

CM / AMO Seminar

Condensed Matter & Atomic Molecular Optical

Thursday, December 7, 2017

703 NWC Building

12:00 PM



Dan Shahar

Weizmann Institute of Science

"Duality symmetry and the superconductor-insulator transition"

The superconductor-insulator transition exhibits a remarkable duality symmetry directly relating the resistance measured in the superconducting regime to the conductance measured in the insulator. This symmetry points to a deep relation between these two seemingly-opposing phases. At very low temperatures (below 200 mK for our amorphous indium-oxide films) this beautiful symmetry is severely violated. We demonstrate that this violation is associated with the emergence of a new insulating ground-state in which the electrons are effectively decoupled from the host phonons[1]. We further show that duality symmetry can be effectively restored by driving the system out of equilibrium.

[1] D.M. Basko, I.L. Aleiner, B.L. Altshuler, *Annals of Physics* 321, 1126 (2006); D.M. Basko, I.L. Aleiner, B.L. Altshuler, *Phys. Rev. B* 76, 052203 (2007)