

Curriculum Vitae

Maxim Sukharev
Position: Associate Professor
Tel.: 480 727 1398
E-mail: maxim.sukharev@asu.edu

Address: Department of Physics
Arizona State University
Tempe, AZ 85287
URL: <http://sukharev.faculty.asu.edu>

PROFESSIONAL EXPERIENCE

Year	Institution	Position
08/2016 – present	Department of Physics, Arizona State University	Associate Professor (joint appointment)
05/2014 – present	Applied Sciences and Mathematics Faculty, College of Integrative Sciences and Arts, Arizona State University	Associate Professor (joint appointment)
08/2008 – 04/2014	Applied Sciences and Mathematics Faculty, College of Letters and Sciences, Arizona State University	Assistant Professor
10/2010 – present	Ira A. Fulton School of Electrical, Computer, and Energy Engineering, Arizona State University	Graduate Faculty <i>Endorsed to Chair</i>
10/2008 – present	Department of Physics, Arizona State University	Graduate Faculty <i>Endorsed to Chair</i>
07/2003 – 7/2008	Department of Chemistry, Northwestern University	Postdoctoral Fellow
09/2001 – 01/2003	CNRS Laboratory for Molecular Photophysics, University of Paris South XI, Orsay, France	CNRS Postdoctoral Fellow

VISITING AND INVITED POSITIONS

Year	Institution	Position
06/2017 – 07/2017	Centre de Recherche Paul-Pascal, Pessac, France	IdEx Bordeaux Visiting Professor
07/2016 – 08/2016	Sackler Visiting Chair, School of Chemistry, Tel Aviv University, Tel Aviv, Israel	Sackler Visiting Chair
03/2016 – 05/2016	Department of Chemistry, University of Pennsylvania, Philadelphia	Invited Professor
02/2016	CNRS Laboratory of Molecular Photophysics, University of Paris South XI, Orsay, France	Invited CNRS Professor
5/2013 – 7/2013	Air Force Research Laboratory, Materials and Manufacturing Directorate, Wright-Patterson Air Force Base	Visiting Scientist
07/2012	Institute of Physics at São Carlos, University of São Paulo, São Carlos, Brazil	Invited Professor
06/2011	CNRS Laboratory of Molecular Photophysics, University of Paris South XI, Orsay, France	Invited CNRS Professor

HONORS AND AWARDS

- IdEx Bordeaux Visiting Professor (June-July 2017), IdEx Bordeaux Scholarship, Centre de Recherche Paul-Pascal, France.
- Sackler Visiting Chair (July–August 2016), School of Chemistry, Tel Aviv University, Tel Aviv, Israel.
- CNRS Invited Professorship (spring of 2016) at CNRS Laboratory of Molecular Photophysics, University of Paris South XI, Orsay, France.
- Summer Faculty Fellowship Award by the US Air Force (10 weeks in the summer of 2013) at Wright-Patterson Air Force Base (Materials and Manufacturing Directorate), Dayton, OH. The award included a stipend for a Ph.D. student.
- São Paulo Research Foundation (FAPESP) Visiting Professorship (summer of 2012) at Institute of Physics at São Carlos, University of São Paulo, São Carlos, Brazil.

- CNRS Invited Professorship (summer of 2011) at CNRS Laboratory of Molecular Photophysics, University of Paris South XI, Orsay, France.
- Department of Energy Innovative and Novel Computational Impact on Theory and Experiment (**INCITE**) award (2007).
- The French Ministry of Research Postdoctoral Fellowship (2001 – 2002).
- Soros Postgraduate Student Award (2000).

EDUCATION

- **Department of High-Power Lasers, General Physics Institute of Russian Academy of Sciences, Moscow, Russia**
Ph.D. in Laser Physics (2000)
Advisor: Professor Mikhail V. Fedorov
Co-advisor: Professor Vladimir P. Krainov
Dissertation: “*Interactions between diatomic molecules, their ions and strong laser fields*”.
- **Moscow Engineering Physics Institute, Moscow, Russia**
M.Sc. in Theoretical Physics (1997)
Advisor: Professor Vladimir P. Krainov
Thesis: “*Ionization and dissociation of H_2 in laser fields*”.

RESEARCH

GRANTS

- Air Force Office of Scientific Research (2015 – 2018): *Optics of plasmon-exciton nanomaterials in the strong coupling limit: self-consistent studies*.
- United States–Israel Binational Science Foundation (2015 – 2019): *Photochemistry and photophysics at plasmonic interfaces*. Collaborative proposal with Prof. Abraham Nitzan (Tel Aviv University, Israel).

PUBLICATION LIST

H-index = 20, i10-index¹ = 36. The total number of citations (as of August, 2017) is 1170².

