

ICTS SPECIAL COLLOQUIUM

THE REALM OF THE SUPERMASSIVE BLACK HOLES

One of the most momentous discoveries in the history of astronomy was the discovery of QUASARS in 1963. Their incredible luminosity - more than million, million times the luminosity of the Sun - implied that their masses must be in excess of a billion solar masses. Another unexpected discovery was that their flux was 'variable'. It soon emerged that the 'central engines' that powered the Quasars must be **supermassive black holes**.

A parallel discovery was that of radio galaxies with their powerful relativistic jets. Various observations led to the conclusion that all types of Active Galactic Nuclei are also powered by supermassive black holes. In the subsequent decades, X-ray observations revealed that all galaxies, and not just the more 'active' ones, have massive black holes in their centres.

This talk will review the evolution of our understanding of the realm of the supermassive black holes. Since this lecture is part of the Summer Course for students, it will be pedagogic in nature and will not assume any prior knowledge. The main thrust of the talk will be towards an understanding of the very recent result from the Event Horizon Telescope - an image of the shadow of the black hole at the centre of the giant galaxy M87.

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Madhava Lecture Hall
ICTS Bengaluru



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BG - An image taken at radio wavelengths of the dramatic jets of charged particles being ejected from the nucleus of the galaxy Cygnus A. Newly obtained radio images were able to resolve hotspots in the jets at the places where they impact the surrounding medium. The conventional thinking is that the bulk of the radiation in such hotspots is produced by shocks, but the new results found that some other processes, perhaps absorption, must be involved. Image credit: NRAO/AU.