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Holomorphic motions, capacity and conformal welding

The notion of a holomorphic motion was introduced by Mané, Sad and Sullivan in the 1980's, motivated by the observation that Julia sets of rational maps often move holomorphically with holomorphic variations of the parameters. In the years that followed, the study of the behavior of various set-functions under holomorphic motions became an area of significant interest. For instance, holomorphic motions played a central role in the work of Astala on distortion of Hausdorff dimension and area under quasiconformal mappings.

In this talk, I will first review the basic notions and results related to holomorphic motions, including the extended lambda lemma. I will then present some recent results on the behavior of logarithmic capacity and analytic capacity under holomorphic motions. The proofs involve different notions such as conformal welding, quadratic Julia sets and harmonic measure. This is joint work with Tom Ransford and Wen-Hui Ai.