

Майнор. Астрофизика.

Семинар 9. (11.11)

Stury = // MAC = C. Sturm 5-l~ gru 29x60x60) ~ 10 cax $l_{QSO} < 10^{5}c$ $\frac{3.10^{10}cm}{c} = 3.10 cm =$ Laso 10 37/c Lo=4.1033 = 17/c =

2) 29 juhr vondena eletura Lacc = M GH 2 2 N LEJJ = 10 38 M LESS LX=

LESS TESS (M)

LESS = 10

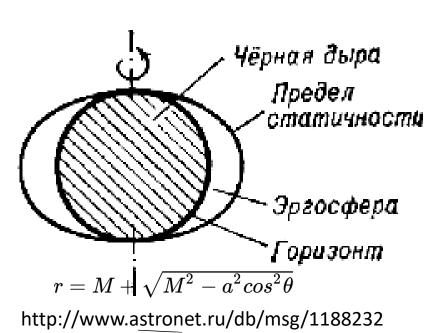
LESS = 1

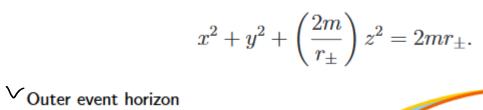
Fg = 6 Mmp [Fr = Pr : 07] $-DT_r = F_s$ $C_T = \frac{8\pi}{2}$ LEJJ $G_{T} = \left(\frac{8\pi}{3}\right) \left(\frac{e^{2}}{m_{e}c^{2}}\right)^{2}$ e? = MeC? => Ve = e? MeC? On 11. Ve Dela = Ma-76 oneprum T-notor $T = \frac{2}{4\pi r^2}$ $T = \frac{2}{4\pi r^2}$ $T = \frac{2}{4\pi r^2}$ $T = \frac{2}{4\pi r^2}$ $T = \frac{2}{4\pi r^2}$ Cr = 7.5.8t] = C.5 = C.81.5 Er=Pr $T = \frac{1}{\sqrt{n}}$ $\frac{1}{\sqrt{n}}$ $\frac{1}{\sqrt{n}}$ LESS = (25 / 1, 4. 10 38 272 M - 1, 4. 10 38 272 M LUSO = 1045 00% => => MBh > 107 MO

Rg= Rs 1 2-2 kom. ha 1, e 26/2= R = Helpoy. Mlayymun65 3 $=3R_{=}6G$ PIS 60= 6M

Вращающиеся черные дыры







 $r_+ = m + \sqrt{m^2 - a^2}$

Inner event horizon $r_- = m - \sqrt{m^2 - a^2}$



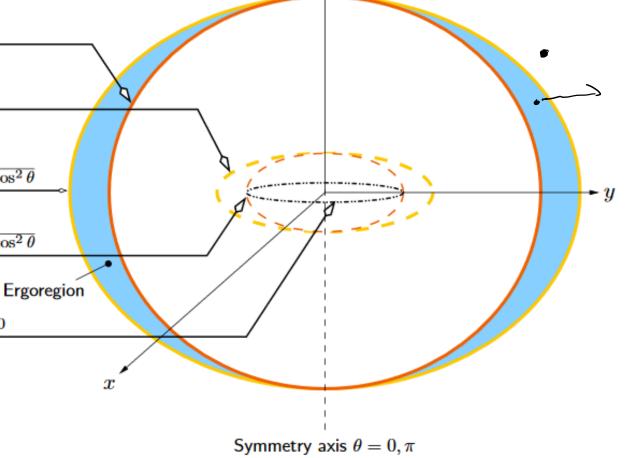
$$r_E^+ = m + \sqrt{m^2 - a^2 \cos^2 \theta}$$

