P. James Schuck
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Molecular Foundry
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Education

1997	B.A. (Physics)	U. C. Berkeley Berkeley, California
1998	M.S. (Applied Physics)	Yale University New Haven, Connecticut
2003	Ph.D. (Applied Physics)	Yale University New Haven, Connecticut
	Thesis Topic: Three-dimensional Imaging Spectroscopy of the III-Nitride Material System Thesis Advisor: Professor Robert Grober	
2003-2006	Post-doctoral Scholar (Chemistry)	Stanford University Stanford, California
	Post-doctoral Advisor: Professor W. E. Moerner	

Career Summary

2006-	Staff Scientist, Molecular Foundry Lawrence Berkeley National Lab
2008-	Co-Principle Investigator Energy Biosciences Institute

Current Research

The control of light, and therefore information, at nanoscale dimensions is critical for addressing, and ultimately providing solutions to, a broad range of pressing scientific and societal challenges. I am particularly interested in understanding light-matter interactions within the context of two of today's significant (and related) scientific issues: the advancement of (1) plasmonics as a cornerstone for next-generation "nanoelectronics"/information science, and (2) alternative energy research. Essential to both is the elucidation of the underlying physics that determines the fundamental properties of quantum, optical and optoelectronic structures, where the critical length scales and time scales involved in these properties are in the nm-scale and sub-picosecond regimes, respectively. Therefore, an aspect of my lab's research has been the

establishment of unique nano-optical capabilities and instrumentation enabling the previously inaccessible exploration of nanosystems. At the Molecular Foundry, I dedicate 50% of my time to external User Projects, and so I note that while my internal research is primarily focused on the above-mentioned topics, the novel expertise and tools we are developing continue to have wide-ranging impact, attracting collaborations and users from leading institutions around the world who represent a number of scientific fields/issues, from biological imaging and ultrasensitive chemical detection to graphene nanoelectronics and biofuel conversion.

Academic Honors

1997-1998 Yale Applied Physics Special Fellowship
2003 NRC Graduate Fellowship Award, NIST Boulder (declined)

Patents

Recent patents, provisionals, and disclosures:
- "A nanowire AFM probe for imaging soft materials," (IB-2691PCT)
- "Lithography dry development using optical absorption," (IB-2816)
- "Nanofabricated plasmonic optical transformer," (NY-LBNL 279-Prov – JIB-2734P)
- "Variable gap bowtie tip based on thermal bimorph technology," (JIB-2577)
- "MEMS-based Nanosword Bowtie Plasmonic Antenna with Adjustable, Controllable Gap"
- "Nanopen Based on Optoelectronic Tweezers for Creating Custom Surface-enhanced Raman Scattering and Plasmonic Substrates"

Professional Activies

Session Chair, SPP5 – The 5th International Conference on Surface Plasmon Photonics, Busan, Korea, May 15-20, 2011
Chair, "Resonant Optical Antennas" symposium session, MRS Fall Meeting, Boston, MA 2010
Chair, "Nanophotonic Mateials" session, SPIE Optics + Photonics Conference, San Diego, CA, August 2010
Co-organizer and Co-chair, "Harvesting and Manipulating Light at the Nanoscale workshop," Molecular Foundry/NCEM Users Meeting, October 2010.
Co-organizer and Co-chair, "Harvesting and Manipulating Light at the Nanoscale workshop," Molecular Foundry/ALS Users Meeting, October 2009
Co-organizer, "Optical Properties of Nanostructures" Focus Sessions for the Division of Materials Physics, American Physical Society March Meeting, 2009
· Chair, "Optical Properties of Nanostructures IV: Optical Antennas and Plasmonics" Focus Session, American Physical Society March Meeting, March 18, 2009
Co-organizer and Co-chair, "Nanophotonics and Nanoplasmonics Break-out Workshop," Molecular Foundry/ALS Users Meeting, October 2007
Co-organizer and Co-chair, "Applications of Nanophotonics Break-out Workshop," Molecular Foundry, NCEM Users Meeting, October 2008
Reviewer for: Department of Energy (DOE), The Office of Basic Energy Sciences (BES); State of Arizona, Science Foundation Arizona (SFAz)

