Existence of highly unstable H-bubbles

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In 1982 S.T. Yau raised the following nonlinear global problem:

Let H be a real-valued function on $\mathbb{R}^3$. Find (reasonable) conditions on H to ensure that one can find a closed surface with prescribed genus in $\mathbb{R}^3$ whose mean curvature is given by H.

In this talk we will present some contributions to Yau's problem in case of surfaces parametrized parameterized by the unit sphere. These results have been obtained in collaboration with Paolo Caldiroli (Università di Torino).

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