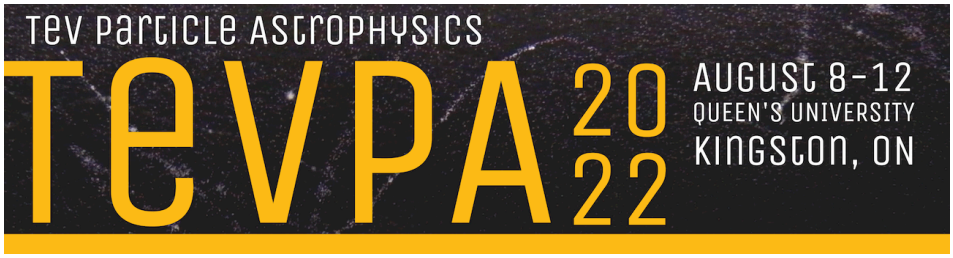

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Mirror Stars and other probes of Dark Complexity

Monday 8 August 2022 14:00 (20 minutes)

Complex Dark Sectors are theories of hidden particles and forces that could constitute all or part of dark matter but have non-minimal interactions between them, such as dark analogues of electromagnetism of the strong force. These scenarios are predicted by many highly motivated extensions of the Standard Model that solve fundamental mysteries like the hierarchy problem, but are notoriously difficult to study due to the complex nature of the resulting dark matter subcomponents on cosmological and astrophysical scales. I will discuss one robust consequence of dark complexity, Mirror Stars, which are dark compact objects of atomic dark matter that can be observed due to emissions from regular matter they capture from the interstellar medium. This opens up a new frontier in the search for dark matter using telescope surveys, and motivates understanding the behaviour of complex dark matter in great detail. I then discuss other signatures of Mirror Stars in gravitational lensing and gravitational wave observations, and close with an update on the world's first atomic dark matter N-body simulations which will greatly enhance our understanding of complex dark matter dynamics in our galaxy.

Collaboration name

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