The list of impact factors of journals, in which I published my papers

<i>ACS Nano</i>	(1 paper)	12.06
<i>ACS Photonics</i>	(1 paper)	5.40
<i>Journal of Chemical Physics</i>	(13 papers)	3.33
<i>Laser Physics</i>	(5 papers)	3.61
<i>Journal of Experimental and Theoretical Physics</i>	(2 papers)	1.03
<i>Journal of Physics: Condensed Matter</i>	(1 accepted)	2.21
<i>Journal of Physical Chemistry A</i>	(1 paper)	2.95
<i>Journal of Physical Chemistry C</i>	(3 papers)	4.81
<i>Journal of the European Optical Society</i>	(1 paper)	1.04
<i>Journal of Optical Society of America B</i>	(1 paper)	2.19
<i>Journal of Physics B</i>	(1 paper)	3.70
<i>International Journal of Quantum Chemistry</i>	(1 paper)	1.30
<i>Laser Physics Letters</i>	(1 paper)	9.97
<i>Molecular Physics</i>	(1 paper)	1.67

¹ i10-index is the number of publications with at least 10 citations. This index is a good indication of a positive trajectory if it is greater than current H-index.

² The data provided in accordance to Google Scholar: <http://scholar.google.com/citations?hl=en&user=7HkylvgAAAAJ>

<i>Nanoletters</i>	(1 paper)	13.20
<i>Nature Physics</i>	(1 paper)	18.97
<i>Optics Letters</i>	(2 papers)	3.40
<i>Physical Review A</i>	(7 papers)	2.88
<i>Physical Review B</i>	(6 papers)	3.69
<i>Physical Review E</i>	(1 paper)	2.26
<i>Physical Review Letters</i>	(4 papers)	7.37
<i>Optics and Photonics News</i>	(1 paper)	1.75
<i>Scientific Reports</i>	(1 paper)	5.23
<i>Quantum Electronics</i>	(1 paper)	1.88

PUBLISHED AND ACCEPTED PAPERS IN THE REFEREED JOURNALS

1. “Topical Review: optics of exciton-plasmon nanomaterials”, M. Sukharev, A. Nitzan, *Journal of Physics: Condensed Matter* (in press, 2017). <https://arxiv.org/abs/1704.05605>
2. “Molecular plasmonics: strong coupling at the low concentration limit”, L. Efremushkin, M. Sukharev, A. Salomon, *Journal of Physical Chemistry C* **121**, 14819 (2017).
3. “Plasmonic opals: observation of collective molecular exciton mode beyond the strong coupling”, P. Fauche, C. Gebhardt, M. Sukharev, R. A. L. Vallee, *Scientific Reports* **7**, 4107 (2017).
4. “Molecular plasmonics: the role of ro-vibrational molecular states in exciton-plasmon materials under strong coupling conditions”, M. Sukharev, E. Charron, *Physical Review B* **95**, 115406 (2017).
5. “Photon echo in exciton-plasmon nanomaterials: a time-dependent signature of strong coupling”, A. Blake, M. Sukharev, *Journal of Chemical Physics* **146**, 084704 (2017).
6. “Non-Hermitian wave packet approximation for coupled two-level systems in weak and intense fields”, R. Puthumpally-Joseph, M. Sukharev, E. Charron, *Journal of Chemical Physics* **144**, 154109 (2016).
7. “Plasmon transmission through excitonic subwavelength gaps”, M. Sukharev, A. Nitzan, *Journal of Chemical Physics* **144**, 144703 (2016).
8. “Surface plasmon-polaritons in periodic arrays of V-grooves strongly coupled to quantum emitters”, A. Blake, M. Sukharev, *Physical Review B* **92**, 035433 (2015).
9. “Optical response of hybrid plasmon-exciton nanomaterials in the presence of overlapping resonances”, M. Sukharev, P. N. Day, R. Pachter, *ACS Photonics* **2**, 935 (2015).
10. “Coherent phase control of internal conversion in pyrazine”, R. J. Gordon, Z. Hu, T. Seideman, S. Singha, M. Sukharev, Y. Zhao, *Journal of Chemical Physics* **142**, 144311 (2015).
11. “Theoretical analysis of dipole-induced electromagnetic transparency”, R. Puthumpally-Joseph, O. Atabek, M. Sukharev, E. Charron, *Physical Review A* **91**, 043835 (2015).
12. “Collective effects in subwavelength hybrid systems: a numerical study”, M. Sukharev and S. Malinovskaya, *Molecular Physics* **113**, 392 (2014).
13. “Dipole-induced electromagnetic transparency”, R. Puthumpally-Joseph, M. Sukharev, O. Atabek, E. Charron, *Physical Review Letters* **113**, 163603 (2014).
14. “Control of optical properties of hybrid materials with chirped femtosecond laser pulses under strong coupling conditions”, M. Sukharev, *Journal of Chemical Physics* **141**, 084712 (2014).
15. “Numerical calculations of radiative and non-radiative relaxation of molecules near metal particles”, M. Sukharev, N. Freifeld, and A. Nitzan, *Journal of Physical Chemistry C* **118**, 10545 (2014).
16. “Ultrafast energy transfer between molecular assemblies and surface plasmons in hybrid nano-materials in the strong coupling regime”, M. Sukharev, T. Seideman, R. J. Gordon, A. Salomon, and Y. Prior, *ACS Nano* **8**, 807 (2014).

