

Black hole candidates and the Kerr bound

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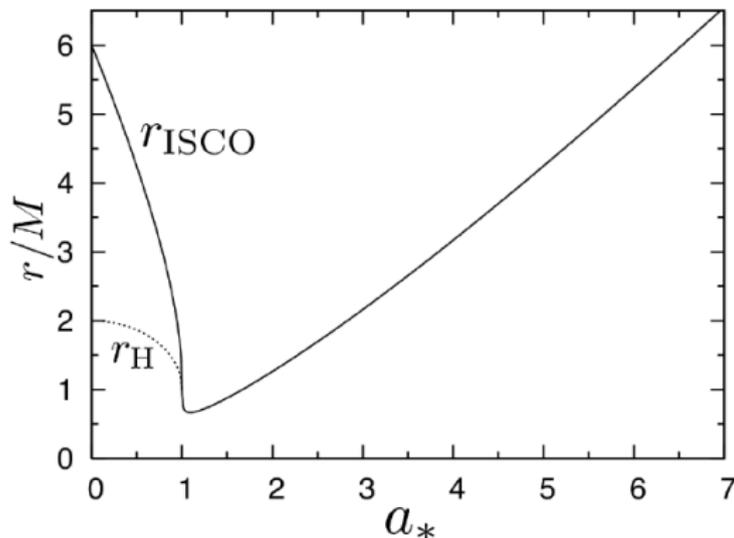
Superspinar

- We can assume that a naked singularity in the super-extremal Kerr solution is excised due to stringy effects. (Gimon & Horava, PLB672, 2009)



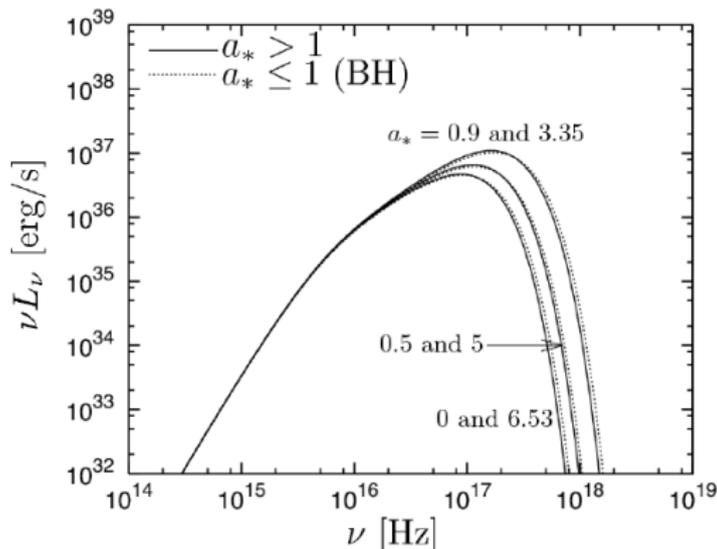
- Overspinning a black hole with a test body (Jaboson & Sotiriou, PRL103, 2009)

ISCO in the Kerr metric



- There is an ISCO even for the superspinner.
- The minimum $(2/3)M$ for $a_* = 4\sqrt{2}/(3\sqrt{3}) \simeq 1.09$
- $r_{\text{ISCO}} > 6M$ for $a_* > 8\sqrt{6}/3 \simeq 6.53$

X-ray spectra from the accretion disks



- Surprisingly, any BH has its superspinar counterpart which gives very similar X-ray spectrum. In contrast, for a superspinar with $1 \lesssim a_* \lesssim 1.67$ or $a_* \gtrsim 6.53$, there is no BH counterpart.

