

Seeing to the Event Horizons of Supermassive Black Holes



Dr. Daniel Wilkins

Einstein Fellow, Kavli Institute for Particle Astrophysics and Cosmology, Stanford University

Active galactic nuclei (AGN) are some of the most luminous objects in the Universe, powered by the accretion of matter onto a supermassive black hole in the centre of a galaxy, yet many of the physical processes by which vast amounts of energy is released and injected into the surroundings remain a mystery.

Detailed observations of supermassive black holes in Seyfert galaxies with the large X-ray observatories XMM-Newton, Suzaku and NuSTAR, have revealed an unprecedented amount. I will discuss, in particular, how the effects of general relativity imprinted upon X-rays that reverberate from the inner regions of the disc of accreting material provide a unique probe of the extreme environment around the black hole.

The reflected X-rays reveal the structure of the powerful X-ray emitting corona and its evolution as the luminosity we observe varies by more than an order of magnitude. This gives us important insight into the processes by which these extreme systems are powered and by which some black holes are able to launch jets of particles at close to the speed of light. We are starting to learn how these processes are governed over cosmic time as supermassive black holes played their vital role in the formation of structure we see in the Universe today.

Wednesday

March 22

4:00 P.M.

Rm 118 NSH

Refreshments
in Rm 202 NSH
@ 3:30 pm