

# IAN D. HOSEIN, Ph. D.

Curriculum Vitae

October 8, 2019

## Assistant Professor

Dept. of Biomedical and Chemical Engineering  
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## EDUCATION

2009	Ph. D.	Materials Science and Engineering	Cornell University
2006	M. Sc.	Materials Science and Engineering	Cornell University
2004	B. A. Sc.	Engineering Science	University of Toronto

## PROFESSIONAL APPOINTMENTS

2014-Present	Assistant Professor	Department of Biomedical and Chemical Engineering <i>College of Engineering and Computer Science</i> <i>Syracuse University</i>
2014-Present	Member	Syracuse Biomaterials Institute <i>Syracuse University</i>
2012–2014	Senior Researcher	Department of Chemistry & Chemical Biology <i>McMaster University</i>
2010-2012	Postdoctoral Researcher	Department of Chemistry <i>University of Waterloo</i>
2009-2010	Postdoctoral Researcher	Department of Materials Science and Engineering <i>Cornell University</i>

## PUBLICATIONS

### *Syracuse Appointment*

1. Saeid Biria, Ian D. Hosein “Direct Light-Writing of Nanoparticle-Based Metallo-Dielectric Optical Waveguide Arrays Over Silicon Solar Cells for Wide-Angle Light Collecting Modules.” *Adv. Opt. Mater.*, 2019, 1900661.
2. Hao Lin, Saeid Biria, Fu-Hao Chen, **Ian D. Hosein**, Kalaichelvi Saravanamuttu “Waveguide-imprinted slim polymer films: beam steering coatings for solar cells.” *ACS Photonics*, 2019, 6, 878-885.
3. Hansheng Li, Fu-Hao Chen, Saeid Biria, **Ian D. Hosein**, “Prototyping of Superhydrophobic Surfaces from Structure-Tunable Micropillar Arrays using Visible Light Photocuring.” *Adv. Eng. Mater.* 2019, 1801150. (*Cover Article*)
4. Francielli S. Genier, Cameron V. Burdin, Saeid Biria, **Ian D. Hosein**, “A Novel Calcium-Ion Solid Polymer Electrolyte Based on Crosslinked Poly(ethylene glycol) Diacrylate.” *J. Power Sources*, 2019, 414, 302-307.

5. Saeid Biria, Fu-Hao Chen, **Ian D. Hosein** “Enhanced Wide-Angle Energy Conversion Using Structure-Tunable Waveguide Arrays as Encapsulation Materials for Silicon Solar Cells.” *Phys. Status Solidi A*, 2018, 216, 1970013. (Cover Article)
6. Hao Lin, **Ian D. Hosein**, Kalaichelvi Saravanamuttu “Slim Films with Seamless Panoramic Fields of View: The Radially Distributed Waveguide Encoded Lattice (RDWEL).” *Adv. Opt. Mater.* 2018, 1801091.
7. Tianyi Yao, Francielli Silva Genier, Saeid Biria, **Ian D. Hosein** “A Solid Polymer Electrolyte for Aluminum Ion Conduction.” *Results Phys.* 2018, 10, 529-531.
8. Saeid Biria, **Ian D. Hosein** “Superhydrophobic Microporous Substrates via Photocuring: Coupling Optical Pattern Formation to Phase Separation for Process-Tunable Pore Architectures.” *ACS Appl. Mater. Interfaces.* 2018, 10, 3094–3105.
9. Saeid Biria, Fu Hao Chen, Shreyas Pathreker, **Ian D. Hosein** “Polymer Encapsulants Incorporating Light-Guiding Architectures to Increase Optical Energy Conversion in Solar Cells.” *Adv. Mater.* 2017, 1705382.
10. Saeid Biria, Derek Morim, Fu An Tsao, Kalaichelvi Saravanamuttu, **Ian D. Hosein** “Coupling Nonlinear Optical Waves to Photoreactive and Phase-Separating Soft Matter: Current Status and Perspectives.” *Chaos*, 2017 104611. [Published in special issue: Dissipative Structures and Irreversibility in Nature: Celebrating the 100th Anniversary of Ilya Prigogine’s Birth.]
11. **Ian D. Hosein**, Hao Lin, Matthew Ponte, Dinesh Baskar, Michael A. Brook, Kalaichelvi Saravanamuttu “Waveguide Encoded Lattices (WELs): Slim Polymer Films with Panoramic Fields of View (FOV) and Multiple Imaging Functionality.” *Adv. Func. Mater.* 2017 1702242.
12. Fuhao Chen, Shreyas Pathreker, Saeid Biria, **Ian D. Hosein** “Synthesis of Micropillar Arrays via Photopolymerization: An in Situ Study of Light-Induced Formation, Growth Kinetics, and the Influence of Oxygen Inhibition.” *Macromolecules*, 2017, 50, 5767–5778.
13. Hari Nanthakumar, Fu-Hao Chen, Saeid Biria, **Ian D. Hosein** “Microtruss structures with enhanced elasticity fabricated through visible light photocuring.” *Results Phys.* 2017, 7, 2194-2196.
14. Saeid Biria, **Ian D. Hosein**, “Simulations of Morphology Evolution in Polymer Blends during Light Self-Trapping.” *J. Phys. Chem. C*, 2017, 121, 11717.
15. Saeid Biria, **Ian D. Hosein**, “Control of Morphology in Polymer Blends through Light Self-Trapping: An in Situ Study of Structure Evolution, Reaction Kinetics, and Phase Separation.” *Macromolecules*. 2017, 50, 3617.
16. Saeid Biria, Phillip P. A. Malley, Tara F. Kahan, **Ian D. Hosein**, “Optical Autocatalysis Establishes Novel Spatial Dynamics in Phase Separation of Polymer Blends during Photocuring.” *ACS Macro Lett.* 2016, 5, 1237–1241.
17. Fu-Hao Chen, Shreyas Pathreker, Jaspreet Kaur, and **Ian D. Hosein**, “Increasing light capture in silicon solar cells with encapsulants incorporating air prisms to reduce metallic contact losses.” *Opt. Lett.* 2016, 24, A1419-A1430. *Energy Express Issue.*
18. Saeid Biria, Phillip P. A. Malley, Tara F. Kahan, **Ian D. Hosein**, “Tunable Nonlinear Optical Pattern Formation and Microstructure in Cross-Linking Acrylate Systems during Free-Radical Polymerization.” *J. Phys. Chem. C*, 2016, 120, 8, 4517-4528.

