



Contribution ID: 27

Type: **not specified**

Why quantum gravity made me fall in love with domain walls

Friday 13 September 2024 11:15 (45 minutes)

Domain walls are a defect that arises when a vacuum manifold is discontinuous. They are often regarded as a problem - literally the “domain wall problem” - but if you can get rid of them, they could be an interesting source of gravitational waves. If the domain walls result from a breaking a global symmetry, the most common way of doing so always struck me as contrived - having an unnaturally small bias term. Quantum gravity is expected to violate all global symmetries - but the process is generally a non-perturbative process like an instanton/wormhole. This means the effective scale of explicit global symmetry breaking is many orders of magnitude above the Planck scale. This makes gravitational waves from domain walls natural. Moreover, if dark matter is protected by a global symmetry which is violated by the same mechanism, one can acquire an independent measurement of a qualitative feature of quantum gravity. Finally, the domain walls themselves can catalyze primordial black hole production, making quantum gravity the indirect source of dark matter.

Presenter: WHITE, Graham