Article courtesy of SKY & TELESCOPE

January's Quiet Fireworks

Quads kick off the year with flash and sparkle.



▶ Framed by bare branches, a bright Quadrantid meteor slices the eastern sky before dawn on January 3, 2025. The shower is a potpourri of faint meteors mixed with occasional fireballs. For the best experience, observe as far from city lights as possible. Particles from the shower's parent asteroid, 2003 EH1, strike the atmosphere at medium speed, around 41 km/s (90,000 mph).

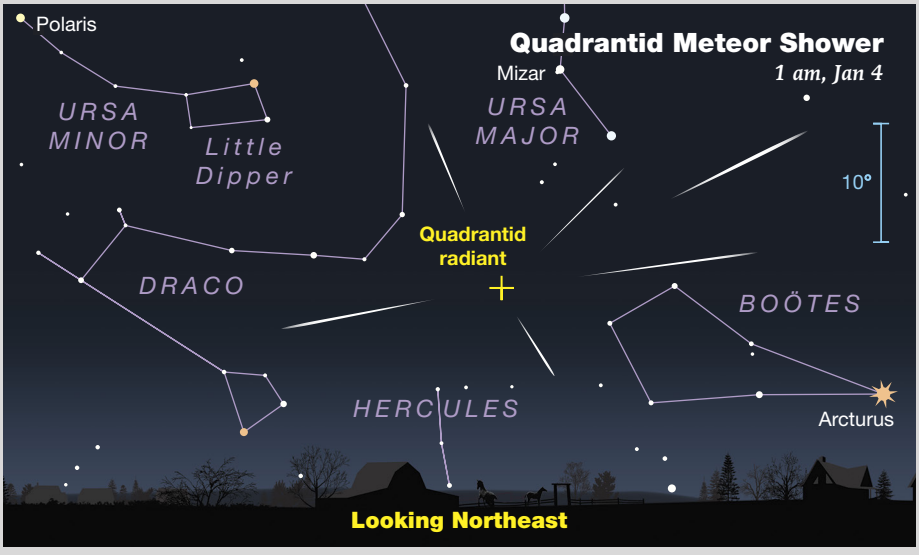
If you missed the fireworks, a quieter but no less exciting cosmic display ushers in the New Year — the annual Quadrantid meteor shower. The shower can be a challenge because its parsimonious peak lasts just six to eight hours. If the *radiant*, the point in the sky where the meteors appear to originate, is well-placed at the same time it's dark at your location, you might spy up to 60 to 200 meteors per hour, including a fair number of fireballs. If the timing is off, your reward for getting out of bed on a cold January morning will be reduced to around 25 meteors per hour.

The annual shower peaks on the night of January 3rd around 10:30 p.m. EST (3:30 UT on January 4th), and the radiant (below the Big Dipper's handle) reaches 20° altitude around 1 a.m. local time. While European and western Asian observers are ideally situated for peak viewing, conditions are good for eastern North America and less so for the western half of the continent.

Given that there's practically no Moon — the waning crescent doesn't rise until the start of dawn — I think watching the shower even off-peak is worth a brief bout with frozen toes, especially for viewers living in the northern U.S. and Canada where the radiant is circumpolar. From Duluth, Minnesota, for instance, the streaming point stands 10° high in the northeast around 11 p.m., very close to the predicted maximum. The later it gets, the higher the radiant climbs, peaking around 60° altitude at the start of dawn. Theoretically that means more meteors, but there's a trade-off because the shower's peak is now in the rearview mirror (see *S&T:* Dec. 2026, p. 48), at least for U.S. observers.

While the northern horizon masks a fair number of shower members early on, the radiant's low altitude increases the chances of seeing *earthgrazers*. These are meteoroids that strike the atmosphere tangentially and flare for great lengths across the sky. I recommend finding as dark a site as possible for watching the shower. The Quads are dimmer on average than Perseids or Geminids but have a penchant for producing fireballs. Weather permitting, I'll dress warmly and watch from the shore of a frozen lake with an unobstructed vista to the north. After an hour or two of soaking in the silent splendor, returning to the warmth of my home will feel like going to heaven.

These January sparklers originate from near-Earth object 2003 EH1, an asteroid that may once have been a comet. It's about 3 kilometers (2 miles) across and orbits the Sun every 5.5 years. Some 500 years ago the asteroid released a batch of debris that left a narrow trail of pebbles and dust in its path. The track's slenderness coupled with the fact that Earth intersects the path at a steep 72° angle means we blast straight through it in a matter of hours. Were we to pass through at a shallower angle, the encounter and hence the shower would last longer. Whether you see lots of meteors or just a few, I can't think of a better astronomical start to the year than catching a cosmic fireworks show.***



▲ The Quadrantids stream from the obsolete constellation Quadrans Muralis, the Mural Quadrant, which once occupied the space between northern Boötes and Draco below the Big Dipper's handle. Meteors fly from this point all over the sky during the shower's peak the night of January 3-4. Observers may see anywhere from about 25 meteors per hour to more than 100, depending upon location. With a declination of +50°, the radiant is circumpolar for observers north of latitude 40° north.

BOB KING