Contribution ID: **535** Type: **Invited Speaker / Conférencier invité**

Dynamics of Gravitational Collapse in AdS Space-Time

Tuesday 16 June 2015 14:15 (30 minutes)

Gravitational collapse in asymptotically anti-de Sitter spacetime is dual to thermalization of energy injected to the ground state of a strongly coupled gauge theory. Following work by Bizon and Rostworowski, numerical studies of massless scalar fields in Einstein gravity indicate that generic initial states thermalize, given time, even for arbitrarily small energies. From the gravitational perspective, this appears due to a combination of a turbulent instability in the nonlinear local dynamics and the ability of matter to reflect from the conformal boundary. I will discuss recent work examining the effects of new length scales in the dynamics, including a scalar mass and higher-curvature corrections to the gravitational action.

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Session Classification: T2-4 Fields and Strings (DTP) / Champs et cordes (DPT)

Track Classification: Theoretical Physics / Physique théorique (DTP-DPT)