

Lights in the sky—meteors, reentry, or E.T.?

August 2 2016, by David Dickinson



A fireball lights up the skies over Dayton, Ohio. Credit: John Chumack

It happens a few times every year. Last week, we poured our morning coffee, powered up our laptop and phone, and prepared to engage the day.

It wasn't long before the messages started pouring in. 'Bright fireball

over the U.S. West Coast!' 'Major event lights up the California skies!' and variations thereof. Memories of Chelyabinsk came immediately to mind. A bit of digging revealed video and a few authentic stills.

Now, I always like to look these over myself before reading just what other experts might think. Chelyabinsk grabbed our attention when we saw the first videos recording the shock wave of sound generated by the blast 'That sucker was close,' we realized.

Thursday's (Wednesday evening Pacific Time) event was less spectacular, but still interesting: the nighttime reentry of the Long March CZ-7 rocket body NORAD ID 2016-042E as it broke up over the U.S. West Coast.

How do we know this, and what do we look for? Is that flash a meteor, bolide, reentry or something stranger still?

Most good meteor footage comes from videos that are already up and running when the event occurs, to include security and dashboard cameras, and mobile phones already recording an event. How fast can YOU have your smartphone camera out and running? If the event occurs on a Friday or Saturday night, with lots of folks out on the town on a clear evening, we might see multiple captures stream in of the event. Just such a fireball was witnessed over the United Kingdom on Friday evening, September 21st, 2012.

Likewise, the fakes are never far behind. We've seen 'em all though you're welcome to try and stump us. Such 'meteor-wrongs' that are commonly circulated are the reentry of Mir, the 1992 Peekskill meteor, Chelyabinsk, the reentry of Hayabusa, and screen grabs from the flick Armageddon... has anyone ever been fooled by this one?

Meteors generally have a very swift motion, and occur with a greater

frequency as the observer rotates forward into the path of its motion around the Sun past local midnight. Remember, its the front of the windshield that picks up the bugs, rolling down the highway.

Evening meteors, however, can have a dramatic slow, stately motion across the sky, as they struggle to catch up with the Earth. If they reach a brilliance of magnitude -14 –about one whole magnitude brighter than a Full Moon– said meteor is known as a bolide.

Sometimes such a fireball can begin shedding fiery debris, in a dramatic display known as a meteor train or meteor precession. Such an event was witnessed over the northeastern United States on July 20th, 1860.

Bright [meteors](#) may exhibit colors, hinting at chemical composition (green, for nickel) is typically seen. MeteoriteMen's Geoffrey Notkin once told us a good rule of thumb: if you hear an accompanying sonic boom a few minutes after seeing a meteor, its close. Folks often think what they saw went down behind a hill or tree, when it was actually more likely more than 50 miles distant—if it hit the ground at all.



1860 meteor train. Credit: Frederic Church

Is that a meteor or a reentry? Reentries move slower still, and will shed lots of debris. Here's what we're looking at to judge suspect sighting as a reentry:

Heavens-Above: A great clearing house for satellite passes by location. One great tool is that Heavens-Above will generate a pass map for your location juxtaposed over a sky chart.

Aerospace Corp current reentries: Follows upcoming reentries of larger debris with refined orbits.

Space-Track: The U.S. Joint Space Operations Command's tracking center for artificial objects in orbit around Earth. Access is available to backyard satellite spotters with free registration. The most accurate

source for swiftly evolving orbital elements.

SeeSat-L: This message board always lights up with chatter whenever a possible reentry lights up the skies worldwide.



Kaboom! Credit: NASA/Pi of the Sky

Stranger Skies

Bizarre sights await the keen eyed. A tumbling rocket booster can often flare in a manner similar to Iridium satellites. Satellites way out in geostationary orbit can flare briefly into naked eye visibility during 'GEOSat flare season' during the weeks surrounding either equinox.

Some gamma ray bursts such as GRB 080319B flare up briefly above magnitude +6 into naked eye visibility from far across the Universe, as of yet, there's never been a reliable observer sighting of such an event, though it should be possible... probably someone far back in humanity's history witnessed just such a brief flash in the sky, pausing silently to wonder just what it was...

Going further back still, a nearby supernova or gamma-ray burst would

leave a ghostly blue afterglow from Cerenkov radiation as it pummeled our atmosphere... though it would be a deadly planet-sterilizing indigo glow, not something you'd want to see. Thankfully, we live in the 'Era of mediocrity,' safely outside of the 25-50 light year 'kill zone' for any potential supernova.

Source: [Universe Today](#)

Citation: Lights in the sky—meteors, reentry, or E.T.? (2016, August 2) retrieved 23 April 2024 from <https://phys.org/news/2016-08-skymeteors-reentry.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.