

Science

# Planet Mars is at its 'biggest and brightest'

By **Jonathan Amos**  
BBC Science Correspondent

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**Nasa Perseverance Mars rover**



In all its glory: Mars pictured by Damian Peach on 30 September

## Get out there and look up!

Mars is at its biggest and brightest right now as the Red Planet lines up with Earth on the same side of the Sun.

Every 26 months, the pair take up this arrangement, moving close together, before then diverging again on their separate orbits around our star.

Tuesday night sees the actual moment of what astronomers call "opposition".

All three bodies will be in a straight line at 23:20 GMT (00:20 BST).

"But you don't have to wait until the middle of the night; even now, at nine or 10 o'clock in the evening, you'll easily see it over in the southeast," says astrophotographer, Damian Peach. "You can't miss it, it's the brightest star-like object in that part of the sky," he told BBC News.

Even though this coming week witnesses the moment of opposition, it was Tuesday of last week that Mars and Earth actually made their closest approach in this 26-month cycle.

A separation of 62,069,570km, or 38,568,243 miles. That's the narrowest gap now until 2035.

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At the last opposition, in 2018, Earth and Mars were just 58 million km apart, but what makes this occasion a little more special for astrophotographers in the Northern Hemisphere is the Red Planet's elevation in the sky. It's higher, and that means telescopes don't have to look through quite so much of the Earth's turbulent atmosphere, which distorts images.

Experienced practitioners like Damian use a technique called "lucky imaging" to get the perfect shot. They take multiple frames and then use software to stitch together the sharpest view.

Damian's picture at the top of this page shows up clearly the "Martian dichotomy" - the sharp contrast between the smooth lowland plains of the Northern Hemisphere and the more rugged terrain in the Southern Hemisphere. Evident too is Mars' carbon dioxide ice cap at the southern pole.

The image was captured using a 14-inch Celestron telescope.

"That's quite a serious bit of equipment; it's not something you get on a whim," says Damian. "But even a telescope half that size will show up all the major features on Mars quite easily. And if you've got a good pair of binoculars, you'll certainly be able to make out that it's actually a planet and not a star."

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Artwork: The UAE's Hope probe will study Mars' atmosphere from next year

It's around opposition that space probes are launched from Earth to Mars. Obviously - the distance that needs to be travelled is shorter, and the time and energy required to make the journey is less.

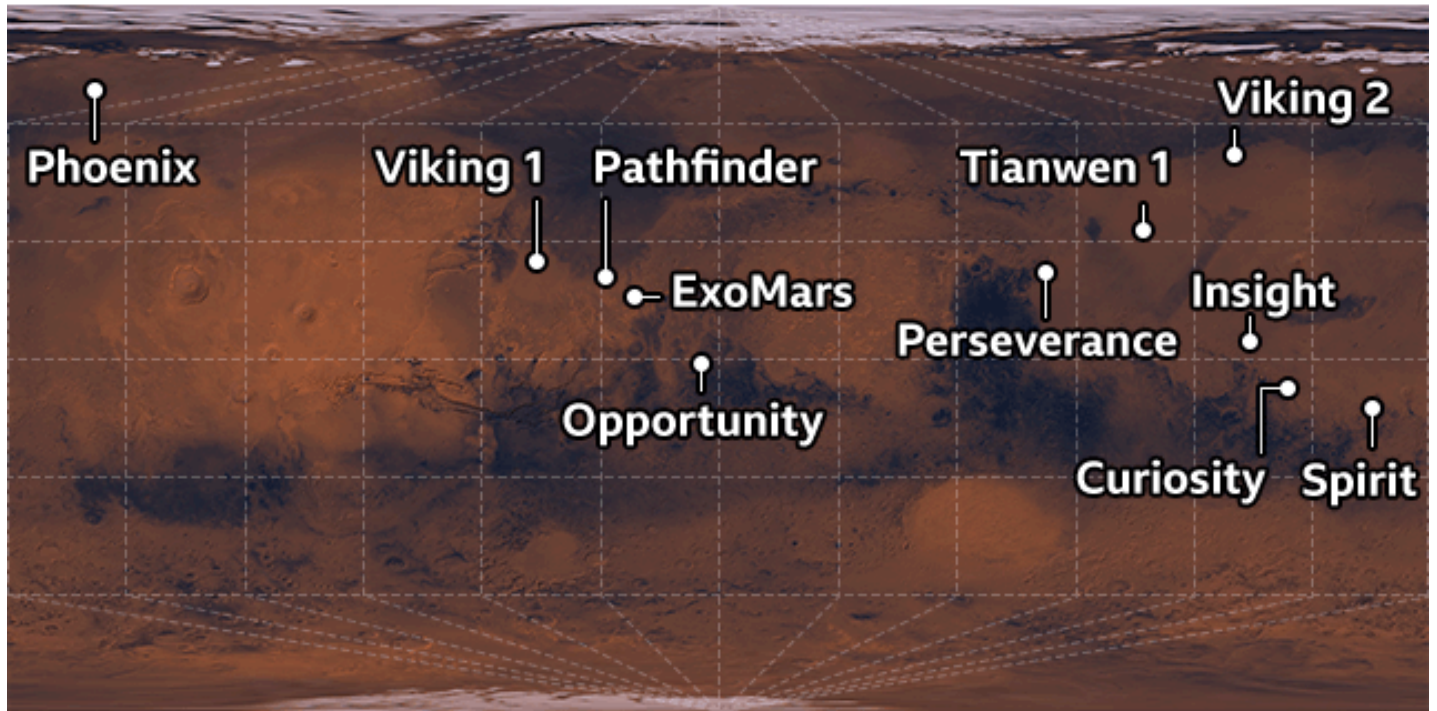
Three missions are currently in transit, all of which were sent on their way in July: The United Arab Emirates' Hope orbiter; China's Tianwen orbiter and rover; and the Americans' Perseverance rover.

Europe and Russia had hoped to despatch their ExoMars "Rosalind Franklin" rover, too, but they missed the launch window and will now have to **wait until late 2022**. That's the penalty you pay when the planets align only every 26 months.

Hope, Tianwen and Perseverance are all on course to arrive at Mars in

February.

## Past and future planned landings on Mars



Source: NASA

BBC

In 2003, Mars made its closest approach to Earth around opposition in nearly 60,000 years - a separation of just 56 million km.

The distance between the two at opposition can be over 100 million km, as happened in 2012.

The variation is a consequence of the elliptical shape of the orbits of both Mars and Earth.

[Jonathan.Amos-INTERNET@bbc.co.uk](mailto:Jonathan.Amos-INTERNET@bbc.co.uk) and follow me on Twitter: [@BBCAmos](https://twitter.com/BBCAmos)

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