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**Exact dynamical AdS black holes and wormholes with a  
Klein-Gordon field**

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We present a set of exact solutions in the Einstein-Klein-Gordon system with a cosmological constant in arbitrary dimensions. The spacetime has spherical, plane, or hyperbolic symmetry and a class of solutions represents an asymptotically locally AdS dynamical black hole or wormhole. In four and higher dimensions, the quasi-local mass blows up at the AdS infinity, suggesting that the slow fall-off is realized. In three dimensions, the scalar field becomes trivial and the solution reduces to the BTZ black hole.