# 2019 Earth Science Week KUNM radio broadcast

***Understanding Earth Using Cosmic Radiation***

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Welcome to Earth Matters – field notes on the geology of New Mexico's Enchanting Landscapes. Celebrating Earth Science Week, I'm Christine Burrill.

There's a way that geologists can find out how old a rock is – and it's not what you'd expect – it's thanks in small part to the sun but mostly exploding stars in the universe!

When stars explode they accelerate charged particles through space. These high energy particles collide with Earth's upper atmosphere creating a shower of radiation, composed mainly of neutrons. These neutrons interact with elements in minerals at the Earth's surface producing very small amounts of cosmogenic nuclides which are rare varieties of elements such as helium 3 and chlorine 36.

When we measure the concentration of these nuclides they can tell us how much time has passed since the rocks have been exposed at the surface within a range from several thousand years to several million years. This dating method is used throughout the earth sciences to determine things such as the timing of landslides and earthquakes, the dynamics of glaciers, rates of soil development and erosion, meteorite impacts and, my personal favorite, volcanic eruptions. This technique has been used to investigate the inflation of the Socorro Magma Body and a number of volcanic features across the state including the Carrizozo lava flow.

It's not just the rocks that get exposed to this cosmic radiation! We humans are as well. The intensity of the cosmic rays varies with elevation and latitude. At higher elevations and latitudes, the cosmic radiation is higher. So for instance, when we fly in airplanes, we are experiencing slightly more cosmic radiation. No need to worry though! On average, cosmic radiation accounts for about 10% of the total dose of natural sources of radiation we are regularly exposed to.

Celebrating Earth Science Week, I'm Christine Burrill, graduate student in the Earth and Environmental Sciences Department at New Mexico Tech.