Reviewer for *JACS, Applied Physics Letters, Optics Communications, Optics Express, Journal of Microscopy, Optics Letters, Nano Letters, ACS Nano, Journal of Physical Chemistry, New Journal of Physics, IEEE Photonics Technical Letters*

Teaching Experience

Supervised/co-Supervised 7 postdocs, 1 UC Berkeley graduate student as primary research advisor, 1 Krell DOE summer practicum fellowship awardee, 1 UC Berkeley undergraduate, 2 visiting diploma students (including oversight of their master's thesis writing), 1 post-baccalaureate researcher, 1 high school summer intern

Dissertation Co-advisor/Committee member, Jeremy Lin, UCSF

Lectures: Each semester at UC Berkeley I regularly give 3-5 guest lectures in graduate and undergraduate courses. Courses include MSE 260, ""Surface Photon Spectroscopies"; Chemistry/MS&E C150, "Optics: the New Wave – state-of-the-art topics in plasmonics"; EE 298-5, "Manipulating Nanoscale Light Fields by Controlling Nanoantenna Asymmetries" and "Harnessing Surface Enhanced Raman Scattering with Optical Nanoantennas"; EE C 235/ NSE 203, "Nanoscale Optical Characterization: Life Beyond Diffraction"

Publications

1. A. McLeod, A. Weber-Bargioni, Z. Zhang, S. Dhuey, B. Harteneck, J. B. Neaton, S. Cabrini, **P. James Schuck***, "Nonperturbative visualization of nanoscale plasmonic field distributions via photon localization microscopy," *Phys. Rev. Lett.* 106, 037402 (2011), chosen as an "Editor's Suggestion"

2. Alexander Weber-Bargioni*, Adam Schwartzberg, Matteo Cornaglia, Ariel Ismach, Jeffrey J. Urban, YuanJie Pang, Reuven Gordon, Jeffrey Bokor, Miquel B. Salmeron, D. Frank Ogletree, Paul Ashby, Stefano Cabrini*, **P. James Schuck***, "Hyperspectral Nanoscale Imaging on Dielectric Substrates with Coaxial Optical Antenna Scan Probes," *Nano Lett*., 11, DOI: 10.1021/nl104163m (2011)

3. A. T. Zayak, Y. Hu, H. Choo, S. Cabrini, **P. J. Schuck**, and J. B. Neaton*, "Mode-dependent and site-selective chemical Raman enhancement for organic adsorbates at metal surfaces," *Phys. Rev. Lett*., accepted for publication (2011)

4. Terefe G. Habteyes, Scott Dhuey, Stefano Cabrini, P. James Schuck and Stephen R. Leone, "Theta-Shaped Plasmonic Nanostructures: Bringing "Dark" Multipole Plasmon Resonances into Action via Conductive and Capacitive Coupling," submitted (2011)

5. Tae Joon Seok, Arash Jamshidi, Myungki Kim, Scott Dhuey, Amit Lakhani, Hyuck Choo, **Peter James Schuck**, Stefano Cabrini, Adam M. Schwartzberg, Jeffrey Bokor, Eli Yablonovitch, and Ming C. Wu, "Radiation Engineering of Optical Antennas for Maximum Field Enhancement," submitted (2011)

6. Chi-Yu Adrian Ni, Shu-Wei Chang, Shun Lien Chuang, and **P. James Schuck**, "Quality Factor of Nanobowtie Antennae", submitted (2011)

7. Pradeep N. Perera, Martin Schmidt, Vincent L. Chiang, **P. James Schuck**, Paul Adams, "Raman spectroscopy-based non-invasive microanalysis of native lignin structure," submitted (2011)

8. Monika Fleischer,* Alexander Weber-Bargioni, M. Virginia P. Altoe, Adam M. Schwartzberg, **P. James Schuck**, Stefano Cabrini, and Dieter P. Kern, "Gold Nanocone Near-field Scanning Optical Microscopy Probes," submitted (2011)