17. "Non-Hermitian wave packet propagation for the calculation of optical properties of ensembles of coupled quantum emitters", E. Charron and M. Sukharev, *Journal of Chemical Physics* **138**, 024108 (2013).
18. "Molecular nanoplasmonics: self-consistent electrodynamics in current carrying junctions", A. White, M. Sukharev, and M. Galperin, *Physical Review B* **86**, 205324 (2012).
19. "Stimulated Raman adiabatic passage as a route to achieving optical control in plasmonics", M. Sukharev and S. A. Malinovskaya, *Physical Review A* **86**, 043406 (2012).
20. "Strong coupling between molecular excited states and surface plasmon modes of a slit array in a thin metal film", A. Salomon, R. J. Gordon, Y. Prior, T. Seideman, and M. Sukharev, *Physical Review Letters* **109**, 073002 (2012).
21. "Numerical studies of the interaction of an atomic sample with the electromagnetic field in two dimensions", M. Sukharev and A. Nitzan, *Physical Review A* **84**, 043802 (2011).
22. "Light-induced current in molecular junctions: local field and non-Markov effects", B. D. Fainberg, M. Sukharev, T.-H. Park, and M. Galperin, *Physical Review B* **83**, 205425 (2011).
23. "Surface-enhanced Raman scattering from silver-coated opals", W. Mu, D.-Q. Hwang, R. P. H. Chang, M. Sukharev, D. B. Tice, and J. B. Ketterson, *Journal of Chemical Physics* **134**, 124312 (2011).
24. "Computational nano-optics: parallel simulations and beyond", M. Sukharev, *Optics and Photonics News* **22**, 29 – 33 (2011).
25. "Transport and optical response of molecular junctions driven by surface plasmon-polaritons", M. Sukharev and M. Galperin, *Physical Review B* **81**, 165307 (2010).
26. "One-dimensional long-range plasmonic-photonic structures", W. Mu, D. B. Buchholz, M. Sukharev, J. Jang, R. P. H. Chang, and J. B. Ketterson, *Optics Letters* **35**, 550 (2010).
27. "Nonadiabatic photodissociation dynamics of F₂ in solid Ar", M. Sukharev, A. Cohen, R. B. Gerber, and T. Seideman, invited paper *Laser Physics* **19**, 1651 (2009).
28. "Perfect coupling of light to surface plasmons with ultra-narrow linewidths", M. Sukharev, P. R. Sievert, T. Seideman, and J. B. Ketterson, *Journal of Chemical Physics* **131**, 034708 (2009).
29. "Optical properties of metal tips for tip-enhanced spectroscopies", M. Sukharev and T. Seideman, invited paper *Journal of Physical Chemistry A* **113**, 7508 (2009).
30. "Laser field alignment of organic molecules on semiconductor surfaces: toward ultra-fast molecular switches", M. G. Reuter, M. Sukharev, and T. Seideman, *Physical Review Letters* **101**, 208303 (2008).
31. "Optimal design of nanoplasmonic materials using genetic algorithms as a multi-parameter optimization tool", J. Yelk, M. Sukharev, and T. Seideman, *Journal of Chemical Physics* **129**, 064706 (2008).
32. "Nanoparticle spectroscopy: birefringence in 2D arrays of L-shaped silver nanoparticles", J. Sung, M. Sukharev, E. M. Hicks, R. P. Van Duyne, T. Seideman, and K. G. Spears, *Journal of Physical Chemistry C* **112**, 3252 (2008).
33. "Optical properties of metal nanoparticles with no center of inversion symmetry: observation of volume plasmons", M. Sukharev, J. Sung, K. G. Spears, and T. Seideman, *Physical Review B* **76**, 184302 (2007).
34. "Numerical analysis of a slit-groove diffraction problem", M. Besbes, J.P. Hugonin, P. Lalanne, S. van Haver, O. T. A. Jansse, A.M. Nugrowati, M. Xu, S. F. Pereira, H. P. Urbach, A. S. van de Nes, P. Bienstman, G. Granet, S. Helfert, M. Sukharev, T. Seideman, F. I. Baida, B. Guizal, D. Van Labeke, *Journal of the European Optical Society: Rapid Publications* **2**, 07022 (2007).
35. "Light trapping and guidance in plasmonic nanocrystals", M. Sukharev and T. Seideman, *Journal of Chemical Physics* **126**, 204702 (2007).
36. "Coherent control of light propagation via nanoparticle arrays", M. Sukharev and T. Seideman, invited paper, *Journal of Physics B: Atomic, Molecular & Optical Physics* **40**, S283 (2007).

