Positivity and convexity properties for harmonic functions on the n-sphere

Consider a harmonic function defined on a spherical disc (an open ball contained in the sphere). In this talk I will discuss the nonnegativity of the iterated Laplace-Beltrami operator applied on a square of such a harmonic function. I will give an outline for the proof in 2 dimensions and of a generalization for any dimension. Furthermore, using spherical means, I will show how this property implies a strong convexity property for the radial $L^2$-growth function. The latter gives an inequality between the radial 2-norm of a harmonic function over three spherical circles (lattitudes), and thus it is a three-circles-type theorem. The talk is based on a joint work with Gabbor Lippner, Dan Mangoubi and Zachary McGuirk.

Link to the seminar: https://us06web.zoom.us/j/99649860282?pwd=SE0vemtYMFIwbFBNTXQyOTBONG0vZz09