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RESOURCES FOR SCHOOL TEACHERS

SOLAR ECLIPSE – 12th AUGUST 2026

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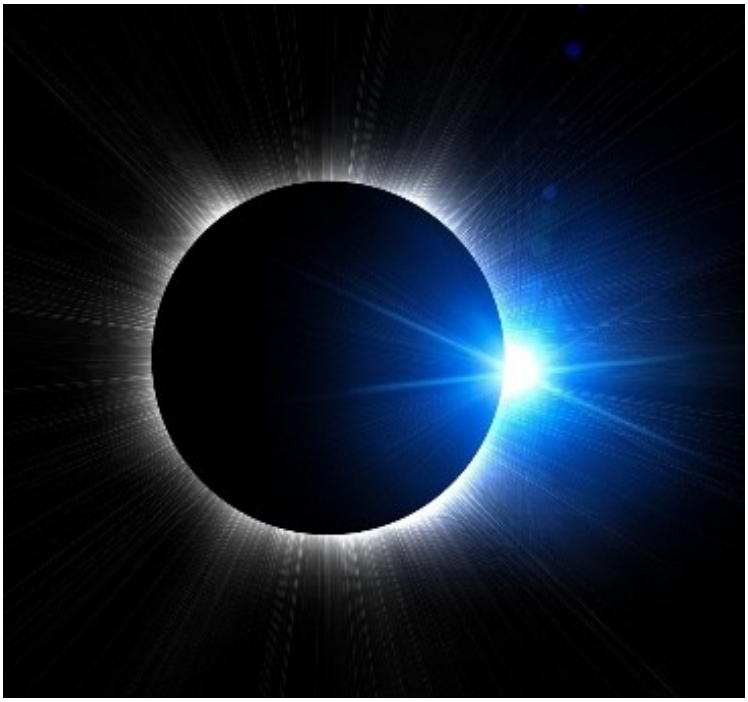


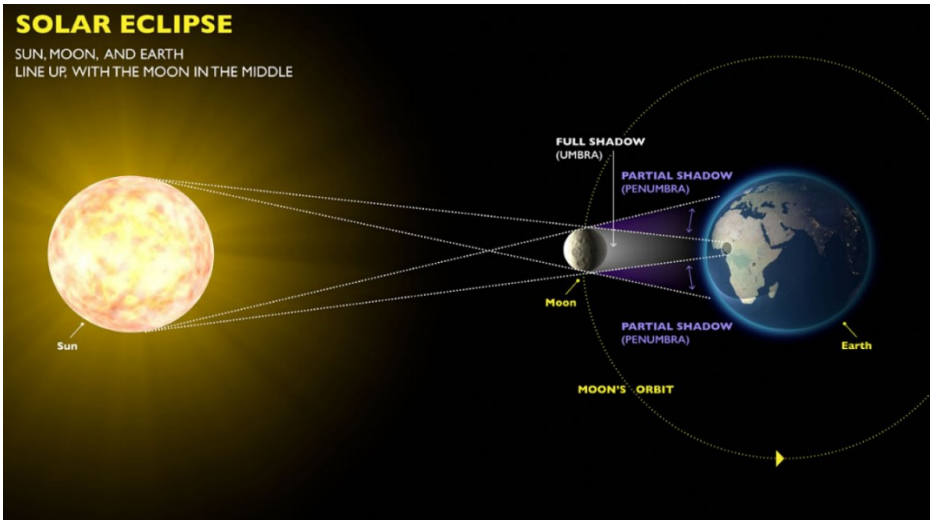
"If the Sun & Moon should Doubt, They'd immediately go out."

— William Blake, Auguries of Innocence (c. 1803)

In *Auguries of Innocence*, William Blake captured the cosmic conviction of the universe: the Sun and Moon fulfil their purpose without hesitation or doubt. To Blake, celestial bodies were not passive mechanical clockwork, but dynamic expressions of unwavering vitality and human imagination.

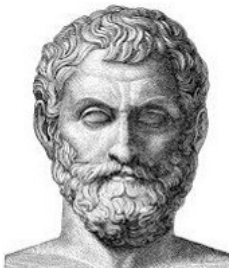
When the Moon glides across the Sun on 12th August 2026, casting total darkness over Spain from the rugged coast of Galicia to the Mediterranean shores (see the ESA trajectory image below), two of human imagination's greatest symbols will merge. A total solar eclipse is a moment where Blake's visionary faith in cosmic certainty meets the precise geometry of nature – a moment in time where scientific accuracy and human awe coexist as one. This short document gives 12 examples of key pioneers selected from the *Atlas of Human Imagination* (davidjarv.is) to mark this special moment.