37. "Surface quality and surface waves on subwavelength-structured silver films", G. Gay, O. Alloschery, J. Weiner, H. J. Lezec, C. O'Dwyer, M. Sukharev, and T. Seideman, *Physical Review E* **75**, 016612 (2007).
38. "The response of nanostructured surfaces in the near field", G. Gay, O. Alloschery, J. Weiner, H. J. Lezec, C. O'Dwyer, M. Sukharev, and T. Seideman, *Nature Physics*, **2**, 792 (2006).
39. "Coherent control approaches to light guidance in the nanoscale", M. Sukharev and T. Seideman, *Journal of Chemical Physics*, **124**, 144707 (2006).
40. "Phase and polarization control as a route to plasmonics nanodevices", M. Sukharev and T. Seideman, *Nanoletters*, **6**, 715 (2006).
41. "Optical control of nonradiative decay in polyatomic molecules", M. Sukharev and T. Seideman, *Physical Review A*, **71**, 012509 (2005).
42. "Optimal control approach to suppression of radiationless transitions", M. Sukharev and T. Seideman, *Physical Review Letters*, **93**, 093004 (2004).
43. "Influence of electron correlations on strong field ionization of calcium", E. Charron, M. Sukharev, and A. Suzor-Weiner, *Laser Physics Letters*, **1**, 18 (2004).
44. "Approximations of adiabatic elimination of the continuum for the calculation of photodissociation in intense laser fields", M. Sukharev, E. Charron, A. Suzor-Weiner, and M. V. Fedorov, *International Journal of Quantum Chemistry*, **99**, 452 (2004).
45. "Enhancement of strong-field two-electron ionization", M. Sukharev, E. Charron, and A. Suzor-Weiner, *Laser Physics*, **13**, 484 (2003).
46. "Excitation of sound waves upon propagation of laser pulses in optical fibers" (invited paper), A. S. Biriukov, M. Sukharev, and E. M. Dianov, *Quantum Electronics*, **32**, 765 (2002).
47. "Quantum control of double ionization of calcium", M. Sukharev, E. Charron, and A. Suzor-Weiner, *Physical Review A*, **66**, 053407 (2002).
48. "Interference stabilization of molecules with respect to photodissociation by a strong laser field", M. Sukharev and M.V. Fedorov, *Physical Review A*, **65**, 033419 (2002).
49. "Strong-field interference stabilization in molecules", M. Sukharev and M.V. Fedorov, *Laser Physics*, **12**, 491 (2002).
50. "Population effects in high-order harmonic generation by the hydrogen molecular ion in a strong laser field", M. E. Sukharev and V. P. Krainov, *Physical Review A*, **62**, 033404 (2000).
51. "Electrostrictive response in single-mode ring-index-profile fibers", E. M. Dianov, M. E. Sukharev, and A. S. Biriukov, *Optics Letters*, **25**, 390 (2000).
52. "Vibration, rotation, and dissociation of molecular ions in a strong laser field", M. Sukharev and V. P. Krainov, *Journal of Optical Society of America B*, **15**, 2201 (1998).
53. "Rotation and alignment of diatomic molecules and their molecular ions in strong laser field", M. Sukharev and V. P. Krainov, *Journal of Experimental and Theoretical Physics*, **86**, 318 (1998).
54. "Dissociation of hydrogen and deuterium molecular ions by strong low-frequency laser field", M. Sukharev and V. P. Krainov, *Laser Physics*, **7**, 803 (1997).
55. "Field-dependent Franck-Condon factors for the ionization of molecular hydrogen and deuterium", M. Sukharev and V. P. Krainov, *Laser Physics*, **7**, 323 (1997).
56. "Franck-Condon factors for the ionization of hydrogen and deuterium molecules in laser fields", M. Sukharev and V. P. Krainov, *Journal of Experimental and Theoretical Physics* **83**, 457 (1996).

INVITED BOOK CHAPTERS

1. “Optics of hybrid nanomaterials in the strong coupling regime”, A. Blake and M. Sukharev, in “Nanoscale Materials and Devices for Electronics, Photonics and Solar Energy”, ed. S. Goodnick, A. Korokin, and R. Nemanich (ISBN 9783319186337, Springer, 2015).
2. “Linear optical properties of periodic hybrid materials at oblique incidence: a numerical approach”, A. Blake and M. Sukharev, in Review Volume “From Atomic to Mesoscale: The Role of Quantum Coherence in Systems of Various Complexity”, ed. I. Novikova and S. Malinovskaya (ISBN 9789814678698, World Scientific, 2015).
3. “Plasmonics – computational approach”, M. Sukharev, in “Mathematical Optics: Classical, Quantum, and Imaging Methods”, ed. V. Lakshminarayanan (ISBN 9781439869604, CRC Press, 2012).
4. “Finite-difference time-domain technique”, M. Sukharev, in Encyclopedia of Nanotechnology, Section on Nano-optical Devices (ISBN 9789048197514, Springer, 2012).
5. “Plasmonics: towards a new paradigm for light manipulation at the nanoscale”, M. Sukharev, in “Nanobiophotonics”, ed. G. Popescu, (ISBN 9780071737012, McGraw-Hill, 2010).

PAPERS FOR GENERAL AUDIENCE

“Physics of nano-optics spur sophisticated models”, M. Sukharev, *Laser Focus World Magazine* **47**, 39 (2011).

CONFERENCE PROCEEDINGS

1. “Phase-Polarization Control as a Route to Plasmonics Nanodevices”, M. Sukharev and T. Seideman, *Proceedings of SPIE*, **6115**, 611517 (2006).
2. “Electrostriction-induced acoustic response in single-mode ring-index profile fibers with larger than $100\mu\text{m}^2$ effective mode area”, Y. Jaouën, E. M. Dianov, L. du Mouza, A. S. Biriukov, M. Sukharev, G. Debarge, P. Nouchi, and L. A. de Montmorillon, *Proceedings of European Conference of Optical Communication 2000*, **3**, 95 (2000).
3. “Electrostrictive response in single-mode ring-index-profile fibers”, E. M. Dianov, M. Sukharev, and A. S. Biriukov, *Proceedings of SPIE*, **4083**, 23 (2000).
4. “Electrostrictive response in single-mode ring-index profile with large effective mode area”, E. M. Dianov, M. E. Sukharev, and A. S. Biriukov, *IEEE Proceedings (Optical Fiber Communication Conference 2000)*, paper ThR5-1, **3**, 264 (2000).

