A brief history of foam

We hold these truths to be self-evident, that all foams are created equal, that they are endowed by their creator with certain unalienable rules…”
Young-Laplace Law

\[ \Delta P = P_A - P_B = \gamma H = \gamma \left( \frac{1}{R_1} + \frac{1}{R_2} \right). \]
Plateau’s Laws

Diagram showing angles and labels such as 'Film', 'Vertex', 'Edge or Plateau border'.
Kelvin structure

Isohedral tiling of space with least surface area?
The structure of singularities in soap-bubble-like and soap-film-like minimal surfaces

By Jean E. Taylor

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Introduction

In this paper we provide a complete classification of the local structure of singularities in a wide class of two-dimensional surfaces in $\mathbb{R}^3$ collected under the adjective $(M, \xi, \delta)$ minimal by Almgren [A8] (see I(8)). The results, Theorems II.4, IV.5, IV.8, are that the singular set of an $(M, \xi, \delta)$ minimal set consists of Hölder continuously differentiable curves along which three
Soap, Cells and Statistics—Random Patterns in Two Dimensions

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ABSTRACT. Random two-dimensional patterns crop up in a wide variety of scientific contexts. What do they have in common? How can they be classified or analysed? These questions are underlined, and partly answered, by a survey of such patterns, paying particular attention to soap cell networks, metallurgical grain structures and the Giant's Causeway.

Firstly, there is the neighbour-switching process shown in fig. 2, which we shall call a T1 process. Secondly, faces (2D cells) may vanish—the T2 process
Least surface area tiling of space with equal volumes?

Weaire-Phelan foam
Proof of the Double Bubble Conjecture

By Michael Hutchings, Frank Morgan, Manuel Ritoré, and Antonio Ros

Abstract

We prove that the standard double bubble provides the least-area way to enclose and separate two regions of prescribed volume in $\mathbb{R}^3$.

THE HONEYCOMB CONJECTURE

Thomas C. Hales

Abstract. This article gives a proof of the classical honeycomb conjecture: any partition of the plane into regions of equal area has perimeter at least that of the regular hexagonal honeycomb tiling.
Tricontinuous mesophases of balanced three-arm ‘star polyphiles’
Stephen T. Hyde,* Liliana de Campo,* and Christophe Ogney*

The structure of foam cells: Isotropic Plateau polyhedra
S. Hilgenfeldt1(*) A. M. Kraynik2, D. A. Reinelt3 and J. M. Sullivan4,5

What is the connection between ballistic deposition and the Kardar-Parisi-Zhang equation?
Eytan Katzav* and Moshe Schwartz*

Perspectives on foam drainage and the influence of interfacial rheology
B. A. Stone1, S. A. Koehler1,3, S. Hilgenfeldt1 and M. Durand1

Pressures in periodic foams
By D. Weaire1, N. Kern1, S. J. Cox1, J. M. Sullivan2 and F. Morgan3
Wine reception at 5pm

…and 30% off…

Foams
Structure and Dynamics

I. Cantat, S. Cohen-Addad, F. Elias, F. Graner, R. Höhler, O. Pitois, F. Rouyer, and A. Saint-Jalmes

Translated by R. Flatman
Scientific editor (English edition) S.J. Cox

1: Uses of foams
2: Foams at equilibrium
3: Birth, life and death
4: Rheology
5: Experimental and numerical methods

in 8 hours