Physics Colloquium

Bartek Czech

"Distance is information"

The space we live in--the space measured in miles, kilometers and parsecs--has an internal structure of its own. Surprisingly, this structure is intimately related to quantum information theory, a field at the intersection of physics and computer science. Understanding this connection is a remarkable achievement of human thought: it required input from the physics of black holes, the idea that the world is a gigantic hologram, quantum mechanics, and some little known results from 19th century geometry. The upshot is that the fabric of space encodes streaming compression protocols analogous to the one used by Netflix. No prerequisites are necessary, but an open mind is advised.

Bartek Czech *is a graduate of Harvard University (B.A. '02) and of the University of Pennsylvania (Ph.D. '09). He has lived and worked in seven countries on three continents, including the Institute for Advanced Study in Princeton and Stanford University. He is currently a tenure-track member of the Institute for Advanced Study at Tsinghua University in Beijing, China. In his research, Bartek applies concepts from quantum information theory and condensed matter theory to understand the microscopic structure of space and time. The background of his work is that a gravitational spacetime is a hologram and the glue that holds it together is quantum information. In their spare time, Bartek and his son like to push the envelope of where two-year-olds can go; among other feats, they have climbed two Colorado fourteeners and completed the notoriously difficult Laugavegur trek in Iceland.*

Physics Faculty and Search Committee Candidate

Thursday, January 24th in LL 316 at 4:10

Refreshments available at 3:45