Inner ergosurface

$$r_E^- = m - \sqrt{m^2 - a^2\,\cos^2 heta}$$

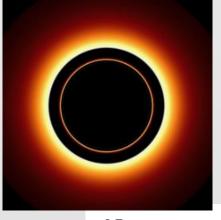
Ring singularity

$$x^2+y^2=a^2 \ {\rm and} \ z=0$$



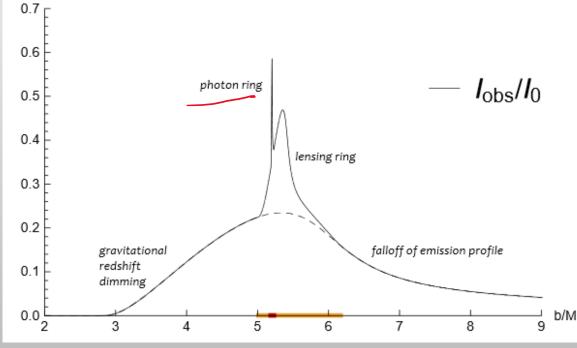
1906.00873

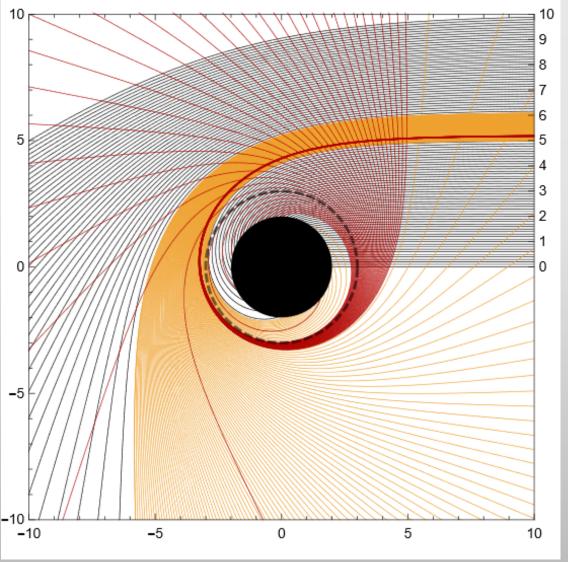
Тень черной дыры, последняя устойчивая орбита и яркое кольцо

