Dirac eigenvalue optimisation on surfaces

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The correspondence between metric maximizing Laplace eigenvalues in a conformal class of a surface and harmonic maps to spheres has been a fruitful tool in finding optimal bound for Laplace eigenvalues. The Dirac operator being in some sense a square root of the Laplacian, it is natural to study its optimal metrics in a similar way. In this talk, I will discuss minimization of Dirac eigenvalues on a surface and how it leads to harmonic maps to complex projective space $\mathbb{CP}^{2m-1}$.

This is based on joint work with Mikhail Karpukhin and Iosif Polterovich.