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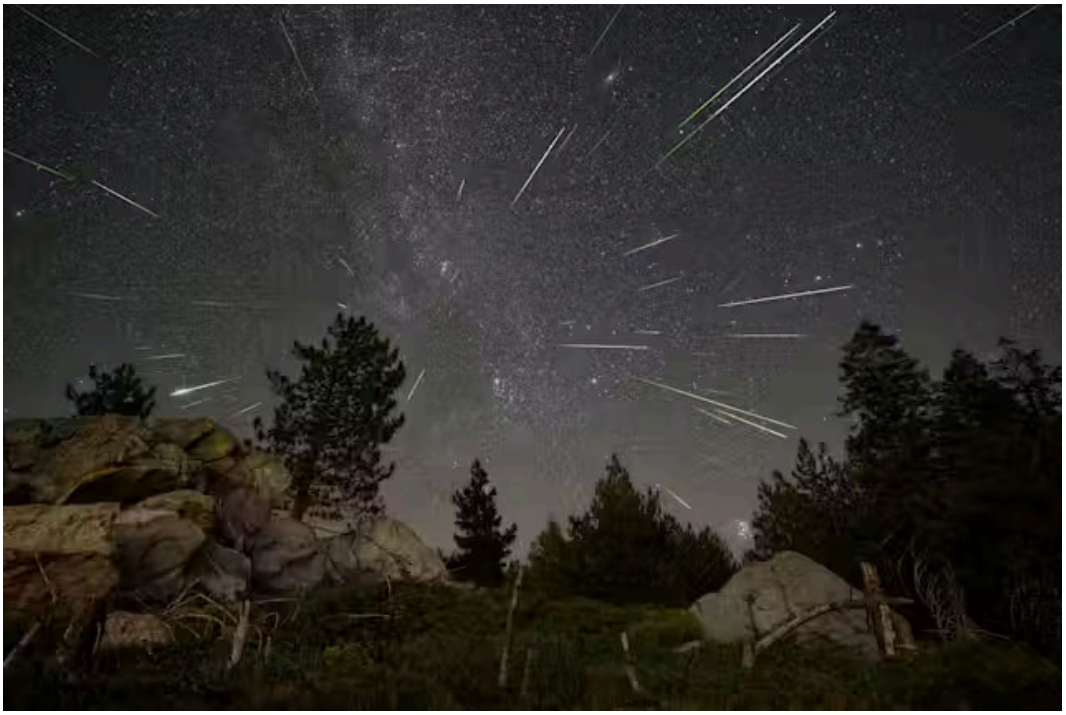

View of the 2023 Perseid meteor shower from the southernmost part of Sequoia National Forest, US. NASA/Preston Dyches

Everyone’s talking about the Perseid meteor shower – but don’t bother trying to see it in Australia or NZ

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In recent days, you may have seen articles claiming the “best meteor shower of the year” is about to start. Unfortunately, the hype is overblown – particularly for observers in Australia and New Zealand.

The shower in question is the Perseids, one of the “big three” – the strongest annual meteor showers. Peaking in the middle of the northern summer, the Perseids are an annual highlight for observers in the northern hemisphere.

As a result, every year social media around the world runs rife with stories about how we can enjoy the show. For an astronomer in Australia, this is endlessly frustrating – the Perseids are impossible to see for the great majority of Australians and Kiwis.

Fortunately, there are a few other meteor showers to fill the void, including a pair that will reach their peak in the next seven days.

What are the Perseids?

Every year, Earth runs into a stream of debris laid down over thousands of years by comet 109P/Swift–Tuttle. The comet swings around the Sun every 133 years or so, shedding dust and debris each time. Over the millenia, that material has spread to create a vast stream.