9. Shiwei Wu, Wei-Tao Liu, Xiaogan Liang, **P. James Schuck**, Feng Wang, Y.R. Shen, Miquel Salmeron, "Hot Phonon Dynamics in Graphene," submitted (2011)

10. Pradeep N. Perera, Martin Schmidt, Vincent L. Chiang, **P. James Schuck**, Paul Adams, "Chemical compositional contours of plant cell wall and insitu structural analysis of lignin with Raman microspectroscopy and Chemometrics," submitted (2011)

11. Pradeep N. Perera, Martin Schmidt, Andrew Carroll, Adam M. Schwartzberg, Chris Somerville, **P. James Schuck**, Paul Adams, "Unraveling cell wall structure: In situ compositional analysis of Arabidopsis thaliana with Raman microspectroscopy and chemometrics," submitted (2011)

12. Adam M. Schwartzberg, Shaul Aloni, Tevye Kuykendall, **P. James Schuck**, and Jeffrey J. Urban*, "Directional Nanoscale White-Light Generation by Efficient Multiphoton Excitation in Gallium Nitride Nanowires", submitted (2011)

13. Wei-Tao Liu, S. W. Wu, **P. J. Schuck**, M. Salmeron, Y. R. Shen, and F. Wang*, "Nonlinear photoluminescence from graphene," *Phys. Rev. B* 82, 081408(R) (2010)

14. T.-R. Lin, S.-W. Chang, S. L. Chuang*, Z. Zhang, **P. James Schuck**, "Coating Effect on Optical Resonance of Plasmonic Nanobowtie Antenna," *Applied Physics Letters*, 97, 063106 (2010)

15. M. Schmidt, P. N. Perera, A. M. Schwartzberg, P. D. Adams, **P. James Schuck***, "Label-free in situ imaging of lignification in plant cell walls," *Journal of Visualized Experiments* (JoVE), doi 10.3791/2064 (2010)

16. A. Weber-Bargioni, A. Schwartzberg, M. Schmid, B. Hartneck, D.F. Ogletree, **P. James. Schuck***, S. Cabrini*, "Functional plasmonic antenna Scanning Probes fabricated by Induced Deposition Mask Lithography", *Nanotechnology*, 21, 065306 (2010)

17. M. Schmidt*, A. M. Schwartzberg, A. Carroll, A. Chaibang, P. D. Adams, **P. James Schuck**, "Raman imaging of cell wall polymers in *Arabidopsis thaliana,*" *Biochemical and Biophysical Research Communications*, 395, 521 (2010)

18. D. L. Olynick,* A. Schipotinin, S. D. Dhuey, D. F. Ogletree, **P. J. Schuck**, and B. Cord, "Electron beam exposure mechanisms in hydrogen silsesquioxane

investigated by vibrational spectroscopy and in-situ electron beam induced desorption," *Journal of Vacuum Science and Technology* B, 28, 581 (2010)

19. Z. Zhang, A. Weber-Bargioni, S. W. Wu, S. Dhuey, S. Cabrini, **P. James Schuck***, "Manipulating Nano-scale Light Fields with the Asymmetric Bowtie nano-Colorsorter," *Nano Letters,* 9, 4505 (2009)

20. M. Schmidt, A. M. Schwartzberg, P. N. Perera, A. Weber-Bargioni, A. Carroll, P. Sarkar, E. Bosneaga, J. J. Urban, J. Song, M. Y. Balakshin, E. A. Capanema, M. Auer, P. D. Adams, V. L. Chiang, **P. James Schuck***, "Label-free in situ imaging of lignification in the cell wall of low lignin transgenic *Populus trichocarpa*," *Planta* Rapid Comm., 230, 589 (2009)

21. Arash Jamshidi, Steven L. Neale, Kyougsik Yu, Peter J. Pauzauskie, **P. James Schuck**, Justin K. Valley, Hsan-Yin Hsu, Aaron T. Ohta, Ming C. Wu, "NanoPen: Dynamic, Low-Power, and Light-Actuated Patterning of Nanoparticles," *Nano Letters*, 9, 2921 (2009)