19. Manu Hegde, **Ian D. Hosein**, and Pavle V. Radovanovic, “Molecular Origin of Valence Band Anisotropy in Single  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Nanowires Investigated by Polarized X-ray Absorption Imaging.” *J. Phys. Chem. C*, 2015, 119, 17450–17457
20. **I. D. Hosein**, M. Hegde, P. D. Jones, V. Chirmanov, P. V. Radovanovic, “Evolution of the Faceting, Morphology and Aspect Ratio of Gallium Oxide Nanowires Grown by Vapor-Solid Deposition.” *J. Cryst. Growth*, 2014, 396, 24–32.
21. T. Wang, A. Layek, **I. D. Hosein**, V. Chirmanov, P. V. Radovanovic, “Correlation between native defects and dopants in colloidal lanthanide-doped Ga<sub>2</sub>O<sub>3</sub> nanocrystals: A path to enhancing functionality and controlling optical properties.” *J. Mat. Chem. C*, 2014. *Invited paper for 2014 Emerging Investigators Themed Issue*.
22. M. A. Halim, K. Hasan, G. Sarwar, **I. D. Hosein**, “Creating a Borderless Platform for Scientific Research in Canadian Chemical Transactions.” *Can. Chem. Trans.* 2013, 1, 1–6.
23. S.S. Farvid, M. Hegde, **I. D. Hosein**, P. V. Radovanovic, “Electronic structure and magnetism of Mn dopants in GaN nanowires: ensemble vs single nanowire measurements.” *Appl. Phys. Lett.* 2011, 99 222504–6.
24. M. Hedge, S. S. Farvid, **I. D. Hosein**, P. V. Radovanovic, “Tuning Manganese Dopant Spin Interactions in Single GaN Nanowires at Room Temperature.” *ACS Nano*, 2011, 5, 6365–6373.
25. **I. D. Hosein**, S. H. Lee, C. M. Liddell, “Dimer-Based Three-Dimensional (3D) Photonic Crystals.” *Adv. Func. Mater.* 2010, 20, 3085–309.
26. **I. D. Hosein**, M. Ghebrebrhan, J. D. Joannopoulos, C. M. Liddell, “Dimer shape anisotropy: A nonspherical colloidal approach to omnidirectional photonic bandgaps.” *Langmuir*, 2009, 26, 3, 2151–2159.
27. **I. D. Hosein**, B. S. John, S. H. Lee, F. A. Escobedo, C. M. Liddell “Rotator and crystalline films via self-assembly of short-bond-length colloidal dimers.” *J. Mater. Chem.* 2009, 19, 344–349. (**Journal “Hot Article”**)  
(Selected for **Virtual Journal of Nanoscale Science & Technology, Jan. 19, 2009 issue**)
28. S.H. Lee, Y. Song, **I. D. Hosein**, C. M. Liddell, “Magnetically responsive and hollow colloids from nonspherical core–shell particles of peanut-like shape.” *J. Mater. Chem.* 2009, 19, 350–355.
29. **I. D. Hosein**, C. M. Liddell, “Convectively Assembled Asymmetric Dimer-Based Colloidal Crystals.” *Langmuir*, 2007, 23, 10479–10485. (**Journal Cover Article, October Issue**)
30. **I. D. Hosein**, C. M. Liddell, “Convectively Assembled Nonspherical Mushroom Cap-Based Colloidal Crystals.” *Langmuir*, 2007, 23, 8810–8814.
31. **I. D. Hosein**, C. M. Liddell, “Homogeneous, Core-Shell, & Hollow Shell ZnS Colloid Based Photonic Crystals.” *Langmuir*, 2007, 23, 5, 2892–2897. (**9<sup>th</sup> Most Accessed Article, January–March, 2007**)
32. J. Kim, W. Ni, C. Lee, E. C. Kan, **I. D. Hosein**, Y. Song and C. Liddell, “Magnetic Property Characterization of Magnetite (Fe<sub>3</sub>O<sub>4</sub>) Nanorod Cores for Integrated Solenoid RF Inductors.” *J. Appl. Phys.* 2006, 99, 08R903.

