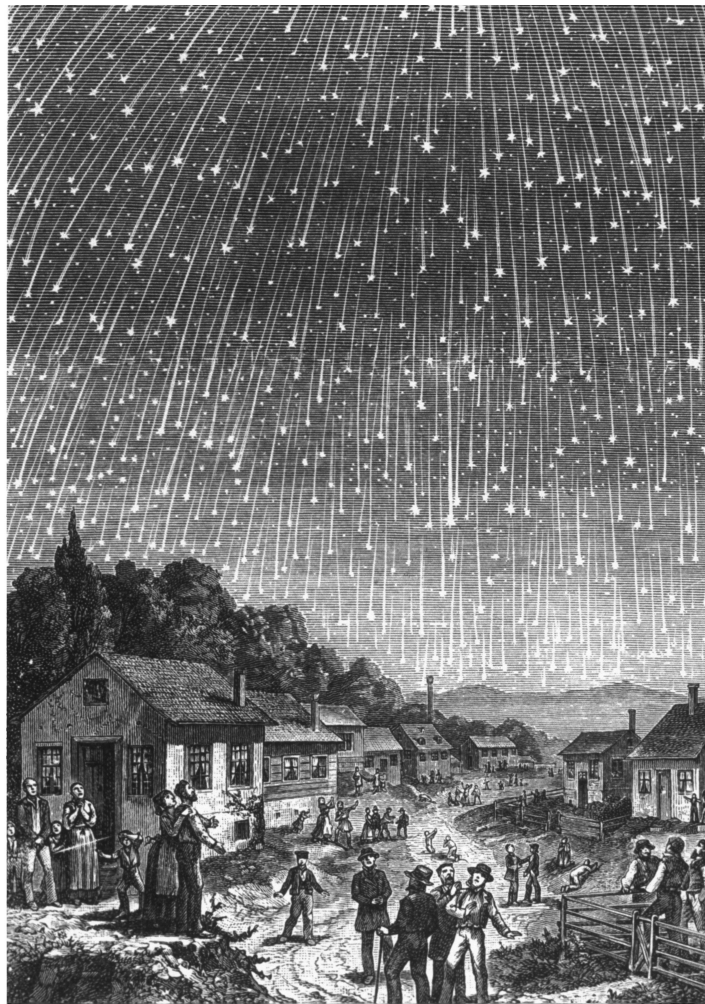


## 1833 Meteor Storm Started Citizen Science

EVENTS

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Woodcut depiction of 1833 meteor storm. Courtesy of Elsevier/M. Littmann

**The science of shooting stars owes much to a storied episode of crowdsourcing, a new historical report shows, kicked off by a stunning 1833 meteor shower.**

Astronomers have increasingly turned to “[citizen science](#)” in the Internet era, setting up everyday folks to look for everything from [alien worlds](#) to the Milky Way’s [galactic gas bubbles](#). But in a new [Endeavour journal report](#), [Mark Littmann](#) and Todd Suomela of the University of Tennessee in Knoxville show that there is nothing new about the practice, with one Yale astronomer pioneering crowdsourced astronomy well over a century ago.

The astronomer, Denison Olmsted, was awakened by neighbors on November 13, 1833, and walked into the cold November night to

Olmsted realized for the first time that they came from one point, one he first called the radiant,” Littmann says. Astronomers today still use the radiant to name meteor showers: The Leonids take their name from their seeming origin in the constellation Leo, the Lion. And the Perseids seen in early August every summer take their name from their origin in the constellation Perseus.

**Citizen Science Starts**

But Olmsted didn’t stop with that discovery. “Just as dawn was brightening the sky, causing the meteors to disappear from view, Olmsted rushed inside and dashed off a brief report on the meteor storm for the New Haven *Daily Herald* newspaper,” says the study.

“As the cause of ‘Falling Stars’ is not understood by meteorologists, it is desirable to collect all the facts attending this phenomenon, stated with as much precision as possible,” Olmsted wrote to readers, in a report subsequently picked up and pooled to newspapers nationwide. Responses came pouring in from many states, along with scientists’ observations sent to the *American Journal of Science and Arts*.

“This was a seminal moment in American science journalism, really in science journalism worldwide,” says Littmann, author of *The Heavens on Fire: The Great Leonid Meteor Storms*. “Until then, the newspapers were mostly political rags, filled with opinion, but here they did a very good job of dispassionately reporting on the meteors, calming people down that it wasn’t ‘The End of Days.’”



Astronomer Denison Olmsted, citizen science pioneer. Courtesy of Elsevier/M. Littmann

The responses also let Olmsted make a series of scientific breakthroughs, ending the 2,200-year grip of Greek philosopher Aristotle on explanations for meteors, which he saw as bubbles of gas lofted high into the sky and ignited. Olmsted’s contemporaries

instead, Olmsted's crowdsourced observations showed that meteor showers were seen nationwide and fell from space under the influence of gravity. The crowd also noted that the showers had appeared before in yearly cycles, something that had eluded scientists, but not European farmers, for centuries.

Olmsted realized that the meteors must be smacking into Earth's atmosphere from outer space. He estimated their speed at about 4 miles per second (6.4 kilometers per second), which he thought was fantastically fast. If he had been less conservative in the calculation, the observations from the crowd would have suggested their actual speed, about ten times faster. Because he didn't realize that friction, instead of conventional burning, was firing up the shooting stars, Olmsted calculated their size as very large, up to a mile (1.6 kilometers) wide instead of the pinprick-size comet dust particles they actually are.

He did get their altitude nearly correct, triangulating the height of the fireballs with another scientific observer in New York at 30 to 50 miles (50 to 80 kilometers) high. He also surmised they originated from a body in a very elongated orbit around the sun, but it would not be until 1867 that astronomers made the connection between meteors and the dust left behind in comet tails, linking the trail of comet Tempel-Tuttle to the Perseids.

"He was ahead of his time, a remarkable guy, not least in using crowdsourcing for the first time, as far as we know, in mass media," Littmann says. "Meteor astronomy really began with this shower."

Every 30 years or so, particularly in 1966, the Leonids have produced remarkably strong showers as a reminder of the 1833 event, although they have declined overall as the comet-tail cloud spawning the meteors has thinned over time. The Leonids are expected to peak around November 16 and 17 this year.

Follow Dan Vergano on [Twitter](#).

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