How citizen scientists can help to track down fragments of meteorites are landing in the Nullarbor Desert

July 10 2014, by Jonathan Paxman

By extending the trajectory backwards, we can estimate from where in the solar system the meteorite originated, gaining important information about its geological context.

This week Curtin University's Dr Jonathan Paxman highlights how fragments of meteorites are landing in the Nullarbor Desert and how citizen scientists can help to track down and unlock the secrets held by these geological wonders.

Have you ever seen a shooting star?

That unexpected streak of light in the night sky is called a meteor, and it occurs when a piece of rock or dust from the solar system enters our atmosphere and starts to burn up.

If you are really lucky, perhaps you have seen a really bright and spectacular meteor, which we call a fireball.

You may have wondered where they come from, where they go, and what they are made of.

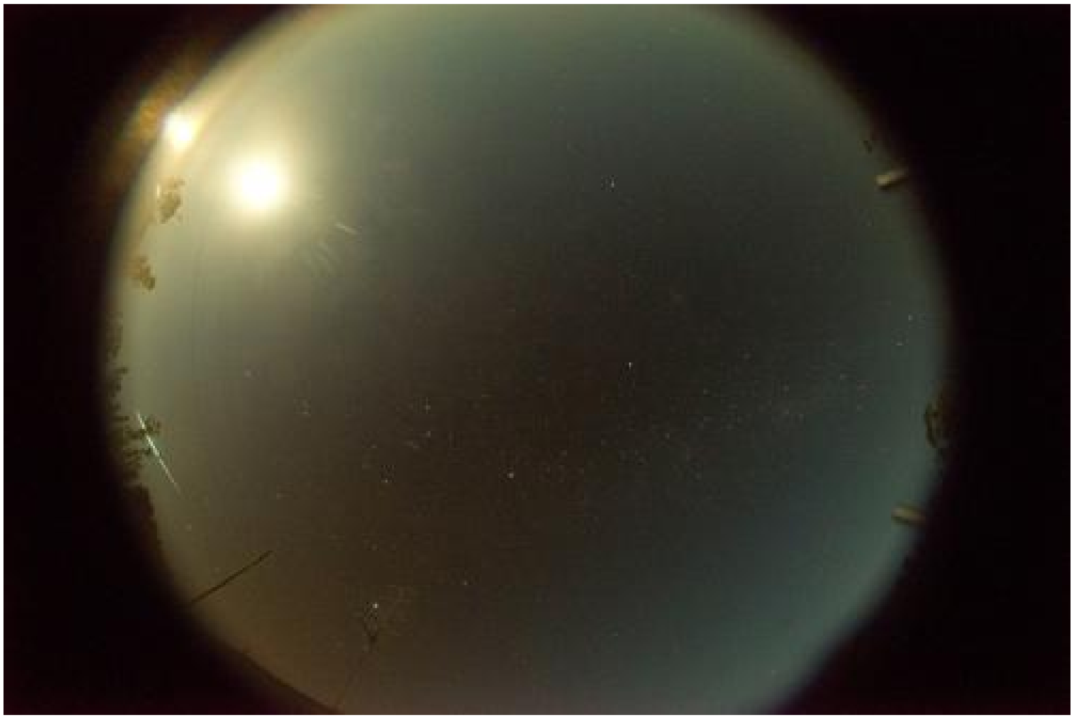
A team of scientists and engineers from Curtin University is attempting to answer these very questions, and to use those answers to discover more about the origins and evolution of our solar system.

A big fireball will sometimes result in a piece of rock which can make it all the way through the atmosphere and land on the earth as a meteorite.

Meteorites are extremely valuable to science, as they provide pristine examples of minerals which originated in the processes which formed the solar system more than four billion years ago.

Tracking the fireballs trajectory

The principle of triangulation means that if we can observe a fireball accurately from two or more separate locations, we can calculate its trajectory.



A fireball appears as a bright streak near the horizon, observed by a camera installed at Northam, Western Australia. Credit: Curtin University

By extending that trajectory forwards, we can calculate where a meteorite will land, and hopefully collect it.

By extending the trajectory backwards, we can estimate from where in the solar system the meteorite originated, gaining important information about its geological context.

The Desert Fireball Network (DFN) is a network of automated observatories in the Australian outback, continuously recording observations of the night sky.

Images are processed to detect unusual events, and observations are coordinated by a central server to enable us to detect fireballs and calculate meteorite fall positions.

If a meteorite is thought to have landed, a search party is deployed (for up to two weeks of searching) to try and find the meteorite.

The DFN has already resulted in the recovery of two new meteorites, making it already one of the most successful meteor networks in the world.

The DFN has grown rapidly from four (large, expensive) film observatories just two years ago, to eleven digital observatories today, and will expand to over thirty observatories by the end of the year.

Calling all citizen scientists!

The most exciting part of the project is that you can help! If you ever spend some time looking at the sky, then you can report any meteor or fireball sightings to us with the free "Fireballs in the Sky" app, available for Android and iPhones.

The app enables us to do what we do with the DFN, but with people (aided by the smart sensors in their phones) as the observers instead of cameras.

If you are interested in our research, or are curious about the origins of our solar system, do check out the app, as well as our Facebook page or our web page, which include profiles of our team members, lots of information about the project, as well as great pictures from our observatories and field work.

Provided by Science Network WA

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