

Faculty Profile



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Neal Armstrong

Regents Professor

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Education and Appointments

- B.S. 1970, Chemistry, University of New Mexico
- Ph.D. 1974, Analytical Chemistry, University of New Mexico

Honors

- Leading Edge Researcher, University of Arizona, 2011
- Galileo Circle Fellow - College of Science, University of Arizona, 2011
- Alexander von Humboldt Senior Research Prize - T.U. Dresden & MPIP-Mainz, 2002
- NSF-Chemistry Special Award for Creativity, 2000
- Career Teaching Award, College of Science, University of Arizona, 1996

Research Interests

- Analytical
- Energy Science
- Materials and Polymer Chemistry
- Surfaces and Solid State

Research Summary

Interface science of solar energy conversion and energy storage materials, surface and interface characterization using photoemission spectroscopies, scanning probe microscopies, electrochemistry; development and characterization of new solar energy conversion platforms.

For More Information please visit [the CISSEM website](#)

Selected Publications

- "Influence of Electrode Surface Composition and Energetics on Small-Molecule Organic Solar Cell Performance: Polar Versus Non-Polar Donors on ITO Contacts," Jeremy Gantz, Diogenes Placencia, Anthony Giordano, Seth R. Marder, Neal R. Armstrong, *J. Phys. Chem. C.*, in press -

