The Moon likely formed from debris generated after a giant impact between the proto-Earth and another planetary body. After the giant impact, some debris (about a lunar mass) had sufficient speed to escape the Earth-Moon system and go into heliocentric orbits. Re-impacting debris could have punctured holes into the crust and sped up the ordinarily slow solidification. They may have also imparted thermal energy and further slowed solidification.

Debris generated after the Moon-forming impact would have re-impacted the Moon, introducing additional heat transfer mechanisms to the conventional conductive-lid scenario.