0-elliptic boundary value problems and applications

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A *0-differential operator* on a manifold with boundary is locally a linear combination of compositions of vector fields vanishing along the boundary. Such operators arise naturally in hyperbolic geometry: all the natural geometric operators on hyperbolic space are of this type. Unlike elliptic operators on closed manifolds, elliptic 0-differential operators are generically not Fredholm: typically, one has to impose additional asymptotic boundary conditions.

In this talk, we will informally introduce this kind of boundary value problems, and we will discuss some applications to low-dimensional geometry and differential topology.