

## Ian R. Nemitz

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### Education

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- Doctor of Philosophy in Physics\*** Fall 2016  
Case Western Reserve University, Cleveland, Ohio  
Dissertation Title: “Liquid Crystals: Surfaces, Nanostructures, and Chirality”  
Advisor: Dr. Charles Rosenblatt
- Doctor of Philosophy in Physics\*** Fall 2016  
Université Pierre et Marie Curie, Paris, France  
Advisor: Dr. Emmanuelle Lacaze
- Master of Science** Summer 2010  
Bowling Green State University  
Thesis Title: “Synthesis of Nanoscale Semiconductor Heterojunctions for Photovoltaic Applications”  
Advisor: Dr. Mikhail Zamkov
- Bachelor of Science in Physics** Spring 2008  
Bowling Green State University, Bowling Green, Ohio  
Minor: Mathematics

### Research Experience

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- Ph.D. Graduate Research Assistant** 2011-Present  
Department of Physics, Case Western Reserve University and Université Pierre et Marie Curie
- Designed and performed experiments and analyzed data to investigate the effects of surfaces, nanopatterned structures, and chirality on liquid crystals
- Graduate Research Assistant** 2009-2010  
Department of Physics and Astronomy, Bowling Green State University
- Synthesized and characterized nanoscale semiconductors, specifically quantum dots, with the goal of improving photovoltaic devices
- Intern – Lewis Educational Research Intern Program** Summers 2007, 2008  
NASA John Glenn Research Center
- Computer-modeled travelling wave tube amplifiers to decrease signal attenuation through application of metamaterials, surface plasmons, and amphoteric refraction
- Undergraduate Researcher** 2007-2008  
Physics Department/Communications Department, Bowling Green State University
- Experimented on a physical model of the human glottis, taking pressure measurements under regulated airflow to model glottal lesions and paralysis, and mathematically simulated similar systems

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\*By agreement of the two universities, simultaneous Ph.D. degrees will be awarded upon completion and defense of my dissertation, which is based on a collaborative research project supervised by both CWRU and UPMC.

## **Teaching/Leadership Experience**

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### **Graduate Mentor** 2012-Present

Department of Physics, Case Western Reserve University

- Mentored high school, undergraduate, and new graduate students in laboratory methods and practices, specifically dealing with research applications

### **President - Graduate Recruitment Committee** Fall 2013-Spring 2015

Department of Physics, Case Western Reserve University

- Directed and actively participated in the planning of recruitment visits for prospective graduate students, working closely with and directing other students, faculty, and staff

### **Teaching Assistant** 2010-2014

Department of Physics, Case Western Reserve University

- Prepared introductions and monitored introductory labs focusing on classical mechanics for 12-16 freshman and sophomore level undergraduates.
- Graded lab course assignments and gave feedback to ensure the students understood the material and stayed on track

### **Teaching Assistant** 2008-2010

Department of Physics and Astronomy, Bowling Green State University

- Prepared introductions to, and monitored introductory labs focusing on classical mechanics and electrodynamics for 20-30 freshman and sophomore level undergraduates
- Graded lab course assignments and gave feedback to ensure the students understood the material and stayed on track

## **Skills**

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- Programming languages / mathematical packages: Mathematica, Matlab, Python, LaTeX
- Microscopies: polarized optical, atomic force (AFM), near-field scanning optical (NSOM), scanning electron (SEM), scanning tunneling (STM)
- Machining and Manufacture: Drill Press, Lathe, Mill, 3D printing
- Other: Mac OS, Windows OS and Peripherals, Computer Aided Design, Origin

## **References**

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### **Charles Rosenblatt, Professor and Ohio Eminent Scholar**

Department of Physics, Case Western Reserve University

(216) 368-4125, [rosenblatt@case.edu](mailto:rosenblatt@case.edu)

### **Mikhail Zamkov, Professor**

Department of Physics and Astronomy, Bowling Green State University

(419) 372-0264, [zamkovm@bgsu.edu](mailto:zamkovm@bgsu.edu)

### **Emmanuelle Lacaze, Director of Research at CNRS**

Institut des Nanosciences de Paris, Université Pierre et Marie Curie, Paris

+33 1 44 27 46 54, [emmanuelle.lacaze@insp.jussieu.fr](mailto:emmanuelle.lacaze@insp.jussieu.fr)

## **Publications**

**Nemitz, I. R.**, Ferris, A., Lacaze, E., Rosenblatt, C. (2016) Chiral oily streaks in a smectic A liquid crystal. *Soft Matter* (submitted)

**Nemitz, I. R.**, Lacaze, E., Rosenblatt, C. (2016) Electroclinic effect in a chiral paranematic liquid crystal above the bulk nematic to isotropic transition temperature. *Physical Review E*, *93*, (10), 022701, 10.1103/PhysRevE.93.022701

**Nemitz, I. R.**, McEleny, K., Crudden, C. M., Lemieux, R. P., Petschek, R., Rosenblatt, C. (2016). Chiral periodic mesoporous organosilica in a smectic- A liquid crystal: source of the electrooptic response. *Liquid Crystals*, *43*, (4), 497-504, 10.1080/02678292.2015.1119321

Kaloadonda, P., Basu, R., **Nemitz, I. R.**, Rosenblatt, C., Iannocchione G. S. (2014) Studies of nanocomposites of carbon nanotubes and a negative dielectric anisotropy liquid crystal. *Journal of Chemical Physics*, *140*, (10), 104908, 10.1063/1.4867791:

Lin, T. C., **Nemitz, I. R.**, McGrath, C. J., Schubert, C. J. P., Yokohama, H., Lemieux, R. P., Rosenblatt, C. (2013), Nematic molecular core flexibility and chiral induction, *Physical Review E*, *88*, (4), 042501, 10.1103/PhysRevE.88.042501:.

