

## 'Gargantuan' Hail in Argentina May Have Smashed World Record



**A gargantuan hailstone that fell in Argentina may have set a world record.**

**IMAGE: VICTORIA DRUETTA**

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**April 29, 2020**

UNIVERSITY PARK, Pa. — A supercell thunderstorm pelted a city center in Argentina a few years ago with hailstones so large scientists suggested a new category to describe them — gargantuan hail.

Researchers investigating the 2018 storm found one hailstone likely measured between 7.4 and 9.3 inches across, potentially setting a new world record. The current record belongs to a hailstone that measured 8 inches across, or about the size of a volleyball, that fell near Vivian, South Dakota.

“It’s incredible,” said Matthew Kumjian, associate professor in the Department of Meteorology and Atmosphere Science at Penn State. “This is the extreme upper end of what you’d expect from hail.”

The scientists proposed hail larger than 6 inches should be classified as gargantuan, and said more awareness of these events, while rare, could help piece together a better understanding of the dangerous storms.

“Anything larger than about a quarter in size can start putting dents into your car,” Kumjian said. “In some rare cases, 6-inch hail has actually gone through roofs and multiple floors in houses. We’d like to help mitigate the impacts on life and property, to help anticipate these kinds of events.”

The storm in heavily populated Villa Carlos Paz, Argentina, offered scientists a rare opportunity to study a well-documented case of gargantuan hail. As the storm unfolded, residents took to social media, posting pictures and videos.

Researchers followed up on the accounts a year later, interviewing witnesses, visiting sites where damage occurred, collecting photogrammetric data and analyzing radar observations. Using photogrammetry — taking measurements from photographs — and video evidence, the scientists estimated one hailstone may have set a world record.

The scientists reported their findings in the *Bulletin of the American Meteorological Society*.

“Such a well-observed case is an important step forward in understanding environments and storms that produce gargantuan hail, and ultimately how to anticipate and detect such extreme events,” Kumjian said.

Hail typically occurs during severe storms, which produce strong, sustained updrafts. The winds hold hailstones aloft long enough to grow in sub-zero temperatures high in the atmosphere. But predicting hail size remains challenging, the scientists said.

Rachel Gutierrez, a graduate student at Penn State and co-author of the paper, found a connection between a storm updraft’s rotational velocity, or how fast it is spinning, and larger hail size, but much remains unknown about the relationship.

She said the data, especially from a storm outside the United States, is invaluable.

“There typically isn’t a lot of data from storms outside the U.S.,” Gutierrez said. “Having this shows us these crazy, high-impact events can happen all over the world.”

Gargantuan hail events may be more common than once believed, but researchers need volunteers willing to report hail and provide accurate measurements, either by including a common item for scale, or a ruler, Gutierrez said.

Kevin Bowley, assistant teaching professor, also contributed from Penn State.

Other researchers on the project were Joshua Soderholm, then a Humboldt Fellow at the University of Bonn, Germany, and now a research scientist with the Bureau of Meteorology in Australia; Stephen Nesbitt, professor at the University of Illinois at Urbana-Champaign; Lorena Medina Luna, education and outreach specialist at the National Center for Atmospheric Research; James Marquis, scientist at Pacific Northwest National Laboratory; and Paolo Salio, professor, Paula Maldonado, doctoral student, and Milagros Alvarez Imaz, student, at the Centro de Investigaciones del Mar y la Atmósfera in Argentina.

The National Science Foundation and the Insurance Institute for Business and Home Safety partly funded this research.