22. Shiwei Wu[†], Gang Han[†], Delia J. Milliron, Shaul Aloni, Virginia Altoe, Dmitri V. Talapin, Bruce E. Cohen[*], and **P. James Schuck**[*], "Non-blinking and photostable upconverted luminescence from single lanthanide-doped nanocrystals," *PNAS*, 106, 10917 (2009)

23. Concetta Nobile, Paul D. Ashby, **P. James Schuck**, Angela Fiore, Rosanna Mastria, Roberto Cingolani, Liberato Manna, Roman Krahne*, "Probe tips functionalized with nanocrystal tetrapods for high resolution atomic force microscopy imaging," *Small* 4, 2123 (2008)

24. Arash Jamshidi, Peter J. Pauzauskie, **P. James Schuck**, Aaron Ohta, Pei-Yu Chiou, Jeffrey Chou, Peidong Yang, and Ming C. Wu, "Dynamic manipulation and separation of individual semiconducting and metallic nanowires," *Nature Photonics* 2, 85 (2008), **Cover Article**

25. Feng Wang, David Cho, Brian Kessler, Jack Deslippe, **P. James Schuck**, Steven G. Louie, Alex Zettl, Tony F. Heinz and Y. Ron Shen, "Observation of excitons in one-dimensional metals," *Phys. Rev. Lett.* 99, 227401 (2007)

26. Samuel J. Lord, Zhikuan Lu, Hui Wang, Katherine A. Willets, **P. James Schuck**, Hsiao-lu D. Lee, Stefanie Y. Nishimura, Robert J. Twieg, W. E. Moerner, "Photophysical Properties of Acene DCDHF Fluorophores: Long-Wavelength Single-Molecule Emitters Designed for Cellular Imaging," *J. Phys. Chem. A* 111, 8934 (2007).

27. Arvind Sundaramurthy[†], **P. J. Schuck**[†], N. R. Conley, D. P. Fromm, W. E. Moerner and G. S. Kino "Toward nanometer-scale optical photolithography: Utilizing the near-field of bowtie optical nanoantennas." *Nano Lett.* 6, 355-360 (2006).

28. D. P. Fromm, A. Sundaramurthy, A. Kinkhabwala, **P. J. Schuck**, G. S. Kino and W. E. Moerner "Exploring the chemical enhancement of surface-enhanced raman scattering with Au bowtie nanoantennas" *J. Chem. Phys* rapid commun. 124, 061101 (2006).

29. **P. J. Schuck**, D. P. Fromm, A. Sundaramurthy, G. S. Kino and W. E. Moerner*, "Improving the mismatch between light and nanoscale objects with gold bowtie nanoantennas." *Phys. Rev. Lett.* 94, 017402 (2005).

30. **P. J. Schuck**, K. A. Willets, D. P. Fromm, R. J. Twieg and W. E. Moerner*, "A novel fluorophore for two-photon-excited single-molecule fluorescence." *Chem. Phys.*- special issue in honour of Daniel Chemla 318, 7 (2005).

31. Arvind Sundaramurthy, D. P. Fromm, K. B. Crozier, **P. J. Schuck**, W. E. Moerner and G. S. Kino "Field enhancement and gap-dependent resonance in visible wavelength optical bowtie antennas." *Phys. Rev. B* 72, 165409 (2005).

32. K. A. Willets, S. Y. Nishimura, **P. J. Schuck**, R. J. Twieg and W. E. Moerner "Nonlinear optical chromophores as nanoscale emitters for single-molecule spectroscopy" *invited review Acc. Chem. Res.* 38, 549-556 (2005).

33. D. P. Fromm, A. Sundaramurthy, **P. J. Schuck**, G. S. Kino and W. E. Moerner "Gap-dependent optical coupling of single "bowtie" nanoantennas resonant in the visible." *Nano Lett.* 4, 957-961 (2004).

