Jing Zhao

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Education

Northwestern University	Ph.D in Chemistry	2003 -2008
University of Science and Technology of China	B.S. in Chemical Physics	1999-2003

Professional Experience

Assistant Professor	Chemistry, University of Connecticut	2012-present
Affiliated Member	Institute of Materials Science, UCONN	2013-present
Postdoctoral Associate Advisor: Prof. Moungi G. Bawendi	Massachusetts Institute of Technology	2008 – 2012
Research Assistant Advisors: Prof. Richard P. Van Duyne and Prof. George C. Schatz	Northwestern University	2003-2008

Teaching Experience at UCONN

CHEM 3332: Quantitative Analysis

CHEM 5337: Optical Methods

CHEM 5395: Special Topics in Analytical Chemistry – Nanomaterials in Analytical Chemistry

Awards

National Science Foundation CAREER Award	2016
Spectroscopy Society of Pittsburgh, Starter Grant Award	2014
Chinese Government Award for Outstanding Students Aboard	2008
Nanoscale Science & Engineering Center Outstanding Research Award	2007
SPIE Scholarship in Optical Science and Engineering	2007
Phi Lambda Upsilon Gelewitz Award	2007
Great Lake Chinese American Chemical Society Student Poster Award	2007
MRS Graduate Student Silver Award	2007
SPIE Newport Spectra-Physics Research Excellence Award	2006

Publications (* corresponding author, "_", undergraduate author)

Work from UConn

1. Jenkins, Julie A.; Wax, Terianna J. and **Zhao, J*** "A Seed-Mediated Synthesis of Gold Nanoparticles of Controlled Sizes to Demonstrate the Impact of Size on Optical Properties" Journal of Chemical Education, 2016, under review.
2. Mazrui, N. M.; Jonsson, S.*; Thota, S.; **Zhao, J.** and Mason, R. P. "Enhanced Availability of Mercury Bound to Dissolved Organic Matter for Methylation in Marine Sediments", Geochimica et Cosmochimica Acta, 2016, 194(1), 153-162.
3. Luo, Y., Dube, L., Zhou, Y., Zou, S. and **Zhao, J*** "Plasmonic Coupling in Single Flower-like Gold Nanoparticle Assemblies", Progress in Natural Science: Materials International, 2016, 26(5), 449–454 (Invited)
4. Dey, S. and **Zhao, J.***, "Plasmonic Effect on Exciton/Multiexciton Emission of Single Quantum Dots", Journal of Physical Chemistry Letters, 2016, 7, 2921–2929 (Invited Perspective) (Cover)
5. Chen, S., Thota, S., Wang, X., and **Zhao, J.***, "From solid to core@shell to hollow Pt–Ag nanocrystals: thermally controlled surface segregation to enhance catalytic activity and durability" Journal of Materials Chemistry A, 2016, 4, 9038-9043 (Hot Article).
6. Thota, S.; Chen, S. and **Zhao, J.*** "An unconventional mechanism of hollow nanorod formation: asymmetric Cu diffusion in Au–Cu alloy nanorods during galvanic replacement reaction" Chemical Communications, 2016, 52, 5593-5596.
7. Fu, K.; Chen, S.; **Zhao, J.** and Willis, B. G.* "Dielectrophoretic Assembly of Gold Nanoparticles in Nanoscale Junctions for Rapid, Miniature Chemiresistor Vapor Sensors", ACS Sensors, 2016, 1 (4), 444-450.
8. Dey, S.; Chen, S.; Thota, S.; Shakil, M. R., Suib, S. L. and **Zhao, J.*** "Effect of Gradient Alloying on Photoluminescence Blinking of Single CdSxSe1–x Nanocrystals", Journal of Physical Chemistry C, 2016, 120 (37), 20547–20554.
9. Chen, S.; Thota, S.; Reggiano, G. and **Zhao, J.*** "Generalized Seeded Growth of Ag-based Metal Chalcogenide Nanorods via Controlled Chalcogenization of the Seeds", Journal of Materials Chemistry C, 2016, 3, 11842-11849.
10. Sun, X.; He, J.; Meng, Y.; Zhang, L.; Zhang, S, Ma,X.; Dey, S.; **Zhao, J.** and Lei, Y.* "Microwave- assisted ultrafast and facile synthesis of fluorescent carbon nanoparticles from single precursor: Preparation, characterization and its application for highly selective detection of explosive picric acid", Journal of Materials Chemistry A, 2016, 4 (11), 4161-4171.
11. Thota, S.; Chen, S.; Zhou, Y.; Zou, S. and **Zhao, J.*** "Structural Defects Induced Peak Splitting in Gold-Copper Bimetallic Nanorods during Growth by Single Particle Spectroscopy", Nanoscale, 2015, 7, 14652-14658.
12. Sun, X.; Liu, Y.; Shaw, G.; Carrier, A.; Dey, S.; **Zhao, J.** and Lei, Y.* "Fundamental Study of Electrospun Pyrene-PES nanofibers using mixed solvents for sensitive and selective explosives detection in aqueous solution", ACS Applied Materials and Interfaces, 2015, 7, 13189-13197.
13. Dey, S.; Zhou, Y.; Tian, X.; Jenkins, J. A.; Chen, O.; Zou, S. and **Zhao, J.*** "An experimental and theoretical mechanistic study of biexciton quantum yield enhancement in single quantum dots near gold nanoparticles", Nanoscale, 2015, 7, 6851-6858.
14. Jenkins, J. A.; Zhou, Y.; Thota, S.; Tian, X.; Zhao, X.; Zou, S. and **Zhao, J.*** "Blue-Shifted Narrow Localized Surface Plasmon Resonance from Dipole Coupling in Gold Nanoparticle Random Arrays", J. Phys. Chem. C, 2014, 118, 26276–26283.

