Contribution ID: **126** Type: **Talk**

Vorticity, kinetic energy, and suppressed gravitational wave production in strong first order phase transitions

Thursday, 5 September 2019 16:40 (20 minutes)

Although in the Standard Model the electroweak phase transition is a crossover, many well-motivated extensions can generate a first-order phase transition at the electroweak scale. For a sufficiently strong phase transition, LISA would be able to observe gravitational waves sourced by plasma motion generated by expanding and colliding bubbles. While numerical simulations have examined 'weak' and 'intermediate' strength phase transitions, we conduct the first 3-dimensional simulations of strong first-order thermal phase transitions in the early Universe. We examine two types of transition, deflagrations and detonations. Detonations in strong transitions behave similarly to their weak and intermediate counterparts. In deflagrations, substantial vorticity is generated, hot droplets form, and the gravitational wave signal is reduced compared to previous models.

Primary authors: Mr CUTTING, Daniel (University of Sussex); Dr WEIR, David (University of Nottingham, University of Helsinki); Prof. HINDMARSH, Mark (University of Sussex, University of Helsinki)

Presenter: Mr CUTTING, Daniel (University of Sussex)

Session Classification: Parallel Sessions: Gravitational Waves and Black Holes (C.A.R.L., H08)

Track Classification: Gravitational Waves and Black Holes