HOW DOES A BLACK HOLE AND NEUTRON STAR PAIR FORM AND MERGE?

In an isolated binary system, two stars become, after exploding as supernovae, a black hole and neutron star, and in the process they move closer together until they merge

In a very dense cluster a black hole and a neutron star form a binary system through three, four or many-body dynamical interactions and then merge

GLOBULAR CLUSTER

A black hole and neutron star pair forms through some specific processes, such as three- or four-body interactions

YOUNG CLUSTER

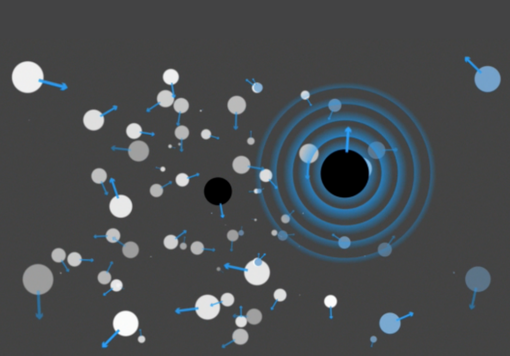
AGN are very crowded environments where chaotic interactions in a dense gaseous disk can give rise to black hole and neutron star pairs

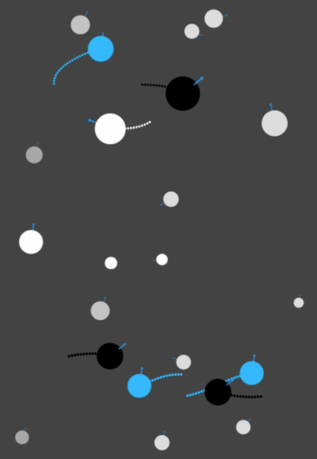
AGN - ACTIVE GALACTIC NUCLEI

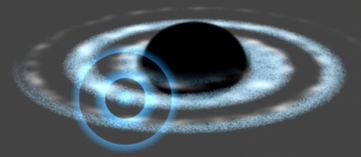
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ISOLATED BINARY SYSTEM

DYNAMICAL INTERACTIONS IN DIFFERENT COSMIC ENVIRONMENTS

BASED ON THE GW200105 AND GW200115 DETECTIONS WE ESTIMATE THAT ANYWHERE BETWEEN 5 TO 15 SUCH SYSTEMS MERGE PER YEAR WITHIN A DISTANCE OF ONE BILLION LIGHT YEARS FROM EARTH

EGO VIRGO