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Comet Holmes Bursts onto the Celestial Stage

by **Megan Rulison**

Scope Correspondent

A little comet named Holmes has unexpectedly brightened a millionfold, and it's causing a flurry of excitement among skywatchers in the Northern Hemisphere. The comet is now so brilliant that it can be seen through city lights or even under a full moon.

On October 23 this year, Holmes was almost invisible and had been so since its discovery a century ago. Then on the following night, J. A. Henriquez Santana, an astronomer in Madrid, observed the comet shining four thousand times brighter than before. Tracked by astronomers across the globe, the comet was seen to brighten steadily throughout the evening. By the end of the night, it was an astounding million times brighter. The glow of Holmes eventually appeared larger than Jupiter's. The Harvard-Smithsonian Center for Astrophysics is calling it a "stunning outburst" that is "brighter than any comet in the past decade."



Comet Holmes

What caused a dim, obscure comet to blossom into a far brighter orb? Multiple hypotheses abound, but Richard Binzel, professor of planetary science at MIT, said it's most likely the comet "blew its top."

A comet is a large mass of ice and rock, like a snowball rolled on a gravel driveway. The comet absorbs heat as it passes the sun, Binzel explained, causing ice beneath the gravel surface to vaporize, creating gas bubbles. Eventually, after many passes around the sun, one or more of those bubbles will burst, blowing off a layer of dust and rock. With that outer layer gone, new ice inside the comet is exposed to the sun for the first time in billions of years. Large portions of the new ice vaporize into a great cloud of gas and dust. This cloud reflects the sun, shining so brightly we can see it from our own backyards.

But this isn't the first times Holmes has blown off a layer. According to Brian Marsden, a comet specialist at the Harvard-Smithsonian Center, it was during a similar outburst that Edwin Holmes first discovered the comet in 1892. Even more interesting, Marsden notes, is that then, as now, the comet was not at its closest location to the sun, when a comet is mostly likely to have an outburst. Holmes is now some 37 million miles beyond that point. "I know of no other comet that has come close to such fantastic behavior," Marsden noted in an email.

Are we seeing a rare cosmic event?

"Comets always surprise us," Binzel said with a smile. He recalls David Levy, a famed comet-discoverer, who said, "Comets are like cats; they have tails, and they do precisely what they want." Part of Holmes's novelty, however, is that there is no tail visible from Earth. Currently, the tail is pointed away from us, leaving Holmes looking like a big fuzzball.