The E-ELT Science Case

Science Pep Talk #5

9 Prominent Science Cases

Planets and Stars

- From giant to terrestrial exoplanets: detection, characterization and evolution
- Circumstellar disks
- Young stellar clusters

Stars and Galaxies

- Imaging and spectroscopy of resolved stellar populations in galaxies
- Black holes and AGN demographics

Galaxies and Cosmology

- Physics of high redshift galaxies
- First light – The highest redshift galaxies (z>10)
- Is the low-density IGM metal-enriched?
- A dynamical measurement of the expansion history of the Universe

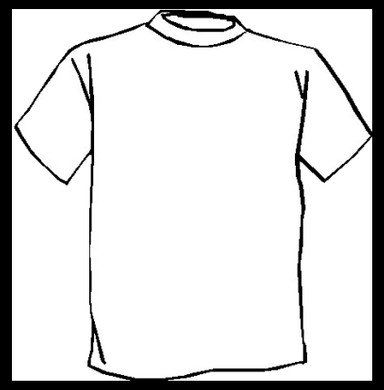
Black Hole:

A black hole is an object which gravitational field is so powerful that nothing, not even light, can escape its pull after having fallen past its event horizon.

[Term Black Hole introduced by John Wheeler 1967]

“Black Holes have no hair”:

A black hole is characterised by only three quantities: mass, spin, charge.



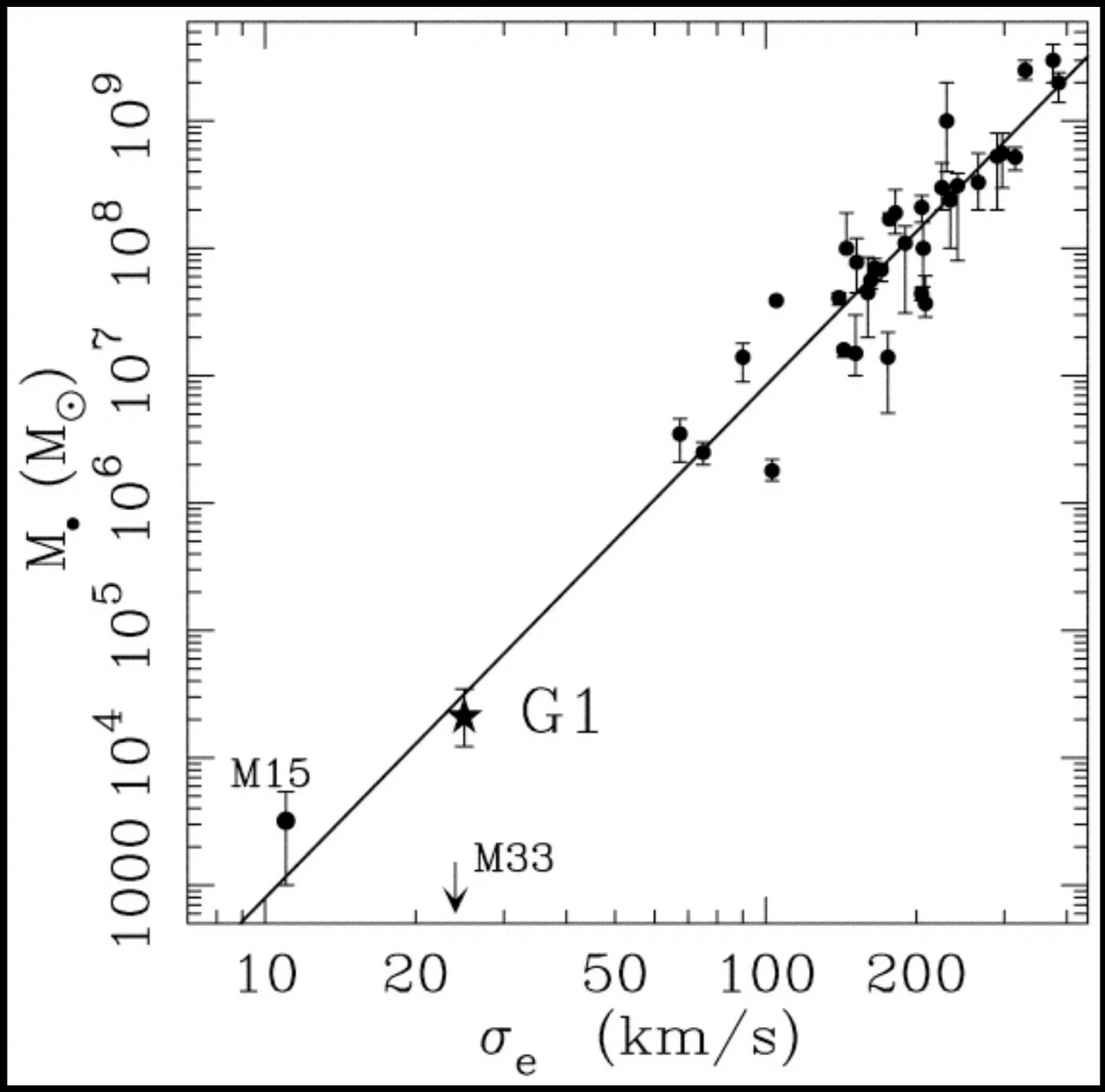
Black Hole come in 3 sizes:

S Stellar-mass Black Holes

M/L Intermediate-mass Black Holes
(e.g. in Star Clusters)

XL/XXL Supermassive Black Holes in galaxies

Mass of the black hole ⟶



Mass of the galaxy ⟶

Goals

- BH in Milky Way out to Virgo distance
- Resolve Sphere of Influence for M~10^9 out to z~0.2
- Search for extremely massive BHs M>10^{10} out to z~0.3

Requirements

- spectral resolution: 5.000-10.000
- spatial resolution: 5 mas (LTAO)
- wavelength: red - NIR


"That's all Folks!"