Lin, T. C., **Nemitz, I. R.**, Pendery, J. S., Schubert, C. P. J., Lemieux, R. P., Rosenblatt, C. (2013), Nematic twist cell: Strong chirality induced at the surfaces, *Applied Physics Letters*, *102*, (13), 134101, 10.1063/14799166:.

Basu, R., **Nemitz, I. R.**, Song, Q. X., Lemieux R. P., Rosenblatt, C. (2012), Surface topography and rotational symmetry breaking, *Physical Review E*, *86*, (1), 011711, 10.1103/PhysRevE.86.011711:.

Acharya, K. P., Khon, E., O'Connor, T., **Nemitz, I. R.**, Klinkova, A., Khnayzer, R. S., Anzenbacher, P., Zamkov, M. (2011), Heteroepitaxial Growth of Colloidal Nanocrystals onto Substrate Films via Hot-Injection Routes, *ACS Nano*, *5*, (6), 4953-4964, 10.1021/nn201064n:.

Khon, E., Mereshchenko, A., Tarnovsky, A. N., Acharya, K., Klinkova, A., Hewa-Kasakarage, N. N., **Nemitz, I. R.**, Zamkov, M. (2011), Suppression of the Plasmon resonance in Au/CdS Colloidal Nanocomposites, *Nano Letters*, *11*, (4), 1792-1799, 10.1021/nl200409x:.

Khon, E., Hewa-Kasakarage, N. N., **Nemitz, I. R.**, Acharya, K., Zamkov, M. (2010), Tuning the Morphology of Au/CdS Nanocomposites through Temperature-Controlled Reduction of Gold-Oleate Complexes, *Chemistry of Materials*, *22*, (21), 5929-5936, 10.102/cm101922m:.

Acharya, K., Klinkova, A., Hewa-Kasakarage, N. N., Alabi, T. R., **Nemitz, I. R.**, Khon, E., Ullrick, B., Anzenbacher, P., Zamkov, M. (2010) Synthesis of PbS/TiO<sub>2</sub> Colloidal Heterostructures for Photovoltaic Applications, *Journal of Physical Chemistry C*, *114*, (29), 12496-12504, 10.1021/jp104197s:.

Hewa-Kasakarage, N. N., El-Khoury, P. Z., Tarnovsky, A. N., Kirsanova, M., **Nemitz, I. R.**, Nemchinov, A., Zamkov, M. (2010), Ultrafast Carrier Dynamics in Type II ZnSe/CdS/ZnSe Nanobarbells, *ACS Nano*, *4*, (4), 1837-1844, 10.1021/nn100229x:.

### **Oral Presentations**

**Nemitz, I. R.**, Ferris, A., Lacaze, R., Rosenblatt, C. (2016, July) Chiral oily streaks in a smectic A liquid crystal. Presented at International Liquid Crystal Conference, Kent, Ohio

### **Poster Presentations**

**Nemitz, I. R.**, Lacaze, E., Rosenblatt, C. (2016, July) Electroclinic effect in a chiral paranematic liquid crystal above the bulk nematic to isotropic transition temperature, Presented at International Liquid Crystal Conference, Kent, Ohio

**Nemitz, I. R.**, McEleny, K., Crudden, C. M., Lemieux, R. P., Petschek, R., Rosenblatt, C. (2016, July). Chiral periodic mesoporous organosilica in a smectic- A liquid crystal: source of the electrooptic response, Presented at International Liquid Crystal Conference, Kent, Ohio

**Nemitz, I. R.**, Gryn, I., Zappone, B., Lemieux, R. P., Petschek, R., Rosenblatt, C., Lacaze, E. (2016, July) Transformation of smectic oily streaks at the smectic-A / smectic-C transition temperature, Presented at International Liquid Crystal Conference, Kent, Ohio

**Nemitz, I. R.**, McEleny, K., Crudden, C. M., Lemieux, R. P., Petschek, R., Rosenblatt, C. (2015, July). Chiral periodic mesoporous organosilica in a smectic- A liquid crystal: source of the electrooptic response, Poster presented at Chirality at the Nanoscale, Kent, Ohio

**Nemitz, I. R.**, McEleny, K., Crudden, C. M., Lemieux, R. P., Petschek, R., Rosenblatt, C. (2015, July). Chiral periodic mesoporous organosilica in a smectic- A liquid crystal: source of the electrooptic response, Poster presented at Liquid Crystals Gordon Research Conference, Biddeford, ME

Basu, R., **Nemitz, I. R.**, Song, Q. X., Lemieux R. P., Rosenblatt, C. (2012, August), Surface topography and rotational symmetry breaking, Poster presented at International Liquid Crystal Conference, Mainz, Germany