Animation of comet Swift–Tuttle’s orbit from 1850 to 2150. The blue orbit is Earth, magenta is the comet, with Jupiter, Saturn and Uranus’s orbits in green, red and yellow respectively. Phoenix7777/Wikimedia Commons, CC BY-SA

Earth starts to run into debris from Swift–Tuttle in mid-July, and takes six weeks to pass through the stream. When the dust and debris hit Earth’s atmosphere, the resulting meteors create bright streaks in the sky – a meteor shower.

For most of that time, the dust we encounter is very widely spread, and so few meteors are seen. Around August 12, Earth reaches the densest part of the Perseid stream and the shower reaches its peak.

The Perseids aren’t even the ‘best’ meteor shower

Comet Swift–Tuttle last passed through the inner Solar System in 1992. With the comet nearby, Earth encountered more dust and debris, making the Perseids the best meteor shower of the year.

In the decades since, the comet has receded to the icy depths of the Solar System, and the peak rates for the Perseids have fallen off.

The “best” (most abundant) meteor shower of the year is now the Geminids. However, for people in the northern hemisphere, the Perseids are still well worth looking out for.

View this post on Instagram

A post shared by Petr Horálek (@petrhoralek)

The curse of the spherical Earth

All meteor showers have a “radiant"– the point at which meteors seem to originate in the sky. This is because, for a given shower, all the debris hitting Earth comes from the same direction in space.

The debris from comet Swift–Tuttle crashes towards Earth from above the north pole, and at an angle. As a result, for people at a latitude of 58 degrees north, the Perseid radiant would be directly overhead in the early hours of the morning.

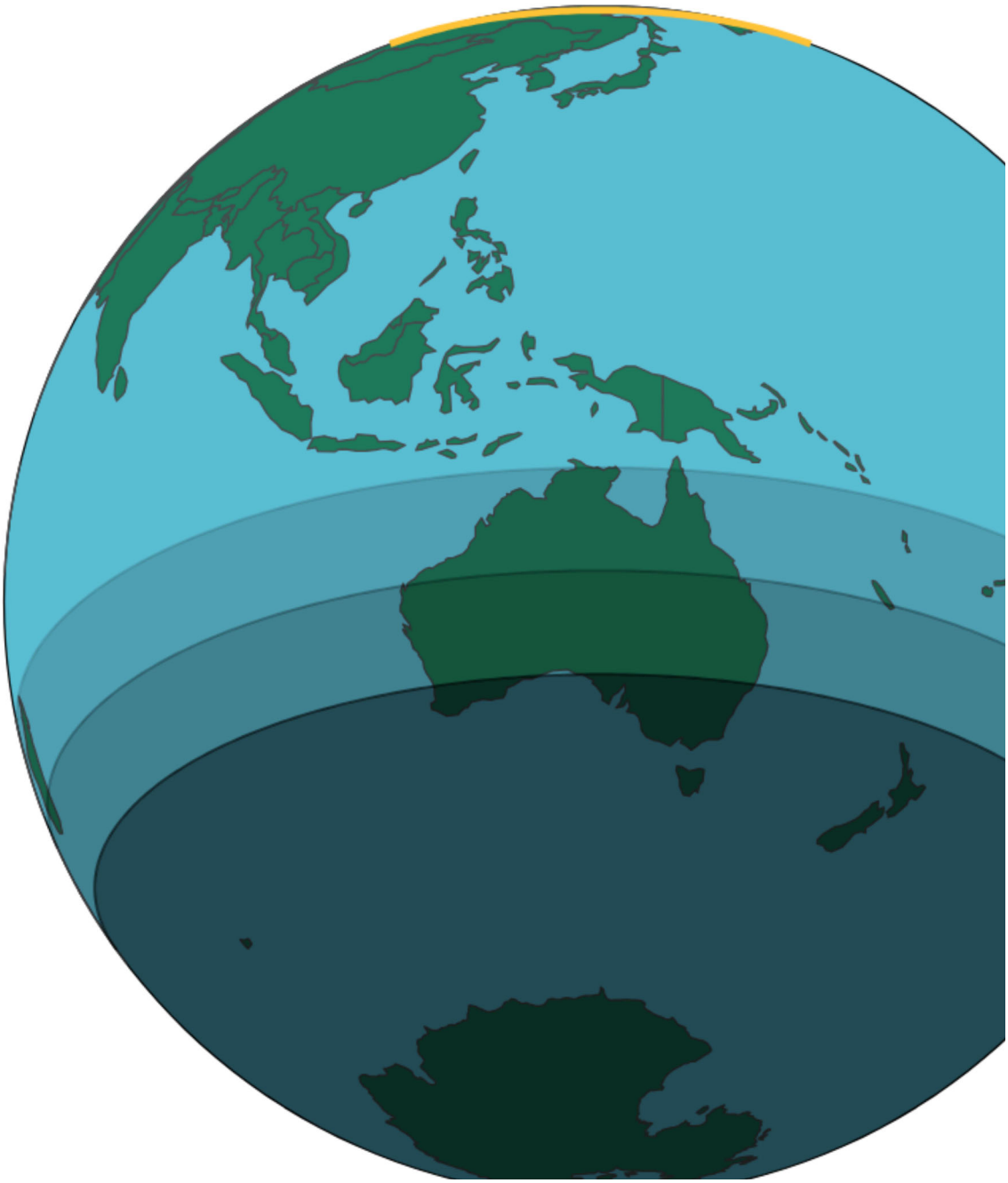
If a meteor shower’s radiant is below the horizon, you won’t see any meteors – Earth is in the way, and all the dust and debris is hitting the other side of the planet. It’s exactly the same reason you can’t see the Sun at nighttime.

