

Recipe for planets

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Credit: Victoria University of Wellington

It's not every day that clues about the origin of our solar system fall from the sky, but one Victoria University of Wellington researcher has found just that—in a meteorite that collided with Earth 50 years ago.

Since it hit Allende in northern Mexico on 8 February 1969, the [meteorite](#) has undergone [extensive study](#), even informing the NASA Apollo missions that returned rock samples from the moon. Half a century later, samples of this meteorite have made their way to Wellington, where scientist Dr. Bruce Charlier is studying them to reveal the secrets they hold about the birth of our solar system.

As part of an international collaboration with scientists from Caltech and the University of Chicago, Bruce is examining the composition of the isotopes of a particular element found in the meteorite. The composition of this element has its origins from before the solar system as we know it was formed, so studying it can give insights into our solar system.

"This meteorite preserves a record of the materials that gave birth to our sun," Bruce says. "In essence, we're looking at the raw ingredients for planets before everything got mixed up and cooked!"

The elements Bruce is studying are found in a part of the meteorite called a calcium-aluminium-rich-inclusion (CAI). CAIs are the oldest dated solids in the solar system.

"These solids are pretty unique because they were formed from gas that cooled directly after the birth of the sun four and a half billion years ago," Bruce says. "They are the only surviving witnesses to that [birth](#), so they can tell us a lot about the chemical composition of the earliest materials in the solar system and how they came together to form our sun and planets."

Using a state-of-the-art [mass spectrometer](#) at the University, Bruce and his team have so far studied the isotopes of the element strontium. However, there are many other elements present in the meteorite, each with a story to tell.

Bruce says they are now looking at ways to develop and enhance their analytical techniques. "This will allow us to study other elements and isotopes found in the Allende meteorite and learn more about the meteorite itself and the materials that came together to form the solar system we know today."

Provided by Victoria University of Wellington

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