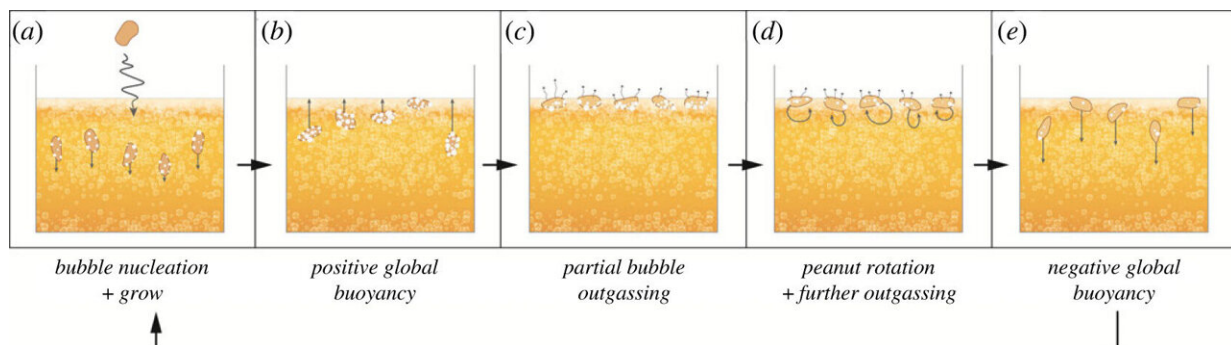


Scientists explain why peanuts 'dance' when dropped in beer

June 14 2023, by Pierre Celerier



A scheme for the dancing peanut cyclicity in beer. (a) Peanuts are introduced into the beer, sink part way and work as nucleation sites for bubbles; (b) bubble–peanut aggregates rise due to positive buoyancy; (c) bubbles are released by bursting at the free surface; (d) peanuts rotate on the free surface allowing further outgassing; (e) bubble–peanut aggregates become negatively buoyant and sink. Credit: *Royal Society Open Science* (2023). DOI: 10.1098/rsos.230376

When peanuts are dropped into a pint of beer, they initially sink to the bottom before floating up and "dancing" in the glass.

Scientists have dug deep seeking to investigate this phenomenon in a new study published on Wednesday, saying it has implications for understanding [mineral extraction](#) or bubbling magma in the Earth's crust.

Brazilian researcher Luiz Pereira, the study's lead author, told AFP that

he first had the idea when passing through Argentina's capital Buenos Aires to learn Spanish.

It was a "bartender thing" in the city to take a few peanuts and pop them into beers, Pereira said.

Because the peanuts are denser than the [beer](#), they first sink down to the bottom of the glass.

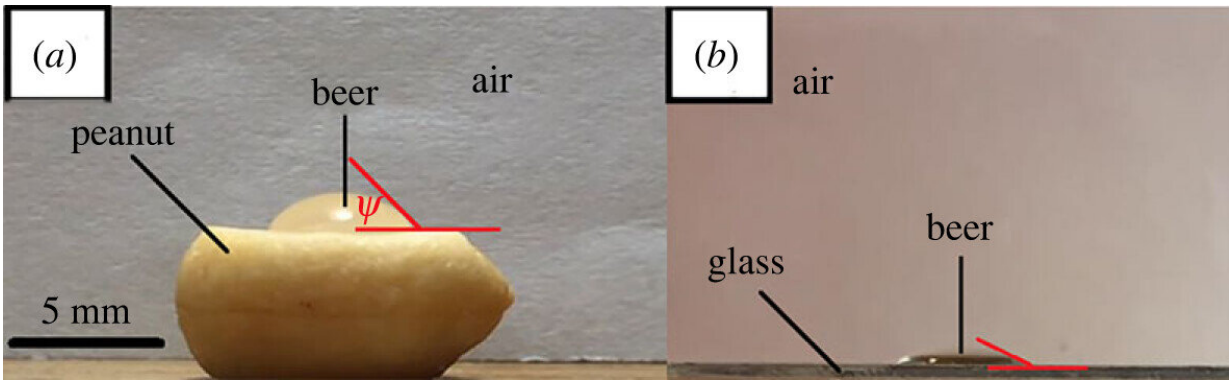
Then each [peanut](#) becomes what is called a "nucleation site". Hundreds of tiny bubbles of [carbon dioxide](#) form on their surface, acting as buoys to drag them upwards.

"The bubbles prefer to form on the peanuts rather than on the glass walls," explained Pereira, a researcher at Germany's Ludwig Maximilian University of Munich.

When the bubbles reach the surface, they burst.

The peanuts then dive down before being propelled up again by freshly formed bubbles, in a dance that continues until the carbon dioxide runs out—or someone interrupts by drinking the beer.

In a series of experiments, the team of researchers in Germany, Britain and France examined how roasted, shelled peanuts fared in a lager-style beer.



Example of a measurement of contact angle Ψ between (a) peanut–beer immersed in air and (b) glass–beer immersed in air. The average values of 10 measurements are $\Psi_{\text{peanut}} = 46.48 \pm 2.43^\circ$ and $\Psi_{\text{glass}} = 23.20 \pm 2.80^\circ$. Credit: *Royal Society Open Science* (2023). DOI: 10.1098/rsos.230376

Next up: more beers

The study, published in the journal *Royal Society Open Science*, describes two key factors in what the researchers dubbed the "beer–gas–peanut system".

They found that the larger the "contact angle" between the curve of an individual bubble and the surface of the peanut was, the more likely it was to form and grow.

But it cannot grow too much—a radius of under 1.3 millimeters is ideal, the study said.

Pereira said he hoped that "by deeply researching this simple system, which everyone can grasp, we can understand a system" that would be useful for industry or explaining [natural phenomena](#).

For example, he said the floatation process was similar to the one used to separate iron from ore.

Air is injected, in a controlled way, into a mixture in which a mineral—such as iron—"will rise because bubbles attach themselves more easily to it, while other (minerals) sink to the bottom," he said.

The same process could also explain why volcanologists find that the mineral magnetite rises to higher layers in the crystallized magma of the Earth's crust than would be expected.

Like peanuts, magnetite is denser, so should sit at the bottom. But due to a high [contact angle](#), the researchers theorize, the [mineral](#) rises through the magma with help from gas bubbles.

Of course, science is never settled—particularly when beer is involved.

Hoping to create a better model of the dancing [peanut phenomenon](#), Pereira said the scientists will continue to "play with the characteristics of different peanuts and different beers".

More information: Luiz Pereira et al, The physics of dancing peanuts in beer, *Royal Society Open Science* (2023). [DOI: 10.1098/rsos.230376](https://doi.org/10.1098/rsos.230376)

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