Nicholas E. Jackson

CONTACT INFORMATION

Energy Sciences Buildng 241
Materials Sciences Division
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RESEARCH

Systems of Interest

- Optoelectronic and degradation processes in molecular and polymeric semiconductors.
- Polyelectrolytes and polyzwitterions at interfaces.

Method Development

- Coarse-graining anisotropic systems and systems with translational entropy loss.
- Graph theoretical characterizations of disordered systems.
- Nested Markov Chain Monte Carlo algorithm development.

PROFESSIONAL EXPERIENCE

Maria Goeppert Mayer Named Postdoctoral Fellow — 10/2016 - Present
Argonne National Laboratory - Lemont, IL
Advisors: Juan J. de Pablo and Venkat Vishwanath

Postdoctoral Researcher — 5/2016 - Present
University of Chicago - Chicago, IL
Advisor: Juan J. de Pablo

EDUCATION

Ph.D. Theoretical and Computational Chemistry — 8/2011 - 4/2016
Northwestern University - Evanston, IL
Advisors: Mark A. Ratner and Lin X. Chen
Thesis Topic: *Optoelectronic Networks in Soft Matter*

B.A. Physics w/High Honors — 8/2007 - 5/2011
Wesleyan University - Middletown, CT
Advisor: Fred M. Ellis
Thesis Topic: *Semiclassical Dissipation in Quantized Helium II Vortices*
Recognition: *Phi Beta Kappa, Karl Van Dyke Prize in Physics*

RECOGNITION

Maria Goeppert Mayer Named Postdoctoral Fellowship, (2016-Present)
Argonne National Laboratory's most prestigious postdoctoral fellowship award.
Northwestern University Presidential Fellowship, (2015-2016)
<15% of nominated students (1-2/department) accepted. Applicants span all NU departments.
Materials Research Society Graduate Student Silver Award, (Fall 2015)
Recognizes excellence and distinction in materials science research.
Telluride Science Research Center Paul Barbara Scholarship, (2014)
<5% acceptance rate. Cash prize and paid trip to Telluride conference of choice.
Lambert Award for Excellence in Graduate Research - NU Chemistry, (2013)
Awarded to one graduate student per class (∼50 students) for the best qualifying exam performance.
National Science Foundation Graduate Research Fellowship, (2012-2015)
14% acceptance rate. Three years full support.

PUBLICATION RECORD

Total Papers:	26 (11 1st author)
Total Citations (Google Scholar - July 14, 2017):	505
H-Index (Google Scholar - July 14, 2017):	11

PUBLICATIONS

Journal Impact Factors (**IF**) - 2016 Thomson Reuters
* denotes equal contributions

Argonne/UChicago

Yu, J.; **Jackson, N.E.**; X. Xu; Kaufman, M.Y.; Ruth, M.; de Pablo, J.J.; Tirrell, M."Multivalent Counterions Impede Lubrication of Polyelectrolyte Brushes" *Submitted*

Yu, J.*; **Jackson, N.E.***; Xu, X.; Brettman, B.K.; Ruths, M.; de Pablo, J.J.; Tirrell, M. "Multivalent Ions Induce Lateral Structural Inhomogeneities in Polyelectrolyte Brushes" *Submitted*

[**26**] Antony, L.W.; **Jackson, N.E.**; Lyubimov, I.; Ediger, M.D.; de Pablo, J.J. "Influence of Vapor Deposition on Structural and Charge Transport Properties of Ethyl Benzene Films." *ACS Cent. Sci.*, **2017**, 3(5), pp 415-424. **IF - 7.939**

[**25**] **Jackson, N.E.**; Brettman, B.K.; Vishwanath, V.; Tirrell, M.; de Pablo J.J. "Comparing Solvophobic and Multivalent Induced Collapse in Polyelectrolyte Brushes" *ACS Macro. Lett.*, **2017**, 6, pp 155-160. **IF - 6.185**

