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# GRAVITATIONAL WAVE SOURCES AT THE HEARTS OF GALAXIES

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The recent gravitational wave detections by LIGO/Virgo revolutionized the way we sense our Universe. However, it remains challenging to explain the formation channels of these sources. Motivated by these challenges, recent studies have emphasized the significant contribution of dynamical formation channels in dense stellar environments to the overall gravitational wave signals. Focusing on the dense stellar clusters surrounding supermassive black holes at the center of galaxies, I will outline stellar binaries' evolution from birth up to possible gravitational wave mergers. The supermassive black hole can induce collisions between binary members, while the frequent interactions with the neighbors in this dense environment can sometimes tend to unbind the binary. I will highlight some exotic outcomes, including gravitational-wave emission, for this dynamical evolution channel. I will show how this channel can leave a clear signature on the gravitational wave signals, allowing differentiation between different merger mechanisms. The Laser Interferometer Space Antenna (LISA) can potentially be used to distinguish between channels.