#### Conference Proceedings

1. **I. D. Hosein**, H. Lin, M. R. Ponte, D. Basker, K. Saravanamuttu, “Multidirectional waveguide arrays in a planar architecture.” *Proc. SPIE*, 2014, 8983, 89830E

2. **I. D. Hosein**, H. Lin, M. R. Ponte, D. K. Basker, and K. Saravanamuttu, “Enhancing Solar Energy Light Capture with Multi-Directional Waveguide Lattices.” in Renewable Energy and the Environment, Optical Society of America, 2013, RM2D.2.
3. M. Hegde, **I. D. Hosein**, T. Sabergharesou, S. S. Farvid, P. V. Radovanovic, “Introducing and manipulating magnetic dopant exchange interactions in semiconductor nanowires.” *Proc. SPIE*, 2013, 8813, 88132S.
4. X. Sun, X. Bai, Y. Wang, M. Hegde, **I. D. Hosein**, P. V. Radovanovic, Y. G. Guo and B. Cui, “Comparison of Structural Analysis and Electrochemical Studies of C-Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub> and CNT-Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub> Nanocomposites particles used as Anode for Lithium Ion Battery.” *MRS Proceedings*, 2013, 1541.
5. X. Sun, A. Iqbal, **I. D. Hosein**, M. J. Yacaman, Z. Y. Tang, P. V. Radovanovic and B. Cui, “Structure Characterization and Electrochemical Characteristics of Carbon Nanotube-Spinel Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub> Nanoparticles.” *MRS Proceedings*, 2012, 1440.

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### **PATENT APPLICATIONS**

1. U.S. Provisional Patent Application No. 62/837,478 entitled “Ultrawide-Angle Light Collecting Modules Formed by Direct Light-Writing of Nanoparticle-Based Metallo-Dielectric Optical Waveguides” Filed on April 29, 2019
2. U.S. Patent Application No. 62/608,179 entitled “Electro-Controllable Ion Exchange Membrane” Filed on December 1, 2018
3. U.S. Patent Application No. 62/579,964 entitled “Synthesis of Superhydrophobic Microporous Surfaces Via Light-Directed Photopolymerization and Phase Separation.” Filed on July 1, 2018.
4. “Light-harvesting, waveguide-embedded coatings for solar cells.” Disclosed to McMaster University, December 15<sup>th</sup>, 2014. This is a provisional patent application.

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### **INVITED TALKS**

#### **External**

1. **Ian D. Hosein**, “UV Processing of Advanced Polymer Materials for Energy Conversion and Storage.” Big Ideas Conference for UV+EB Technology, Redondo Beach, March 19-20, 2019
2. **I. D. Hosein**, “Controlling Polymer Blend Morphology Using the Self-Focus Properties of Light.” AICHE National Conference, Inhomogeneous Polymers Session, Pittsburgh, November 1<sup>st</sup>, 2018
3. **I. D. Hosein**, “Towards Solid Calcium Ion Batteries: Solid and Gel Polymer Electrolytes for Effective Calcium Ion Conduction and Battery Separator Operation.” NY-BEST Annual Technology Conference, September 27, 2018
4. **I. D. Hosein**, “Coupling Nonlinear Optical Dynamics to Polymer Systems for Light-Directed Organization of Materials”, State University of New York at Binghamton, September 26, 2018
5. **I. D. Hosein**, “Coupling Nonlinear Optical Dynamics to Polymer Systems for Light-Directed Organization of Materials”, Cornell University, September 21, 2018
6. I. D. Hosein, “Revolutionizing Engineering Through Visible Light”, TEDx at Clarkson University, April 21, 2018
7. **I. D. Hosein**, “Coupling Nonlinear Optical Dynamics to Polymer Systems for Light-Directed Evolution of Morphology.” ACS National Meeting, March 18, 2018

8. **I. D. Hosein.** “Developing Smart Optical Coatings for Enhanced Solar Energy Conversion.” Rochester Institute of Technology, November 8<sup>th</sup>, 2017
9. **I. D. Hosein.** “White Light Driven Self-Organization of Two-Component Monomer Systems to Create Microstructures.” 98th Canadian Chemistry Conference and Exhibition, Ottawa, Canada, June 13-17<sup>th</sup>, 2015
10. **I. D. Hosein.** “Transparent Conducting Oxide Nanostructures: Tuning Optical Properties through Defect Manipulation.” Department of Chemistry, McMaster University, Hamilton, Ontario, January 31<sup>st</sup>, 2012.
11. **I. D. Hosein.** “Convective Self-Assembly of Non-spherical Colloids.” Department of Chemistry, University of Waterloo, Ontario, March 19<sup>th</sup>, 2010.
12. **I. D. Hosein.** “Creating new colloidal crystal structures with nonspherical colloidal bases.” *SoftMatter 2008 – Research Symposium on Soft Materials*, Raleigh, NC, June 19, 2008.

