

Physics Colloquium

Ioannis Papadimitriou – Korea Institute
for Advanced Study

“From Quantum Black Holes to Exotic Materials”

Strongly interacting quantum systems are all around us, from the beginnings of the universe to the latest technological advances. States of matter as diverse as the quark-gluon plasma that permeated the early universe and the high temperature superconductors found in MRI machines, maglev trains and particle colliders have one thing in common – strongly coupled quantum dynamics. As it turns out, they are also related to black holes. In one of the most profound developments in theoretical physics in recent years, holographic dualities provide a mathematical dictionary between strongly interacting quantum matter and quantum gravity, paving the way for addressing previously inaccessible questions in both. I will present an overview of some of the questions holographic dualities have helped to answer and will outline some of the key open problems and future directions for the field.

Ioannis Papadimitriou is a graduate of Imperial College London (M.Sci. '00), the University of Pennsylvania (M.S. '02) and the University of Amsterdam (Ph.D. '05). Following postdoctoral appointments at a number European institutes including CERN, he is currently an Assistant Professor at the Korea Institute for Advanced Study in Seoul. Ioannis' research uses string theory, quantum field theory, and the remarkable mathematical relation between them known as holographic duality in order to probe the quantum nature of black holes and the exotic properties of strongly interacting quantum matter.

Physics Faculty and Search Committee Candidate

Tuesday, February 26th in LL 316 at 4:10
Refreshments available at 3:45