

## Andrew J. Wilson

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### EDUCATION

- **The University of Texas at Austin.** Austin, TX  
Ph.D., Physical Chemistry  
Certification in Nanoscience and Nanotechnology  
December 2015
- **The University of Iowa.** Iowa City, IA  
B.S., Chemistry  
May 2010

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### PROFESSIONAL EXPERIENCE

- **Postdoctoral Research Fellow** 2016-present  
*Springborn Postdoctoral Fellow 2016-2018*  
*Department of Chemistry, University of Illinois at Urbana-Champaign,*  
*Urbana, IL*  
Advisor: Professor Prashant K. Jain
- **Postdoctoral Research Fellow** 2015-2016  
*Department of Chemistry, Temple University,*  
*Philadelphia, PA*  
Advisor: Professor Katherine A. Willets
- **Graduate Research Fellow** 2010-2015  
*Department of Chemistry, The University of Texas at Austin,*  
*Austin, TX*  
Advisor: Professor Katherine A. Willets  
*Dissertation Title: Optical Readouts of Electrochemistry on Plasmonic Nanoparticle Electrodes*
- **Undergraduate Research Assistant** 2009-2010  
*Department of Chemistry, The University of Iowa,*  
*Iowa City, IA*  
Advisor: Professor Johna Leddy

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### PUBLICATIONS

23. D. Devasia, **A.J. Wilson** and P.K. Jain. "In situ detection of surface species in plasmonic photoreduction of CO<sub>2</sub>," *in preparation*
22. **A.J. Wilson**, D. Devasia, P.K. Jain. "Optical imaging of chemical reactions at the nanoscale," *J. Phys. Chem. C, in preparation*
21. **A.J. Wilson** and P.K. Jain. "The underlying characteristics of a plasmon-enhanced electrocatalytic reduction reaction," *submitted*
20. **A.J. Wilson** and P.K. Jain. "Structural dynamics of the oxygen evolving complex of Photosystem II in water-splitting action," *J. Am. Chem. Soc.*, **2018**, *140*, 5853-5859

