ALMUT BURCHARD, University of Toronto

On pointwise (non)-monotonicity of heat kernels for metrics on the two-sphere

I will present recent work with Ángel Martínez, regarding pointwise monotonicity of heat kernels. Previously we had found that Riemannian metrics for which the heat kernel $K_t(x,y)$ decreases as x moves away from y along a minimal geodesic are extremely rare, though there are non-trivial examples (beyond products of standard spheres). Here we show that the only metrics on $\mathbb{S}^2$ with this monotonicity property are the uniform ones. The proof depends on a surprising connection with Hersch's inequality for the principal eigenvalue of the Laplacian.