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Minimal submanifolds in higher codimension

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The study of minimal submanifolds has a long history. They arise naturally and have a lot of applications. There are sharp differences between properties of minimal hypersurfaces and minimal submanifolds in high codimension. For instance, in higher codimension the uniqueness and stability for solutions of Dirichlet problem of minimal surface equation no longer hold, and the solvability and smoothness of solutions are not guaranteed either. We are particularly interested in a special class of minimal submanifolds in higher codimension, called minimal Lagrangian submanifolds. Such examples in \mathbb{R}^{2n} or in a Calabi-Yau manifold are called special Lagrangians. They are always volume minimizing and play an important role in Mirror Symmetry in String theory. We allow singularities in the study.

In the first part of this talk, I will first give an introduction and overview on the subject, including possible methods to study their existence and related results. In the second part, I will focus on the continuity method and my recent project.

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