PRESS RELEASES

- 2016 Editor’s Choice – “Non-Hermitian wave packet approximation for coupled two-level systems in weak and intense fields”, R. Puthumpally-Joseph, M. Sukharev, E. Charron, *Journal of Chemical Physics* **144**, 154109 (2016) <http://scitationinfo.org/p/1XPS-38J/jcpeditorschoice2016>
- “Light-matter interaction can turn opaque materials transparent”, Lisa Zyga, *Phys.org*, October 2014. <http://phys.org/news/2014-10-light-matter-interaction-opaque-materials-transparent.html>
- “Step in line”, Research Highlights, *Nature Photonics*, Vol. 3, January 2009, p. 5.
- “Numerical Approach Guides Light in the Nanoscale”, Argonne Leadership Computing Facilities, Project Highlights http://www.alcf.anl.gov/collaborations/projects/control_light.php

- “*INCITE Allocation Helps Achieve Coherent Control of Light in Nanoscale Devices*”, ASCR DOE computing news roundup, September 2007:
<http://www.er.doe.gov/ascr/News/MonthlyNewsRoundup9-07.html>
- “*Toward Coherent Control in the Nanoscale*”, Tamar Seideman, 2physics.com, June 2007.
<http://2physics.blogspot.com/2007/06/toward-coherent-control-in-nanoscale.html>
- “*Tiny spheres could control light*”, Belle Dumé, *Physicsweb.org*, June 2007.
<http://physicsweb.org/articles/news/11/6/7/1>
- “*Nanoparticle arrays control light*”, Belle Dumé, *Nanotechweb.org*, June 2007.
<http://nanotechweb.org/articles/news/6/6/11/1>
- “*Guiding light in the nanoscale via nanoparticle arrays*”, Michael Berger, *Nanowerk*, March 2006.
<http://www.nanowerk.com/spotlight/spotid=318.php>

INVITED TALKS

1. “*The quest of strongly coupled nanomaterials: from collective exciton resonances to nonlinear spectroscopy*”, invited seminar, **Center de Recherche Paul Pascal, CNRS**, Pessac, France, July 6, 2017.
2. “*The quest of strongly coupled nanomaterials: from collective exciton resonances to nonlinear spectroscopy*”, invited seminar, invited seminar, **Laboratory of Charles Fabry, Institute d’Optique**, France, June 22, 2017.
3. “*Modeling aspects of molecular plasmonics*”, invited seminar, **Department of Chemistry, University of California at San Diego**, December 13, 2017.
4. “*Molecular plasmonics: optics of molecular aggregates at plasmonic interfaces*”, invited seminar, **Department of Chemistry, University of California at Los Angeles**, October 11, 2017.
5. “*Molecular plasmonics*”, **Special seminar, Institute of Nanotechnology, Bar-Ilan University**, Rama-Gan, Israel, July 31, 2016.
6. “*Modeling aspects of optical phenomena in exciton-plasmon materials*”, **Physics Colloquium, Department of Physics, Lehigh University**, Bethlehem, April 27, 2016.
7. “*Modeling aspects of optical phenomena in exciton-plasmon materials*”, **Physical Chemistry Seminar, Department of Chemistry, University of Pennsylvania**, Philadelphia, April 21, 2016.
8. “*Optical functionality of plasmon-exciton nanomaterials in the strong coupling regime*”, invited talk, **APS meeting**, Baltimore, March 14, 2016.
9. “*Optical phenomena at plasmonic interfaces*”, invited seminar, **Center de Recherche Paul Pascal, CNRS**, Pessac, France, February 19, 2016.
10. “*Optical phenomena at plasmonic interfaces*”, invited seminar, **ISMO, University Paris-SUD**, Orsay, France, February 17, 2016.
11. “*Optical properties of molecular aggregates at plasmonic interfaces*”, invited talk, **QuASI: Workshop on Quantum Sensing and Atom-Surface Interaction**, Natal, Brazil, August 17 – 19, 2015.
12. “*Optics of hybrid nanomaterials*”, invited talk, **Seminar on Multiphoton Processes**, General Physics Institute of Russian Academy of Sciences, Moscow, Russia, December 24, 2014.
13. “*Ultra-fast optics of hybrid materials under strong coupling conditions*”, invited talk, **ITAMP workshop – from atomic to mesoscale: the role of quantum coherence in systems of various complexities**, Cambridge, March 10 – 12, 2014.

