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Variational problems in the intersection homology theory of singular varities

In this talk, I am going to discuss "soap films" or "minimal surfaces" that live in singular spaces such as singular complex projective varieties. On complex projective varieties, the intersection homology theory introduced by MacPherson and Goresky is more suitable than ordinary homology theory. I will first discuss how to express the intersection homology groups in terms of integer multiplicity rectifiable currents. These are then isomorphic to the usual intersection homology groups defined by geometric or subanalytic chains with the corresponding perversity conditions. After that, I will discuss the existence and regularity of modified mass minimizer in every intersection homology class on a compact stratified subanalytic pseudomanifold. My modified mass minimizers may intersect the singular locus of the singular variety in a controlled fashion.