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Sharp estimates for higher eigenvalues on surfaces. Preliminary report.

When we choose a metric on a manifold we determine the spectrum of the Laplace operator. Thus an eigenvalue may be considered as a functional on the space of metrics. For example the first eigenvalue would be the fundamental vibrational frequency. In some cases the normalized eigenvalues are bounded independent of the metric. In such cases it makes sense to attempt to find critical points in the space of metrics. For some surfaces it is possible to find metrics that maximize the first nonzero eigenvalue. In this talk we will discuss the question of maximizing higher eigenvalues on surfaces. (Received January 08, 2019)