Northwestern

Manley, E.F.; Strzalka, J.; Fauvell, T.J.; **Jackson, N.E.**; Marks, T.J.; Chen, L.X. "In-Situ GIWAXS Analysis of Solvent and Additive Effects on PTB7 Thing Film Microstructure Evolution During Spin-Coating" *Submitted*

[**24**] Mosquera, M; **Jackson, N.E.**; Chen, L.X.; Schatz, G.C.; Ratner, M.A. "Exciton Absorption by Linear Response Methods: Application to Conjugated Polymers", *J. Am. Chem. Soc.*, **2017**, 139(10), pp 3728-3735. **IF - 13.858**

[**23**] Gagorik, A.G.; Savoie, B.M.; **Jackson, N.E.**; Agrawal, A.; Kohlstedt, K.L.; Choudhary, A.; Ratner, M.A.; Schatz, G.C. "Improved Scaling of Molecular Network Calculations: The Emergence of Molecular Domains". *J. Phys. Chem. Lett.*, **2017**, 8, pp 415-421. **IF - 9.353**

[**22**] Root, S.E.; **Jackson, N.E.**; Savagatrup, S.; Arya, G.; Lipomi, D.J. "Modelling the morphology and thermomechanical behavior of low-bandgap conjugated polymers and bulk heterojunction films." *Energy. Environ. Sci.*, **2017**, 10, 558-569. **IF - 29.518**

[**21**] **Jackson, N.E.**; Kohlstedt, K.L.; Chen, L.X.; Ratner, M.A. "A n-Vector Model for Charge Transport in Molecular Semiconductors" *J. Chem. Phys.*, **2016**, 145, 204102. **IF - 2.965**

[**20**] Storm, F.E.; Olsten, S.T.; Hansen, T.; De Vico, L.; **Jackson, N.E.**, Ratner, M.A., Mikkelsen, K.V. "Boron Subphthalocyanine Based Molecular Triad Systems for the Capture of Solar Energy." *J. Phys. Chem. A*, **2016**, 120(39), pp 7694-7703. **IF - 2.847**

[**19**] **Jackson, N.E.**; Chen, L.X.; Ratner, M.A. "Charge Transport Network Dynamics in Molecular Aggregates" *Proc. Natl. Acad. Sci.*, **2016**, 113(31), pp 8595-8600. **IF - 9.423**.

[**18**] Chen, L.X.; Shelby, M.L.; Lestrange, P.J.; **Jackson, N.E.**; Haldrup, K.; Stickrath, A.B.; Zhu, D.; Lemke, H.; Hoffman, B.M.; Li, X. "Imaging ultrafast excited state pathways in transition metal complexes by X-ray transient absorption and scattering using X-ray free electron laser source" *Faraday Discussions*, **2016**, DOI: 10.1039/c6fd00083e. **IF - 3.588**

[**17**] Shelby, M.L.; Lestrange, P.J.; **Jackson, N.E.**; Mara, M.W.; Haldrup, K.; Stickrath, A.B.; Zhu, D.; Lemke, H.; Hoffman, B.M.; Li, X.; Chen, L.X. "Ultrafast Excited State Relaxation of a Metalloporphyrin Revealed by Femtosecond X-Ray Absorption Spectroscopy" *J. Am. Chem. Soc.*, **2016**, 138(28), pp 8752-8764. **IF - 13.858**.

[**16**] Fauvell, T.J.; Zheng, T.; **Jackson, N.E.**; Ratner, M.A.; Yu, L.; Chen, L.X. "The Photophysical and Morphological Implications of Single-Strand Conjugated Polymer Folding in Solution." *Chem. Mater.*, **2016**, 28 (8), 2814-2822 **IF - 9.466**.