(Courtesy: ESA)



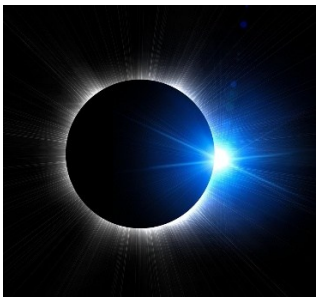
(Courtesy: Oregon State University)

1. Thales of Miletus (585 BC)



The Predictor

Thales is credited with being the first person to predict the occurrence of a solar eclipse in advance.



In 585 BC, Thales predicted a solar eclipse (see image, right) that brought a battle between the Lydians and Medes to a sudden, peaceful halt. By observing patterns, rather than attributing darkening skies to divine intervention, Thales marked the birth of natural philosophy. The 2026 eclipse over Spain represents the continuation of this tradition: an event calculated down to the precise millisecond thousands of years after Thales took the first step.

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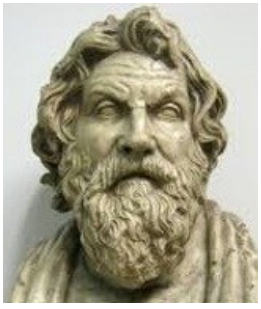
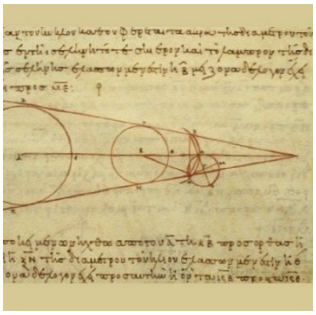
2. Aristarchus (270 BC)



The Geometer

Aristarchus proposed the first known heliocentric model and used geometry to estimate the relative sizes and distances of the Sun, Moon and Earth.



Long before modern satellites, Aristarchus used the geometric relationship of the Earth, Moon and Sun during eclipses and lunar phases to estimate their relative sizes and distances (see image, right). Recognising that the Sun's diameter vastly exceeded that of the Earth, he proposed the first known *heliocentric* model of the cosmos, placing the Sun firmly at the centre of our celestial system.

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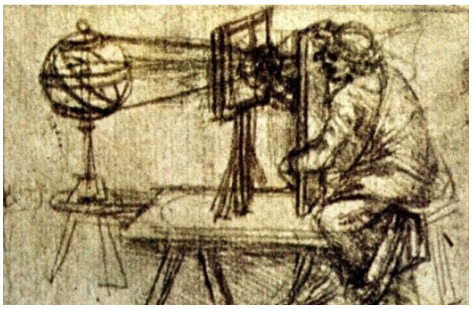
3. Leonardo Da Vinci (1510)

The Visualiser

Da Vinci further developed the pinhole camera (or *camera obscura*) to observe light rays from the Sun.



Leonardo Da Vinci used the principle of the *camera obscura* (see his drawing of a pinhole projection, right) to study the projection of sunlight through small apertures. This indirect method was later used to safely observe and sketch the Sun and shadow geometries. His deep study of *chiaroscuro* – the interplay of light and dark – mirrors the visual phenomenon of totality, where solar rays project through lunar valleys to create Baily's Beads and the spectacular Diamond Ring effect during totality.

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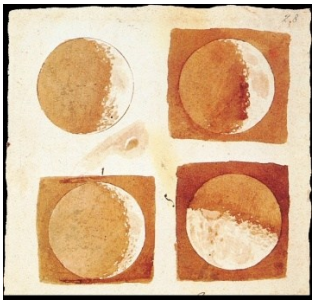
4. Galileo Galilei (1609)

The Mapper

Galileo was one of the first to draw detailed images of the Moon, as well as mapping out the Sun's spots.



With his revolutionary telescope, Galileo mapped the Moon (see image, right) and surface features of the Sun, charting *sunspots* and tracking their motion across the solar face. His work challenged ancient dogma, opening the door to treating our star as a dynamic, physical object subject to universal laws. Together with his observations of Venus and Jupiter's moons, Galileo's work helped transform humanity's understanding of the Solar System and opened the way for modern observational astronomy.

