



Jennifer Dionne

Associate Professor of Materials Science and Engineering

CONTACT INFORMATION

- **Administrator**

Carol Scott - Administrative Associate

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Bio

BIO

Jen Dionne's research investigates metamaterials - engineered materials with optical and electrical properties not found in nature. She is especially interested in plasmonic and colloidal nanocrystal-based metamaterials, including their fundamental electrodynamic properties and applications to solar energy and bioimaging. Active research areas in her group include visible-frequency metamaterials for subwavelength light manipulation, enhanced photovoltaics and photocatalysis, and active neuronal imaging.

ACADEMIC APPOINTMENTS

- Associate Professor, Materials Science and Engineering
- Member, Bio-X
- Affiliate, Precourt Institute for Energy
- Member, Stanford Neurosciences Institute

HONORS AND AWARDS

- CAREER Award, National Science Foundation (2011)
- Gold Award, Materials Research Society (2008)
- Francis Clauser Prize, Clauser family (2009)
- Robert Noyce Family Faculty Fellow, Robert Noyce Scholarship & Fellowship Programs (2010)
- Frederick E. Terman Fellow, Stanford University (2010)
- Young Investigator, Air Force Office of Scientific Research (2010)

PROFESSIONAL EDUCATION

- PhD, California Institute of Technology , Applied Physics (2009)
- MS, California Institute of Technology , Applied Physics (2005)
- BS, Washington University in St. Louis , Physics (2003)
- BS, Washington University in St. Louis , Systems Science and Mathematics (2003)

LINKS

- <http://dionne.stanford.edu>: <http://dionne.stanford.edu>

Teaching

COURSES

2017-18

- Electronic Materials Engineering: MATSCI 152 (Spr)
- Science of the Impossible: MATSCI 82N (Spr)
- Waves and Diffraction in Solids: MATSCI 195, MATSCI 205, PHOTON 205 (Win)

2016-17

- Electronic Materials Engineering: MATSCI 152 (Spr)
- Science of the Impossible: MATSCI 82N (Spr)

2015-16

- Electronic Materials Engineering: MATSCI 152 (Spr)
- Materials Science Colloquium: MATSCI 230 (Win)
- Science of the Impossible: MATSCI 82N (Spr)

2014-15

- Electronic Materials Engineering: MATSCI 152 (Spr)
- Science of the Impossible: MATSCI 82N (Spr)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Stefan Fischer, Mark Lawrence, Randy Mehlenbacher, Amr Ahmed Essawi Saleh, Michal Vadai Eilat, Yang Zhao

Doctoral Dissertation Advisor (AC)

Fariah Hayee

Master's Program Advisor

Derek Wang

Publications

PUBLICATIONS

- **Subwavelength-scale plasmon waveguides** *Surface Plasmon Photonics*
Atwater, H., Dionne, J., Sweatlock, L.
edited by Brongersma, M., L., Kik, P., G.
Dordrecht, NL: Springer.: 87–104
- **Parity-time-symmetric plasmonic metamaterials** *PHYSICAL REVIEW A*
Alaeian, H., Dionne, J. A.
2014; 89 (3)
- **Non-Hermitian nanophotonic and plasmonic waveguides** *PHYSICAL REVIEW B*
Alaeian, H., Dionne, J. A.
2014; 89 (7)

- **A metafluid exhibiting strong optical magnetism.** *Nano letters*
Sheikholeslami, S. N., Alaeian, H., Koh, A. L., Dionne, J. A.
2013; 13 (9): 4137-4141
- **Surface-enhanced circular dichroism spectroscopy mediated by nonchiral nanoantennas** *PHYSICAL REVIEW B*
Garcia-Etxarri, A., Dionne, J. A.
2013; 87 (23)
- **NANOPLASMONICS Plasmons rock in metal bands** *NATURE MATERIALS*
Dionne, J. A.
2013; 12 (5): 380-381
- **A Broadband Negative Index Metamaterial at Optical Frequencies** *ADVANCED OPTICAL MATERIALS*
Atre, A. C., Garcia-Etxarri, A., Alaeian, H., Dionne, J. A.
2013; 1 (4): 327-333
- **Narrow-bandwidth solar upconversion: Case studies of existing systems and generalized fundamental limits** *JOURNAL OF APPLIED PHYSICS*
Briggs, J. A., Atre, A. C., Dionne, J. A.
2013; 113 (12)
- **Observation of Quantum Tunneling between Two Plasmonic Nanoparticles** *NANO LETTERS*
Scholl, J. A., Garcia-Etxarri, A., Koh, A. L., Dionne, J. A.
2013; 13 (2): 564-569
- **Plasmons rock in metal bands** *Nature Materials 12*
Dionne, J.
2013: 380
- **Toward Efficient Optical Trapping of Sub-10-nm Particles with Coaxial Plasmonic Apertures** *NANO LETTERS*
Saleh, A. A., Dionne, J. A.
2012; 12 (11): 5581-5586
- **Plasmonics: Metal-worthy methods and materials in nanophotonics** *MRS BULLETIN*
Dionne, J. A., Atwater, H. A.
2012; 37 (8): 717-724
- **Plasmon nanoparticle superlattices as optical-frequency magnetic metamaterials** *OPTICS EXPRESS*
Alaeian, H., Dionne, J. A.
2012; 20 (14): 15781-15796
- **Opportunities and Challenges of Using Plasmonic Components in Nanophotonic Architectures** *IEEE JOURNAL ON EMERGING AND SELECTED TOPICS IN CIRCUITS AND SYSTEMS*
Wassel, H. M., Dai, D., Tiwari, M., Valamehr, J. K., Theogarajan, L., Dionne, J., Chong, F. T., Sherwood, T.
2012; 2 (2): 154-168
- **Quantum plasmon resonances of individual metallic nanoparticles** *NATURE*
Scholl, J. A., Koh, A. L., Dionne, J. A.
2012; 483 (7390): 421-U68
- **Toward high-efficiency solar upconversion with plasmonic nanostructures** *JOURNAL OF OPTICS*
Atre, A. C., Garcia-Etxarri, A., Alaeian, H., Dionne, J. A.
2012; 14 (2)
- **Optimized light absorption in Si wire array solar cells** *JOURNAL OF OPTICS*
Alaeian, H., Atre, A. C., Dionne, J. A.
2012; 14 (2)
- **Waveguides with a silver lining: Low threshold gain and giant modal gain in active cylindrical and coaxial plasmonic devices** *PHYSICAL REVIEW B*
Saleh, A. A., Dionne, J. A.
2012; 85 (4)