[**15**] Pandit, B.; **Jackson, N.E.**; Zheng, T.; Fauvell, T.J.; Manley, E.F.; Orr, M.; Brown-Xu, S.; Yu, L.; Chen, L.X. "Molecular Structure Controlled Transitions Between Free Charge Generation and Trap Formation in a Conjugated Copolymer Series." *J. Phys. Chem. C*, **2016**, 120(8), pp 4189-4198 **IF - 4.536**.

[**14**] Hartnett, P.E.; Matte, R.H.S.S.; Eastham, N.D.; **Jackson, N.E.**; Wu, Y.; Chen, L.X.; Ratner, M.A.; Chang, R.P.H.; Hersam, M.C.; Wasielewski, M.R.; Marks, T.J. "Ring-Fusion as a Perylenediimide Dimer Design Concept for High-Performance Non-Fullerene Organic Photovoltaic Acceptors." *Chem. Sci.*, **2016**, 7 (6), 3543-3555 **IF - 8.668**.

[**13**] **Jackson, N.E.**; Kohlstedt, K.L.; Savoie, B.M.; Olvera de la Cruz, M.; Schatz, G.C.; Chen, L.X.; Ratner, M.A. "Conformational Order in Aggregates of Conjugated Polymers." *J. Am. Chem. Soc.*, **2015**, 137(19), pp 6254-6262. **IF - 13.858**.

[**12**] **Jackson, N.E.**; Savoie, B.M.; Chen, L.X.; Ratner, M.A. "A Simple Index for Characterizing Charge Transport in Molecular Materials." *J. Phys. Chem. Lett.*, **2015**, 6, pp 1018-1021. **IF - 9.353**

[**11**] **Jackson, N.E.***; Savoie, B.M.*; Marks, T.J.; Chen, L.X.; Ratner, M.A. "The Next Breakthrough for Organic Photovoltaics?" *J. Phys. Chem. Lett.*, **2015**, 6(1), pp 77-84. **IF - 9.353**.

[**10**] Zheng, T.; Lu, L.; **Jackson, N.E.**; Lou, S.J.; Chen, L.X.; Yu, L. "Roles of Quinoidal Character and Regioregularity in Determining the Optoelectronic and Photovoltaic Properties of Conjugated Polymers." *Macromolecules*, **2014**, 47(18), pp 6252-6259. **IF - 5.554**.

[**9**] Savoie, B.M.; **Jackson, N.E.**; Chen, L.X.; Marks, T.J.; Ratner, M.A. "Mesoscopic Features of Charge Generation in Organic Semiconductors." *Acc. Chem. Res.*, **2014**, 47(11), pp 3385-3394. **IF - 20.268**.

[**8**] Fransted, K.A.; **Jackson, N.E.**; Zong, R.; Mara, M.W.; Huang, J.; Harpham, M.R.; Shelby, M.L.; Thummel, R.P.; Chen, L.X. "Ultrafast Structural Dynamics of Cu(I)-Bicinchoninic Acid and Their Implications for Solar Energy Applications." *J. Phys. Chem. A*, **2014**, 118(45), pp 10497-10506. **IF - 2.847**.

[**7**] Savoie, B.M.; Kohlstedt, K.L.; **Jackson, N.E.**; Chen, L.X.; Olvera de la Cruz, M.; Schatz, G.C.; Marks, T.J.; Ratner, M.A. "Mesoscale Molecular Network Formation in Amorphous Organic Materials." *Proc. Natl. Acad. Sci.*, **2014**, 111(28), pp 10055-10060. **IF - 9.423**.

[**6**] **Jackson, N.E.**; Chen, L.X.; Ratner, M.A. "Solubility of Nonelectrolytes: A First-Principles, Computational Approach." *J. Phys. Chem. B*, **2014**, 118(19), pp 5194-5202. **IF - 3.177**.

[**5**] **Jackson, N.E.**; Heitzer, H.M.; Savoie, B.M.; Reuter, M.G.; Ratner, M.A. "Emergent Properties in Locally Ordered Molecular Materials." *Isr. J. Chem.*, **2014**, 54, no. 5-6, pp 454-466. **IF - 1.720**.

