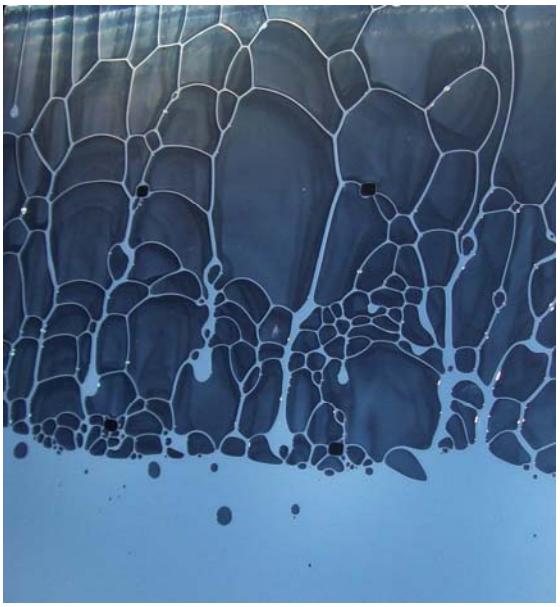

Photogenic Fluids I: Soap Bubbles in Thin Enclosures*

Said Shakerin, University of the Pacific, Stockton, CA

These images show liquid soap flow in a sealed enclosure with 1.6 mm spacing between its black back and clear front acrylic sheets. About equal volumes of soap and air occupy the enclosure. At idle, the soap is at the bottom of the enclosure. Upon turning the enclosure 180^{o}, fluid instability is initiated and the soap flows down while air bubbles creep up through the soap. Because the enclosure is thin, the bubbles are flattened and easily seen, often in clusters and organic forms. Plateau borders are clearly visible once most of the soap has drained. Large bubbles are created at the first turning after a very long idle (several days) when practically all soap has drained to the bottom. Bubble size is reduced with successive turns.

The effects of geometrical and optical variables on the visual impact were examined by making several enclosures. Two examples are on display below; feel free to play with them. The variables included shape, size, internal details (e.g., partitions), and the use of color for background and soap. Overall, a combination of dark background, white soap, and small spacers in the enclosure produced a visually attractive device. Recently, we installed an interactive circular (0.4 m dia.) version of this enclosure in our university library for public use. The installation serves as a demonstration tool for informal science education and also enhances a blank wall.

* Fluid dynamics of soap bubbles and foam continue as research topics. A recent example is: M. Krzan, et al., “High stability of the bovine serum albumine foams evidenced in Hele–Shaw cell,” Colloids and Surfaces A: Physicochem. Eng. Aspects 438 (2013) 112– 118.