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A singular energy minimizing free boundary

In this talk, we consider the problem of minimizing the energy functional $\int \left(|\nabla u|^2 + \chi_{\{u>0\}} \right)$. We will exhibit the first example of a singular energy minimizer, which occurs in dimension $n = 7$. This is the analogue of the 8-dimensional Simons cone in the theory of minimal surfaces.

This is joint work with D. Jerison.