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News

# Perseid meteors promise shower of science

**Astronomers worldwide prepare for a night of meteoroid studies.**

Lucas Laursen

Professional and amateur astronomers will be teaming up tonight to gather information about the origins and future of the Perseid meteor showers. The spectacle occurs every year when dust from a particular comet hits Earth's atmosphere, visible as streaks of light shooting across the night sky.

Members of the International Meteor Organization (IMO), a group of amateur astronomers who are located around the world, will collect reports of meteor sightings made with the naked eye — aided by the new Moon, which will provide especially dark skies. The astronomers will collate their results using a standardized report form with details of timings, cloud cover and sky position, and the resulting global estimate of meteor distribution will complement the measurements of the professionals.

Geert Barentsen, an IMO member, will be watching the shower in the hills of Antrim, north of Belfast. Despite being a graduate student in stellar physics at Armagh Observatory in Northern Ireland, Barentsen says that meteor watching is strictly a hobby.

However, he says, the observations logged by IMO members are vital: "For its wide field of view and sensitivity, there's not a single camera which replaces the human eye."

Meanwhile, Peter Brown, an astronomer at the University of Western Ontario, Canada, will be leading a team of scientists who will be tracking the shower with several instruments. These include a broad, all-sky camera that detects meteoroids down to about a centimetre in diameter, a night-vision camera that is sensitive to millimetre-sized objects and a radar that can detect particles measuring a few hundred micrometres across during the day or night. They hope to get an accurate count of the number of Perseid meteoroids that are coming down in each size range. "That hasn't been done before," Brown says.



Tonight's observations could help to hone future forecasts of the Perseid meteor shower's intensity.

*SWNS/UPPA/Photoshot*

Unlike Barentsen, however, who plans to be up all night watching the meteors, Brown's team will be sleeping. "We let the instruments do all the work," Brown says.

## Mysterious meteors

The Perseid shower still manages to surprise scientists despite its annual appearance. "Five to ten years ago, the main idea about these particles is that they were homogeneous," recalls Pavel Spurný of the Ondřejov Observatory in the Czech Republic. To investigate that theory, he and his team compared the observed paths of meteoroids through the atmosphere with the light curves predicted by a physical model of homogeneous particles, and found that they didn't match<sup>1</sup>. "We proved that meteoroids are composed of two main parts — a grain and glue," explains Spurný. This year, the team hopes to get data that will help them refine their models.

A meteor shower occurs when a group of small dust particles flying together in formation strikes Earth's atmosphere. Astronomers think that the Perseid shower — one of the most prominent in the annual calendar — is detritus from the comet Swift–Tuttle. "Most of the particles escaped from the comet core during its closest approach to the Sun," Spurný says. "It's nice to study the dynamics of this shower and see how particles from this outburst are distributed around the Sun."

The movements of meteoroids tell astronomers how pieces of a comet break up and spread out across the Solar System. But they also let researchers test their forecasts of exactly where and how dense each year's shower will be. This is crucial information for space missions.

"The Perseids are of particular interest because they are the only meteoroids to kill a spacecraft," says meteor forecaster Bill Cooke, of NASA's Marshall Space Flight Center near Huntsville, Alabama. The loss of the European Space Agency's Olympus satellite in 1993 may have been due to a collision with the Perseids, Cooke explains, and last year's Perseid shower could have caused an anomaly with Landsat 5, part of the satellite programme that collects images of Earth from space. Meteoroids hitting the spacecraft at around 60 kilometres per second would have generated a hot plasma that interfered with the satellite's electronics.

This year's shower is expected to be of normal intensity — about half that of last year and just a quarter of its strength the year it disabled Olympus, Cooke says. For astronauts, such as those on yesterday's spacewalk at the International Space Station, the shower doesn't represent much of a risk: "The Perseids only add 15% to the background flux at a millimetre size," Cooke says. In any case, astronauts don't perform spacewalks during high-intensity meteor storms.

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Cooke relies on observations from Brown's instruments and from the IMO's far-flung network to test his predictions of meteoroid effects on US government spacecraft. But unlike Brown, Cooke will be up tonight, as he is hosting a [live webchat](#) about the shower. "I'm going to be a tired little puppy come Friday morning," he says.

Barentsen says that he will try to get some science done tonight, too, but like Cooke he's mostly going to be busy sharing his excitement with others. Thanks to the IMO's widespread network, he can count on members in Russia and Mexico to take formal observations. "We just need everybody to go out and count and send us the data," he says.



## References

1. Borovička, J., Spurný, P. & Koten, P. *Astron. Astrophys.* **473**, 661-672 (2007).

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