

Graduate Student Seminar

**Left-handed
Materials and
Random Lasing**

Josh Holt

Over the last two years I have studied left-handed material (LHM's) with Prof. Efros and random lasing (RL) with Prof. Vardeny and will give an introduction to both fields. An LHM is a material where in some frequency range electric permittivity and magnetic permeability are both negative and provide very interesting effects, such as negative group velocity and negative refraction. I will show these effects using photonic crystal simulations and demonstrate a unique imaging device called the Veselago lens. I will also briefly introduce the concepts behind random lasing. Normally, scattering within a laser cavity is exponentially detrimental to laser gain. I will show you, however, how scattering can become an ally to laser output in gain media with a high concentration of scatterers and will demonstrate how it can be used to detect cancerous cells in biological tissue.

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