Given the location of the Perseid radiant, it will never rise for observers south of 32 degrees. This means anyone below that line will never see any Perseids.

Perseid meteor shower visibility

Spin the globe to reveal the meteor shower visibility

- [ ] Yellow line: the Perseid radiant will pass directly overhead for all locations on this line (58 degrees north) in the early hours of the morning.
- [ ] Zone of disappointment (12–22 degrees south): on a perfect night, some Perseids will be visible in the early hours, but it will still be a disappointing show compared to your friends in the northern hemisphere.
- [ ] Semi-dead zone (32–22 degrees south): on a perfect night, in the early hours of the morning, you may see a small handful of meteors when the Perseids peak.
- [ ] Dead zone (32 degrees south and beyond): the region on Earth where you will never see the Perseids except through pictures on the internet.



In theory, anyone north of 32 degrees south latitude *can* see the Perseids – but there are other complications.

The higher a shower’s radiant is in the sky, the more meteors you will see. This is why the Perseids can’t put on a great show for people in Australia. Even in the far north of Australia, the Perseid radiant remains low in the sky at its highest. For most Australians, the Perseids will be a spectacular disappointment.

Look for these meteor showers instead

If you’re keen to see a meteor shower from Australia or New Zealand, it’s best to cross the Perseids off your list. Fortunately, there are other options.

Every May, Earth passes through debris left behind by comet 1P/Halley, creating the Eta Aquariid meteor shower – only visible in the hours before dawn. For Australian observers, that’s the second best shower of the year.

At the end of July each year, two minor meteor showers reach their peaks: the Southern Delta Aquariids and Alpha Capricornids. This year, they peak on 29 and 30 July, with the best views coming in the hours around midnight. It’s a perfect time to head out to a dark sky site and relax under the stars – the centre of the Milky Way is high overhead in the evening sky, and these two showers provide some added fireworks to make the sky extra special.

Then, in December, comes the true "best shower of the year” – the Geminids. Reaching a peak on 14 and 15 December, the Geminids always put on a spectacular show. Unlike the Perseids, it can be seen from all across our island continent and in Aotearoa.

If you really want to see a great meteor shower, skip the Perseids and plan to head somewhere dark this summer, to spend a couple of nights relaxing under the stars.