

You can see the Hubble Space Telescope in the sky above

30 April 2015, by Tanya Hill



A well-timed shot of the Hubble Space Telescope and the space shuttle Atlantis in 2009, as they transited the sun together in just 0.8 seconds. NASA/Thierry Legault, CC BY-NC

The Hubble Space Telescope ([HST](#)) has now been in orbit for 25 years and this achievement has been a wonderful excuse to pour over the telescope's [beautiful imagery](#), to consider its valuable contribution to science, to remember its troubled beginnings and applaud its stellar success.

But one way, I'm hoping to mark the telescope's anniversary is to hunt for it in the night sky.

I've often watched out for the International Space Station ([ISS](#)) and, with my children, [we've tracked](#) its slow and steady path across the sky wondering what the astronauts [might be doing](#) up there at that given moment.

But I have to admit, as much as I am a Hubble fan, I've never seen the telescope travel across the sky looking like a bright moving "star". And while it's possible to do this from Australia, it's not quite as easy to spot as the ISS and here's why.

Hubble's orbit

On April 25, 1990, the HST was deployed by the [space shuttle Discovery](#) at an altitude of just over 600km. In fact, this was about the extent of the shuttle's reach. Most times, it flew at an altitude of around 320km, with visits to the ISS for instance, taking it up to 400km or so.

Of course, by placing Hubble further away from the Earth, it sits above most of Earth's atmosphere and therefore produces the stunningly sharp images we've come to expect.

Currently, Hubble's almost circular orbit is carried out an altitude of 550 km. And each trip around the Earth takes about 96 minutes. With Hubble circling the Earth 15 times a day, you would think it could be in seen in the sky quite often. But there's a catch.

Importance of a launch site

Hubble is best seen from areas of the Earth that are between the latitudes of 28.5 degrees north and 28.5 degrees south. This is because Hubble's orbit is inclined to the equator at 28.5 degrees. This inclination matches the latitude of Hubble's [launch site - Cape Canaveral, Florida](#) – and was the easiest and most economical orbit to establish.



The two websites that I recommend are [Heavens-Above](#) and [N2YO.com](#).

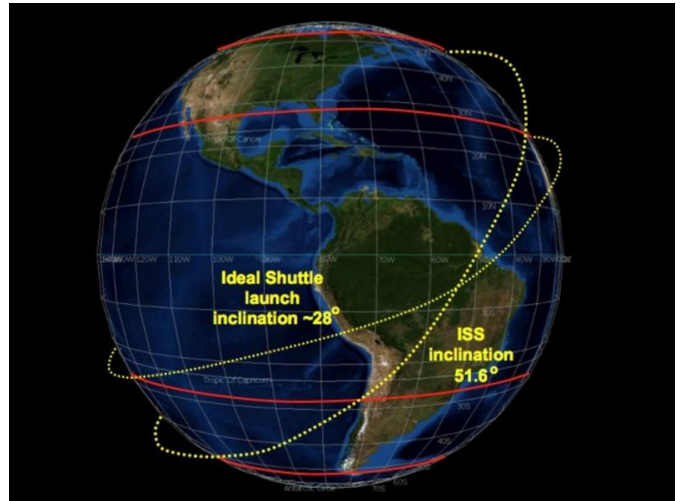
Both websites allow you to adjust the latitude and longitude for your specific location, including in-built search facilities that will locate most cities and towns.

The Heavens-Above site provides a great star chart showing the telescope's path across the sky for each event, while N2YO.com shows the path of the HST across Earth, as if you were looking down on it from space.

Hubble in the morning sky

The STS-31 crew aboard the space shuttle Discovery send the Hubble Space Telescope on its way. Credit: NASA

In contrast, the ISS passes over much more of the Earth because its orbit has a higher inclination at 51.6 degrees. This inclination was chosen because it works best for launches from Russia and it takes less fuel for the USA to launch to higher inclinations than it would for Russia to launch to lower inclinations.



In fact, not only is the Russian launch site at [Baikonur](#) further north than Cape Canaveral, but spacecraft launched from there are [given an extra boost](#) to ensure that if an accident were to happen no debris would fall into China, Russia's neighbour.

The ISS can be seen from more places on Earth than the Hubble Space Telescope because of its highly inclined orbit. Credit: Quora/Robert Frost

The outcome for Hubble, is that its flight path stretches as far north as Cape Canaveral, Florida and approximately as far south as Brisbane (which has a latitude of 27.5 degrees south).

At present, Hubble is visible in the early morning sky from Australia.

So northern parts of Australia have great access to seeing the HST and can catch the telescope flying right overhead. Unfortunately for people in the south, like myself in Melbourne, the telescope travels much closer to the horizon, and it's even worse for Tasmania but not impossible.

There are some great passes coming up for Darwin, including [Sunday May 3](#), when the telescope will travel directly overhead from 5:43am to 5:49am (local time).

A few days later it will be Brisbane's turn, with the best HST pass occurring on [May 7](#), between 5:43am and 5:52am.

How do I see it?

Because Hubble will travel right overhead it will also be at its brightest during these passes. It will appear about as bright as the brightest star in the [Southern Cross](#), known as [Acrux](#) (which shines at a magnitude of 0.8).

By my rough calculations, Hubble's odometer is approaching almost 6 billion km, that's like travelling to the sun and back 20 times. The telescope truly is an engineering marvel, so why not give it a try and see the orbiting space observatory for yourself.



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Watching Hubble track across the Earth. Credit: N2YO.com

Source: The Conversation

For other capital cities, which are further south, the HST doesn't climb as high in the sky and the best passes coming up will occur on the mornings of May 11 or May 12 (click on the capital cities mentioned below to obtain details of each HST pass).

From [Perth](#) and [Sydney](#), the telescope will appear about as bright as [Gamma Crucis](#) in the Southern Cross (around magnitude 1.6) and reach an altitude (or height above the horizon) of 49 degrees and 39 degrees, respectively.

[Adelaide](#) and [Canberra](#) will see the HST travel 32 degrees above the northern horizon. While in [Melbourne](#), the telescope drops to an altitude of 20 degrees and for [Hobart](#) it almost hugs the horizon, just reaching a height of 10 degrees. It'll also be fainter, about as bright as [Epsilon Crucis](#), the faint fifth star of the Southern Cross. So dark skies and good views of the northern horizon will be important considerations.

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