

Danqing Wang

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EDUCATION

University of California, Berkeley , Berkeley, CA Miller Postdoctoral Fellow	2019 –
Northwestern University , Evanston, IL Ph.D. in Applied Physics	2013 – 2019
Nanjing University , Nanjing, China B.S. in Physics	2009 – 2013

RESEARCH EXPERIENCE

Northwestern University, Evanston, IL

- Graduate research co-advised by Prof. Teri W. Odom and Prof. George C. Schatz
Highlight activities include:
 - Achieved controlled multi-modal nanolasing in multi-scale plasmonic superlattice arrays and unveiled the origin from multiple band-edge modes
 - Exploited hybrid quadrupole plasmons as a new lasing feedback mechanism and realized stretchable nanolasing based on metal nanoparticles on a flexible, polymer matrix
 - Established a robust computational approach in finite-difference time-domain to investigate time- and spatial- dependent lasing buildup in plasmonic nanocavities
 - Collaboratively realized deterministic coupling of quantum emitters in hexagonal boron nitride to plasmonic nanocavities for enhanced single-photon emission

Nanjing University, Nanjing, China

- Undergraduate project titled “*Enhanced Light Propagation in Hybrid Nonlinear Waveguides*” in *National Laboratory of Solid State Microstructures*

AWARDS

- 2019 Miller Research Fellowship, University of California, Berkeley
- 2018 Material Research Society Graduate Student Award (GSA) Silver Award
- 2018 Excellent Poster Award, Gordon Research Conference on Lasers in Micro, Nano and Bio Systems
- 2018 International Precious Metals Institute (IPMI) Student Award Honorable Mention
- 2018 Chinese Government Award for Outstanding Self-Financed Students Abroad
- 2017 Outstanding Research Award (International Institute for Nanotechnology, Northwestern University)

2013 Excellence Prize in Chinese Undergraduate Innovation Program (*national* level)

2013 Shengda and Renmin Fellowships, Nanjing University

PUBLICATIONS

1. **Wang, D.**; Yang, A.; Wang, W.; Hua, Y.; Schaller, R.D.; Schatz, G.C.; Odom, T.W. "Band-edge Engineering for Controlled Multi-modal Nanolasing in Plasmonic Superlattices," *Nature Nanotechnology* **12**, 889 (2017) [**Highlighted in News and Views** *Nature Nanotechnology* **12**, 838 (2017)] DOI: 10.1038/nnano.2017.126
2. Fernandez-Bravo, A.*; **Wang, D.***; Tajon, C.; Teitelboim, A.; Guan, J.; Schatz, G.C.; Cohen, B.E.; Chan, E.; Schuck, P.J.; Odom, T.W. "Continuous-wave upconverting plasmon nanolasing at room temperature," *ASAP in Nature Materials* *equal contribution
3. **Wang, D.**; Bourgeois, M.R.; Lee, W.; Li, R.; Trivedi, D.; Knudson, M.P.; Wang, W.; Schatz, G.C.; Odom, T.W. "Stretchable Nanolasing from Hybrid Quadrupole Plasmons," *Nano Letters* **18**, 4549–4555 (2018) DOI: 10.1021/acs.nanolett.8b01774
4. **Wang, D.**; Wang, W.; Knudson, M.P.; Schatz, G.C.; Odom, T.W. "Structural Engineering in Plasmon Nanolasers," *Chemical Reviews* **118**, 2865–2881 (2017) DOI: 10.1021/acs.chemrev.7b00424
5. **Wang, D.**; Guan, J.; Hu, J.; Bourgeois, M.R.; Odom, T.W. "Manipulating Light-matter Interactions in Plasmonic Nanoparticle Lattices," *under review in Accounts of Chemical Research*
6. Tran, T.T.*; **Wang, D.***; Xu, Z-Q.*; Yang, A.; Toth, M.; Odom, T.W.; Aharonovich, I. "Deterministic Coupling of Quantum Emitters in 2D Materials to Plasmonic Nanocavity Arrays," *Nano Letters* **17**, 2634–2639 (2017) *equal contribution DOI: 10.1021/acs.nanolett.7b00444
7. **Wang, D.**; Yang, A.; Hryn, A.J.; Schatz, G.C.; Odom, T.W. "Superlattice Plasmons in Hierarchical Au Nanoparticle Arrays," *ACS Photonics* **2**, 1789 (2015) DOI: 10.1021/acsphotonics.5b00546
8. Lin, Y.; **Wang, D.**; Hu, J.; Liu, J.; Wang, W.; Schaller, R.D.; Odom, T.W. "Engineering Symmetry-breaking Nanocrescent Arrays for Nanolasing," *Adv. Funct. Mater. ASAP* (2019) DOI: 10.1002/adfm.201904157
9. Hu, J.; **Wang, D.**; Bhowmik, D.; Liu, T.; Deng, S.; Knudson, M.P.; Ao, X.; Odom, T.W. "Lattice-Resonance Metalenses for Fully Reconfigurable Imaging," *ACS Nano* **13**, 4613–4620 (2019) DOI: 10.1021/acsnano.9b00651
10. Ao, X.; **Wang, D.**; Odom, T.W. "Enhanced Fields in Mirror-backed Low-Index Dielectric Structures," *under review in ACS Photonics*
11. Li, R.; **Wang, D.**; Guan, J.; Wang, W.; Ao, X.; Schatz, G.C.; Schaller, R.C.; Odom, T.W. "Plasmon nanolasing with aluminum nanoparticle arrays," *J. Opt. Soc. Am. B* **36**, 104–111

