

East Carolina University®

Department of Physics

Colloquium

Friday, April 11, 2025, Room N109, Howell Science
3:15 p.m. (Refreshments at 3:00 p.m.)

Professor Carl Rodriguez
University of North Carolina – Chapel Hill

The Lives and Deaths of Star Clusters and the Black Holes They Make Along the Way

The life cycles of star clusters are an integral part of the formation of galaxies and their black hole populations. In these dense stellar environments, stars and black holes participate in complicated dynamical interactions that can create many unique objects, such as detached black hole binaries, hypervelocity stars, and gravitational-wave sources. In this talk, I will review our current understanding of the evolution of dense star clusters in the Milky Way, and their complicated relationship with their black hole populations. I will then describe a project to self-consistently evolve star clusters formed in a high-resolution MHD simulation of a Milky Way-mass galaxy, from their formation from collapsing giant molecular clouds to their destruction by galactic tidal fields. Finally, I will show how the birth conditions of these star clusters create massive black holes—from the 30 solar mass binaries detected by LIGO and Gaia to the ever illusive intermediate-mass black holes.

WebEx Link: <https://ecu.webex.com/ecu/j.php?MTID=m597b61dec85df5a0e1e21138fe56cd86>

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