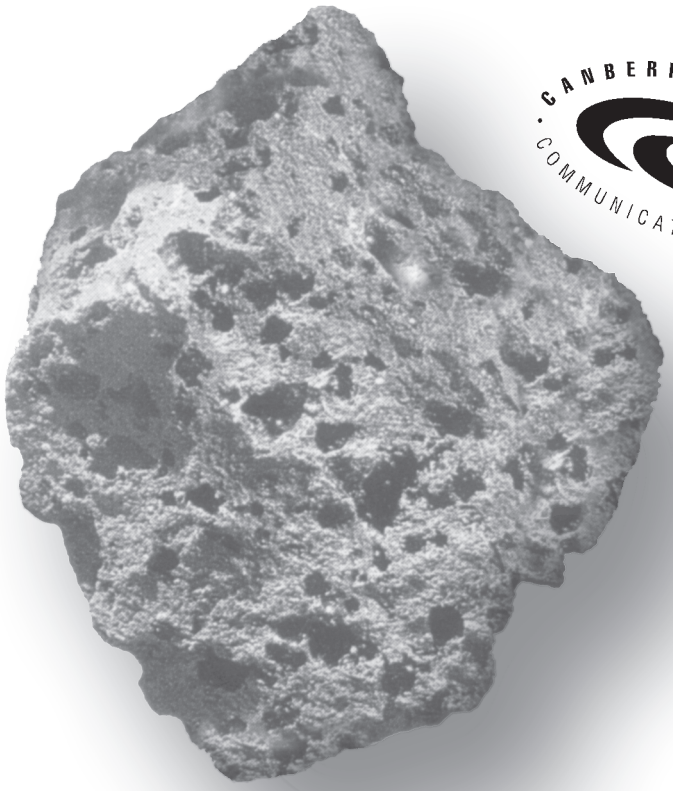

Lunar Sample 10072,80

Canberra Space Centre
FACT SHEET
www.cdscc.nasa.gov

Moon Rock

Display Sample: 10072,80

Rock Type: Vesicular, intersertal basalt

Original Mass: 447 grams

Sample Mass: 142.25 grams

Absolute Age: 3.8 billion years
(since crystallisation of lava)

Exposure Age on Lunar Surface:
200 - 400 x million years
(since excavation by meteorite impact)

Collected by Astronaut Edwin 'Buzz' Aldrin during the Apollo 11 mission from the surface regolith over an area of about 20 square metres, south of the Lunar Module.

THE MOON ROCK sample on display at the *Canberra Space Centre* is a basalt 3.8 billion years old, a little older than Australia's oldest known rock. It weighs 142.25 grams, which is similar to what an Earth-based basalt of similar size would weigh.

On long term loan from NASA, it was collected by astronaut Edwin 'Buzz Aldrin' during the Apollo 11 mission (July 16 - 24, 1969).

The shape, size, arrangement and chemical composition of individual grains and crystals in a rock tell us about its history. Basalts were once lavas, ie: molten rock from volcanoes. When this basalt was lava, its contained gas expanded to form bubble cavities. As it *degassed*, the lava cooled and solidified to become basalt. The rapid cooling preserved the bubble cavities as small holes called vesicles, which are lined by a sparkly secondary material.

The rocks on the lunar surface are mainly basalts erupted 4 to 3.7 billion years ago. The lunar soil (regolith) is mainly the product of rock dust settled back on the surface after meteorite bombardment. Earth soils are quite different as they formed mainly through weathering (or rotting) of rocks by water, oxygen and organic activity. None of these weathering agents are present on the Moon.

Moon rocks can have surface coatings of *rock glass*. High temperatures and pressures experienced at the instant of meteorite impacts can cause rock to instantaneously melt and become rock glass. This can be splashed from the impact site like mud from a puddle and stick to the outside of rocks. Tiny micro-meteorites can cause the formation of glass-lined pits on lunar rock surfaces too.

Buzz Aldrin on the Moon

Rock glass can also be formed inside the rock. Some lavas can cool and solidify very quickly to form a volcanic rock glass, as crystals may not have enough time to form. On Earth, volcanic glasses tend not to be chemically stable. So they *devitrify* (much as antique glass bottles become smoky with age), and secondary minerals of similar composition can form in their place. On the Moon, rock glass survives indefinitely, so to preserve the Moon rock, it has been sealed in nitrogen gas to keep it in pristine condition.

More information: http://spacelink.nasa.gov
Click the 'M' link, then click 'Moon Rocks'

Our thanks go to Tony Yeates from the Australian Geological Survey Organisation for assisting in the compiling of this fact sheet.