

Matthew J. Jurow
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Training and Education

<i>Post Doctoral Research Associate</i>	2016 -
The Molecular Foundry; Lawrence Berkeley National Laboratory Advisor: Facility Director Dr. Yi Liu	
<i>Post Doctoral Research Associate</i>	2013 - 2015
University of Southern California Advisor: Prof. Mark Thompson	
<i>Ph.D. Chemistry</i>	2008 - 2012
City University of New York Advisor: Prof. Charles Drain	
<i>Undergraduate</i>	2004-2007
University of Southern California	

Experience

<i>Post Doctoral Research Associate</i>	2016-
The Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, CA 94720	
<ul style="list-style-type: none">• Currently investigating the surface structure and properties of quantum confined perovskite nanocrystals.• Exploring the impact of surface chemistry on particle formation, charge transfer and transport properties. Analyzing the relationship between chemical compositions and morphology on light emission and absorption both on surfaces and in solution.	
<i>New Materials Development</i>	2015-2016
Ubiquitous Energy, Redwood City, CA 94063	
<ul style="list-style-type: none">• Ubiquitous Energy is a technology company focused on developing visibly transparent solar cells established by Prof V. Bulovic (MIT) and others.• Created an organic materials research program. Designed and synthesized a series of visibly transparent donor and acceptor species now incorporated into efficient highly transparent solar cells. Trained and supervised the research of a team of chemists.	
<i>Post Doctoral Research Associate</i>	2013-2015
University of Southern California, Los Angeles, CA 90007	
<ul style="list-style-type: none">• Explored orientation and morphology of solid-state photonic materials, host/dopant relationships, and mechanisms by which solid-state materials both orient and degrade during device operation.	

- Developed organometallic phosphors and OLED host materials by computational screening and subsequent organic synthesis. Fabricated and tested multi-layer vapor deposited organic electronic devices. Advisor: M. E. Thompson

User

2010-2013

Brookhaven National Laboratory, Upton, NY 11973

- Worked with both the Center for Functional Nanomaterials and the National Synchrotron Light Source. Fabricated and tested organic solar cells. Analyzed nanostructure by GISAXS on a variety of different beam lines. Explored and elucidated correlations between dye molecular structure, active layer packing order and solar cell performance parameters. Collaborators: E. DiMasi, C. T. Black, C. Y. Nam, K. Yager

Graduate Research Assistant

2008-2013

Hunter College CUNY, New York, NY 10065

- Designed and synthesized dye systems to study the structure and function of bulk heterojunction solar cells. Fabricated and tested both solution processed and vapor deposited photovoltaic devices.
- Developed self-assembled donor/acceptor systems and characterized their photophysical properties in solution and on surfaces. Designed and synthesized sensitized fullerenes including graphene for photonic devices and photodynamic therapeutics. Advisor: C. M. Drain

Technical Expertise

- *Spectroscopic techniques:* UV-Visible, fluorescence, time correlated single photon counting, NMR, MALDI MS, ESI MS; phosphorescent organometallics and porphyrin/phthalocyanine photonics.
- *Imaging Techniques:* AFM, TEM, SEM, fluorescence microscopy; especially characterization of supramolecular nanoparticle assemblies, films and solid-state materials.
- *Analytical techniques:* DLS, DSC, TGA, electronic measurements of photonic devices
- *X-ray scattering techniques:* GISAXS, GIWAXS, SAXS and WAXS (National Synchrotron Light Source, Advanced Light Source, and Stanford Synchrotron Radiation Lightsource).
- *Device Fabrication:* Thermal vapor deposition, organic vapor phase deposition, solution processing, air free fabrication and measurement.

Teaching Experience

Lecturer

2013-2015

USC, Los Angeles, CA 90089

- Recipient of the Burg Postdoctoral Teaching Award. Prepared and delivered advanced inorganic chemistry lecture course for a class of 30 physical science majors.
- Directed and supervised research of undergraduates and graduate students. Results were published in peer reviewed journals.

Adjunct Lecturer

2008-2012

Hunter College, CUNY, New York, NY 10065

- Taught quantitative analysis laboratory, introductory chemistry laboratory, general research methods, advanced general chemistry discussion
- Tutored students of extremely diverse abilities and backgrounds in general and inorganic chemistry.
- Directed and supervised research of undergraduates and talented high school students yielding results published in major peer reviewed journals.

