

## EDUCATION

### **The City University of New York**, New York, NY

Ph.D., Physics, September 2012

- Aperture Array Photonic Metamaterials: Theoretical approaches, numerical techniques and a novel application
- Advisor: Professor David T. Crouse

M.A., Physics, The City College of New York, September 2009

### **Yeshiva University**, New York, NY

B.A. Physics, Minor in Mathematics, May, 2007, *Magna Cum Laude*

- Recipient, Professor Arnold N. and Bertha Lowan Memorial Award for Excellence in Physics Research, 2007

## RESEARCH EXPERIENCE

### **Riverside Research** – New York, NY

May 2012 – Current

*Member of the Research Staff, Electromagnetics Laboratory*

Providing subject matter expertise in computational electromagnetics and metamaterials. Developing state-of-the-art algorithms for high performance computing software tools.

### **The Research Foundation of CUNY** – New York, NY

May 2009 – May 2012

*Ph.D. Candidate*

Research towards Ph.D. in physics, conducted in the research group of Professor David T. Crouse

- Developed and computationally implemented a theoretical model for enhanced optical transmission through 2D aperture array metamaterials
- Designed a microwave photon sorting metamaterial device, that has been experimentally verified to spectrally and spatially split photons, and demonstrates enhance absorption at its resonances
- Developed an approximate electromagnetic boundary condition for metal surfaces in metal-dielectric photonic metamaterial structures
- Contributed to fabrication and characterization of nanocavity array metamaterials
- Configured, maintained and utilized a high performance computing cluster
- Developed specialized plotting and data analysis package in Mathematica for research applications

Software: HFSS, Mathematica, MATLAB, C, C++, LaTeX, MS HPC

Equipment: optical microscopes, optical bench, monochromator, AFM, refractometer

### **Unilever** – Trumbull, CT

Summer 2008

*Summer Research Intern*

Refined existing experimental techniques and developed a data analysis package. Calculated theoretical limitations of existing equipment

- Calculated theoretical limitations of existing optical rheology equipment, and corrected analysis package shipped with device
- Verified my corrections experimentally, and advised a change to experimental methodology with minimal additional expense
- Analyzed existing data using Mathematica, and devised a method to improve quality of future measurements
- Presented results to other interns and executive staff

## TEACHING EXPERIENCE

### Adjunct Instructor of Physics

September 2009 – May 2012

*Department of Physics, The City College of New York – New York, NY*

Teach undergraduate physics laboratory courses, open tutoring sessions and grading undergraduate physics homework and exams.

### Adjunct Instructor of Physics

January 2007 – May 2012

*Department of Physics, Yeshiva University – New York, NY*

Teach undergraduate general physics and honors laboratory courses and recitations.

## PUBLICATIONS AND PRESENTATIONS

- I. Mandel, E. Lansey, *et al.*, "Near field light localization and photon sorting in subwavelength cavity arrays in the infrared regime," in preparation.
- E. Lansey, I.R. Hooper, J. N. Gollub, A. P. Hibbins, and D. T. Crouse, "Measurement of photon sorting at microwave frequencies in sub-wavelength cavity arrays," in preparation.
- E. Lansey, *et al.*, "An effective cavity resonance model for enhanced optical transmission through arrays of subwavelength apertures in metal films," in review, *J. Opt. Soc. Am. B*.
- E. Lansey, I.R. Hooper, J.N. Gollub, A.P. Hibbins, and D.T. Crouse, "Light localization, photon sorting, and enhanced absorption in subwavelength cavity arrays," in press *Opt. Express*, 20 (2012)
- E. Lansey, N. Pishbin, J.N. Gollub and D.T. Crouse. "Analytical analysis of the resonance response of subwavelength nanoscale cylindrical apertures in metal at near ultraviolet, optical, and near infrared frequencies," *J. Opt. Soc. Am. B*, Vol. 29, Issue 3, pp. 262-267 (2012).
- E. Lansey, J. Gollub, and D. T. Crouse, "Dispersion analysis of subwavelength square apertures at optical frequencies," *Proc. SPIE*, Vol. 8255, 825526 (2012).
- E. Lansey, J.N. Gollub, T.L. James and D.T. Crouse. "Polarization independent wavelength-tuned metamaterial for solar energy applications," in *Renewable Energy and the Environment*, OSA Technical Digest, paper PWD2.
- I. Bendoy, N. Pishbin, D.T. Crouse and E. Lansey. "Rapidly optimizing optoelectronic devices using full wave 3D simulation software," *Proc. SPIE*, Vol. 7933, 793377 (2011).
- E. Lansey and D.T. Crouse. "Design of photonic metamaterial multi-junction solar cells using rigorous coupled wave analysis," *Proc. SPIE* Vol. 7772, 777205 (2010).
- A.M. Schilowitz, D.G. Yablon, E. Lansey and F.R. Zypman. "Measuring hydrocarbon viscosity with oscillating microcantilevers," *Measurement*, Volume 41, Issue 10, December 2008, Pages 1169-1175.
- E. Lansey, A. Lapin and F.R. Zypman, "Level statistics in disordered linear networks," *Physica A: Statistical Mechanics and its Applications*, Volume 386, Issue 2, 15 December 2007, pp. 655-658.
- E. Lansey and F.R. Zypman, "Experimental measurements of dispersion relations in a disordered mechanical chain," Poster: Pan-America Advanced Studies Institute (PASI), December, 2006.
- E. Lansey and F.R. Zypman, "Force-Strain Curves of Microcapsules With Atomic Force Microscopy," *Scanning-Probe and Other Novel Microscopies of Local Phenomena in Nanostructured Materials*, edited by S.V. Kalinin, B. Goldberg, L.M. Eng, and D. Huey, O10.14.

## MEMBERSHIPS AND CONFERENCES

**American Physical Society:** APS March Meeting 2012

**SPIE:** SPIE Optics+Photonics 2010, SPIE Photonics West 2012

**Optical Society of America:** OSA Renewable Energy Optics and Photonics Congress 2011

**Pan-American Advanced Studies Institute:** December 2006, Mar Del Plata, Argentina