*NEW YORK CITY COLLEGE OF TECHNOLOGY*
**Physics Department**
**Center for Theoretical Physics**

# Modes and transmission channels, and focusing in Disordered Media

***Presented by:***
## Distinguished Professor Azriel Z. Genack

**Queens College of the City University of New York**
**Queens, NY, USA**

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**Namm, Room 823**

**Abstract**

I'll discuss wave propagation and localization in disordered media from the related perspectives of modes, and transmission eigenchannels. These concepts cannot be probed directly for electronic systems but can be explored for classical waves utilizing spectra of field transmission coefficients between arrays of points on the incident and output surfaces of ensembles of random samples. This is demonstrated in microwave measurements of transmission through random waveguides in the Anderson localization transition. These experiments supply the link between the statistics of intensity and conductance and make it possible to decompose the transmitted field into the underlying quasi-normal modes [1] and transmission eigenchannels [2-4] of the sample. The power of each of these approaches and the links between them will be illustrated by examples that reveal new aspects of wave propagation.

[1] J. Wang and A. Z. Genack, Nature 471, 345-348 (2011).
[2] O. N. Dorokhov, Solid State Commun. 51, 381 (1984).
[3] P. A. Mello, P. Pereyra, and N. Kumar, Ann. Phys. (N.Y.) 181, 290 (1988).
[4] Z. Shi and A. Z. Genack, Phys. Rev. Lett. 108, 043901 (2012).

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*Light refreshments will be served.*