

# Simulations of Supermassive Black Hole Binaries on their way to Merger

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Supermassive black hole mergers are one of the most dramatic phenomena in the Universe. For a few hours, they can emit as much power in gravitational waves as all the stars in the Universe produce in light. Moreover, they are an important element in determining the mass distribution of the entire population of supermassive black holes. However, none has yet been caught in the act, in large part because they are rare, and no one knows what sort of light they should emit along with the gravitational waves. In this talk, I will present new simulations aimed at providing detailed astrophysical knowledge about the environments close to supermassive black hole binaries on their way to merger. I will show how gas flows in the immediate neighborhoods of these binaries, especially when both black holes are spinning, and present calculations of jet launching and light signals that observers should search for in order to find examples.

**Author:** CAMPANELLI, Manuela (Rochester Institute of Technology)

**Presenter:** CAMPANELLI, Manuela (Rochester Institute of Technology)

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