- **Mirror, Mirror** *Physics* 5
Dionne, J.
2012: 38
- **Controlling the Interplay of Electric and Magnetic Modes via Fano-like Plasmon Resonances** *NANO LETTERS*
Sheikholeslami, S. N., Garcia-Etxarri, A., Dionne, J. A.
2011; 11 (9): 3927-3934
- **Realistic upconverter-enhanced solar cells with non-ideal absorption and recombination efficiencies** *JOURNAL OF APPLIED PHYSICS*
Atre, A. C., Dionne, J. A.
2011; 110 (3)
- **Giving photovoltaics the green light: Plasmon-enhanced upconversion for broadband solar absorption** *IEEE Photonics Conference (PHO)*
Dionne, J. A., Atre, A., Alaeian, H., Garcia, A.
IEEE.2011: 447-448
- **Observations of shape-dependent hydrogen uptake trajectories from single nanocrystals** *JACS Communications*
Tang, M., L., Liu, N., Dionne, J., Alivisatos, A., P.
2011
- **Si-based plasmonics for on-chip photonics** *invited review, Journal of Selected Topics in Quantum Electronics*
Dionne, J., Sweatlock, L., Sheldon, M., Alivisatos, A., P., Atwater, H.
2010; 16: 295
- **PlasMOSstor: a metal-oxide-silicon field-effect plasmonic modulator** *Nano Letters* 9
Dionne, J., Diest, K., Sweatlock, L., Atwater, H.
2009: 897
- **Flatland Photonics: Circumventing diffraction with planar plasmonic architectures** *Caltech Thesis*
Dionne, J.
2009
- **Tunable color filters based on metal-insulator-metal resonators** *Nano Letters* 9
Diest, K., Dionne, J., Spain, M., Atwater, H.
2009: 2579
- **Are negative index materials achievable with surface plasmon waveguides? A case study of three plasmonic geometries** *Optics Express* 16
Dionne, J., Verhagen, E., Polman, A., Atwater, H.
2008: 19001
- **Near field visualization of strongly confined surface plasmon polaritons in metal-insulator-metal waveguides** *Nano Letters* 8
Verhagen, E., Dionne, J., Kuipers, K., Atwater, H., Polman, A.
2008: 2925
- **Silver diffusion bonding and layer transfer of lithium niobate to silver** *Applied Physics Letters* 93
Diest, K., Archer, M., Dionne, J., Czubakowski, M., Atwater, H.
2008: 092906
- **Negative refraction at visible frequencies** *Science* 316
Lezec, H., Dionne, J., Atwater, H.
2007: 430
- **Highly confined photon transport in subwavelength metallic slot waveguides** *NanoLetters* 6
Dionne, J., Lezec, H., Atwater, H.
2006: 1928
- **Plasmon slot waveguides: Towards chip-scale propagation with subwavelength-scale localization** *Phys. Rev. B* 73
Dionne, J., Sweatlock, L., Polman, A., Atwater, H.
2006: 035407

- **Planar metal plasmon waveguides: frequency-dependent dispersion, propagation, localization, and loss beyond the free electron model** *Phys. Rev. B* 72
Dionne, J., Sweatlock, L., Polman, A., Atwater, H.
2005: 075405
- **The new 'PN junction': Plasmonics enables photonic access to the nanoworld** *MRS Bulletin*
Atwater, H., Maier, S., Polman, A., Dionne, J., Sweatlock, L.
2005: 30