

On black universes of multidimensional origin.

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We consider 6D manifolds with the structure $M_0 \times M_1 \times M_2$, where M_0 is 2D Lorentzian space-time while each of M_1 and M_2 can be a 2-sphere or a 2-torus. Among such geometries, we find examples of regular solutions of 6D general relativity with a scalar field as a source of gravity, which depend on a single coordinate x ranging over the whole real axis, with different asymptotic behavior at plus and minus infinity. On one end, it is a 4D de Sitter universe times small extra dimensions, while on the other end there is some kind of a static space-time. We thus obtain configurations called black universes, looking as a black hole on the static end and as an expanding universe on the other, and the cosmological expansion begins from a horizon.

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