15. Tian, X.; Zhou, Y.; Thota, S.; Zou, S. and **Zhao, J.***, "Plasmonic Coupling in Single Silver Nanosphere Assemblies by Polarization Dependent Dark-Field Scattering Spectroscopy." J. Phys. Chem. C, 2014, 118, 13801–13808.

Work Prior to UConn

16. Chen, O.; Riedemann, L.; Etoc, F.; Herrmann, H.; Coppey, M.; Barch, M.; Farrar, C.; Zhao, J.; Bruns, O.; Wei, H.; Guo, P.; Cui, J.; Jensen, R.; Chen, Y.; Harris, D. K.; Cordero, J. M.; Wang, Z.; Fukumura, D.; Dahan, M.; Jain, R. K. and Bawendi, M. G.* "Magneto-Fluorescent Core-Shell Supernanoparticles", Nature Commun., 2014, 5, 5093.
17. Chen, O.; Zhao, J.; Chauhan, V. P.; Cui, J.; Wong, C.; Harris, D.K.; Wei, H.; Han, H.; Fukumura, D.; Jain, R. K.; Bawendi, M. G.*, "Compact high-quality CdSe–CdS core–shell nanocrystals with narrow emission linewidths and suppressed blinking", Nat. Materials, 2013, 12, 445-451.
18. Zhao, J.; Chen, O.; Strasfeld, D. B. and Bawendi, M. G.*, "Biexciton Quantum Yield Heterogeneities in Single CdSe(CdS) Core(Shell) Nanocrystals and Its Correlation to Exciton Blinking", Nano Lett., 2012, 12, 4477-4483.
19. Greytak, A. B.; Allen, P. M.; Zhao, J.; Liu, W.; Young, E. R.; Popović, Z.; Walker, B.; Bawendi, M. G.* and Nocera, D. G*., "Alternating Layer Addition Approach to CdSe/CdS Core/Shell Quantum Dots with Near-Unity Quantum Yields" Chem. Sci., 2012, 3, 2028-2034.
20. Nair, G.; Zhao, J. and Bawendi, M. G.*, "Biexciton Quantum Yield of Single Semiconductor Nanocrystals from Photon Statistics", Nano Lett., 2011, 11, 1136-1140.
21. Ren, S.; Chang, L.; Lim, S.-K.; Zhao, J.; Smith,M.; Zhao, N.; Bulović, V.; Bawendi, M. G. and Gradečak, S.*, "Inorganic–Organic Hybrid Solar Cell: Bridging Quantum Dots to Conjugated Polymer Nanowires", Nano Lett., 2011, 11, 3998-4002.
22. Zhao, J.; Nair, G.; Fisher, B. F. and Bawendi, M. G.*, "Challenge to the Charging Model of Semiconductor-Nanocrystal Fluorescence Intermittency from Off-State Quantum Yields and Multiexciton Blinking", Phys. Rev. Lett., 2010, 104, 157403.
23. Ashkenaz, D. E.; Hall, W. P.; Haynes, C. L.; Hicks, E. M.; McFarland, A. D.; Sherry, L. J.; Stuart, D. A.; Wheeler, K. E.; Yonzon, C. R.; Zhao, J.; Godwin, H. A. and Van Duyne, R. P.*, "Coffee Cup Atomic Force Microscopy," J. Chem. Educ., 2010, 87, 306-307.
24. Das, A.; Zhao, J.; Schatz, G. C.; Sligar, S. G. and Van Duyne, R. P.*, "Screening of Type I and II Drugs Binding to Human Cytochrome P450-3A4 in Nanodisc by Localized Surface Plasmon Resonance Spectroscopy," Anal. Chem., 2009, 81, 3754-3759.
25. Zhao, J., Dieringer, J.; Zhang, X.; Schatz, G. C. and Van Duyne, R. P.*, "Wavelength-Scanned Surface-Enhanced Resonance Raman Excitation Spectroscopy", J. Phys. Chem. C, 2008, 112, 19302-19310.
26. Zhao, J.; Pinchuk, A. O.; McMahon, J. M.; Li, S.; Ausman, L. K.; Atkinson, A. L.; Schatz, G. C.*, "Methods for describing the electromagnetic properties of anisotropic silver and gold nanoparticles", Acc. Chem. Res., 2008, 41, 1710-1720.
27. Zhao, J.; Das, A.; Schatz, G. C.*; Sligar, S. G.* and Van Duyne, R. P.* "Resonance Localized Surface Plasmon Spectroscopy: Sensing Substrate and Inhibitor Binding to Cytochrome P450," J. Phys. Chem. C., 2008, 112, 13084-13088.
28. Camden, J.P.; Dieringer, J. A.; Zhao, J.; Van Duyne, R. P.*, "Controlled Plasmonic Nanostructures for Surface-Enhanced Spectroscopy and Sensing," Acc. Chem. Res., 2008, 41, 1653-1661.

