

# Particles of meteor heard exploding in Tahoe found on West Slope

By Scott Sonner, AP

RENO – Tiny meteorites found in the Sierra foothills of northern California were part of a giant fireball that exploded over the weekend with about one-third the explosive force of the atomic bomb dropped on Hiroshima in World War II, scientists said Wednesday.

The rocks each weighed about 10 grams, or the weight of two nickels, said John T. Wasson, a longtime professor and expert in meteorites at UCLA's Institute of Geophysics and Planetary Physics.

Experts say the flaming meteor, dating to the early formation of the solar system 4 to 5 billion years ago, was probably about the size of a minivan when it entered the Earth's atmosphere with a loud boom early Sunday. It was seen from Sacramento, Calif., to Las Vegas and parts of Northern Nevada.

An event of that size might happen once a year around the world, said Don Yeomans of NASA's Near-Earth Object Program Office at the Jet Propulsion Laboratory in Pasadena, Calif. But most of them occur over the ocean or an uninhabited area, he said.

"Getting to see one is something special," he said. He added, "Most meteors you see in the night's sky are the size of tiny stones or even grains of sand, and their trail lasts all of a second or two."

The meteor probably weighed about 154,300 pounds, said Bill Cooke, a specialist in meteors at NASA's Marshall Space Flight

Center in Huntsville, Ala. At the time of disintegration, he said, it probably released energy equivalent to a 5-kiloton explosion. The Hiroshima bomb was 15 kilotons.

“You don’t often have kiloton rocks flying over your head,” he said.

The boom, another expert said, was caused by the speed with which the space rock entered the atmosphere. Meteorites enter Earth’s upper atmosphere at somewhere between 22,000 and 44,000 mph – faster than the speed of sound, thus creating a sonic boom.

The friction between the rock and the air is so intense that “it doesn’t even burn it up, it vaporizes,” said Tim Spahr, director of the Minor Planet Center at Harvard University.

Wasson said one meteorite was found near the town of Coloma, about 35 miles northeast of Sacramento. “I’m sure more will be found, I’m hoping, including some fairly big pieces,” he said.

“The fact that two pieces already have been found means one knows where to look,” Wasson said.

Bits of the meteor could be strewn over an area as long as 10 miles, most likely stretching west from Coloma, where James W. Marshall first discovered gold in California, at Sutter’s Mill in 1848.

Robert Ward of Prescott, Ariz., who has been hunting and collecting meteorites around the world for more than 20 years, said he found the first piece about 10am Tuesday in between a baseball field and park on the edge of the town of Lotus.

Ward said he “instantly knew” it was a rare meteorite known as “CM” – carbonaceous chondrite – based in part on the “fusion crusts from atmospheric entry” on one side of the rock. He actually has two rocks that he suspects were part of the same small meteorite that split on impact.

"It was just, needless to say, a thrilling moment," he said.

"It is one of the oldest things known to man and one of the rarest types of meteorites there is," he said. "It contains amino acids and organic compounds that are extremely important to science."

Yeomens confirmed this type of meteorite is one of the more primitive types of space rocks out there, dating to the origin of the solar system 4 to 5 billion years ago. And it's "actually kind of unusual," he said.

Yeomens said it's got two of the most important chemicals that scientists look for: carbon and a form of water. In fact, this type of space rock is likely full of water and would have made a good candidate for the new space company announced Tuesday that plans to mine asteroids, he said.

"And this one landed in their backyard for a lot less than they planned to spend," he said.

The minivan sized asteroid wasn't on NASA's lengthy list of near Earth objects that they track coming close to the planet, so it took scientists by surprise. "There are millions of objects of that size that we don't know about," he said. "They're too small to image unless they're right up on top of you."

Ward and others tracked the meteorites' possible location based on estimates by, among others, scientists with the Meteor Group at the Western University of Ontario in Canada that the fireball likely had exploded in the upper atmosphere above California's Central Valley.

Wasson suspected hundreds of dealers and collectors already have joined the search. He said it was important to recover the meteorites soon because any rain will cause them to degrade, losing their sodium and potassium.

“From my viewpoint as a meteorite researcher,” he said, “I’m hopeful some big pieces are found right away.”

*AP science writer Seth Borenstein contributed to this story from Washington, D.C.*