Neumann domains on manifolds and graphs

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The nodal set of a Laplacian eigenfunction forms a partition of the underlying manifold or graph. Another natural partition is based on the gradient vector field of the eigenfunction (on a manifold) or on the extremal points of the eigenfunction (on a graph). The submanifolds (or subgraphs) of this partition are called Neumann domains (you may guess the reason for this name, and it would also be mentioned in the talk ;) We present results for Neumann domains on manifolds and on graphs - their count, geometric properties and spectral positions. The Neumann domain results are compared to those of the nodal domain study.

The talk is based on joint works with Lior Alon, Michael Bersudsky, Graham Cox, Sebastian Egger, David Fajman and Alexander Taylor.