Gluing constructions for minimal surfaces and other geometric objects

Abstract:

During my talk I will concentrate on the current status and ongoing work on the following:

1) Doubling constructions for minimal surfaces: I will first discuss the general motivation and framework and I will mention briefly the earlier work in [Kapouleas-Yang: 2010] and work of David Wiygul. I will then concentrate on the ideas in [Kapouleas: arXiv:1409.0226, 2014] and in particular I will present in some detail the Linearized Doubling methodology. I will also mention ongoing work and future possibilities.

2) Desingularization constructions for minimal surfaces: I will first discuss the $O(2)$-invariant initial configuration case as in [Kapouleas: JDG 1997]. I will then briefly discuss some recent constructions with more symmetry in various settings, including a current construction with Martin Li for free boundary minimal surfaces in the unit three-ball. I will outline and discuss extensions to less symmetric settings or settings without any symmetries as discussed in [Kapouleas: Clay proceedings, Vol.2, 2005], [Kapouleas: ALM, vol 20, 2011], and further ongoing work.


4) Finally to the extent that time permits I will briefly discuss gluing constructions for Special Lagrangian cones as in [Haskins-Kapouleas: Inventiones 2007] and [Haskins-Kapouleas: ALM, vol.7, 2008] and ongoing work, and also for CMC (hyper)surfaces in early work of mine and recent work with Christine Breiner [Breiner-Kapouleas: Math. Annalen 2014] and [Breiner-Kapouleas: Preprint close to completion].

Hosts: Ben Chow and Lei Ni

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