Contribution ID: **7** Type: **not specified**

The Case for Non-Lorentzian Strings

Thursday 11 August 2022 09:00 (45 minutes)

Non-Lorentzian strings are strings that move in a target space-time that has a non- Lorentzian metric structure defined on it. Some of these strings are described by worldsheet CFTs and some are described by non-Lorentzian 2D sigma models. Most of these types of strings have so far been obtained as limits of ordinary string theory but their notion and definition can be given independently of ordinary string theory and it is expected that there exists a whole landscape of different non-Lorentzian string theories. In this talk I will mainly focus on closed bosonic strings that can be obtained as non-relativistic approximations of standard closed bosonic strings. In particular I will discuss the 1/c expansion of relativistic strings and the equivalence with the Gomis-Ooguri string at the next-to-leading order in 1/c. I will conclude with a brief overview of a few other non-Lorentzian strings and discuss open problems/questions such as: is there a holographic duality possible in such a non-Lorentzian setup and does there exist a well-defined regime of non-relativistic quantum gravity whose UV completion is a string theory?

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