14. “*Optical properties of nanoscale hybrid materials*”, invited talk, **Nano and Giga Challenges in Electronics, Photonics, and Renewable Energy**, Tempe, March 10 – 14, 2014.
15. “*Nano-optics 101: why do we need this and why should we care?*” invited colloquium, **Department of Physics, Northern Arizona University**, Flagstaff, October 28, 2013.
16. “*Transient spectroscopy of hybrid materials: ultra-fast energy transfer between surface plasmons and molecular aggregates*”, invited oral presentation, **Workshop on Surface Plasmons, Metamaterials, and Catalysis**, Rice University, Houston, October 21 – October 23, 2013.
17. “*Molecular nanoplasmonics: a self-consistent approach*”, invited hot topic presentation, **Gordon Research Conference: Quantum Control of Light and Matter**, Mount Holyoke College, July 29 – August 2, 2013.
18. “*Optics of hybrid nano-materials: merging electromagnetics with quantum dynamics*”, invited seminar, **Department of Chemistry, Northwestern University**, Evanston, April 19, 2013.
19. “*Optics of hybrid nano-materials: merging electromagnetics with quantum dynamics*”, invited seminar, **Department of Chemistry, University of Illinois at Chicago**, Chicago, April 18, 2013.
20. “*Optics of hybrid nano-materials: merging electromagnetics with quantum dynamics*”, invited Nanoscale Seminar Series, **Department of Physics, Arizona State University**, Tempe, April 4, 2013.
21. “*Molecular nanoplasmonics in linear and nonlinear regimes*”, plenary lecture, **2nd International Symposium on Nanoscience and Nanomaterials, National Autonomous University of México at Ensenada**, Mexico, March 4 – 8, 2013.
22. “*Optical properties of quantum systems strongly coupled to metal nano-materials: linear and nonlinear dynamics*”, invited talk, **6th International Conference on Multiscale Materials Modeling (MMM2012)**, Singapore, October 15 – 19, 2012.
23. “*Optics of hybrid nano-materials: self-consistent studies*”, invited University seminar, **Nanotechnology Program Seminar Series, Stevens Institute of Technology**, Hoboken, September 26, 2012.
24. “*Linear and nonlinear optics of nano-materials – a self-consistent approach*”, invited seminar, **Institute of Physics at São Carlos, University of São Paulo**, Brazil, December 14, 2011.
25. “*Electrodynamics of quantum many-body systems optically coupled to plasmonic materials*”, invited seminar, **ISMO at University Paris South XI**, Orsay, France, June 10, 2011.
26. “*Computational nano-optics: parallel simulations and beyond*”, plenary lecture, **Center for Nanoscience and Nanotechnology, National Autonomous University of México**, Ensenada, Mexico, February 23 – 25, 2011.
27. “*Optics at the nanoscale: computational studies*”, invited seminar, **Seagate Technology, Research Division**, Bloomington, Minnesota, February 4, 2011.
28. “*Ab initio electrodynamics of multi-level media optically coupled to metal nanostructures*”, invited talk, **the Winter Colloquium on the Physics of Quantum Electronics**, Snowbird, Utah, January 2 – 6, 2011.
29. “*Ab initio description of spatiotemporal dynamics of multi-level atoms resonantly coupled to plasmonic materials*”, plenary lecture, **2010 NanoBiophotonics Summer School, University of Illinois at Urbana-Champaign**, June, 2010.
30. “*Computational aspects of nano-optics*”, invited colloquium, **Department of Physics and Astronomy, Western Kentucky University**, April 12, 2010.
31. “*Optimal design of advanced plasmonic materials for nano-optics optics*”, plenary lecture, **2009 NanoBiophotonics Summer School, University of Illinois at Urbana-Champaign**, June, 2009.
32. “*Optimal design of advanced plasmonic materials for subwavelength optics*”, Nanotechnology Program Seminar Series, **Stevens Institute of Technology**, Hoboken, February 11, 2009.

33. “*Optics at the nanoscale: coherent control of light and matter beyond the diffraction limit*”, invited seminar, **Nanoscale Science Seminar, Department of Physics, Arizona State University**, Tempe, September 22, 2008.
34. “*Optics at the nanoscale: coherent control of light and matter beyond the diffraction limit*”, invited seminar, **Department of Chemistry, Loyola University**, Chicago, March 27, 2008.
35. “*Plasmon resonance assisted manipulation of light in nanoscale*”, invited colloquium, **Department of Physics and Astronomy, Western Kentucky University**, April 30, 2007.
36. “*Plasmon resonance assisted manipulation of light in nanoscale*”, invited seminar, **The Frederick Seitz Materials Research Laboratory Seminar, University of Illinois at Urbana-Champaign**, March 1, 2007.
37. “*Optics of nanomaterials: coherent and optimal control of light in nanoscale*”, invited colloquium, **Department of Physics and Astronomy, Northwestern University**, August 11, 2006.
38. “*Applications of phase, polarization and optimal control techniques in nanoplasmonics*”, invited seminar, **Field and Optics Seminar, School of Electrical and Computer Engineering, Purdue University**, April 28, 2006.

