

THE
CATHOLIC UNIVERSITY
of AMERICA



Department of Physics
Colloquium

Dr. Louis Pecora

United States Naval Research Laboratory

**Tunneling and Transmission of Waves through a Chaotic
Cavity (or, equivalently, Quantum Dot) and the
Regularization of Tunneling Rates**

Tunneling rates and transmission rate in closed, double well or single cavity quantum or microwave systems in two dimensions or higher are radically different between wells with classically regular or chaotic behavior. Wells with regular dynamics have tunneling rates that fluctuate by several orders of magnitude as a function of energy or frequency. Wells with chaotic dynamics have fluctuations smaller than one order of magnitude (a regularization of the fluctuations). I will introduce the idea of tunneling in systems with 2D and higher geometry and show how it differs greatly from the usual 1D examples most physicists use to think of and teach others about tunneling. These results will apply to quantum dots (conductance) and microwave cavities (transmittance) in the same way. Former theories for conductance in quantum dots will not apply here. We developed a theory, which uses proper boundary conditions at the barriers and yields the scattering matrix.

Wednesday, October 4, 2017

4:00pm

108 Hannan Hall

Refreshments will be served at 3:45

Sponsored in part by the Graduate Student Association

For more information or if you would like to request disability accommodations, please contact:

Patrick Burke (202) 319-5315