Just a few really basic notes on AGN: From discussions with Andy L. and David H.

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1 Where's the energy coming from??

Note, very bright radio sources have flux densities of ∼a Jansky. An iPhone 6 has an RF output of ≈30 dBm (at 824.2 - 848.8MHz and 1850.2 - 1909.8MHz) where a dBm is a decibel-milliwatt and 30dBm is 1.0 Watt[1]. So placing an iPhone on the Moon would give it a radio flux of...??
The Schwarzschild radius is:

$$R_{\mathrm{Sch}} = \frac{2GM}{c^2} \tag{1}$$

The Event Horizon is at 2 Schwarzschild radii!!!
How much of the energy is coming from various Schwarzschild radii?? 3-5 or 3-10 R_{Sch} vs. 5-∞ R_{Sch}??

$L = 4\pi\sigma R^2 T^4$, so...

$$T = (Lc^4)/\sigma\pi G^2 \tag{2}$$

Working this all through...

$$L = 1.38 \times 10^{31}\,\mathrm{Watts}\,(M/M_{\odot}) \tag{3}$$

which with $M_{\odot} = 2 \times 10^{30}$ kg is just

$$L = 6.37M. \tag{4}$$

in S.I. units.

$$\Delta E_p = \frac{GMm}{R} \tag{5}$$

[1] https://en.wikipedia.org/wiki/DBm

with $R = 2GM/c^2$ gives

$$\Delta E_p = \frac{mc^2}{2} \tag{6}$$

but "of course" this wont go all into 'shining', turns into K.E., and you need some friction... etc. etc. etc. :-) But then divide by two for rotation and divide by 3 for LSO (last stable orbit). ie. $\sim 1/12$.

$$E = \mu \Delta m c^2 \tag{7}$$

and thus

$$L = \mu \Delta \dot{m} c^2 \tag{8}$$

μ is 0.7% for nuclear fusion.
μ is 10-40% for grav. potential accretion.
And, L for BHs doesn't depend on the mass of the BH (!!)

L increases with ṁ, upto the Eddington Luminosity.
The luminosity itself cuts off itself the growth (in L).

Use Wien's Displacement Law such that:
λ T = 2900 (L in μm and T in K)
$\Rightarrow$ if T = 100,000K then $\lambda = 0.03\mu$m,
i.e. and the EUV.
(Note, a photon with 12.6 eV of energy has a wavelenght of 100nm.) So, you can expect the peak to be at $\sim$ 300Å.
However, we see the turnover at $\sim$ 1000Å, a little cooler than we'd expect...
Why??!!

2 Resources

Classic References:
Shakura & Sunyaev (1973) (and King (2009))
Pringle (1981)
(also e.g., Pringle & Rees (1972); Pringle et al. (1973); Pringle (1996))
Richards et al. (2006)
Kishimoto et al. (2008)
Lawrence (2012), and the paper trail therein...

Good links:
Schwarzschild radius: https://en.wikipedia.org/wiki/Schwarzschild_radius

www-astro.physics.ox.ac.uk/∼garret/teaching/lecture7-2012.pdf
jila.colorado.edu/ pja/astr3730/lecture18.pdf
https://andyxl.wordpress.com/2011/03/03/a-dim-glimmer/

References

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Kishimoto M., Antonucci R., Blaes O., Lawrence A., Boisson C., Albrecht M., Leipski C., 2008, Nat, 454, 492

Lawrence A., 2012, MNRAS, 423, 451

Pringle J. E., 1981, ARA&A, 19, 137

Pringle J. E., 1996, MNRAS, 281, 357

Pringle J. E., Rees M. J., 1972, Astron. & Astrophys., 21, 1

Pringle J. E., Rees M. J., Pacholczyk A. G., 1973, Astron. & Astrophys., 29, 179

Richards G. T., et al., 2006, ApJS, 166, 470

Shakura N. I., Sunyaev R. A., 1973, Astron. & Astrophys., 24, 337