CONTRIBUTED TALKS

1. AFOSR annual review talk.
2. Poster presentation: “*Optics of molecular aggregates at plasmonic interfaces*”, Maxim Sukharev (presenter), **Gordon Research Conference: Plasmonics & Nanophotonics**, Sunday River, July 7 – July 15, 2016.
3. “*Nonlinear optics of hybrid nano-materials under strong coupling conditions*”, Maxim Sukharev (presenter), **APS meeting**, Denver, March, 2014.
4. Poster presentation: “*Optics of hybrid nano-materials: merging coherent control with nano-optics*”, Maxim Sukharev (presenter), **Gordon Research Conference: Quantum Control of Light and Matter**, Mount Holyoke College, July 29 – August 2, 2013.
5. “*Stimulated Raman adiabatic passage as a route to achieving optical control in plasmonics*”, Maxim Sukharev (co-author), Svetlana Malinovskaya (speaker), **the Winter Colloquium on the Physics of Quantum Electronics**, Snowbird, Utah, January 6 – 10, 2013.
6. “*Ab initio spatiotemporal dynamics of atoms resonantly coupled to plasmonic materials*”, Maxim Sukharev (speaker), **Nano-optics Plasmonics Conference**, National Institute of Standards and Technology, Gaithersburg, April 22, 2010.
7. “*Perfect coupling of light to surface plasmons with ultra-narrow linewidths*”, Maxim Sukharev (speaker), John B. Ketterson (co-author), Tamar Seideman (co-author), **APS meeting**, Pittsburgh, March, 2009.
8. Poster presentation: “*Genetic algorithms as a multi-parameter design tool for plasmonic devices*”, Joseph Yelk (undergraduate student, presenter), Maxim Sukharev (co-author, mentor), Tamar Seideman (co-author, mentor), **Gordon Research Conference: Quantum Control of Light and Matter**, Salve Regina University, Newport RI, USA, August 12 – 17, 2007.
9. Poster presentation: “*Coherent and optimal control of light at the nanoscale*”, Maxim Sukharev (presenter), Tamar Seideman (co-author), **Gordon Research Conference: Quantum Control of Light and Matter**, Salve Regina University, Newport RI, USA, August 12 – 17, 2007.
10. “*Coherent control of light via plasmon resonance in nanoscale*”, Maxim Sukharev (speaker), Tamar Seideman (co-author), **13th International Conference on Unconventional Photoactive Systems**, Northwestern University, Evanston, IL, USA, August 5 – 9, 2007.

11. (hot topic): “*Applications of phase, polarization and optimal control techniques in nanoplasmonics*”, Maxim Sukharev (speaker), Tamar Seideman (co-author), **Gordon Research Conference “Multiphoton processes”**, Tilton School, NH, USA, June 11 – 16, 2006.
12. “*Applications of phase, polarization and optimal control techniques in nanoplasmonics*”, Maxim Sukharev (speaker), Tamar Seideman (co-author), **SPIE International Conference “Physics and Simulation of Optoelectronic Devices XIV”**, San Jose, CA, USA, January 21 – 26, 2006.
13. Poster presentation: “*Phase, polarization and optimal control as a route to the new types of plasmonic nanodevices*”, Maxim Sukharev (presenter), Tamar Seideman (co-author), **Gordon Research Conference: “Quantum control of light and matter”**, Colby College, Maine, USA, July 31 – August 5, 2005.
14. Poster presentation: “*Optimal control of internal conversion of polyatomic molecules*”, Maxim Sukharev (presenter), Tamar Seideman (co-author), **Gordon Research Conference: “Multiphoton processes”**, Tilton School, New Hampshire, USA, June 13 – 18, 2004.
15. “*A coherent control approach to suppression of radiationless transitions*”, Maxim Sukharev (speaker), Tamar Seideman (co-author), **Building computational devices using coherent control**, University of Michigan, Ann Arbor, USA, June 7 – 9, 2004.
16. Poster presentation: “*Quantum control of double ionization of calcium*”, Maxim Sukharev (presenter), Eric Charron (co-author), Annick Suzor-Weiner (co-author), DPG-Schule für Physik: **Optimal Femtosecond Laser Control of Microscopic Dynamics**, Bad Honnef, Germany, September 22 – 27, 2002.
17. Poster presentation: “*Quantum control of single versus double ionization of calcium*”, Maxim Sukharev (presenter), Eric Charron (co-author), Annick Suzor-Weiner (co-author), **ICTCP IV**, France, July 10 – 15, 2002.
18. (Post Deadline Paper) “*Quantum control of single versus double ionization of calcium*”, Maxim Sukharev (speaker), Eric Charron (co-author), Annick Suzor-Weiner (co-author), **International Quantum Electronics Conference**, Moscow, Russia, June 22 – 28, 2002.
19. “*Stabilization of H_2^+ with respect to photodissociation by a strong laser field*”, Maxim Sukharev (speaker), Mikhail Fedorov (co-author), **International Quantum Electronics Conference**, Moscow, Russia, June 22 – 28, 2002.
20. “*Strong-field interference stabilization in molecules*”, Maxim Sukharev (speaker), Mikhail Fedorov (co-author), **10th International Laser Physics Workshop**, Moscow, Russia, July 3 – 7, 2001.
21. “*Electrostriction-induced acoustic response in single-mode ring-index profile fibers with larger than 100 μm^2 effective mode area*”, Eugeny M. Dianov (speaker), Maxim Sukharev (co-author), and A. S. Biriukov (co-author), **European Conference on Optical Communications**, Munich, Germany, September 4 – 7, 2000.
22. Oral presentation: (Post Deadline Paper) “*Electrostrictive response in single-mode ring-index profile with large effective mode area*”, Eugeny M. Dianov (speaker), Maxim Sukharev (co-author), and A. S. Biriukov (co-author), **Optical Fiber Communications**, Baltimore, USA, 2000.
23. Poster presentation: “*Vibration, rotation and dissociation of molecular ions in a strong laser field*”, Maxim Sukharev (presenter), Vladimir Krainov (co-author), **7th International Laser Physics Workshop**, Berlin, Germany, July 6 – 10, 1998.