34. J. A. Matteo, D. P. Fromm, Y. Yuen, **P. J. Schuck**, W. E. Moerner and L. Hesselink "Spectral analysis of strongly enhanced visible light transmission through single C-shaped nanoapertures." *Appl. Phys. Lett.* 85, 648-650 (2004).

35. R. Twieg, H. Wang, Z. Lu, S. Y. Kim, S. Lord, S. Nishimura, **P. J. Schuck**, K. A. Willets, and W. E. Moerner, "Synthesis, Properties and Applications of Dicyanomethylenedihydrofuran (DCDHF) Single-Molecule Fluorophores," *Nonlinear Optics, Quantum Optics* (in press 2005).

36. U. T. Schwarz, **P. J. Schuck**, M. D. Mason, R. D. Grober, A. M. Roskowski, S. Einfeldt, and R. F. Davis. "Microscopic mapping of strain relaxation in uncoalesced pendeo-epitaxial GaN on SiC." *Phys. Rev. B.* 67, 045321 (2003).

37. **P. J. Schuck***, R.D. Grober, A.M. Roskowski, S. Einfeldt, and R.F. Davis. "Cross-sectional Imaging of Pendeo-epitaxial GaN Using Continuous Wave Two-photon Micro-photoluminescence." *Appl. Phys. Lett.* 81, 1984 (2002).

38. **P. J. Schuck***, M.D. Mason, R.D. Grober, O. Ambacher, A.P. Lima, C. Miskys, R. Dimitrov, M. Stutzmann. "Spatially Resolved Photoluminescence of Inversion Domain Boundaries in GaN based Lateral Polarity Heterostructures." *Appl. Phys. Lett.* 79, 952 (2001).

39. A.M. Roskowski, E.A. Preble, S. Einfeldt, P.M. Miraglia, **J. Schuck**, R. Grober, and R.F. Davis. "Reduction in dislocation density and strain in GaN thin films

grown via maskless Pendeo-epitaxy." invited paper *Opto-Electron. Rev.* 10, 261 (2002).

40. A.M. Roskowski, P.Q. Miraglia, E.A. Preble, S. Einfeldt, T. Stiles, R.F. Davis, **J. Schuck**, R. Grober, U. Schwarz. "Strain and Dislocation Reduction in Maskless Pendeo-Epitaxy GaN Thin Films." *Phys. Stat. Sol. A* 188, 729 (2001).

41. M. Stutzmann, O. Ambacher, M. Eickhoff, U. Karrer, A.L. Pimenta, R. Neuberger, J. Schalwig, R. Dimitrov, **P. J. Schuck**, R.D. Grober. "Playing with polarity." *Phys. Stat. Sol. A* 228, 505 (2001).

42. R.F. Davis, T. Gehrke, K.J. Linthicum, P. Rajagopal, A.M. Roskowski, T. Zheleva, E.A. Preble, C.A. Zorman, M. Mehregany, U. Schwarz, **J. Schuck**, R. Grober. "Review of Pendeo-Epitaxial Growth and Characterization of Thin Films of GaN and AlGaN Alloys on 6H-SiC(0001) and Si(111) Substrates." *MRS Internet J N S R* 6, 1 (2001).

43. R.D. Grober, J. Acimovic, **J. Schuck**, D. Hessman, P.J. Kindlemann, J. Hespanha, A.S. Morse, K. Karrai, I. Tiemann, S. Manus. "Fundamental limits to force detection using quartz tuning forks." *Rev. Sci. Instrum.* 71, 2776 (2000).

44. J. Larsson, P.A. Heimann, A. Lindenberg, **P. J. Schuck**, P. H. Bucksbaum, R. W. Lee, H. A. Padmore and R.W. Falcone. "Ultrafast structural changes measured by time-resolved X-ray diffraction." *Appl. Phys. A* 66, 587 (Invited paper 1998).

