String theory subsumes established physical principles into a larger structure. A consequence of this enlarged perspective has been the discovery of unanticipated connections, or dualities, between previously unrelated physical phenomena. Most surprisingly, it has been found that the gravitational dynamics of black holes can be completely reformulated as that of an exotic many body state of matter without gravity. The states of matter that emerge have features in common with those that are believed to underlie the still ill-understood high temperature superconductors and other exotic materials. I will discuss some highlights from the rapidly developing two-way connection between black hole physics and materials with technological applications.

SEAN HARTNOLL is an Assistant Professor in the Department of Physics at Stanford University. He completed his undergraduate and graduate work at the University of Cambridge, receiving his PhD from the Department of Applied Mathematics and Theoretical Physics. He was a postdoctoral fellow at the Kavli Institute for Theoretical Physics in Santa Barbara and subsequently at Harvard University.

Wednesday, October 12, 2011
8:00 PM (reserved seats held until 7:50 PM)
Kavli Institute for Theoretical Physics, Main Seminar Room