19. S. Yu, **A.J. Wilson**, J. Heo, P.K. Jain. “Plasmonic control of multi-electron transfer and C-C coupling in visible-light-driven CO<sub>2</sub> reduction on Au nanoparticles,” *Nano Lett.*, **2018**, *18*, 2189-2194  
\*Featured on the April issue front cover  
\*Among most read articles, March and May 2018 list  
\*Featured in Chemistry World article “Forcing reactions with plasmons”  
\*Thomson Reuters Highly Cited (top 1%)
18. S. Yu, **A.J. Wilson**, G. Kumari, X. Zhang, P.K. Jain. “Opportunities and challenges of solar-energy-driven carbon dioxide to fuel conversion with plasmonic catalysts,” *ACS Energy Lett.*, **2017**, *2*, 2058-2070  
\*Among most read articles, September 2017 list  
\*Featured in virtual issue “Plasmons for Energy Conversion”, *ACS Energy Lett.*, **2018**, *3*, 1467–1469
17. Z. Zhang, P. Li, Y. Tang, **A.J. Wilson**, K.A. Willets, M. Wuttig, R. Xiong, S. Ren. “Tunable electroresistance and electro-optic effects of transparent molecular ferroelectrics,” *Sci. Adv.*, **2017**, *3* (8), e1701008  
\*News Spotlight, Nanowerk: Advancing molecular ferroelectric thin-film technologies.  
<http://www.nanowerk.com/spotlight/spotid=47909.php>
16. Y. Kim, **A.J. Wilson**, P.K. Jain. “The nature of plasmonically assisted hot electron transfer in a donor-bridge-acceptor complex,” *ACS Catal.*, **2017**, *7*, 4360-4365
15. P.B. Joshi, T.P. Anthony, **A.J. Wilson**, K.A. Willets. “Imaging out-of-plane polarized emission patterns on gap mode SERS substrates: from high molecular coverage to the single molecule regime,” *Faraday Discuss.*, **2017**, *205*, 245-259
14. V. Sundaresan, K. Marchuk, Y. Yu, E.J. Titus, **A.J. Wilson**, C. Armstrong, B. Zhang, K.A. Willets. “Visualizing and Calculating Tip-Substrate Distance in Nanoscale Scanning Electrochemical Microscopy Using 3-Dimensional Super-Resolution Optical Imaging,” *Anal. Chem.*, **2017**, *89*, 922-928
13. K.A. Willets, **A.J. Wilson**, V. Sundaresan, P.B. Joshi. “Super-resolution imaging and plasmonics,” *Chem. Rev.*, **2017**, *117*, 7538–7582
12. S. Zaleski, M.F. Cardinal, D.V. Chulhai, **A.J. Wilson**, K.A. Willets, L. Jensen, R.P. Van Duyne. “Towards Monitoring Electrochemical Reactions with Dual-Wavelength SERS: Characterization of Rhodamine 6G (R6G) Neutral Radical Species and Covalent Tethering of R6G to Silver Nanoparticles,” *J. Phys. Chem. C*, **2016**, *120*, 24982-24991
11. S. Zaleski, **A.J. Wilson**, M. Mattei, X. Chen, G. Goubert, M.F. Cardin, K.A. Willets, R.P. Van Duyne. “Investigating nanoscale electrochemistry with surface- and tip-enhanced Raman spectroscopy,” *Acc. Chem. Res.*, **2016**, *49*, 2023-2030
10. **A.J. Wilson** and K.A. Willets. “Unforeseen distance-dependent SERS spectroelectrochemistry from surface-tethered Nile Blue: the role of molecular orientation,” *Analyst*, **2016**, *141*, 5144-5151
9. **A.J. Wilson**, N.Y. Molina, K.A. Willets. “Modification of the electrochemical properties of Nile Blue through covalent attachment to gold as revealed by electrochemistry and SERS,” *J. Phys. Chem. C*, **2016**, *120*, 21091-21098

8. **A.J. Wilson** and K.A. Willets. "Molecular Plasmonics," *Annu. Rev. Anal. Chem.* **2016**, *9*, 27-43
7. B. Xu, Z. Luo, **A.J. Wilson**, K. Chen, H.D. Chopra, X. Chen, K.A. Willets, Z. Dauter, S. Ren. "Multifunctional charge-transfer single crystals through supramolecular assembly," *Adv. Mater.* **2016**, *28*, 5322-5329
6. B. Xu, Hu. Li, Ha. Li, **A.J. Wilson**, L. Zhang, K. Chen, K.A. Willets, F. Ren, J.C. Grossman, S. Ren. "Chemically driven interfacial coupling in charge-transfer mediated functional superstructures," *Nano. Lett.* **2016**, *16*, 2851-2859
5. B. Xu, Z. Luo, W. Gao, **A.J. Wilson**, C. He, X. Chen, G. Yuan, H-L Dai, Y. Rao, K.A. Willets, Z. Dauter, S. Ren. "Solution-processed molecular opto-ferroic crystals" *Chem. Mater.* **2016**, *28*, 2441-2448
4. **A.J. Wilson**, K. Marchuk, K.A. Willets. "Imaging electrogenerated chemiluminescence at single gold nanowire electrodes," *Nano Lett.* **2015**, *15*, 6100-6115
3. M.L. Weber, **A.J. Wilson**, K.A. Willets. "Characterizing the spatial dependence of redox chemistry on plasmonic nanoparticle electrodes using correlated super-resolution SERS imaging and electron microscopy," *J. Phys. Chem. C*, **2015**, *119*, 18591-18601
2. **A.J. Wilson** and K.A. Willets. "Visualizing site-specific redox potentials on the surface of plasmonic nanoparticles with super-localization SERS microscopy," *Nano Lett.* **2014**, *14*, 939-945
1. **A.J. Wilson** and K.A. Willets. "Surface-enhanced Raman scattering (SERS) imaging using noble metal nanoparticles," *WIREs Nanomedicine and Nanobiotechnology* **2013**, *5*, 180-189