#### **Internal**

1. **I. D. Hosein.** “A Self-Assembly Approach to Photonic Crystals.” Cornell Electron Device Society, June, 2007.

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#### **PRESENTATIONS**

##### **External**

1. F. Genier, **I. D. Hosein**, “Solid Polymer Electrolyte Networks Via the Active Monomer Mechanism for Lithium Ion Conduction.” Fall MRS Meeting, Boston, November 26-30, 2018
2. S. Biria, **I. D. Hosein**, “Towards Solid Calcium Ion Batteries: Solid and Gel Polymer Electrolytes for Effective Calcium Ion Conduction and Battery Separator Operation.” 2018 AIChE Annual Meeting, Pittsburg, PA, October 28-November 3, 2018.
3. S. Biria, **I. D. Hosein**, “Solid Polymer Electrolyte Networks Via the Active Monomer Mechanism for Lithium Ion Conduction.” 2018 AIChE Annual Meeting, Pittsburg, PA, October 28-November 3, 2018.
4. S. Biria, **I. D. Hosein**, “Teaching Energy and Sustainability Using Only Active Learning Pedagogies.” 2018 AIChE Annual Meeting, Pittsburg, PA, October 28-November 3, 2018.
5. Shreyas Pathreker, “Using Visible Light to Develop Advanced Battery Electrodes” Syracuse Center of Excellent Symposium, 2018 (1<sup>st</sup> Place)
6. Francielli Silva Genier, “Solid Polymer Electrolyte Networks for Calcium Ion Conduction” Syracuse Center of Excellent Symposium, 2018 (2<sup>nd</sup> place)
7. S. Biria, **I. D. Hosein**, “Controlling Polymerization Induced Phase Separation (PIPS) Using the Nonlinear Optical Properties of Light.” 2017 AIChE Annual Meeting, Minneapolis, MN, October 29-November 3, 2017.
8. Saeid Biria, **I. D. Hosein**, “In situ study of morphology evolution in polymer blends during light self-trapping.” the 254th ACS National Meeting in Washington, DC, August 20-24, 2017
9. Shreyas S. Pathreker, **Ian D. Hosein**, 'Nanocomposite Architectures for Batteries via a Novel Photopolymerization Route', Syracuse University Engineering & Computer Science Research Day, Syracuse NY, April 25<sup>th</sup>, 2017

