Title: Bifurcation of solutions to the Singular Yamabe problem on spheres

Abstract:

Using the background developed in Part I, I will present an application of bifurcation techniques to a singular version of the Yamabe problem. Given a closed Riemannian manifold $M$ and a submanifold $S$, this problem consists of finding a complete metric on the complement of $S$ in $M$ that has constant scalar curvature and is conformal to the original metric. In other words, these are (smooth) solutions to the Yamabe problem on $M$ that blow up along the prescribed submanifold $S$. A particularly interesting case is the one where $M$ is a round sphere and $S$ is a subsphere. Elementary conformal equivalences give the existence of a trivial solution, and bifurcation provides uncountably many new solutions when $S$ is a great circle, via a spectral analysis of hyperbolic surfaces. This is based on joint work with B. Santoro and P. Piccione.