45. J. Larsson, Z. Chang, E. Judd, **P. J. Schuck**, R. W. Falcone , P. A. Heimann, H. A. Padmore, H. C. Kapteyn, P. Bucksbaum, M. M. Murnane, R. W. Lee, A. Machacek and J. S. Wark. "Ultrafast x-ray diffraction using a streak-camera detector in averaging mode." *Optics Letters* 22, 1012 (1997).

Book Chapters

1. M. Schmidt, P. N. Perera, P. D. Adams, A. Weber-Bargioni, **P. J. Schuck***, "Raman Spectroscopic Imaging of Biological Systems," in *Biophysical Cell Biology: Imaging Life across the Scales*; G. C. Howard, W. E. Brown, M. Auer, Editors; Oxford University Press, in prep., expected publication 2011

2. S. Cabrini, P. James Schuck, et al., "Nanophotonics Applications of Nanofabriction," Handbook of Nanofabrication, in prep. Taylor & Francis (Chapman & Hall, CRC Press, Garland Science, Marcel Dekker), expected publication 2011

3. Moerner, W. E.; **Schuck, P. J.**; Fromm, D. P.; Kinkhabwala, A.; Lord, S. J.; Nishimura, S. N.; Willets, K. A.; Sundaramurthy, A.; Kino, G.; He, M.; Lu, Z.; Twieg, R. J. "Nanophotonics and Single Molecules" in *Single Molecules and Nanotechnology*; R. Rigler and H. Vogel, Eds.; Springer Series in Biophysics, Vol. 12; Springer-Verlag: Berlin, 2008; pp 1–23.

4. G. S. Kino, A. Sundaramurthy, **P. J. Schuck**, D. P. Fromm, and W. E. Moerner, "Optical Field Enhancement with Plasmon Resonant Bowtie Nanoantennas," Chapter 9 of *Surface Plasmon Nanophotonics*, M. Brongersma and P. Kik, Editors (Kluwer, Dordrecht, The Netherlands, May 2007).

Invited Presentations

1. **"**High spatial resolution optical investigations of nanostructures and nanomaterials," University of Utah, Condensed Matter Seminar series, Salt Lake City, Utah, February 8, 2011

2. "Computational modeling for nano-plasmonic applications: an experimentalist's view," nanoHUB.org User Conference, Washington, D. C., December 8, 2010

3. "Non-perturbative visualization of nanoscale plasmonic field distributions via photon localization microsocopy," MRS Fall Meeting, Boston, MA, November, 2010

4. **"**High spatial resolution optical investigations of nanostructures and nanomaterials," Stanford University, Stanford Optical Society Seminar Series, Stanford, CA, October, 28, 2010

5. "Non-perturbative visualization of nanoscale plasmonic field distributions via photon localization microsocopy," 11th International Conference on Near-Field Optics, Nanophotonics and Related Techniques (NFO-11), August 29-September 2, 2010

6. "Plasmonic nano-optical probes for novel nanomaterial characterization," SPIE Optics + Photonics, San Diego, California, August 1, 2010

7. "Computational modeling for nano-plasmonic applications: an experimentalist's view," Network for Computational Nanotechnology (NCN), Purdue, West Lafayette, Indiana, April 28, 2010

8. "Nano-Optics and the Molecular Foundry: Controlling Localized Light and Information," Ludwig-Maximilians-Universität, Munich, Germany, Nov. 9, 2009

9. "Nanofabrication and Optical Characterization of a 3-D Optical Transformer," European Optical Society Topical Meeting on Optical Microsystems, Capri, Italy, Sept. 29, 2009

10. "Toward Complete Control of Localized Light," *Plenary Speaker*, KNOS 2009, Seoul, South Korea, Aug. 27, 2009

11. "Manipulating nanoscale light fields with localized plasmons," KAIST University, Daijun, South Korea, Aug. 26, 2009

12. "Upconverting nanocrystals as ideal single-molecule probes," Korean Research Institute for Chemical Technology, Daijun, South Korea, Aug. 25, 2009

13. "Non-blinking and photostable upconverted luminescence from single lanthanide-doped nanocrystals," 4th Hands-On Workshop on Making Single Molecule Fluorescence (Lifetime) Measurements Simple, U.C. Davis Center for Biophotonics Science and Technology, Sacramento, Ca, January 22, 2009

