

# CRATERS

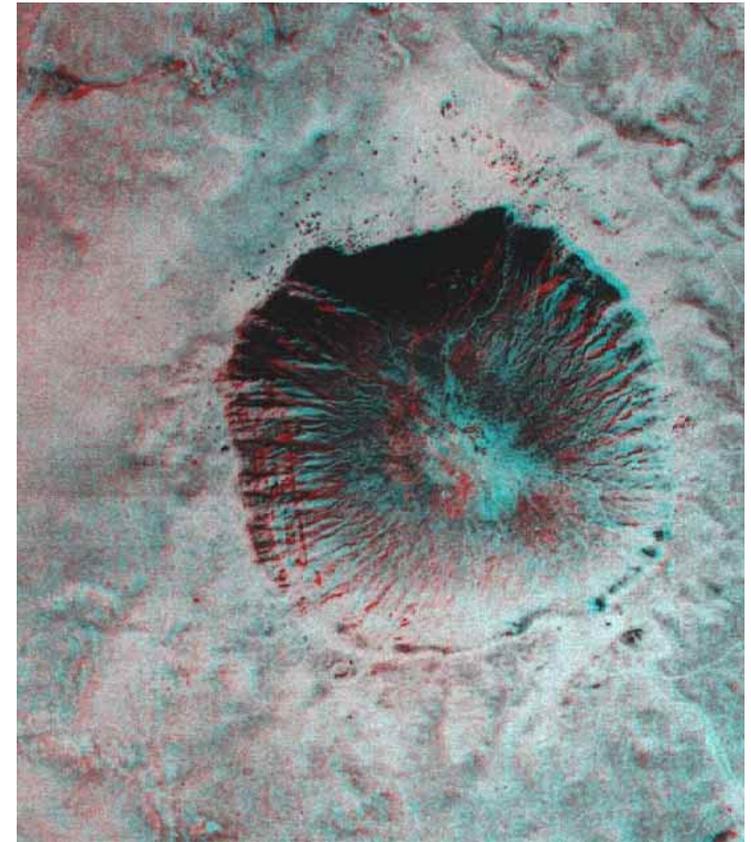
## Meteor Crater, Arizona, USA, Earth

Meteor Crater is one of the youngest and best-preserved impact craters on Earth. The crater formed roughly 50,000 years ago when a 30-meter-wide iron-rich meteor weighing 100,000 tons struck the Arizona desert at an estimated 20 kilometers per second. The resulting explosion exceeded the combined force of today's nuclear arsenals and created a 1.1-kilometer-wide, 200-meter-deep crater. Meteor Crater is a simple crater since it has no central peak or rim terraces. The crater formed in layered sedimentary rocks, some of which are exposed in the nearby Grand Canyon. These rocks have been uplifted and in some cases overturned at the crater's raised rim. Debris sliding and subsequent erosion have partially filled the bottom of the crater with minor amounts of rim material and sediment.

The heavily-cratered history of the Moon indicates that Earth also experienced many impact events early in its history. The processes of erosion and plate tectonics have combined to erase nearly all Earth's craters. To date only about 140 impact craters have been identified on Earth, and most of those are severely eroded or buried by later rock units.

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*use 3-D glasses to view image*



## Arandas, Acidalia Planitia, Mars

Arandas is an example of a martian crater with "fluidized" ejecta deposits, a distinguishing characteristic of rampart craters. A thick concentric platform, or pedestal deposit, surrounds the rim. Narrow striations on the surface of

the ejecta and radial to the center of the crater suggest

outward flow. This type of crater is most commonly found poleward of  $\pm 30^\circ$  latitude. This distribution coincides with the occurrence of terrain softening, another potential indicator of the presence of ground ice on Mars.

## Pit Craters, Mars

These two large impact craters are examples of central pit craters. Both are approximately 52 kilometers across, and there is a 15-kilometer-wide pit in the center of each crater. In contrast, "ordinary" craters of similar size on Mars have central peaks. In some cases, the pits appear at the summits of central peaks, suggesting that there is a continuum between peak and pit formation processes. Pit craters were first recognized in abundance on Mars. Approximately 30 percent of all martian craters with some central structures are pit craters.

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