FIREBALLS in the sky

WHAT CAN WE LEARN FROM METEORITES?

Meteorites are extremely useful in order to better understand the formation and evolution of orbiting bodies and their minerals.

Most meteorites contain minerals that have been frozen in place for billions of years. Others come from fragments of asteroids, the Moon, or even Mars, and contain samples of the minerals of those planets.

By studying the internal structure of a meteorite, we can find out what kind of asteroid it belonged to, learn how asteroids and planets were made and determine the composition of the early solar system.

COLLECTING METEORITES FOR STUDY

Traditional methods of recovering samples from asteroids involve sending robotic spacecraft to asteroids and comets and returning with a sample capsule. These sample return missions cost billions of dollars, take decades to complete and only return limited samples from a small number of asteroids.

FREE SAMPLES

Instead of sampling asteroids in space directly, we can analyse the insides of meteorites that are found here on Earth. These "free samples" from space contain a wealth of information about the asteroids that they came from. There are many different kinds of meteorite and we are able to classify those meteorites into distinct groups. This gives us some indication of which type of asteroid they came from. However, they can't tell us exactly which asteroid they came from.

DESERT FIREBALL NETWORK

The Desert Fireball Network aims to photograph meteors as they fall and calculate the orbit they were in before hitting Earth. By tracking the meteorite's orbit and analysing the internal composition of recovered meteorites we can find out what their parent asteroids are made of.

By combining the mineral data with the orbital data we can create a geological map of the solar system.

GLOSSARY

Mineral: A naturally occurring solid substance with a regular atomic structure. Minerals are different from rocks – rocks are made of many different minerals.

Asteroid: A small orbiting body of rock which does not have the features of a comet and is not large enough to be a planet.

Orbit: The motion of an object around a gravity point in space, such as the motion of a moon around a planet or the motion of a planet around the sun.