14. "Optically Probing the Nanoworld: Seeing Beyond Diffraction," 6th Annual Advanced Imaging Workshop, Berkley, Ca, January 21, 2009

15. "Nano-Optics: Beating Diffraction One Bowtie at a Time," Technical University of Munich, Munich, Germany, November 20, 2008

16. "Optically Probing Zeptoliter volumes with Plasmonic Nanoantennas" 5th Annual Advanced Imaging Methods Workshop, Berkeley, CA, January 17, 2008.

17. "Nano-optics: Life Beyond Diffraction," 2008 Winter Workshop on Nano Optics and Related Techniques, hosted by the Korean Nano Optical Society, Muju Resort, South Korea, Feb. 28, 2008

18. "Improving the mismatch between light and nanoscale objects using gold bowtie nanoantennas," Korea Research Institute of Chemical Technology, Daijun, South Korea, Feb. 27, 2008.

19. "Optically Probing the Nanoworld: Life Beyond Diffraction," POSTECH University, Department of Chemistry, Pohang, South Korea, March 3, 2008.

20. "Beating Diffraction One Bowtie at a Time," Seoul National University, Department of Physics, Seoul, South Korea, March 4, 2008.

21. "Optically Probing the Nanoworld: Beating Diffraction One Bowtie at a Time," Korea University, Department of Physics, Seoul, South Korea, March 4, 2008.

22. "Technologies Based on Nano-optics," Technology and Inventors Expo for Venture Capitalists, LBNL, Jan. 30, 2008

23. "Nano-optics: Beating Diffraction One Bowtie at a Time," U. C. Berkeley Nanosciences and Nanoengineering Institute *Nano Seminar*, April 25, 2008.

24. "Toward nanoscale optical lithography: utilizing the near-field of bowtie optical nanoantennas," EIPBN Conference, May 28 – June 1, 2007.

25. "Two-Photon Single-Molecule Fluorescence of DCDHF Fluorophores," Stanford Photonics Research Center Annual Meeting, Stanford, CA, September 2004.

