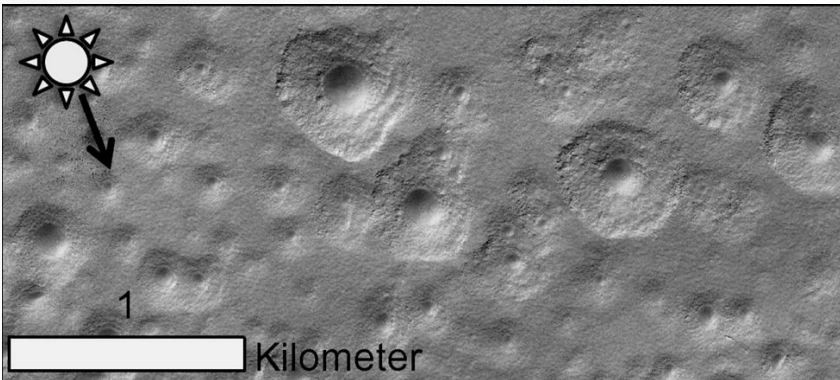
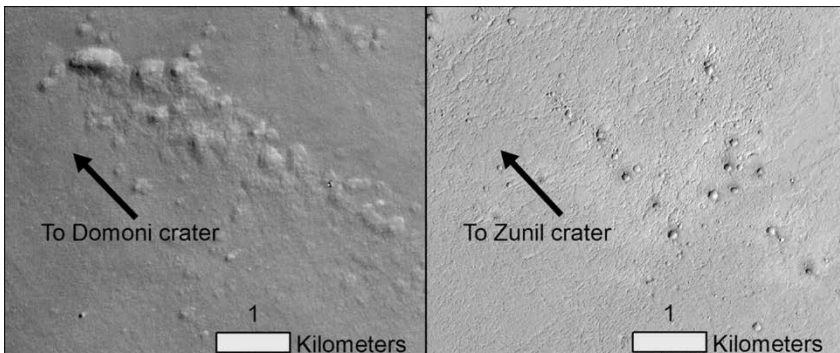


Collapsed Craters Provide Evidence for Subsurface Ice on Mars

- Large impacts often send up chunks of material that re-impact the surface and form smaller craters distributed in a circle around the original crater, called secondary craters, or simply “secondaries”.
- In a region of the northern plains of Mars called Arcadia Planitia, the High Resolution Imaging Science Experiment (HiRISE) and Context Camera (CTX) instruments on the Mars Reconnaissance Orbiter observe secondary craters with edges that appear to have “expanded” (top).



- Scientists think this is caused by sublimation, where a layer of subsurface ice was converted into gaseous water vapor after the ice layer was exposed to the atmosphere after these impact events.
- In this study, four large craters, with well-preserved secondary crater fields were studied and dated to between 20 and 70 million years old based on crater counts. Therefore, subsurface ice throughout this region must be at least that old, and is still preserved beneath an upper layer of dry material.
- The teams estimate that a volume of at least 6000 cubic kilometers (1500 cubic miles) of ancient ice remains in the near subsurface of Arcadia Planitia. This could be a promising source of water for future human explorers on Mars.



Bottom: secondary craters both ~130km from the source crater, showing expanded (left) and crisp edges (right) potentially related to subsurface ice.