Contribution ID: **1156** Type: **Poster (Non-Student) / affiche (non-étudiant)**

Super-Entropic Black Holes

Tuesday 14 June 2016 19:06 (2 minutes)

Black Hole Chemistry is a new perspective on black hole thermodynamics, one that indicates that once vacuum energy is taken into account, black holes behave more like chemical systems. As a consequence mass becomes chemical enthalpy, the notion of a thermodynamic volume appears, and black holes exhibit a broad range of chemical phenomena, including liquid/gas phase transitions similar to a
Van der Waals fluid, triple points similar to that of water, and re-entrant phase transitions that appear in gels. One conjecture to follow from this program is that the entropy of an AdS black hole is bounded above by a function of its thermodynamic volume via a relation known as the Reverse Isoperimetric Inequality. Here I construct a new new class of rotating AdS black holes that provide counterexamples to this conjecture. They are formed by taking a new ultraspinning limit to the Kerr-AdS class of black holes, yielding objects whose event horizons are non-compact but have finite area. The structure of the spacetime is qualitatively changed since it is no longer possible to return to a frame that does not rotate at infinity. I shall present both the construction of these "super-entropic"black holes and their implications for black hole thermodynamics.

Author: MANN, Robert (University of Waterloo)

Co-authors: KUBIZNAK, David (Perimeter Institute); HENNIGAR, Robie

Presenter: MANN, Robert (University of Waterloo)

Session Classification: DTP Poster Session with beer / Session d'affiches, avec bière DPT

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