# Irradiation and Impact in Apollo Rock and Soil Samples

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In contrast to findings for several Apollo 11 rocks, particle track studies in Rock 12002 show that it has remained stationary throughout its residence time on the lunar surface. Studies of a vertical slice of this rock enabled us to determine its orientation on the lunar surface.

Track annealing studies show that there has been no significant loss of tracks during the exposure of rock 12002.

Investigations of individual feldspar and pyroxene crystals from sixteen levels of the Apollo 12 double core show no obvious track stratigraphy and indicate that mixing is efficient at least to depths of 40 cm. As expected in aggregate mixing only a small fraction of regolith grains has ever formed a part of the soil surface monolayer as evidenced by the scarcity of crystals in the core showing steep track density gradients. The few grains showing such steep track density gradients are randomly distributed throughout both Apollo 11 and Apollo 12 cores.

A portion of 12-15 cm shows lower average track densities than all other locations sampled and appears to be a broken clod.

Investigation of Rock 12017 shows the glass coating partially covering its surface to reflect several events separated in time. After deposition of the major melt mass, additional droplets splashed over the surface from two different directions, followed or accompanied by a deposit from vapor or fine liquid spray. Particle impacts postdating these events are rare.