Most of the light in the Universe comes from stars located in galaxies like that in which we live. Studying the dynamics of galaxies is therefore crucial to our understanding of the Universe as a whole. Galactic dynamics deals with the motion of stars under the effect of gravity, and is tightly linked to galaxy formation and evolution. Recent evidence suggests that all galaxies host supermassive black holes in their centers. When two galaxies interact and merge, the black holes in their nuclei become bound in a binary system and eventually coalesce to form a single more massive black hole. The coalescence is accompanied by emission of gravitational waves.

N-body simulations represent a powerful tool for studying the complexity of the gravitational dynamics of galaxies. Galaxies are modeled as a collection of gravitating particles representing the stars and their motion is computed by determining the gravitational forces on each particle according to Newton's law of gravity and then solving the appropriate equations of motion.

External Collaborations:
- The Coma Cluster Treasury Survey[^8] The astrophysics and galactic dynamics group participates in the Coma Cluster Treasury Survey, a Hubble Space Telescope (HST) Advanced Camera for Surveys (ACS) Treasury Program that was designed to survey both the core and an infall region of the richest local cluster of galaxies: the Coma cluster.

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