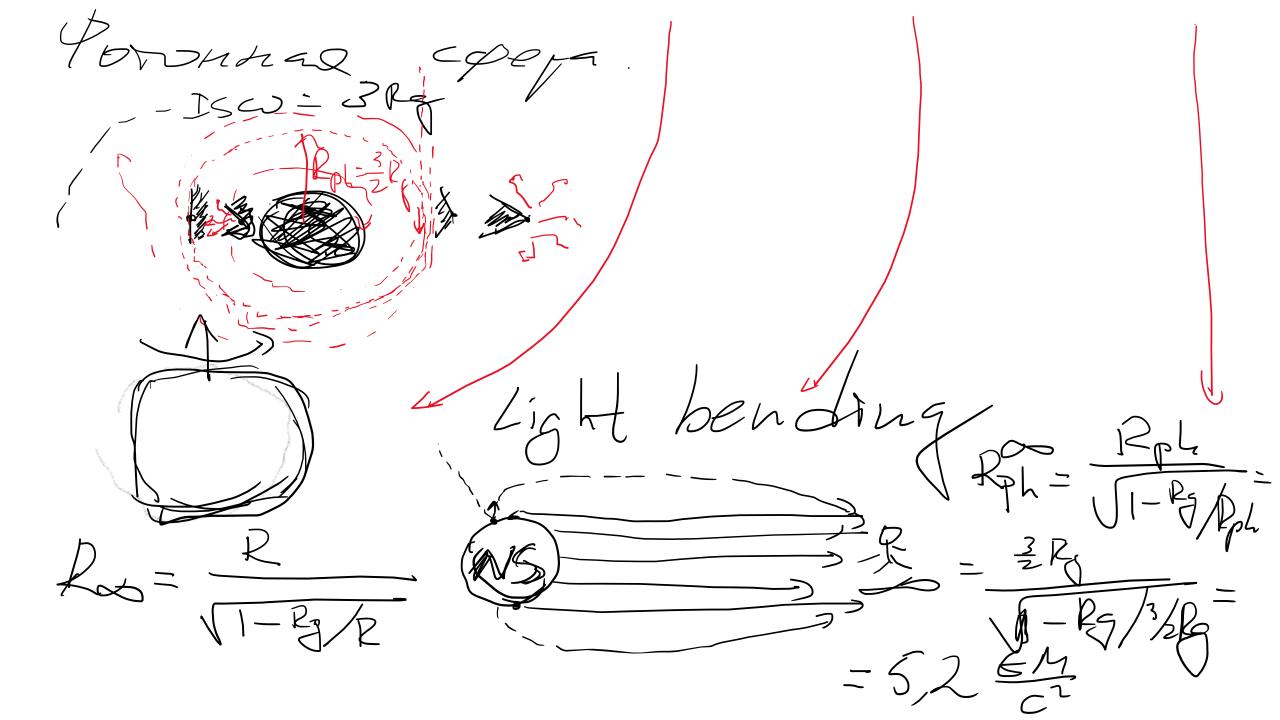


$$R_{\infty} = R / \sqrt{1 - r_g / R}$$

$$b_c = 3\sqrt{3}M$$



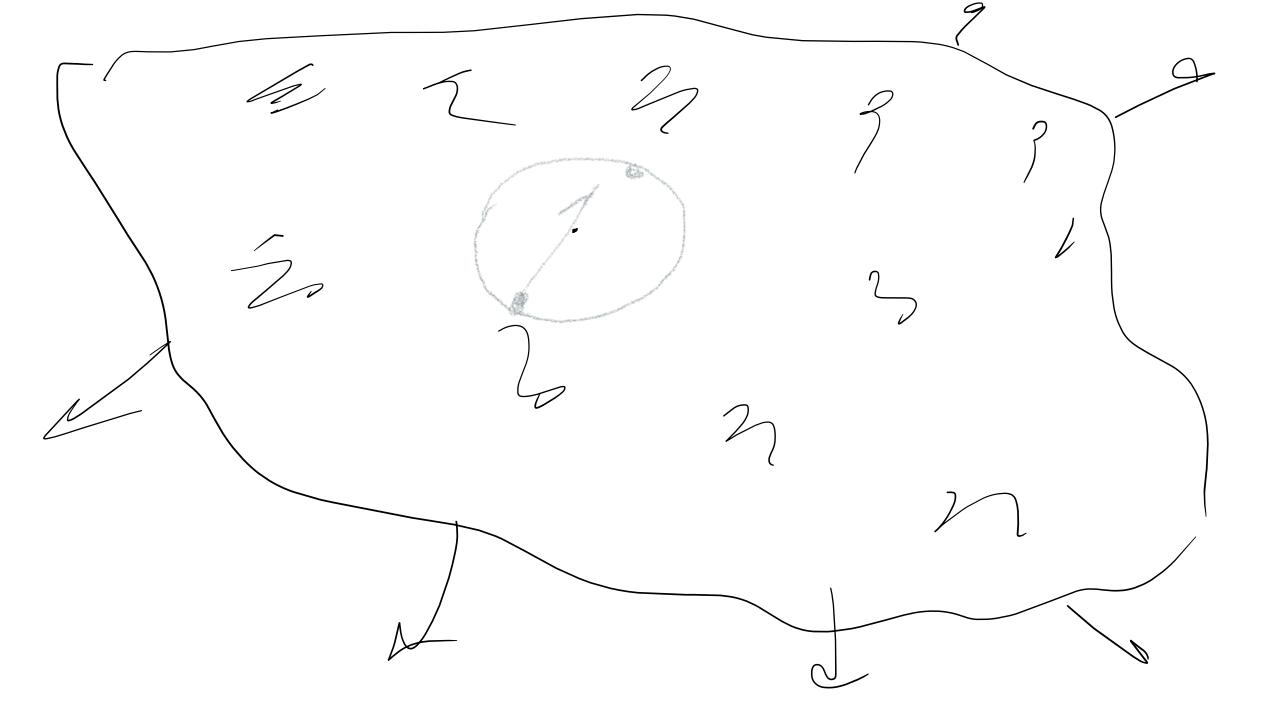


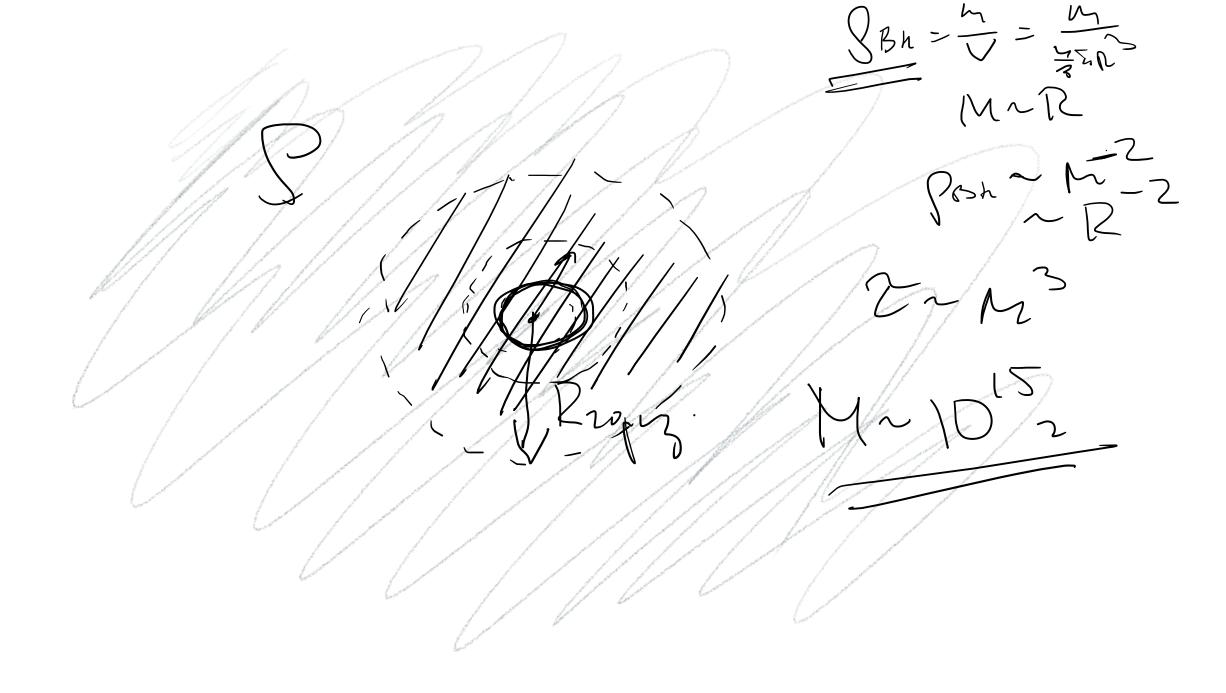


Maahrolered C65 Cp/~10-33 $\frac{1}{2}$. $\frac{1}{2}$. Low = 10²³20

Monageme 29 h. Jap. $F = h \cdot \nu$ $V = \sqrt{2}$ E=h=mc= 67 sx = 6/24 AP=m·c $X = \frac{h}{\sqrt{a} mc}$ F= 60 = 6.1 RT= h T= hc Rh = 2 Rg = 271. 226 / 1- LZ = 423 R85GA L= 45 B - 05B T OSB = 112 le (Zu)

 $L = \frac{dM}{dt}$. L= 4507 = dh = 2 4- (26m) (12 kh) (12 kh) = dh = 2 $\frac{M}{M} = \frac{M}{M} = \frac{2}{M} = \frac{2}{M}$ $M^2 = const$ $T \sim M^3$





 \sqrt{z} barmo B3764 -0