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## AWARDS

- Springborn Postdoctoral Fellowship, University of Illinois at Urbana-Champaign, 2016-2018
- Fall 2015 Nano Portfolio Program Student Presentations Best Presentation Award, The University of Texas at Austin, 2015
- Professional Development Award/Travel Award, The University of Texas at Austin, 2014
- Jeff Byers Memorial Graduate Award in Chemistry and Chemical Engineering, The University of Texas at Austin, 2013-2014
- Faraday Teaching Award, The University of Texas at Austin, 2010-2011
- Analytical Chemistry Award, The University of Iowa, 2009

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## CONFERENCES/PRESENTATIONS

13. *Photosynthesis in Photosystem II-Plasmonic Hybrid Photocatalysts*, Gordon Research Conference, Renewable Energy: Solar Fuels, poster, Ventura, CA, January 28-February 2, 2017
12. *Structural Analysis of the Oxygen Evolving Complex Using Low Frequency SERS*, International Symposium on Molecular Spectroscopy, oral presentation, Champaign-Urbana, IL, June 21, 2017
11. Light/Matter Interactions at the Nano-Bio Interface, workshop participant, University of Illinois at Urbana-Champaign, IL, November 28-29, 2016

10. *Probing Nanoelectrochemistry with Optical Microscopy*, ACS National Meeting, oral presentation, Philadelphia, PA, August 23, 2016
9. *Optical Readouts of Nanoelectrochemistry on Plasmonic Electrodes*, Philadelphia Electrochemical Society Symposium, poster, Drexel University, Philadelphia, PA, April 28, 2016
8. *Spectroelectrochemical Microscopy on Plasmonic Nanoparticle Electrodes*, MRS Spring Meeting, poster, Phoenix, AZ, March 28-April 1, 2016
7. *Plasmon-assisted Electrochemistry*, Temple Materials Institute Inaugural Meeting, poster, Philadelphia, PA, March 1, 2016
6. *Optical Readouts of Electrochemistry on Plasmonic Nanoparticle Electrodes*, Nano Portfolio Program, oral presentation, The University of Texas at Austin, Austin, TX, December 2015 (won oral presentation competition)
5. *Electrochemistry on Plasmonic Nanoparticle Electrodes*, ACS National Meeting, oral presentation, Denver, CO, March 22-26, 2015
4. *Plasmon-mediated electrochemical reactions*, Gordon Research Conference: Plasmonics, poster, Newry, ME, July 6-11, 2014
3. *Visualizing Site-Specific Redox Potentials on the Surface of Plasmonic Nanoparticles*, Nano Night annual poster session, Center for Nano- and Molecular Science, The University of Texas at Austin, Austin, TX, March 26, 2014
2. *Visualizing Site-Specific Redox Potentials on the Surface of Plasmonic Nanoparticles*, 2014 CEC Annual Workshop on Electrochemistry, poster, Austin, TX, February 8-9, 2014
1. *Electron transfer rates of Cobalt (III) tris(1,10-phenanthroline)*, Analytical Chemistry Award, acceptance poster, Iowa City, IA, May 2009