10. S. Biria, Kirsten E. Judge, **I. D. Hosein**, “Precise Control of Mesoscale Morphology in Photoreactive Polymer Blends using Visible Light Beams.” 2016 AIChE Annual Meeting, San Francisco, CA, November 13-18, 2016.
11. S. Biria, Kirsten E. Judge **I. D. Hosein**, “Optochemical Self-Organization in Photoreactive Polymer Blends.” 2016 ACS National Meeting, Philadelphia, PA, August 21-26, 2016.
12. Shreyas S. Pathreker, **Ian D. Hosein**, 'Nanocomposite Architectures for Batteries via a Novel Photopolymerization Route', Syracuse University Engineering & Computer Science Research Day, Syracuse NY, April 25<sup>th</sup>, 2017
13. F.-H. Chen, S. Pathreker, J. Kaur, **I. D. Hosein**, “Enhanced Solar Energy Capture by Cloaking the Metallic Contacts of Silicon Solar Cells.” Syracuse University-Tohoku University (SU-TU) Joint Forum on Energy and Environment, April 11, 2016.
14. S. Biria, **I. D. Hosein**, “Optochemical Self-Organization in Cross-Linking Polymer Systems.” 2015 AIChE Annual Meeting, Salt Lake City, UT, November 8-13, 2015.
15. M. Hegde, S. S. Farvid, **I. D. Hosein**, P. V. Radovanovic, “Transparent Magnetic Semiconductor Nanostructures.” 97<sup>th</sup> Canadian Chemistry Conference, Vancouver, British Columbia, June 1–5, 2014.
16. **I. D. Hosein**, H. Lin, M. R. Ponte, D. Basker, K. Saravanamuttu, “Multidirectional waveguide arrays in a planar architecture.” Photonics West, San Francisco, CA, February 1–6, 2014.
17. **I. D. Hosein**, M. Hegde, P. V. Radovanovic, “Introducing and manipulating magnetic dopant exchange interactions in III-V semiconductor nanowires.” SPIE Nanoscience+Engineering, San Diego, CA, August 25–29, 2013.
18. **I. D. Hosein**, D. Basker, M. R. Ponte, K. Saravanamuttu, “Multidirectional waveguide lattices for wide-angle light capture in solar cells.” Photonics North, Ottawa, Ontario, June 3–5, 2013.
19. **I. D. Hosein**, D. Basker, M. R. Ponte, M. A. Brook, K. Saravanamuttu, “Optochemical organization of multidirectional waveguide lattices for wide-angle light capture in solar cells.” *Materials Research Symposium (MRS)*, San Francisco, CA, April 1–5, 2013
20. M. R. Ponte, **I. D. Hosein**, K. Saravanamuttu, “Optochemical self-organization of multidirectional waveguide arrays.” Nano Ontario Conference and Workshop, Waterloo, Ontario, October 11–12, 2012.
21. X. Sun, Y. Zhang, M. J. Yacaman, Z. Tang, **I. D. Hosein**, P. V. Radovanovic, B. Cui, “Preparation, Structure Characterization and Electrochemical Studies of Carbon-Coated Spinel Nano-structured  $\text{Li}_4\text{Ti}_5\text{O}_{12}$  Particles.” *Materials Research Symposium (MRS)*, San Francisco, CA, April 9–13, 2012.
22. **I. D. Hosein**, M. Hegde, S. S. Farvid, P. V. Radovanovic, “Multi-functional Nanostructures: Tuning Optical and Magnetic Properties through Defect Manipulation.” Nano Ontario Conference and Workshop, Hamilton, Ontario, October 14–15, 2011.
23. **I. D. Hosein** and C. M. Liddell, “Self-Assembled Structures from Nonspherical C-60 Hexagonal Discs and Rods.” *Materials Research Symposium (MRS)*, San Francisco, CA, April 4–9, 2010.
24. **I. D. Hosein** and C. M. Liddell, “Convective Assembly Of Three-Dimensional Dimer- And Spherocylinder Based Colloidal Crystals.” *Materials Research Symposium (MRS)*, San Francisco, CA, April 4–9, 2010.
25. **I. D. Hosein**, S. H. Lee, A. Lee, C. M. Liddell, “Three-Dimensional Crystals from Polystyrene Asymmetric Dimer-Shaped Colloids.” *The 82<sup>nd</sup> ACS Colloid & Surface Science Symposium*, Raleigh, NC, June 15–18, 2008.

26. T. G. Dastidar, **I. D. Hosein**, P. Rajendran, U. Wiesner and C. M. Liddell, “Co-Assembly of Non-Spherical Colloids and Nanoparticle Depletants.” *81st American Chemical Society (ACS) Colloid and Surface Science Symposium, Colloidal Assembly I: Particles Session*, Newark, DE, Jun. 24–27, 2007.
27. **I. D. Hosein** and C. M. Liddell, “Crystalline monolayers from convectively self-assembled non-spherical colloids.” *The 81<sup>st</sup> ACS Colloid & Surface Science Symposium*, Newark, DE, June 24–27, 2007.
28. **I. D. Hosein** and C.M. Liddell, "Non-spherical Based Colloidal Crystals from Asymmetric-dimer Shaped Polymer Mesoparticles." *Materials Research Symposium (MRS)*, San Francisco, CA, April 9–13, 2007. (**Poster Presentation Award Nominee**)
29. **I. D. Hosein** and C.M. Liddell, "Mesocrystals from Peanut- and Mushroom Cap-shaped Colloids." *Materials Research Symposium (MRS)*, San Francisco, CA, April 9–13, 2007.
30. **I. D. Hosein**, S. H. Lee, P. R. Rajendran, C. M. Liddell, “Functional Composites Self-Assembled from Non-Spherical Colloids.” *Gordon Research Conference (GRC)*, Solid State Studies in Ceramics, Andover, NH, Aug. 13–18, 2006.
31. **I. D. Hosein**, S. H. Lee, M. Ghebrebrhan, B. S. John, F. A. Escobedo, J. D. Joannopoulos, and C. M. Liddell. "Mushroom-cap and snowman -shaped colloid-based mesocrystals for light control." *American Chemical Society (ACS) Colloid and Surface Science Symposium*, Boulder, CO, June 18–21, 2006.
32. **I. D. Hosein** and C. M. Liddell, "Tunable Stop-Gap in ZnS based Photonic Crystals of Homogeneous and Core-Shell Morphology." *Materials Research Symposium (MRS)*, San Francisco, CA, April 17–21, 2006.
33. I. Watson, S. H. Lee, **I. D. Hosein**, C. M. Liddell, “Metal-Polymer and Metal-Ceramic Colloidal Building Blocks for 3D Photonic Crystals.” *AAAS Annual Meeting*, St. Louis, MO, Feb. 16–20, 2006.
34. S. H. Lee, M. R. Buckley, **I. D. Hosein**, I. Cohen, C. M. Liddell, “Synthesis & Assembly of Non-spherical Iron Oxide-Silica Colloidal Building Blocks.” *Materials Research Symposium (MRS)*, San Francisco, Apr. 17–21, 2006.
35. J. Kim, W. Ni, **I. D. Hosein**, Y. Song, C. Liddell and E. C. Kan, “On-chip planar solenoid inductors using magnetite (Fe<sub>3</sub>O<sub>4</sub>) nanorod cores for high frequency applications.” *Material Research Symposium (MRS)*, Boston, MA, Nov. 28 – Dec. 2, 2005.
36. J. Kim, W. Ni, C. Lee, E. C. Kan, **I. D. Hosein**, Y. Song and C. Liddell, “Magnetic property characterization of magnetite (Fe<sub>3</sub>O<sub>4</sub>) nanorod cores for integrated solenoid RF inductors.” *50<sup>th</sup> MMM (Magnetism and Magnetic Materials) Conference*, San Jose, CA, Oct. 30 – Nov. 3, 2005.
37. I. Watson, S. H. Lee, **I. D. Hosein**, C.M. Liddell. "Metal-Polymer and Metal-Ceramic Colloidal Building Blocks for 3D Photonic Crystals." *EMERGE Workshop and Conference*, Georgia Institute of Technology, Atlanta, GA, Sept. 22–25, 2005. (**Award for 2<sup>nd</sup> place**)
38. S. H. Lee, **I. D. Hosein**, V. L. Anderson, V. Crockett, W. W. Webb, U. B. Wiesner and C. M. Liddell. “Preparation and Properties of ‘Raspberry’-type Colloidal Building Blocks of ZnS and Fluorescent Core-Shell Silica Nanoparticles.” *79th American Chemical Society (ACS) Colloid and Surface Science Symposium*, Clarkson University, Potsdam, NY, Jun. 12–15, 2005.

