

Where the Foam Rests, The Unwritten Laws, 80 x 100 cm

How foam divides itself: its walls meet in threes, at nearly equal angles.

The data

The data are the published physics of foam. In a dry, flat foam, the walls meet three at a time at 120 degrees, and each wall is a circular arc (Plateau 1873; Taylor 1976, *Annals of Mathematics* 103:489). Plateau found this in soap films; Taylor later proved it.

The method

A computer lets a small raft of flat bubbles relax: each cell keeps its area while the walls shorten as far as they can. The equal angles are not drawn in; they appear as the walls settle. A small learned program, trained only on simulated foam, then turned, scaled and placed two groups of cells on the sheet without changing any wall, and the artist chose the colors and this composition.

What the checks found

A computer compared the finished image with the computed foam: 8/8 regions matched, with nothing added. The angles where three walls meet were measured on the finished image: 6 junctions, mean 7.5 degrees from 120. Before any of this, the checking software was tried on 12 test images that were deliberately altered, and it caught every one. The full technical record is available on request.

Sources & verification

Every cell in the finished image matches the geometry computed from the published physics of foam. All 8/8 regions matched, each in its place, and nothing was added. Where three walls meet, the angles were measured on the finished image: 6 junctions, mean 7.5 degrees from 120. The full record is available on request, so anyone can rerun the checks.

What the checks establish: every shape in the finished image matches the geometry computed from the data or the published model. They do not test the model against nature itself; that rests on the data and the published science named above.