd be gasping, and then pass out. RIP Moongazer.

But the really nasty part is that, without air, there is no air pressure, so all the wet stuff in your body would begin to fizzle like Coke or Fanta. The spit on your tongue and the moisture in your eyes would begin to fizzle and pop. Your blood would start to foam with millions of tiny bubbles and your veins would bulge. In fact, you'd puff up like a balloon. Fortunately, your skin is strong, so you won't pop!

But then there's the heat. You're standing on the Moon, bathed in sunlight. The part of you facing the Sun would cook, at over 100°C. Your skin would blister and char, like you've been popped into an oven. But those parts of you away from the Sun would drop to -170°C and you would freeze stiff, like a steak in a deep-freeze. So half of you is blistering and sizzling and the other half is stiff and colder than ice.

Meanwhile, invisible space radiation zaps into you like a giant cosmic X-ray machine.

And that's why an astronaut wears a space suit: it's like high-tech armour, giving you air, keeping the pressure in and the temperature pleasant.

OK, so if you were standing on the Moon in a space suit, you would now safely enjoy an amazing sight. The Sun would totally disappear as a large dark globe (the Earth, four times wider than the Sun) covers it. The black disk would have a thin glowing red ring around it. On the lunar surface, everything around you is lit by a dim copper-coloured light as you stand in the shadow of the world.

What can we learn from a lunar eclipse?

Besides being an amazing sight, a lunar eclipse offers valuable scientific lessons:

Our planet is a ball: The curved edge of Earth's shadow cast upon the Moon provides simple, visual evidence that our planet is round.

It's all about perfect timing: The precise timing of an eclipse confirms our advanced understanding of the orbits and geometry of the Sun, Earth, and Moon.

The Moon is a giant weather report: The colour and brightness of the "Blood Moon" is based on the amount of dust and aerosols in our atmosphere. This allows scientists to study global climate and atmospheric conditions.

A window to the past: Records of ancient eclipses help scientists refine historical calendars and study the subtle changes in Earth's rotation over thousands of years.

A practice run for finding new worlds: A lunar eclipse serves as a natural model for how astronomers can analyze the atmospheres of distant exoplanets, a key step in the search for life beyond our solar system.