*Preface

These notes correspond to lectures given itemize

a t Institut d'Astrophysique de Paris (France) in March-April 2016, within the framework of the IAP Advanced Lectures:

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In complement to these notes, one may recommend various monographs devoted to black holes: O'Neill (1995) ONeil95, Heusler (1996) Heusl96, Frolov & Novikov (1998) FroloN98, Poisson (2004) Poiss04, Frolov & Zelnikov (2011) FroloZ11, Bambi (2017) Bambi17, Chruściel (2020) Chrus20, Grumiller & Sheikh-Jabbari (2022) GrumiS22 and King (2023) King23, as well as review articles by Carter (1987) Carte87, Wald (2001) Wald01, Chruściel (2002, 2005) Chrus02, Chrus05 and Chruściel, Lopes Costa & Heusler (2012) ChrusLH12. In addition, let us point out other lecture notes on black holes: Hawking (1994) Hawki94,HawkiP15, Townsend (1997) Towns97, Compre (2006, 2019) Compe06,Compe19, Dafermos and Rodnianski (2008) DaferR13, Deruelle (2009) Derue09, Andersson, Bckdahl & Blue (2016) AnderBB18 and Reall (2020) Reall20.

The history of black holes in theoretical physics and astrophysics is very rich and fascinating. It is however not discussed here, except in some small historical notes. The interested reader is referred to Nathalie Deruelle's lectures Derue09, to Kip Thorne's book Thorn94, to Carter's article Carte06 and to Jean Eisenstaedt's articles Eisen82,Eisen93.

The web pages associated to these notes are center https://relativite.obspm.fr/blackholes