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Astronomers shed light on mysterious nature of dark matter

Scientists have furthered their understanding of dark matter, the elusive material that accounts for much of the mass of the Universe.

They used NASA telescopes to study how dark matter behaved during cosmic crashes between galaxies in deep space. Each collision took hundreds of millions of years, and is captured as a freeze-frame from a single camera angle.

Their findings show that dark matter interacts with itself even less than was previously thought. It improves scientists' understanding of the mysterious substance, and helps pinpoint what it might be made of.

Astronomers used observations from the NASA/ESA Hubble Space Telescope and NASA's Chandra X-ray Observatory to examine 72 large cluster collisions. They studied what happened to their constituent stars, clouds of gas, and dark matter.

They saw that dark matter passed straight through the violent collisions, without slowing down, showing that it does not interact with visible particles, or with itself.

Narrowing down the properties of dark matter will help improve scientists' models of the Universe.

Further research will examine whether dark matter particles bounce off each other, and will look at collisions between individual galaxies, which are much more common.

The study, published in the journal *Science*, was carried out by a collaboration co-led by the University of Edinburgh and the École Polytechnique Fédérale de Lausanne.

Professor Andy Taylor, of the University of Edinburgh's School of Physics and Astronomy, who took part in the study, said: "We expected to find that dark matter had minimal interaction with other objects, but we were surprised at how dark and elusive it seems to be."

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