



The Sailing Stones

Kirti Chhabra

HAVE you ever seen something moving by itself? Well, in Racetrack Playa in Death Valley National Park of California large rocks slide on their own without any human or animal intervention or any gravitational force. It is the driest place in North America with temperatures hitting a record high of 56.7°C. Racetrack Playa is a barren lakebed, which offers the world's strangest phenomenon of "sailing stones".

Well, normally rocks move during an avalanche but in Racetrack Playa rocks move on a flat deserted landscape. The moving rock size is estimated to weigh around 318 kg.

These rocks are composed of dolomite and syenite, the same material as of the surrounding mountains. They erode and tumble down to the parched ground below. After reaching the surface of the playa, the rocks start moving horizontally leaving long and smooth tracks behind. The

rocks even travel as far as 1500 feet from their original location. The rocks with rough bottomed surfaces tend to leave straight tracks while smooth surface rocks tend to make 90 degrees turn and wander. These rocks have been observed since the 1900s for their mysterious movements.

In 2014, for the first time scientists were able to record the movement of the stones by time-lapse photography. According to their study published in the journal *PLoS ONE*, the team of researchers installed several time-lapse cameras around the playa and a weather station. They also embedded GPS into some rocks of different sizes and waited for the rocks to move.

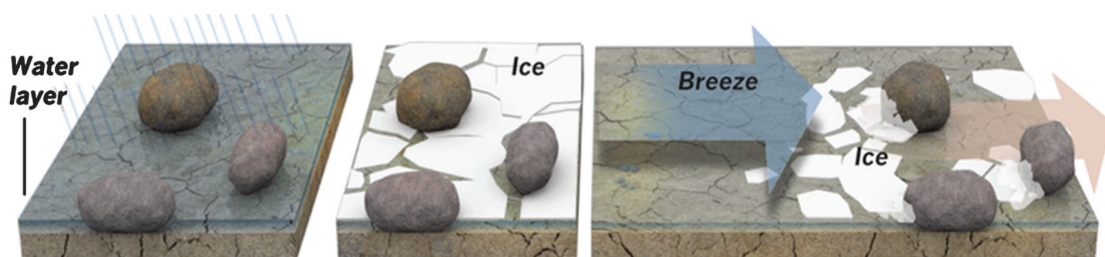
The researchers called it the most boring experiment ever. But eventually things got interesting one day when a significant amount of rain and snow created a small pond in the desert. The pond cyclically froze at night and thawed



How the rocks move

A new scientific paper studies the mechanism that pushes 'moving boulders' across Racetrack Playa in Death Valley National Park.

- 1 Rain creates a shallow water layer on the dry terrain.
- 2 Water freezes overnight. In the morning, ice breaks into thin sheets.
- 3 Wind pushes the floating ice against the boulders. The ice acts as a 'sail' making the rocks slowly slide over the wet, muddy terrain



Source: *Plos One*

Javier Zarracina / @latimesgraphics

during the day. As the temperature got warmer thin layers of surface ice started breaking into large floating sheets of ice. Before the ice had completely melted it got pushed by a steady light wind around 7-10 miles per hour. This pushed the floating ice sheets behind the rocks and generated enough force to set the rocks in motion.

Instead of floating and rolling, the rocks drive their way across the wet muddy terrain, leaving behind their

signature tracks. The results strongly suggest that the sailing stones are the result of an ideal balance of ice, water, and wind. The rocks won't move if there's excessive amount of water or ice, an excessive amount of sun, or not enough wind. Everything must act in perfect harmony for the races to ensue.

Contributed by Ms Kirti Chhabra, Research Intern, CSIR-NISCAIR, New Delhi