On the stable Bernstein problem

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A celebrated result by S.N. Bernstein asserts that the planes are the only entire minimal (i.e. critical points of the area functional) graphs in $\mathbb{R}^3$. This result, known as the Bernstein problem, has been generalized for entire minimal graphs in $\mathbb{R}^{n+1}$, with $n \leq 7$ and it turns out to be false for $n \geq 8$. Motivated by the fact that minimal graphs are actually stable (i.e. the second variation of the area functional is non-negative), the following natural generalization of the Bernstein problem is still an open and fascinating question: if M is a complete, orientable, immersed, stable, minimal hypersurface in $\mathbb{R}^{n+1}$, does it have to be necessarily a hyperplane? In a recent paper Chodosh and Li proved that this is true in $\mathbb{R}^4$.

In this talk I will discuss an alternative proof of the result by Chodosh and Li obtained in collaboration with G. Catino and P. Mastrolia.