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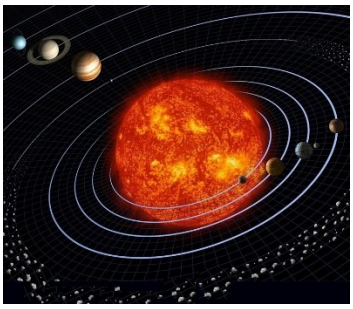
5. Johannes Kepler (1615)

The Orbiter

Kepler was the first to recognise elliptical orbits, a key fact for understanding solar eclipses.



Through his Three Laws of Planetary Motion, Kepler mapped the elliptical pathways that govern how the Earth and other planets orbit the Sun (see image, right). Eclipses are exquisite demonstrations of Keplerian geometry: only when a new Moon is near a node of its orbit can a solar eclipse occur. Kepler's work on elliptical orbits also helped us understand why the apparent sizes and distances of celestial bodies vary, contributing to our understanding of why some solar eclipses are *total* while others are *annular* ('the ring of fire').

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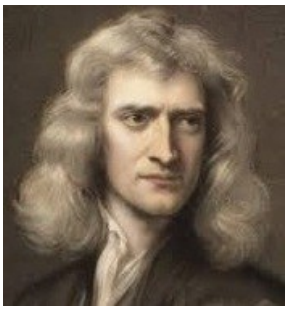
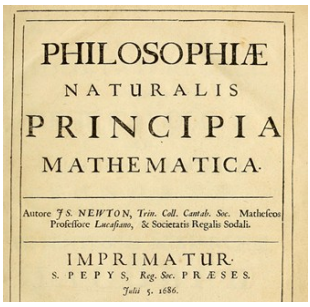
6. Sir Isaac Newton (1686)



The Mechanic

Newton was the first to understand and correctly model the force of gravity – a critical step in predicting planetary motion and eclipses with accuracy.


PHILOSOPHIÆ
NATURALIS
PRINCIPIA
MATHEMATICA.

Autore *Is. NEWTON, Trin. Coll. Cantab. Soc.* Matheseos Professore *Lucasiano*, & Societatis Regalis Sodali.

IMPRIMATUR.
S. PEPYS, Reg. Soc. PRÆSES.
Julii 5. 1686.

Building upon Kepler's laws above, Sir Isaac Newton conceived and formulated the *Law of Universal Gravitation* ($F = G\frac{m_1 m_2}{r^2}$) in 1686 (see image, right). Newton provided the physical engine and mathematical model that allow modern astronomers to calculate shadow tracks with sub-kilometre precision across the Iberian Peninsula hundreds of years in advance.

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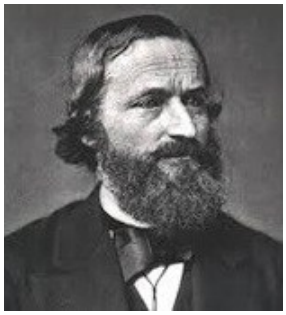
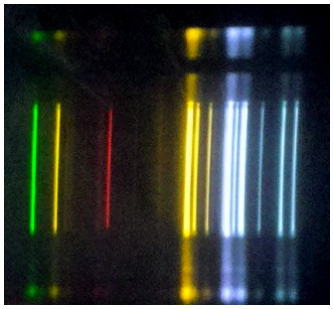
7. Gustav Kirchhoff (1859)



The Chemist

Kirchhoff was the first to measure the chemical composition of objects, like the Sun, from afar using *spectroscopy*.



By discovering that every chemical element produces a unique spectral signature when heated (see image, right), Kirchhoff transformed astrophysics. During totality on 12th August 2026, as the bright photosphere is hidden, the delicate pink chromosphere and pale white corona will reveal their elemental composition through the spectroscopic principles Kirchhoff and Bunsen established more than 165 years ago.