[**4**] **Jackson, N.E.**; Savoie, B.M.; Kohlstedt, K.L.; Marks, T.J.; Chen, L.X.; Ratner, M.A. "Struc-

tural and Conformational Dispersion in the Rational Design of Conjugated Polymers." *Macromolecules*, **2014**, 47(3), pp 987-992. **IF - 5.554**.

[**3**] **Jackson, N.E.**; Savoie, B.M.; Kohlstedt, K.L.; Olvera de la Cruz, M; Schatz, G.C.; Chen, L.X.; Ratner, M.A. "Controlling Conformations of Conjugated Polymers and Small Molecules: The Role of Nonbonding Interactions." *J. Am. Chem. Soc.*, **2013**, 135(28), pp 10475-10483. - **IF - 13.858**.

[**2**] Savoie, B.M.*; **Jackson, N.E.***; Marks, T.J.; Ratner, M.A. "Reassessing the Use of One-electron Energetics in the Design and Characterization of Organic Photovoltaics." *Phys. Chem. Chem. Phys.*, **2013** 15(13), pp 4538-4547. **IF - 4.123**.

[**1**] Mara M.W.; **Jackson, N.E.**; Huang, J.; Stickrath, A.B.; Zhang, X.; Gothard, N.A.; Ratner, M.A.; Chen, L.X. "Effects of Electronic and Nuclear Interactions on the Excited-State Properties and Structural Dynamics of Copper (I) Diimine Complexes." *J. Phys. Chem. B*, **2013**, 117(6) pp 1921-1931. **IF - 3.177**.

Oral Presentations

October 2018	**AIChE** - Multiscale and Coarse-Grained Modeling of Polymers, Minneapolis, MN
October 2018	**AIChE** - Organic, Polymeric, and Hybrid Semiconductors, Minneapolis, MN
July 2017	**TSRC Workshop** - Regulating the Interfacial Physicochemical Processes of Organic Semiconductors by Design, Telluride, CO
July 2016	**Wesleyan University** - Summer Lecture Series, Middletown, CT
January 2016	**EFRC** - (ANSER) Midterm Review, Washington, DC
November 2015	**MRS** - Modeling and Theory-Driven Design of Soft Materials, Boston, MA
October 2015	**Northwestern University** - BIP Inorganic Seminar, Evanston, IL
March 2015	**ACS** - Computational Design, Discovery, and Optimization of Organic Semiconducting Materials, Denver, CO

Teaching and Mentoring Activities

2017	Mentoring undergraduate student Gabriela Basel, UChicago
2017	Co-Instructor (MENG24100 - Molecular/Materials Modeling I), *UChicago*
2014-2015	Northwestern University Teaching Certificate Program
2015	Student Teaching Intern (CHEM 445 - Contemporary Spectroscopy), *NU*
2014 (Summer)	Mentored MRSEC undergraduate student Arlina Anderson, *NU*
2013 (Summer)	Mentored MRSEC undergraduate student Angela Boulineau, *NU*
2012	Teaching Assistant (CHEM 101 General Chemistry Laboratory), *NU*
2012	Teaching Assistant (CHEM 342-3 Kinetics and Statistical Thermodynamics), *NU*
2012	Teaching Assistant (CHEM 350-2 Advanced Physical Chemistry Laboratory), *NU*
2011	Teaching Assistant (CHEM 171 Accelerated General Chemistry Laboratory), *NU*
2010	Teaching Assistant (PHYS 116 General Physics II), *Wesleyan*
2009	Teaching Assistant (PHYS 113 General Physics I), *Wesleyan*
2009	Teaching Assistant (PHYS 105 The Physics of Sustainability), *Wesleyan*

Computer Skills

- Languages: C/C++, Python.
- Software: LAMMPS, TINKER, ORCA, QCHEM, ADF, NWCHEM, MOLPRO, Mathematica.