Quasars in Crisis: Grumpy Question

October 15, 2018

Accretion

- What is the origin of the soft X-ray excess/UV downturn?
- Why do disks look different at $0.2L_{\rm Edd}$ in AGN (big Soft X-ray excess/UV downturn) than in Binaries (something that looks and varies like a Shakura-Sunyaev disc!)
- At around eddington the NLS1 do look like a disc - but why are there discs in AGN when they are radiation pressure unstable?
- Why are there discs in black hole binaries since they are radiation pressure unstable too (just not quite so badly as AGN!)
- How do we make discs vary - the NLS1 have optical/UV that change on timescales of weeks-months yet this can't be reprocessing as the x-rays are weak.
- How badly has Cloudy misled the AGN field?
- Do *any* supermassive black holes accrete super-critically?
- Is Soltan wrong? Are we missing *significant* accretion in the Universe? (we just dont see TDEs in $\log M_{\rm BH}/M_{\odot} > 7.5$ objects; Andrew Kings maximums mass SMBHs)
- Is the physics of accretion redshift dependent (e.g. metals in the early Universe)?

Structure

- What is the BLR?
- What the actual frig is the Broad Line Region?
- Are Warm Absorbers seen in X-rays due to a thermal wind from the torus?

- What is the NLR?
- How do we make a torus have large scale height?
- Do all AGN have tori - Do true type 2 seyferts?
- What geometry does the dust have? (oldie but a goodie)
- Are any of Mrk 231, Mrk 1018, PDS 456 or NGC5548 actual rosetta stones for the general AGN population?
- Do jets associated with radio-emission actually do anything connected to galaxy formation?

General galactic impacts

- How do we resolve the paradox of rapid AGN evolution (e.g. in their luminosity function) and the fact they are being touted using several methods to be used as Standard(isable) Candles to high-z?
- Where are the $100 - 10,000 M_{\odot}$ IMBHs?