FREE BOUNDARY REGULARITY FOR THE 3 MEMBRANES PROBLEM

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For a positive integer N, the N-membranes problem describes the equilibrium position of N ordered elastic membranes subject to forcing and boundary conditions. If the heights of the membranes are described by real functions u_1, u_2, \ldots, u_N , then the problem can be understood as a system of N-1 coupled obstacle problems with interacting free boundaries which can cross each other. When N = 2 there is only one free boundary and the problem is equivalent to the classical obstacle problem for the difference $u_2 - u_1$. In my talk I will discuss the next case when N = 3 and there are two interacting free boundaries.