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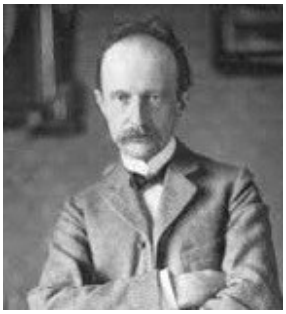
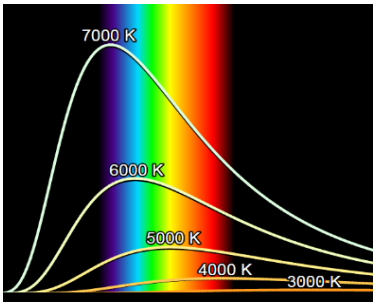
8. Max Planck (1900)



The Quantum Mechanic

Planck was the first to show that energy, from the Sun and other hot objects, came in discrete *quanta*.



Planck's quantum hypothesis solved the blackbody radiation problem of the Sun (see image, right), showing that light is emitted in discrete packets of energy (*quanta*) governed by E=hf. Understanding the solar spectrum relies entirely on his foundation. It governs the visible light emitted thermally by the dense photosphere, as well as the quantum atomic transitions that produce the intense ultraviolet radiation originating from the superheated solar corona.

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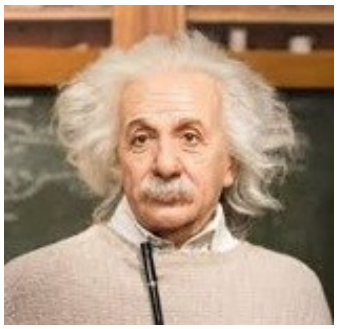
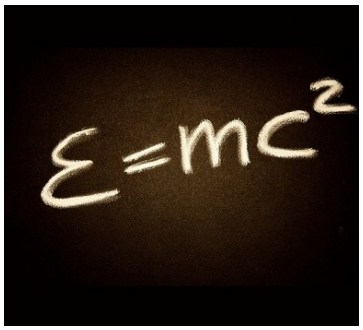
9. Albert Einstein (1919)



The Spacetime Theorist

Einstein revolutionised astrophysics with his Theory of Relativity, correctly calculating that starlight grazing the edge of the Sun would be deflected by 1.75 arcseconds.



During the famous total solar eclipse of 29th May 1919, Sir Arthur Eddington led an expedition to measure the slight bending of starlight passing near the edge of the Sun. The results from Sobral in Brazil confirmed Einstein's *General Theory of Relativity*: mass warps spacetime itself. An eclipse is not just an alignment of shadows; it is a lens flexing the very fabric of space.

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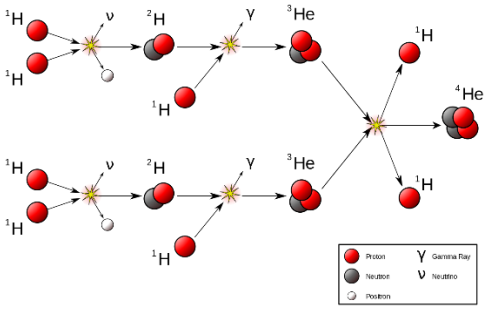
10. Hans Bethe (1939)

The 'Fusioneer'

Bethe was the first to definitively prove what powers the Sun, with his breakthrough nuclear fusion equations.



What powers the blinding light that the Moon momentarily conceals? Hans Bethe unravelled the proton-proton chain (see image, right) and CNO cycle – the key nuclear fusion reactions deep inside the solar core converting hydrogen into helium at 15 million degrees Celsius. Totality therefore exposes the outer atmosphere (the *corona*) of a colossal nuclear fusion reactor floating in deep space.

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11. Wernher von Braun (1969)

The Space Architect

Von Braun was the first person to design the space hardware, rockets and capsules, to safely land man on the Moon.

Von Braun's creation of the mighty Saturn V rocket opened the gateway for deep-space solar observation. From the early Apollo era in the late 1960s – when astronauts aboard Apollo 11 and Apollo 12 witnessed stunning *solar eclipses from deep space* – to modern exploration, humankind can now view solar phenomena from beyond Planet Earth. Carrying on this tradition on 6th April 2026, the Artemis II crew observed a rare 54-minute solar eclipse from behind the Moon during their lunar flyby. Today, satellite constellations like SOHO and the Parker Solar Probe monitor sunspots, solar flares and coronal mass ejections continuously – helping protect our global infrastructure, such as communication satellites, GPS navigation and electrical power grids.

