Meteorites – what they tell us about how planets formed

Some of our SciBar participants prepared this glossary, independently of Professor Gilmour. Your feedback on the level of information and usefulness of the SciBar glossaries is most welcome.

Achondrite Stony meteorites that contain no chondrules (see below).

Asteroid Small rocky or metallic bodies that orbit the Sun, mostly between Mars and Jupiter. Many are the shattered remnants of early 'planetesimals'.

Carbonaceous chondrite A meteorite rich in carbon. Some may have originated from comets.

Chondrite Stony meteorites that contain metal flakes and 'chondrules'.

Chondrules Millimetre-sized silicate particles that formed as molten droplets in space before being incorporated into the meteorite's parent body. Chondrules are evidence that the parent body has not been modified by melting. Terrestrial rocks do not contain chondrules.

Decay The process in which an unstable (radioactive) nucleus breaks down to a more stable nucleus (a different element or isotope) by emitting alpha, beta or gamma radiation. Radioactive decay is random but occurs at a predictable rate.

Differentiation The separation of an initially uniform mixture into layers. Usually refers to metal-silicate differentiation in a molten parent body: nickel-iron sinks to the core and silicate minerals float to the top.

Fusion crust A meteorite's shiny outer layer caused by melting in the last moments as the meteorite passes through the Earth's atmosphere at many miles per second.

Half-life The time taken for half the unstable nuclei in a sample of a radioactive isotope to decay.

Isotope Two or more forms of the same element with differing numbers of neutrons, giving different masses. Not all isotopes are radioactive.

Mass spectrometry A technique used to identify substances in a sample, by measuring the differing masses of ions in a vaporized sample. Different isotopes have different masses.

Meteorite A piece of debris from the solar system that passes through the Earth's atmosphere, impacts the surface and is not destroyed.

Parent body The object from which a meteorite comes. Most come from asteroids, some from the Moon or Mars.

Radiometric dating A method of estimating the age of a rock (the date it 'sets') from the amount of a certain radioactive isotope in the sample compared to the amount of its breakdown product. This depends on many half-lives have passed.

Radioactive isotope An unstable isotope that undergoes decay. Some decay very slowly, and several of these are used as 'geologic clocks' in radiometric dating.

Stony meteorite A meteorite that contains mostly silicate minerals.

Stony-iron meteorite A meteorite that contains silicate minerals and nickel-iron in roughly equal proportions.

Useful weblinks:

http://physicsworld.com/cws/article/news/43563 'Solar system older than we thought'

No SciBar in December. Next SciBar: 9 January, topic to be announced. Time: 6.30pm as usual. Stem cells coming in February!