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## OUTREACH/SERVICE

- Invited peer review: *Nano Letters, Advanced Materials, ACS Photonics, Journal of Physical Chemistry C, ACS Sustainable Chemistry & Engineering, Sensors, Nanomaterials*
- Parkland Community College research shadow mentor, Younger Chemists Committee, East Central Illinois ACS Local Section, Urbana, IL, July 30, 2018
- Post-doc career panelist, Younger Chemists Committee, East Central Illinois ACS Local Section, Urbana, IL, May 15, 2018
- Committee member, Physical Chemistry Seminars, UIUC, 2017-2018
- Station leader, Women's Chemist Committee Day Camp, "Nanochemistry," Urbana, IL, June 24 & July 8, 2017
- Chemistry After Dark, "Probing Nanoelectrochemistry with Optical Microscopy," Temple University, Philadelphia, PA, August 26, 2016, oral presentation
- Welch Summer Scholar Program, "Metal Nanoparticles and Color", Austin, TX, July 3, 2014, oral presentation
- GirlStart Conference in STEM,
  - "Chemistry in Action", Austin, TX, March 26, 2014
  - "Exploring the Nanoworld: How do we "see" what we cannot see?", Austin, TX, March 26, 2011
- Explore UT volunteer, Superabsorbent polymer demonstration, K-12, Austin, TX, 2011
- Seminar Host
  - Materials Chemistry Seminar, UIUC: Shane Ardo, UC Irvine, April 12, 2018

## Curriculum Vitae

- Physical Chemistry Seminar, UIUC: Uwe Bergmann, SLAC National Accelerator Laboratory, October 25, 2017
- Physical Chemistry Seminar, UIUC: Jens Nørskov, Stanford University, October 4, 2017
- Materials Chemistry Seminar, UIUC: Ming Lee Tang, University of California, Riverside, September 7, 2017
- Physical Chemistry Seminar, UIUC: Christy Landes, Rice University, February 8, 2017
- Judge
  - East Central Illinois ACS Undergraduate Research Conference, Urbana, IL, October 14, 2017
  - Rao Prize Competition, International Symposium on Molecular Spectroscopy, UIUC, Urbana, IL, 2017
  - Undergraduate Research Symposium, UIUC, Urbana, IL, April 27, 2017
  - Undergraduate Research Symposium, Temple University: College of Science & Technology, Philadelphia, PA, September 16, 2016
  - Undergraduate Research Symposium, Temple University: College of Science & Technology, Philadelphia, PA, September 17, 2015
  - "Safety Madness", UT Austin, 2014

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## TEACHING EXPERIENCE

### *Temple University*

- **Chem 8300**, Optical Spectroscopy and Microscopy Spring 2016  
Chemistry graduate course  
Guest lecturer

### *University of Texas at Austin*

- **Chemistry 455**, Fundamentals of Analytical Chemistry Spring 2013, 2012  
Non-chemistry major students  
Student Rating: 4.3/5.0  
Duties: Lecture, exam writing, recitation
- **Chemistry 456**, Analytical Chemistry Fall 2012, 2011  
Spring 2012  
Student Rating: 4.3/5.0  
Duties: Lecture, data analysis workshops, recitation
- **Chemistry 302**, Principles of Chemistry II Summer 2012  
Student Rating: 4.3/5.0  
Duties: Lecture, exam writing, recitation
- **Chemistry 376K**, Advanced Analytical Chemistry Spring 2011  
Student Rating: 4.4/5.0  
Duties: Advise independent research projects, lead laboratory experiments
- **Chemistry 456**, Analytical Chemistry Laboratory Fall 2010  
Student Rating: 4.4/5.0  
Duties: Laboratory experiment leader

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## MENTORING

### *Graduate Students*

- Dinamol Devasia  
Current graduate student at University of Illinois at Urbana-Champaign
- Natalia Molina  
Current graduate student at Temple University

## Curriculum Vitae

- Vignesh Sundaresan  
Current postdoc at University of Notre Dame

### *Undergraduate Students*

- Yutichai Mueangern  
Current chemistry graduate student at The Ohio State University
- Jennifer Linares  
Graduated UT
- Justin Kirkland  
Current chemistry graduate student at The University of Tennessee
- Taylor Hernandez  
Current chemistry graduate student at Rice University
- Anish Shah  
Current Temple student
- Allison Cutri  
Current chemistry graduate student at University of Notre Dame