### Internal

1. Shreyas Pathreker, **Ian D. Hosein**, “Advanced Battery Electrodes using Visible Light.” 18th Annual SyracuseCoE Symposium, Syracuse, 2018 (*1st Place*)

2. Francielli S. Genier, **Ian D. Hosein**, “Solid Polymer Electrolyte Networks for Calcium Ion Conduction” 18th Annual SyracuseCoE Symposium, Syracuse, 2018 (*2nd place*)
3. Shreyas Pathreker, Ian D. Hosein. “Self-Written, Scalable Microstructure Arrays for Advanced Battery Applications: ECS Annual Research Day.” ECS Annual Research Day, March, 2018
4. Saeid Biria, **I. D. Hosein**. “Polymer Encapsulants Incorporating Light-Guiding Architectures to Increase Optical Energy Conversion in Solar Cells.” 17th Annual SyracuseCoE Symposium, Syracuse, NY, October 4, 2017.
5. Fu-Hao Chen, Ian D. Hosein, “Increasing light capture in silicon solar cells with encapsulants incorporating air prisms to reduce metallic contact losses,” 17th Annual SyracuseCoE Symposium, Syracuse, NY, October 4, 2017.
6. Shreyas Pathreker, Ian D. Hosein, “A Novel Light Induced Photo-polymerization based Approach towards Developing Enhanced Battery Anode.” 17th Annual SyracuseCoE Symposium, Syracuse, NY, October 4, 2017.
7. Shreyas Pathreker, Ian D. Hosein. “A Novel Light Induced Photo-polymerization based Approach towards Developing Enhanced Battery Anodes.” ECS Annual Research Day, April, 2017
8. Fu-Hao Chen, Shreyas Pathreker, Jaspreet Kaur, and **Ian D. Hosein**, “Enhanced Solar Energy Capture by Cloaking the Metallic Contacts of Silicon Solar Cells.” Syracuse University-Tohoku University (SU-TU) Joint Forum on Energy and Environment, April 11, 2016.
9. **I. D. Hosein**, D. Basker, M. R. Ponte, M. A. Brook, K. Saravanamuttu, “Improving solar energy technologies with wide-angle light capturing waveguide arrays.” McMaster Innovation Showcase, Hamilton, Ontario, May 10, 2013
10. **I. D. Hosein**, D. Basker, M. R. Ponte, H. Lin, M. A. Brook, K. Saravanamuttu, “Optochemical organization of multidirectional waveguide lattices for wide-angle light capture.” Current Research in Engineering, Science, & Technology (CREST) Meeting, Hamilton, Ontario, April 6<sup>th</sup>, 2013
11. **I. D. Hosein**, M. R. Ponte, K. Saravanamuttu. “Optical properties of multidirectional waveguide arrays.” PolyMAC Conference, McMaster University, Hamilton, Ontario, December 5<sup>th</sup>, 2012.
12. **I. D. Hosein** and C. M. Liddell. “Asymmetric dimer based colloidal crystals.” *MSE Advisory Board Poster Session*, Ithaca, NY, October 7, 2007. (Award for second place presentation)