29. Anker, J.A.; Hall, W.P.; Lyandres, O; Shan, N.C.; Zhao, J.; Van Duyne, R.P.*, "Biosensing with Plasmonic Nanosensors," Nat. Matarials., 2008, 7, 442-453.
30. Chan, G. H.; Zhao, J.; Schatz, G. C.* and Van Duyne, R. P.* "Localized Surface Plasmon Resonance Spectroscopy of Triangular Aluminum Nanoparticles," J. Phys. Chem. C., 2008, 112, 13958-13963.
31. Sung, J.; Kosuda, K. M.; Zhao, J.; Spears, K. G.; Van Duyne, R. P.*, J. Phys. Chem. C 2008, 112, 5707-5714.
32. Zhao, J; Sherry, L. J; Schatz, George C.*; Van Duyne, R. P.* "Molecular Plasmonics: Chromophore-Plasmon Coupling and Single-Particle Nanosensors", IEEE Journal of Selected Topics Quantum Electronics, 2008, 14, 1418-1429.
33. Zhao, J.; Jensen, L.; Sung, J.; Zou, S.; Schatz, George C.*; Van Duyne, R. P.* "Interaction of Plasmon and Molecular Resonances for Rhodamine 6G Adsorbed on Silver Nanoparticles", J. Am. Chem. Soc. 2007, 129, 7647-7656.
34. Chan, G. H.; Zhao, J.; Hicks, E. M.; Schatz, G. C.*; Van Duyne, R. P.* "Plasmonic Properties of Copper Nanoparticles Fabricated by Nanosphere Lithography", Nano Lett. 2007, 7, 1947-1952.
35. Yonzon, C. R.; Zhang, X.; Zhao, J.; Van Duyne, R. P.* "Surface-Enhanced Nanosensors, " Spectroscopy 2007, 22, 42-56.
36. Zhao, J.; Das, A.; Zhang, X.; Schatz, G. C.*; Sligar, S. G.*; Van Duyne, R. P.* "Resonance Localized Surface Plasmon Spectroscopy: Low Molecular Weight Substrate Binding to Cytochrome P450," J. Am. Chem. Soc. 2006, 128, 11004-11005.
37. Haes, A. J.; Zou, S.; Zhao, J.; Schatz, G. C.*; Van Duyne, R. P.* "Localized Surface Plasmon Resonance Spectroscopy near Molecular Resonances," J. Am. Chem. Soc. 2006, 128, 10905-10914.
38. Zhang, X.; Zhao, J.; Whitney, A. V.; Elam, J. W.; Van Duyne, R. P.* "Ultrastable Substrates for Surface-Enhanced Raman Spectroscopy Fabricated by Atomic Layer Deposition: Improved Anthrax Biomarker Detection," J. Am. Chem. Soc. 2006, 128, 10304-10309.
39. Zhao, J.; Zhang, X.; Yonzon, C. R.; Haes, A. J.; Van Duyne, R. P.* "Localized Surface Plasmon Resonance Biosensors," Nanomedicine 2006, 1, 219-228.
40. Zhang, X.; Whitney, A. V.; Zhao, J.; Hicks, E. M.; Van Duyne, R. P*. "Advances in Contemporary Nanosphere Lithographic Techniques," Nanosci. Nanotechnol. 2006, 6, 1920-1934.
41. Zhang, X.; Hicks, E. M.; Zhao, J.; Schatz, G. C.; Van Duyne, R. P.* "Electrochemical Tuning of Silver Nanoparticles Fabricated by Nanosphere Lithography," Nano Lett. 2005, 5, 1503-1507.
42. Haes, A.J.; Zhao, J.; Zou, S.; Own, C. S.; Marks, L. D.; Schatz, G. C.; Van Duyne, R. P. * "Solution-Phase, Triangular Ag Nanotriangles Fabricated by Nanosphere Lithography," J. Phys. Chem. B 2005, 109, 11158-11162.

