

Plenary Talk PV VIII Wed 9:00 HSZ/AUDI
25 years of the AdS/CFT correspondence: Current status and future prospects — ●KOEENRAAD SCHALM — Institute Lorentz, Leiden University, Leiden, The Netherlands

Maldacena’s 1997 discovery that certain gauge theories have an equivalent description in terms of anti-de-Sitter quantum gravity in one extra dimension has led to several dramatic new physics insights. Three of these are: 1) From the gauge theory perspective the gravitational force is emergent and recent research on black holes and wormholes has elucidated that this is best phrased in terms of quantum entanglement. 2)

The classical gravity limit dual to strongly coupled physics has a universal hydrodynamic limit at low energies. This fluid/gravity aspect has shed new light on the century-old physics of fluids from computational control to non-thermal fixed points. 3) Finally in context of condensed matter physics AdS/CFT indicated the existence of novel IR fixed points, subsequently validated in Sachdev-Ye-Kitaev models. Moreover, these fixed points are strong candidates to explain high T_c superconductors. We review each briefly and discuss how these new insights can point the way for current experiments as well as possibly test quantum gravity holographically in the lab.