References

Prof. Mark E. Thompson

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University of Southern California
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Dr. Yi Liu

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Lawrence Berkeley National Laboratory
Phone: (510)-486-6287
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Prof. Charles Michael Drain

Chemistry Department
Hunter College of CUNY and
Rockefeller University
Phone: (212)-650-3791
Email: cdrain@hunter.cuny.edu

Dr. Elaine DiMasi

Photon Sciences
Brookhaven National Labs
Phone: (631)-344-2211
Email: dimasi@bnl.gov

Journal Articles

1. Jurow, M. J.; Mayr, C.; Schmidt, T. D.; Lampe, T.; Djurovich, P. I.; Brütting, W.; Thompson, M. E., Understanding and predicting the orientation of heteroleptic phosphors in organic light-emitting materials. *Nat Mater* **2016**, 15 (1), 85-91.
2. Ren, B.-Y.; Zhong, D.-K.; Sun, Y.-G.; Zhao, X.-H.; Zhang, Q.-J.; Liu, Y.; Jurow, M.; Sun, M.-L.; Zhang, Z.-S.; Zhao, Y., Quinoyl functionalized spiro[fluorene-9,9'-xanthene] host materials with bipolar characteristics for green and red phosphorescent organic light-emitting diodes. *Organic Electronics* **2016**, 36, 140-147;
3. Lampe, T.; Schmidt, T. D.; Jurow, M. J.; Djurovich, P. I.; Thompson, M. E.; Brütting, W., Dependence of Phosphorescent Emitter Orientation on Deposition Technique in Doped Organic Films. *Chemistry of Materials* **2016**, 28 (3), 712-715;
4. Alison, P.; Erin, A.; Matthew, J.; Bradley, E.; Ayelet, V.; Charles Michael, D.; James, B., Studies of the structure and phase transitions of nano-confined pentanedithiol and its application in directing hierarchical molecular assemblies on Au(1 1 1). *Journal of Physics: Condensed Matter* **2016**, 28 (9), 094013;
5. Jurow, M. J.; Bossi, A.; Djurovich, P. I.; Thompson, M. E., In Situ Observation of Degradation by Ligand Substitution in Small-Molecule Phosphorescent Organic Light-Emitting Diodes. *Chemistry of Materials* **2014**, 26 (22), 6578-6584;
6. Jurow, M. J.; Hageman, B. A.; DiMasi, E.; Nam, C.-Y.; Pabon, C.; Black, C. T.; Drain, C. M., Controlling morphology and molecular packing of alkane substituted phthalocyanine blend bulk heterojunction solar cells. *Journal of Materials Chemistry A* **2013**;
7. Jurow, M.; Varotto, A.; Manichev, V.; Travlou, N. A.; Giannakoudakis, D. A.; Drain, C. M., Self-organized nanostructured materials of alkylated phthalocyanines and underivatized C60 on ITO. *RSC Advances* **2013**, 3 (44), 21360-21364;
8. Jurow, M.; Manichev, V.; Pabon, C.; Hageman, B.; Matolina, Y.; Drain, C. M., Self-Organization of Zr(IV) Porphyrinoids on Graphene Oxide Surfaces by Axial Metal Coordination. *Inorganic Chemistry* **2013**, 52 (18), 10576-10582;
9. Jurow, M.; Farley, C.; Pabon, C.; Hageman, B.; Dolor, A.; Drain, C. M., Facile synthesis of a flexible tethered porphyrin dimer that preferentially complexes fullerene C70. *Chemical Communications* **2012**, 48 (39), 4731-4733;
10. Nia, S.; Gong, X.; Drain, C. M.; Jurow, M.; Rizvi, W.; Qureshy, M., Solvent-free synthesis of meso- tetraarylporphyrins in air: product diversity and yield optimization. *Journal of Pophryins and Phthalocyanines* **2010**, 14 (7), 621-629;

Book Chapters and Reviews

1. W. Rizvi, C. M. Drain, P. Moy, M. J. Jurow*, *Comprehensive Organic Chemistry Experiments for the Laboratory Classroom* **2016**, "Preparation and characterization of free base and tetraphenyl metalloporphyrin";

2. Jurow, M.; Schuckman, A. E.; Batteas, J. D.; Drain, C. M., Porphyrins as molecular electronic components of functional devices. *Coordination Chemistry Reviews* **2010**, 254 (19–20), 2297–2310.

Patent Disclosures

1. (Filed 6/5/2016) US Patent application # 15/174,409; Organic Electroluminescent Materials and Devices

Selected Presentations

- Gordon Research Conference Crystal Growth and Assembly. Biddeford, ME. June 2015; “Mechanism and Impact of Orientation in Dopant/Host Systems”
 - Gordon Research Conference Electron Donor/Acceptor Interactions. Newport, RI. August 2014; “Electrolytic Bond Rupture and Ligand Substitution in OLEDs”
 - 244th ACS National Meeting. Philadelphia, PA. August 2012; “Axial Metal-Oxygen Bonding to Graphene Oxide”
 - SPIE Optics + Photonics. San Diego, CA. August 2011; “Porphyrinoid Blends for Use in Solution Processed Bulk Heterojunction Solar Cells”
 - 240th ACS National Meeting. Boston, MA. August 2010; “Commercially Viable Porphyrinoid Dyes for Solar Cells”
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