- It appears as a dark circle silhouetted by an orbiting disk of hot, glowing matter. The supermassive black hole is located at the heart of a galaxy called M87, located about 55 million light-years away, and weighs more than 6 billion solar masses.

Active Galaxies

- Active Galaxy Nuclei - A class of galaxies which spew massive amounts of energy from their centers, far more than ordinary galaxies. Many astronomers believe supermassive black holes may lie at the center of these galaxies and power their explosive energy output.
- Active galaxies are galaxies that have a small core of emission embedded at the center of an otherwise typical galaxy.
- This core is typically highly variable and very bright compared to the rest of the galaxy.
- For normal galaxies, we think of the total energy they emit as the sum of the emission from each of the stars found in the galaxy, but in active galaxies, this is not true.
    - There is a great deal more emitted energy in active galaxies than there should be and this excess energy is found in the infrared, radio, UV, and X-ray regions of the electromagnetic spectrum.

Accretion Disk of AGN

- In an active galaxy, its supermassive black hole is accreting material from the galaxy's dense central region.
- As the material falls in toward the black hole, angular momentum will cause it to spiral in and form into a disk.
- This disk, called an accretion disk, heats up due to the gravitational and frictional forces at work.
- The black hole and accretion disk produce narrow beams of energetic particles and ejects them outward in opposite directions away from the disk.
- These jets, which emerge at nearly the speed of light, become a powerful source of radio wave emission.
- Classification based on the black hole's mass, the rate of accretion onto the black hole and the angel at which we view