(2019) DOI: 10.1364/josab.36.00e104

12. Liu, J.; Wang, W.; **Wang, D.**; Hu, J.; Ding, W.; Schaller, R.D.; Schatz, G.C.; Odom, T.W. "Spatially Defined Molecular Emitters Coupled to Plasmonic Nanoparticles," *Proc. Natl. Acad. Sci.* **116**, 5925-5930 (2019) DOI.org/10.1073/pnas.1818902116
13. Hooper, D. C.; Kuppe, C.; **Wang, D.**; Wang, W.; Guan, J.; Odom, T.W.; Valev, V.K. "Second harmonic spectroscopy of surface lattice resonances," *Nano Letters* **19**, 165-172 (2019) DOI: 10.1021/acs.nanolett.8b03574
14. Knudson, M.P.; Li, R.; **Wang, D.**; Wang, W.; Schaller, R.D.; Odom, T.W. "Polarization-Dependent Lasing Behavior from Low-Symmetry Nanocavity Arrays," *ACS Nano ASAP* (2019) DOI: 10.1021/acsnano.9b01142
15. Cherqui, C.; Bourgeois, M.R.; **Wang, D.**; Schatz, G.C. "Plasmonic Surface Lattice Resonances: Theory and Computation," *Accounts of Chemical Research ASAP* (2019) DOI: 10.1021/acs.accounts.9b00312
16. Li, R.; Bourgeois, M.R.; Cherqui, C.; Guan, J.; **Wang, D.**; Hu, J.; Schaller, R.D.; Schatz, G.C.; Odom, T.W. "Hierarchical Hybridization in Plasmonic Honeycomb Lattices," *Nano Letters ASAP* (2019) DOI: 10.1021/acs.nanolett.9b02661
17. **Wang, D.**; Wang, W.; Odom, T.W. et al. "Roadmap on Plasmonics: Nanoarray Lasing Spasers," *Journal of Optics* **20**, 043001 (2018) DOI: 10.1088/2040-8986/aaa114
18. Trivedi D.; **Wang, D.**; Odom, T.W.; Schatz, G.C. "Model for Describing Plasmonic Nanolasers Using Maxwell-Liouville Equations with Finite-difference Time-domain Calculations," *Phys. Rev. A.* **96**, 053825 (2017) DOI: 10.1103/PhysRevA.96.053825
19. Yang, A.; **Wang, D.**; Wang, W.; Odom, T. W. "Coherent Light Sources at the Nanoscale," *Annu. Rev. Phys. Chem.* **68**, 83-99 (2017) DOI: 10.1146/annurev-physchem-052516-050730
20. Wang, S.; **Wang, D.**; Hu, X.; Li, T.; Zhu, S. "Compact Surface Plasmon Amplifier in Nonlinear Hybrid Waveguide," *Chinese Physics B* **25**, 7 (2016)

