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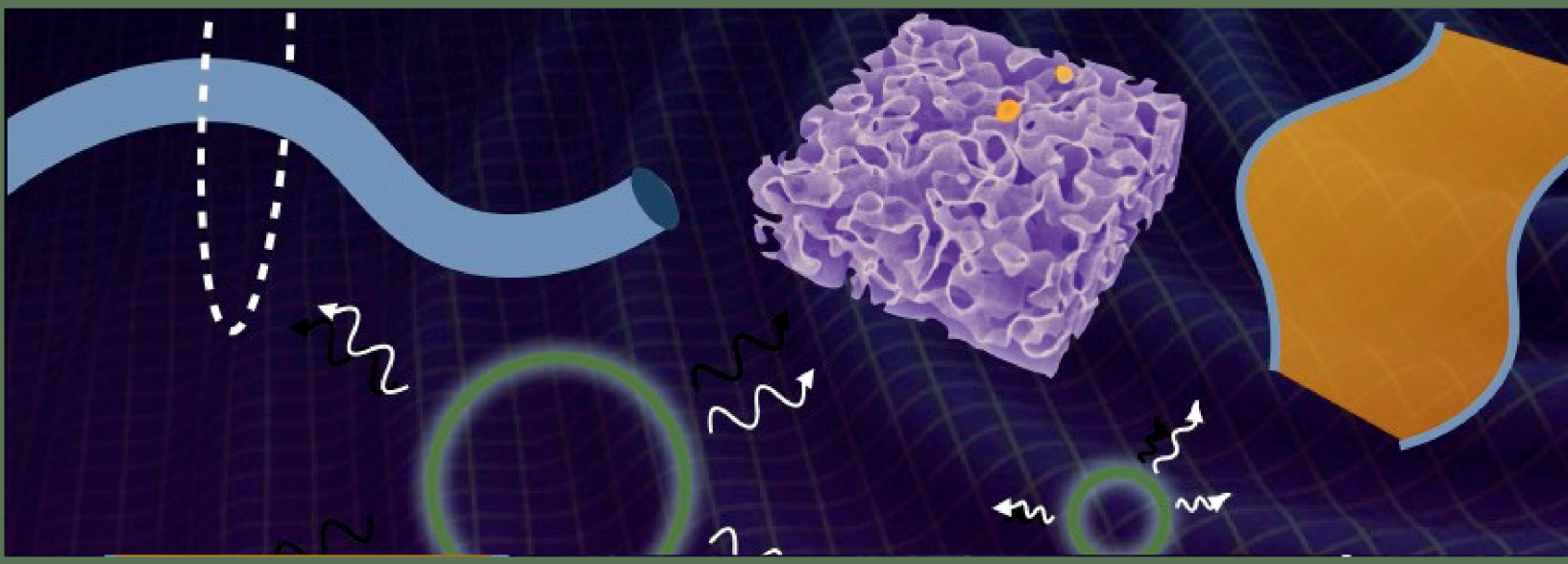

GRAVITATIONAL WAVES AND PRIMORDIAL BLACK HOLES FROM TOPOLOGICAL DEFECTS IN THE EARLY UNIVERSE

David Dunsky | New York University (NYU)

Spontaneous symmetry breaking in the early universe often leaves behind relic topological defects such as cosmic strings, domain walls, or magnetic monopoles. These topological defects are massive and can move at relativistic speeds, thereby generating appreciable gravitational waves. In this talk, I will discuss the stochastic gravitational wave background of different topological defects and how detection of such signals can be used to probe the early universe and infer characteristics about the energy scale and pattern of symmetry breaking that generates these defects. Finally, I will discuss how spheroidal domain walls associated with the axion can form around the QCD phase transition. These enclosed domain walls collapse under their own self tension, compressing an enormous amount of energy into a small volume and potentially forming a primordial black hole. For a sufficiently large axion decay constant, there may be an observable gravitational lensing signal at future telescopes.

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