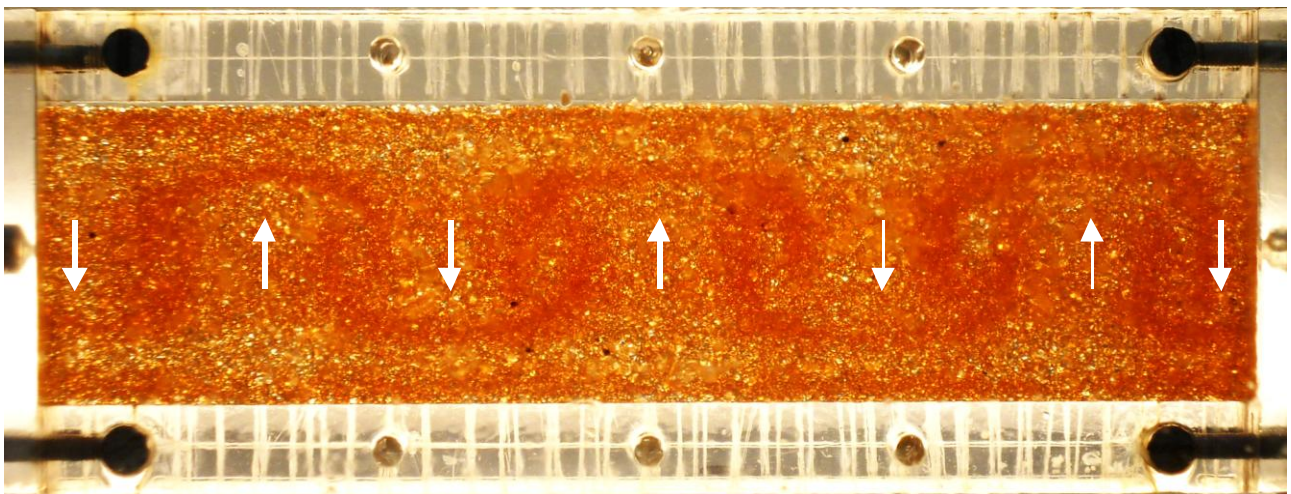


## Convection rolls in a rotating box

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Continuously driven systems are beyond thermodynamic equilibrium and often exhibit an intriguing zoo of patterns.

The picture above shows a box that is almost completely filled with a bimodal mixture of glass beads. After long, slow rotation around the horizontal container axis, the smaller (orange) and larger (white) beads have by far not distributed homogenously. Six convection rolls are visible, the direction of motion is indicated by arrows. Such beads show always the same convective behavior irrespective of whether the interstitial space is filled with water or air or is even evacuated. This phenomenon has no trivial explanation like instabilities of liquids that have a gradient e.g. in density or temperature. Despite the fact that the experiment seems to be relatively simple, it cannot be explained by any known mechanism for granular convection.