PRESS RELEASES

1. "[The chameleon and the crystal maze](#)", *Laboratory News, UK* (Sep. 2018) [**Highlighted** as the featured article and the cover story]
2. "[Mimicking the Master of Camouflage](#)", *Chicago Biomedical Consortium Success Story* (July 2018)
3. "[Nanolaser Changes Color when Stretched](#)", *Chemical & Engineering News* (July 2018)
4. "[Chameleon-inspired Nanolaser Changes Colors](#)", *National Science Foundation's web homepage* (June 2018)
5. "[Chameleons Inspire Mechanochromic Nanolaser](#)", *Physics World* (June 2018)
6. "[Chameleon-inspired Nanolaser Changes Colors](#)", *ScienceDaily* (June 2018)

CV: Danqing Wang (September 2019)

7. "[Chameleon-inspired Nanolaser Changes Colors](#)", *Northwestern Now* (June 2018)
8. "[Northwestern's New Chameleon-Inspired Laser Changes Colors](#)", *WTTW* (June 2018)
9. "[Nanolasing: Multimode Superlattice Arrays](#)", *Nature Nanotechnology News and Views* (Sep. 2017)
10. "[New Laser Design Offers More Inexpensive Multi-color Output](#)", *Northwestern Now* (July 2017)
11. "[Controlling Multi-modal Nanolasing with Plasmonic Superlattices](#)", *Nanowerk News* (July 2017)

CONFERENCES AND PRESENTATIONS

1. **ACS Fall Meeting** San Diego, CA 2019
Invited talk: "Extraordinary Optics from Structured Nanoparticles"
2. **MRS Fall Meeting** Boston, MA 2018
Talk: "Stretchable Nanolasing from Hybrid Quadrupole Plasmons"
3. **Gordon Conference** Waterville Valley, NH 2018
Poster: "Structural Engineering in Plasmon Nanolasers"
4. **Nanjing University Tiandi Symposium** Nanjing, China 2017
Invited talk: "Structural Engineering in Plasmon Nanolasers"
5. **MRS Fall Meeting** Boston, MA 2017
Talk: "Band-edge Engineering for Controlled Multi-modal Nanolasing in Plasmonic Superlattices"
6. **Northwestern SPIE-MRSEC Student Seminar Series** Evanston, IL 2017
Invited talk: "Structural Engineering in Plasmon Nanolasers"
7. **OSA Incubator on Science & Applications of Nanolasers** Washington, DC 2016
Invited talk: "Lasing from Plasmonic Nanocavity Arrays"
8. **Gordon Conference** Newry, ME 2016
Poster: "Band-edge Engineering in Hierarchical Plasmonic Nanolasers"
9. **APS March Meeting** San Antonio, TX 2015
Poster: "Superlattice Plasmons in Finite Nanoparticle Arrays"

PROFICIENCIES AND SKILLS

Nanofabrication

Bench-top Multi-scale Pattern Transferring, Phase-shift Photolithography, Vapor Deposition, Reactive Ion Etching, Deep Reactive Ion Etching, Scanning Electron Microscopy

Optical characterization

Optical Set-up, Lasing Detection, Time-resolved Photoluminescence, Angle-resolved Spectroscopy, Dark-field Microscopy

Modeling and Computation

Finite-Difference Time-Domain (FDTD) Modeling, COMSOL Multiphysics, MATLAB, Adobe Illustrator, Blender 3D Software

LEADERSHIP POSITIONS

- 2016-18 Laser Instrument Manager, the Odom Group
- 2015-17 Rotational-stage Spectrometer Manager, the Odom Group
- 2016 Management for Scientists and Engineers Certificate, Northwestern University, Kellogg School of Management
- 2014-16 McCormick Graduate Leadership Council, Professional Development Co-chair
- 2014-15 Cleanroom Manager, the Odom Group

REFERENCE CONTACTS

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