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## STUDENTS

(13 women, 5 Underrepresented Minority)

### Graduate Students (PhD)

Francielli Genier	Fall 2017—present
Shreyas Pathreker	Fall 2017—present
Saeid Biria	Fall 2014—present
Fuhao Chen	Spring 2015—Spring 2019 (Graduated May, 2019)

### Masters Students (MSc)

Tianyi Yao	Fall 2017—Spring 2018
Hansheng Li	Fall 2016— Spring 2018
Jiayue Wang	Fall 2016— Spring 2018
Susruthreddy Busireddy	Fall 2016— Spring 2017



Jaspreet Kaur                      Spring 2015—Spring 2016  
Hemapriyadarshini Vadarevu Spring 2015— Spring 2016  
Colleen Tamargo                  Spring 2015

#### Undergraduate Students

Sophia Figueroa                  Summer REU (NSF Career Award Supplement)  
Madison Leiman                  Summer REU (NSF Career Award Supplement)  
Katharine Stasior                Summer REU (Stevens Funds in Support of REU work)  
Seth Reed                          Summer REU (ECS Leadership Scholars REU Summer Internship)  
Henry Overhauser                Undergraduate Research  
Jamila Jenkins                    Undergraduate Research 2018 (NSF Upstate Louis Stokes Alliance for Minority Participation)  
  
Cameron Burdin                  Summer REU  
Jack Milligan                      Independent Study  
Kwaku Jyamfi                      Independent Study  
Jose Waimin                        Undergraduate Research 2015 (NSF Upstate Louis Stokes Alliance for Minority Participation)  
  
Kirsten Judge                      Dean's Award for Research  
Jennifer Chen                      Independent Study  
Nikki Tabor                        Research (NSF Upstate Louis Stokes Alliance for Minority Participation)  
Thomas McKean                  Summer REU  
Eldin Shabaz                      Dean's Award for Research

#### Highschool Students

Fateema Islam                      Academic Year Research Intern & Summer Research Intern  
Mazen Al-Safi                      Summer Research Intern  
Nick Barna                         Summer Research Intern  
Hari Nanthakumar                Summer Research Experience, Science Fair Project

#### **PhD Thesis Committees:**

Paul Chando (PhD Candidacy, 5/2019)  
Huilin Ma (PhD Defense, 3/2019)  
Matthew Ali (PhD Defense, 2/2019)  
Zheng Xiong (PhD Candidacy, 10/2018)  
Seungrag Choi (PhD Candidacy, 7/2018)  
Kelechi Okoroafor (PhD Defense, 7/2018; PhD Candidacy Exam 10/2017; Q-Exam 6/2016)  
Joshua Gopeesingh (PhD Candidacy, 6/2018)  
Melodie Lawton (PhD Defense, 5/2018)  
Sweta Roy (Q-exam, 12/2017)  
Wenbin Kuang (PhD Defense, 9/2017; PhD Candidacy Exam, 1/2017)  
Yue Nan (Q-exam, 6/2015; PhD Defense, 12/2017)  
Jiuxu Liu (PhD Defense, 12/2017; PhD Candidacy Exam, 12/2016)  
Ariel Ask-Shakoor (PhD Defense, 8/2017)  
Huilin Ma (PhD Candidacy Exam, 8/2017)

Anargyros Chatzidimitriou (PhD Defense, 7/2017; PhD Candidacy Exam, 2/2017)  
 Shelby Buffington (PhD Candidacy Exam, 5/2017)  
 Stephanie Smith (Q-exam, 10/2016)  
 Michelle Pede (Q-exam, 1/2016)  
 Yutian Yang (Defense, 6/2015)  
 Mike Weigand (Chair, Q-exam 4/2015)  
 Aarti Anil Shenoy (Chair, Q-exam 8/2015)

**MSc Thesis Committees:**

Patrick Howe (Defense, 3/2019)  
 Haiyan Li (Defense, 6/2018)  
 Jiayue Wang (Defense, 5/2018)  
 Hansheng Li (Defense, 12/2017)  
 Nan Wang (Defense, 8/2016)  
 Liang Yang (Defense, 8/2016)  
 Christian Jungong (Defense, 1/2016)  
 Amogh Srihari (Defense, 12/2016)

**RESEARCH AWARDS**

<b>3M, Non-Tenured Faculty Award</b>	\$15,000
PI	
Advanced Polymer Materials for Energy Conversion and Storage	9/1/2018-8/31/2020
<b>National Science Foundation</b>	\$16,000
PI	
NSF Request for Supplement (Summer REU) for CAREER Award	6/1/2019-8/15/2019
<b>Syracuse University</b>	\$25,000
PI	
Accelerating Energy Storage Research with a Multi-Channel Battery Tester	01/2019
<b>Air Force Office of Scientific Research</b>	\$100,000
Syracuse co-PI within the scope of subcontract	
Laser Power Converters With > 80% Efficiency and Low Thermal	9/1/2018-8/31/2020
<b>Syracuse, CUSE Grant</b>	\$30,000
PI	
Smart Coatings to Boost Energy Generation in Solar Cells	9/1/2018-8/31/2020
<b>NSF, CMMI CAREER AWARD</b>	\$500,000
PI	
Fabrication of Composite Material Structures using Light-Induced Self Writing	9/1/2018-8/31/2023
<b>Syracuse Center of Excellence, Faculty Fellow</b>	\$10,000

