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P. Kotlarik: Gravity of static thin discs around black holes

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The astrophysical black holes are not isolated bodies. One of the most prominent structures which form in the proximity of the black hole is a thin accretion disc. Whether treated in Newton's theory or in general relativity, in the static and axially symmetric case the gravitational potential is determined by the Laplace equation. Though clear in principle, its solution is only known explicitly for several disc density profiles. We will show some explicit closed-form potentials and, in some cases, also the full metric describing the exact BH+disc "superposition".

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