

Free boundary minimal surfaces in the unit ball

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Free boundary minimal surfaces arise naturally in partitioning problems for convex bodies, in capillarity problems for fluids and in the study of extremal metrics for Steklov eigenvalues on manifolds with boundary. The theory has been developed in various interesting directions, yet many fundamental questions remain open. One of the most basic ones can be phrased as follows: Can a surface of any given topology be realised as an embedded free boundary minimal surface in the 3-dimensional Euclidean unit ball? We will answer this question affirmatively for surfaces with connected boundary and arbitrary genus.