



## Nicholas Siemons

Postdoctoral Scholar, Materials Science and Engineering

### CONTACT INFORMATION

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### Bio

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#### BIO

Nicholas began his academic career by studying integrated Masters at University College, London. During this time he published his first article, "Multiple exciton generation in nanostructures for advanced photovoltaic cells" - a review of how to produce photovoltaics with greater than 100% internal efficiencies. Following this Nicholas began research into solar voltaics and organic batteries in the group of Prof. Jenny Nelson at Imperial College, London. During this time Nicholas developed his keen interest in how to relate the chemical design of polymers to their ability to function as battery electrode materials. To achieve this goal, Nicholas applies atomistic simulation methods to such polymer systems, and relates the simulated findings to experimental results, bridging the gap between chemistry and device properties. As well as linking molecular chemical design to device performance, Nicholas applies novel simulation and analysis methodologies to study these systems, including Molecular Dynamics, Density Functional Theory, Molecular Metadynamics and Network Analysis.

#### PROFESSIONAL EDUCATION

- Master of Science, University College London (2018)
- Doctor of Philosophy, Imperial College of London (2023)
- PhD, Imperial College, London , Physics (2023)
- MSci, University College, London , Natural Sciences (2018)

#### STANFORD ADVISORS

- Alberto Salleo, Postdoctoral Faculty Sponsor

#### COMMUNITY AND INTERNATIONAL WORK

- Science Tutor, Greater London

#### LINKS

- Metadynamics Free Energy Analysis Package: <https://github.com/nicholas9182/Analytics>
- Conjugated Polymer Molecular Dynamics Forcefield: [https://github.com/nicholas9182/ForceField\\_for\\_Conjugated\\_Polymers](https://github.com/nicholas9182/ForceField_for_Conjugated_Polymers)

## Publications

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### PUBLICATIONS

- **Controlling swelling in mixed transport polymers through alkyl side-chain physical cross-linking.** *Proceedings of the National Academy of Sciences of the United States of America*  
Siemons, N., Pearce, D., Yu, H., Tuladhar, S. M., LeCroy, G. S., Sheelamanthula, R., Hallani, R. K., Salleo, A., McCulloch, I., Giovannitti, A., Frost, J. M., Nelson, J.  
2023; 120 (35): e2306272120
- **Ion Size-Dependent Electrochromism in Air-Stable Naphthalenediimide-Based Conjugated Polymers** *ACS APPLIED MATERIALS & INTERFACES*  
Giri, D., Saha, S., Siemons, N., Anderson, I., Yu, H., Nelson, J., Balasubramanyam, R., Patil, S.  
2023; 15 (14): 17767-17778
- **The Effect of Glycol Side Chains on the Assembly and Microstructure of Conjugated Polymers** *ACS NANO*  
Moro, S., Siemons, N., Drury, O., Warr, D. A., Moriarty, T. A., Perdigao, L. A., Pearce, D., Moser, M., Hallani, R., Parker, J., McCulloch, I., Frost, J. M., Nelson, et al  
2022; 16 (12): 21303-21314
- **Impact of Side Chain Hydrophilicity on Packing, Swelling and Ion Interactions in Oxy-bithiophene Semiconductors.** *Advanced materials (Deerfield Beach, Fla.)*  
Siemons, N., Pearce, D., Cendra, C., Yu, H., Tuladhar, S. M., Hallani, R. K., Sheelamanthula, R., LeCroy, G. S., Siemons, L., White, A. J., Mcculloch, I., Salleo, A., Frost, et al  
2022: e2204258
- **The Role of Long-Alkyl-Group Spacers in Glycolated Copolymers for High-Performance Organic Electrochemical Transistors** *ADVANCED MATERIALS*  
Tan, E., Kim, J., Stewart, K., Pitsalidis, C., Kwon, S., Siemons, N., Kim, J., Jiang, Y., Frost, J. M., Pearce, D., Tyrrell, J. E., Nelson, J., Owens, et al  
2022; 34 (27): e2202574
- **Multiple Exciton Generation in Nanostructures for Advanced Photovoltaic Cells** *JOURNAL OF NANOTECHNOLOGY*  
Siemons, N., Serafini, A.  
2018; 2018