PI		
Towards an All Solid-State Calcium Ion Battery		7/1/2017-6/20/2019
<b>ACS PRF Doctoral New Investigator, PRF# 57332-DNI7</b>		\$110,000
PI		
Stimulating Self-Directed Polymer Phase Evolution with Nonlinear Light Waves during Free-Radical Polymerization		5/1/2017-8/31/2019
<b>NSF, DMR BMAT #1609523</b>		\$360,000
Co-PI		~10%
Study of Synthetic/Living Feedback Systems Enabled by Innovation in Shape-Memory Polymers		9/1/2016-8/31/2019

### **FELLOWSHIPS AND AWARDS**

Natural Sciences and Engineering Research Council of Canada, Cornell University, 2008–2009  
\$63,000 over 3 years

Natural Sciences and Engineering Research Council of Canada, University of Toronto, 2003  
\$4,500

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### **TEACHING EXPERIENCE**

#### **At Syracuse University:** **Course Instructor**

Experimental Methods in Chemical Engineering and Bioengineering (CEN/BEN 212)  
Materials for Energy Systems (CEN 455/655)  
Engineering Materials, Properties, and Processing (ECS 326)

#### **Pre-SU Appointment:**

##### **Teaching Assistant**

Biomaterials for the Skeletal System, Cornell University

##### **Lecture Contributions**

Physical Chemistry of Advanced Materials, McMaster University  
Spectro-Microscopy, University of Waterloo  
Materials Design Concepts, Cornell University  
Colloids and Colloid Assemblies for Advanced Materials Applications, Cornell University

##### **Lab Coordinator**

Surface and Interfaces, University of Waterloo  
Materials Chemistry, Cornell University

## Outreach

Children's Science Workshop, Cornell Centre for Materials Research, Cornell University  
Science Summer Camp Coordinator/Head Instructor, University of Toronto

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## MEDIA COVERAGE & FEATURES

“Hosein’s Research Garners 3M Award, Publication in Key Journals”

“Aluminum Ion Batteries For High-Demand Applications.” Science Trends

“Hosein Delivers TED Talk on Revolutionary Material” Syracuse University News

“Transparent Coatings Incorporating Light-Guiding Architectures Boost Energy Generation In Solar Cells.” Science Trends

“Bio-inspired Slim Polymer Films With Wide Fields Of View And Multiple Imaging Capabilities.” Science Trends.

“CBA student makes important scientific breakthrough.” Local Syracuse News

“NASA Recognizes High School Student’s Research Project at SU.” Syracuse University News.

“Hosein Earns Prestigious DNI Grant.” The Daily Orange.

“Professor Ian Hosein, Students Develop Technology to Increase Solar Cell Efficiency”, Syracuse University News

“Syracuse University professors explore the development of ‘smart’ biomaterials.” The Daily Orange. September 13, 2016.

“Ian D. Hosein Strives to Develop World-Class Researchers”. Syracuse Engineering College News. October 2014.

“Cheaper More Efficient Solar Cells: A New Type of Material Could Allow Solar Cells to Harvest Far More Light.” *MIT Technology Review*. March 2007.

“Cornell Researchers Honored For Solar Cell Structure Research (R&D)” *Renewable and Sustainable Energy Newsletter*. November 2007

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## MEMBERSHIPS AND AFFILIATIONS

Materials Research Society  
American Institute of Chemical Engineers  
American Chemical Society

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### **SERVICE TO PROFESSION**

Reviewer, *National Science Foundation*

Editor, *Scientific Reports*

External Reviewer: *Mitacs, Ontario Centres of Excellence*

Session Chair, AiCHE & ACS conferences

Peer-Reviewer: *Journal of Solid State Chemistry, Langmuir, Materials Science in Semiconductor Processing, Macromolecules, Optics Letters, Journal of Physical Chemistry C, Journal of Physical Chemistry Letters, Advanced Optical Materials, Advanced Engineering Materials, ACS Applied Energy Materials, ACS Applied Materials and Interfaces, Scientific Reports*

Co-Founder & Organizer, Nanotech Knowledge Initiative at the University of Toronto

Science Education Outreach, Cornell Centre for Materials Research

Conference Coordinator, Materials & Manufacturing Ontario (MMO)

Guest Lecture Coordinator, Engineers Without Borders, University of Toronto Chapter

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### **RELATED PROFESSIONAL DEVELOPMENT**

University of Waterloo, Centre for Teaching Excellence, Teaching Development Certificate

Cornell University, Teaching in Higher Education Workshop