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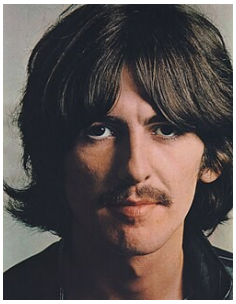
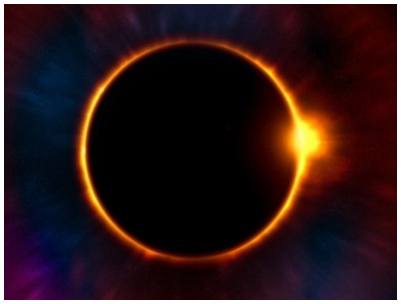
12. The Beatles (1969)



The Soundtrack

George Harrison's song "*Here Comes the Sun*" from The Beatles' Abbey Road album is the most-streamed Beatles song on Spotify with 1.87 billion streams.



"Here comes the sun, and I say, it's all right."

Written by George Harrison of The Beatles in April 1969, *Here Comes The Sun* captures the deep emotional release when light returns after darkness. As the Moon steps aside on 12th August 2026 and the dark totality gives way to the first flashes of returning sunlight (see image, right), this melody remains the universal anthem of human optimism, joy and renewal.

Conclusion:

The total solar eclipse of 12th August 2026, crossing Spain from the Atlantic to the Balearic Islands, is more than a spectacle of nature. It is a living canvas painted by geometry, gravity, quantum mechanics, optics, space exploration and human curiosity. From the ancient observers like Thales predicting celestial rhythms to the modern spacefarers like the Artemis crew exploring the cosmos, our understanding of the Sun reflects the incredible growth of human imagination itself.

David Jarvis
3rd August 2026
www.davidjarv.is

Solar Eye Safety: Protecting Your Vision

Looking directly at the Sun at any time without specialised protection can cause permanent, irreversible thermal damage to your retinas, a condition known as solar retinopathy. To safely witness the 12th August 2026 eclipse, observers must wear certified solar eclipse glasses meeting the ISO 12312-2 international safety standard. Standard sunglasses, polarised lenses and unfilmed camera lenses offer zero protection against intense infrared and ultraviolet radiation. The only moment it is safe to look at the Sun with the naked eye is during the brief, spectacular minutes of absolute totality, precisely when the Moon completely blocks the solar disc – but protection must go right back on the moment the first flash of the Diamond Ring effect appears.

Look after your eyes – you're down to the last pair!

Live Photos from the Total Solar Eclipse

Location: Guadalajara, Spain (north of Madrid)

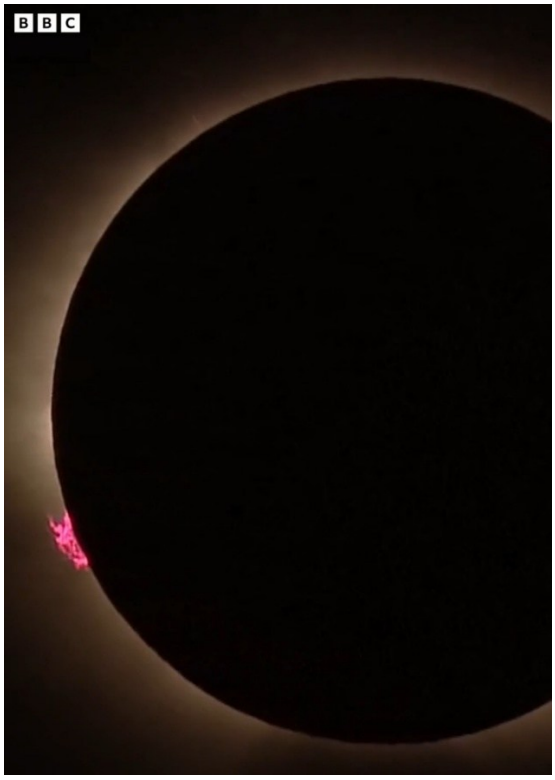
Date: 12th August 2026

Time: 20:31 (totality for 1 minute and 10 seconds)

Sitting on a high ridge on the western part of Guadalajara with the river Henares below.

At this point it went very quiet, as the sky went noticeably darker.

From 20:31-20:32 it went dark as the Moon obscured the Sun, and only the outer chromosphere was visible. Interestingly, we observed a large solar prominence at the 8 o'clock position.



A professional recording (shown later on the BBC) revealed this enormous prominence of hydrogen and helium plasma, glowing a fiery pink at the exact moment of totality.

Amazing!