Activities

Review Service

Ad hoc Reviewer for journals:

Journal of American Chemical Society, Nano Letters, Journal of Materials Chemistry C, Nanoscale, Chemical Communications, Journal of Physical Chemistry, Chemical Physics Letters, Journal of the Optical Society of America, Optics Letters, Journal of Material Research

Ad hoc review for NSF, winter 2014
Panel reviewer for NSF, spring 2014, March 2016

Outreach

Mentor for **SECRET** (School of Exploratory Chemistry Research Experience & Training) at UConn, June 2013-2016

Mentor for Johns Hopkins Center for Talented Youth-UCONN Nanoscience workshop in March 2013 and March 2016

Mentor for **ACS SEED Project** students, Summer 2015 and 2016

Member of American Chemical Society and Materials Research Society

Funding:

External:

- PI, "CAREER: Synthetically Controlled Plasmon-Multiexciton Interaction in Semiconductor-Metal Hybrid Nanostructures" NSF CAREER award, $675,000, Feb 1, 2016-Jan 31, 2021. (Current)
- Co-PI, (PI: Robert Mason) "Examining the role of nanoparticles in the formation and degradation of methylated mercury in the ocean", NSF, $330,000, Aug 1, 2016 - July 31, 2019. (Current)
- Co-PI (PI: Yu Lei) "Collaborative Research: Injectable, Biocompatible, Programmed-Bioresorbable Nanosensor Array for In-Vivo Continuous Glucose Monitoring", NSF, $284,165, July 15, 2015 - July 14, 2018. (Current)
- PI, "Fluorescence Lifetime Sensing and Imaging based on Colloidal Quantum Dots", Spectroscopy Society of Pittsburgh Starter Grant Award, $40,000, June 1, 2014-May 30, 2015. (Completed)
- PI, "Probe nanoscale catalytic sites with surface-enhanced Raman scattering using core/shell nanoparticles", ACS Petroleum Research Foundation, $100,000 (direct, no overhead), Sep 1, 2014 – Aug 31, 2017. (Current)

Internal:

- PI, Faculty Large Grant, "Plasmonic Waveguiding and Surface-Enhanced Raman Scattering in Nanoparticle Assemblies", UConn Research Foundation, $14,000, Jan 1, 2013-Dec 31, 2013. (Completed)
- PI, (Co-PIs: Yao Lin and Jie He), CLAS Innovative Educational Grant, "Development of a Macromolecular, Supramolecular and Nano Chemistry Course", $65,000, Jan 1 2017-Dec 31 2018.