

# Stanford

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## Jennifer Dionne

Associate Professor of Materials Science and Engineering

### CONTACT INFORMATION

- **Administrator**

Carol Scott - Administrative Associate

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### Bio

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#### 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

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### COURSES

#### 2017-18

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

#### 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

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### 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*  
Alaiean, H., Dionne, J. A.  
2014; 89 (3)
- **Non-Hermitian nanophotonic and plasmonic waveguides** *PHYSICAL REVIEW B*  
Alaiean, H., Dionne, J. A.  
2014; 89 (7)
- **A metafluid exhibiting strong optical magnetism.** *Nano letters*

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- 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