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„Knotted families of arcs"

Abstract:
Goodwillie and Weiss developed a powerful homotopy theoretic technique for studying spaces of embeddings. For properly embedded arcs in a manifold of any dimension we give this theory a geometric flavour inspired by Vassiliev theory for classical knots. On one hand, in that classical case, this viewpoint can be used to prove some missing cases of Goodwillie-Klein connectivity estimates, and also partially confirm the conjecture that these invariants are universal Vassiliev. On the other hand, in higher dimensions we produce knotted families of arcs, which in joint work with Peter Teichner we apply to solve an open problem in 4-dimensional topology. In this talk I will outline these various cases, and try to point out a very exciting common thread.