Conference Abstracts

1. P. James Schuck, "Toward Complete Control of Localized Light," *Plenary Speaker*, Korean Nano Optical Society 2009, KINTEX, Korea, August 26-28, 2009
2. P. James Schuck, "Toward complete control of localized light," EOS Topical Meeting on Optical Microsystems, *Invited Talk*, September 27-30, 2010, Capri, Italy
3. P. James Schuck**,** A. Weber-Bargioni, S. Dhuey, S. Cabrini, A. Jamshidi, M. Wu, "Manipulating the Local Symmetry and Geometry of Optical Antennae, and Integrating them into Useful Devices," Functionalized Plasmonic Nanostructures for Biosensing, Monte Verita, Switzerland, April 18-23, 2010
4. P. James Schuck, Z. Zhang, A. Weber-Bargioni, S. W. Wu, S. Dhuey, S. Cabrini, "Manipulating nano-scale light fields with the asymmetric bowtie nano-colorsorters," CLEO/QELS, San Jose, May 2010
5. A. S. McLeod, P. James Schuck, J. B. Neaton, "Finite difference time domain studies of plasmonic nanostructures across wide frequency ranges," CLEO/QELS, San Jose, May 2010
6. A. Weber-Bargioni, S. Dhuey, D. F. Ogletree, P. James Schuck, S. Cabrini, "Manipulating the local symmetry and geometry of bowtie optical antennae for controlling spectral properties while maintaining the near-field enhancement," 54th EIPBN Conference, Anchorage, Alaska, June 1-4, 2010
7. P. James Schuck, "Controlling optical near-fields with plasmonic nanoantennae: Nanoscale imaging," Gordon Research Conference – Plasmonics, June 13-18, 2010
8. S. W. Wu, G. Han, D. Milliron, S. Aloni, M. V. P. Altoe, D. Talapin, B. E. Cohen, P. James Schuck, "Non-blinking and photostable upconverted luminescence from single lanthanide-doped nanocrystals," 2010 APS March Meeting, Portlandn Oregon
9. P. James Schuck, A. McLeod, A. Weber-Bargioni, Z. Zhang, S. Dhuey, B. Harteneck, J. B. Neaton, S. Cabrini, "Non-perturbative visualization of nanoscale plasmonic field distributions via photon localization microscopy," 36th International Conference on Micro and Nano Engineering, Genoa, Italy, September 19-22, 2010
10. P. J. Schuck, S. Wu, A. Weber-Bargioni, Z. Zhang, M. Schmidt, D. F. Ogletree, P. Ashby, H. Choo, J. Bokor, S. Cabrini, A. Schwartzberg, J. Urban, P. Adams, M. Salmeron, "Toward complete control of localized light and its interactions with matter," 2009 DOE NSRC Contractors Meeting, Annapolis, Maryland
11. P. James Schuck, A. McLeod, A. Weber-Bargioni, Z. Zhang, S. Dhuey, B. Harteneck, J. B. Neaton, S. Cabrini, "Non-perturbative visualization of nanoscale plasmonic field distributions via photon localization microscopy," *Invited Talk*, 11th International Conference on Near-Field Optics, Nanophotonics and Related Techniques (NFO-11), August 29-September 2, 2010
12. M. Fleischer, B. Zeeb, A. Weber-Bargioni, M.V.P. Altoe, A.M. Schwartzberg, D. Zhang, K. Braun, S. Jaeger, Y. Fulmes, C. Schaefer, A.J. Meixner, P.J. Schuck, S. Cabrini, and D.P. Kern, "Gold nanocone antenna scanning probes," 11th International Conference on Near-Field Optics, Nanophotonics and Related Techniques (NFO-11), August 29-September 2, 2010
13. D. L. Olynick, A. Schipotinin, S. D. Dhuey, S. Cabrini and P. J. Schuck, "An alternative electron beam exposure mechanism for hydrogen silsesquioxane – a Raman and FTIR study," EIPBN Conference, Portland, Oregon, June 2008.

14. Weber-Bargioni, B. Hartneck, P.J. Schuck, S. Cabrini "Novel Approach for the Fabrication and Precise Placement of Optical Antennas" 2nd International Workshop on Focused Electron Beam Induced Processing Thun CH, Accepted, July 2008
15. Weber-Bargioni, B. Hartneck, P.J. Schuck, S. Cabrini "Novel Approach for the Fabrication and Precise Placement of Optical Antennas" MNE 2008 Athen GR, September 2008
16. P.J. Schuck, D.P. Fromm, A. Sundaramurthy, A. Kinkhabwala, N.R. Conley, G.S. Kino, W.E. Moerner, S. Dhuey, S. Cabrini, "Toward nanoscale optical lithography: utilizing the near-field of bowtie optical nanoantennas," EIPBN Conference, May 28 – June 1, 2007.
17. Moerner WE, Cohen A, Fromm D, Kim SY, Nishimura S, Schuck PJ, McConnell HM, "Single-molecule biophysics, nanophotonics, and trapping," Abstracts of Papers of the American Chemical Society **230**, U336 (2005).

Laboratory Service

Molecular Foundry, Imaging and Manipulation Facility Staff Scientist search sommittee, 2010
Molecular Foundry Director search committee, 2009
Organizer and team captain, Molecular Foundry softball team, summers 2009, 2010
Speaker, 6th Annual Laser Safety Officers Workshop, Ken Barat organizer, LBNL, July 27-29, 2010
Speaker, ALS Science Café, Fall 2010
LBNL Video Glossary, contribution of "Plasmon" definition entry
"In Conversation with…" Seminar Series Speaker, July 2009
Design of online laser safety course, with LBNL laser safety officer Ken Barat and MSD safety officer Rick Kelly
High School Student Research Participant Program Mentor, June-August 2008
MSD EH&S subcommittee alternate, May 2006-present
Frequent Foundry tour guide, 2006-present