- "Electrical Property Heterogeneity at Transparent Conductive Oxide/Organic Semiconductor Interfaces: Mapping Contact Ohmicity Using Conducting-Tip Atomic Force Microscopy," Gordon MacDonald, P. Alex Veneman, Diogenes Placencia, Neal R. Armstrong, *ACS Nano*, 6, 9623-9636, DOI: 10.1021/nn303043y, 2012.
- "Electron Transfer Processes in Monolayer-Tethered Zinc Phthalocyanines: Characterization by Waveguide Spectroelectrochemistry, Voltammetry, and Potential-Modulated Attenuated Total Reflectance (PM-ATR)," Hsiao-Chu Lin, Nathan W. Polaske, Luis E. Oquendo, Matthew Gliboff, Kristina M. Knesting, Dennis Nordlund, David S. Ginger, Erin L. Ratcliff, Brooke M. Beam, Neal R. Armstrong, Dominic V. McGrath, S. Scott Saavedra, *J. Phys. Chem. Lett.* 3, 1154-1158, 1, 1900-1905, 2012.
- "Modeling Nanometer-Scale Heterogeneity in the Electrical Properties of Contacts in Organic Solar Cells," Brian Zacher, Neal R. Armstrong, *J. Phys. Chem. C.*, 115, 25496-25507, (2011). DOI: 10.1021/jp207471f, 2, 863-869, 2010.
- "A Planar, Chip-Based, Dual-Beam Refractometer Using an Integrated Organic Light Emitting Diode (OLED) Light Source and Organic Photovoltaic (OPV) Detectors," Erin L. Ratcliff, P. Alex Veneman, Adam Simmonds, Brian Zacher, Daniel Huebner, S. Scott Saavedra, Neal R. Armstrong, *Analytical Chemistry*, 82, 2734-2742, 2010.
- "Highly Photoactive Titanyl Phthalocyanine Polymorphs as Textured Donor Layers in Organic Solar Cells," Diogenes Placencia, Weining Wang, Jeremy Gantz, Judith Jenkins, Neal R. Armstrong, *J. Phys. Chem. C.*, 115, 18873-18884, 2011, 20, 2672-2679, 2010.
- "Photoelectrochemical Processes in Polymer-Tethered CdSe Nanocrystals," R. Clayton Shallcross, Gemma D. D'Ambruoso, Jeffrey Pyun, Neal R. Armstrong, *J. Amer. Chem. Soc.*, 132, 2622-2632, 2010.
- "Tuning the Effective Work Function of Gold and Silver Using ω -Functionalized Alkanethiols: Varying Surface Composition Through Dilution and Choice of Terminal Groups," Dana M. Alloway, Amy L. Graham, Xi Yang, Anoma Mudalige, Ramon Colorado, Jr., Vicki H. Wysocki, Jeanne E. Pemberton, T. Randall Lee, Ronald J. Wysocki, Neal R. Armstrong, *Journal of Physical Chemistry C*, 113, 20328-20334, 2009.
- "The Modification of Indium Tin Oxide with Phosphonic Acids: Mechanism of Binding, Tuning of Surface Properties, and Potential for use in Organic Electronic Applications," Peter Hotchkiss, Simon Jones, Sergio Paniagua, Bernard Kippelen, Neal R. Armstrong, Asha Sharma, Seth Marder, *Accounts of Chemical Research*, 45, 337-346 (2012). DOI: 10.1021/ar200119g, 4, 1377-1384 2010.
- "Oxide contacts in Organic Photovoltaics: Characterization and Control of Near-Surface Composition in Indium-Tin Oxide (ITO) Electrodes," Neal R. Armstrong, P. Alex Veneman, Diogenes Placencia, Erin Ratcliff, Michael Brumbach, *Accounts Chemical Research (Invited)*, 42, 1748-1757, 2009.
- "Organic/Organic' Heterojunctions: Organic Light Emitting Diodes and Organic Photovoltaic Devices," Neal R. Armstrong, Weining Wang, Dana M. Alloway, Diogenes Placencia, Erin Ratcliff, Michael Brumbach, Invited Review, *Macromol. Rapid Commun.*, 30, 717-731, 2009.
- "Organic Photovoltaic Cells Based On Solvent-Annealed, Textured Titanyl Phthalocyanine/C60 Heterojunctions," Diogenes Placencia, Weining Wang, R. Clayton Shallcross, Kenneth W. Nebesny, Michael Brumbach, Neal R. Armstrong, *Advanced functional Materials*, 19, 1913-1921, 2009.
- "Selective Interlayers and Contacts in Organic Photovoltaic Cells," Erin L. Ratcliff, Brian Zacher, and Neal R. Armstrong, *J. Phys. Chem. Letters -Perspective - Invited*, *J. Phys. Chem. Lett.* 2, 1337-1350, 2011.
- "Organic Heterojunctions of Layered Perylene and Phthalocyanine Dyes: Characterization with UV Photoelectron Spectroscopy and Luminescence Quenching," Dana Alloway, Neal R. Armstrong, *Appl. Phys. A.*, 95, 209-218 2009.
- "Electrodeposited, "Textured" poly(3-hexyl-thiophene)(eP3HT) Films for Photovoltaic Applications," Erin L. Ratcliff, Judith L. Jenkins, Ken Nebesny and Neal R. Armstrong, *Chemistry of Materials*, 20, 5796-5806 2008.
- "Hydrogen Bonded Phthalocyanine Aggregates," Niranjani Kumaran, Britt A. Minch, Neil Jacobsen, David F. O'Brien, Neal R. Armstrong, *Chemistry of Materials*, 22, 2491-2501, 2010.
- "Phosphonic Acid Modification of Indium-Tin Oxide Electrodes: Combined XPS/UPS/Contact Angle Studies," Sergio A. Paniagua, Peter J. Hotchkiss, Simon C. Jones, Seth R. Marder, Anoma Mudalige, F. Fathima Saneeha Marrikar, Jeanne E. Pemberton, Neal R. Armstrong, (invited paper, Larry Dalton Festschrift) *J. Phys. Chem C*, 112, 7809-7817, 2008.
- "Surface Composition, Electrical and Electrochemical Properties of Freshly Deposited and Acid-Etched Indium-Tin Oxide Electrodes," Michael Brumbach, P. Alex Veneman, F. Saneeha Marrikar,

Thomas Schulmeyer, Adam Simmonds, Wei Xia, Paul Lee, Neal R. Armstrong, *Langmuir*, 23, 11089-11099, 2007.

- "Modification of Indium-Tin Oxide Electrodes with Thiophene Copolymer Thin Films: Optimizing Electron Transfer to Solution Probe Molecules," F. Saneeha Marrikar, Michael Brumbach, Dennis H. Evans, Ariel Lebrón-Paler, Jeanne E. Pemberton, Ronald J. Wysocki, Neal R. Armstrong, *Langmuir*, 23, 1530-1542, 2007.
- "Electrochemically Tunable Surface-Plasmon-Enhanced Diffraction Gratings and Their (Bio-) sensing Applications," Shengjun Tian, Neal R. Armstrong, and Wolfgang Knoll, *Langmuir*, 21, 4656-4660, 2005.

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