TEACHING AND ADVISORY

STUDENT MENTORING AND SUPERVISORY

Current graduate students

- Clark Miller, Department of Physics, Arizona State University (Spring 2017 – present). Tentative PhD thesis: *Nonlinear optics of exciton-plasmon materials*.

Current undergraduate students

- Brandon Thornton, Department of Physics, Arizona State University (Spring 2015 – present). Tentative research project: *Theory of of exciton-plasmon materials*.

Former graduate students

- Andre Brewer, Department of Chemical Engineering, Arizona State University (Spring 2015 – Spring 2017). Master's thesis: *Surface plasmon-polariton enhanced lasing: numerical studies*. Andre successfully defending his Master's thesis on April 7th, 2017.
- Adam Blake, Department of Physics, Arizona State University (Spring 2012 – November 2016). Ph.D. title: *Optics of hybrid nanomaterials*. Adam successfully defended his thesis on November 2nd, 2016.
- (under physics research rotation) Graduate student Cody Petrie, Department of Physics, Arizona State University (Spring 2015). Research rotation project: *Optics of silver nano-islands deposited on silica substrate*.
- (under physics research rotation) Graduate student Qiushi Mou, Department of Physics, Arizona State University, Tempe (Summer 2010) – research rotation project. Projects: *Nonlinear optics of atomic clusters near metal interface*. Qiushi successfully passed his qualifying exam.
- (under physics research rotation) Graduate student Yanan Zhao, Department of Physics, Arizona State University, Tempe (Spring 2009) – research rotation project. Projects: *Classical dynamics of atoms near metal surfaces*. Yanan successfully passed his qualifying exam.
- Graduate student Matt Reuter, Department of Chemistry, Northwestern University (2007-2008). Projects: *Nonadiabatic alignment of organic molecules influenced by metal tips*. This work resulted in a publication (see item 14 in Publication List).

Former undergraduate students

- Anthony Angus, Fulton School of Engineering, Electrical Engineering, Arizona State University (Fall 2014 – Spring 2015). Research project: *Optimization of FDTD algorithm for massively parallel computers*.
- Undergraduate student Jordan Swenson, Department of Physics, Arizona State University, Tempe (Fall 2013 – Spring 2014). Honors Thesis: *Physical aspects of refractive index measurements using Michelson interferometer*. Jordan has successfully defended his thesis in the Spring of 2014.
- Undergraduate student Thomas Nagy, Department of Mechanical and Manufacturing Engineering Technology, College of Technology and Innovation, Arizona State University (Fall 2011 – Spring 2012). Honors Thesis: *curriculum development – advanced laser laboratory for engineering students*. Tom has successfully defended his thesis in the Fall of 2012.
- Undergraduate student Andrew Knapp, Department of Physics, Arizona State University (Spring 2011 – Fall 2011). Projects: *Parallel simulations of atomic clusters coupled to metal nanostructures*.
- Undergraduate students: Thomas Nagy, Geoffrey Clark (both engineering majors), Derek Nasir, and Andrew Knapp (both physics majors) (Fall 2011) – advanced laser laboratory with several hands-on projects such as building and utilizing various interferometers (Michelson, Mach-Zehnder, Sagnac), using high-power laser for sound wave detection. The work was presented as a poster at the Innovation Showcase at Arizona State University, Polytechnic Campus at the end of the semester.
- Undergraduate student Thomas Nagy, Department of Mechanical and Manufacturing Engineering Technology, College of Technology and Innovation, Arizona State University at the Polytechnic Campus (Spring 2009 –

Spring 2011). Projects: *Optics of subwavelength gratings, new parallel schemes for FDTD*. Later on in his studies Tom wrote and defended an Honors Thesis partially based on our interaction and his simulations.

- Undergraduate student Anton Bashnev, Department of Mechanical and Manufacturing Engineering Technology, College of Technology and Innovation, Arizona State University at the Polytechnic Campus (Fall 2008). Projects: *Simulations of electromagnetic wave propagation at the nanoscale*.
- Undergraduate student Margaret Stucky, Department of Mechanical and Manufacturing Engineering Technology, College of Technology and Innovation, Arizona State University at the Polytechnic Campus (Fall 2008). Projects: *Classical dynamics of a dielectric particle near plasmonic materials*.
- Undergraduate student Joseph Yelk, Department of Physics and Astronomy, Northwestern University (2005 – 2008). Projects: *Optimal control of light at the nanoscale*. This work resulted in a publication (see item 15 in Publication List). Joseph was admitted to Graduate School at University of Colorado at Boulder.

Other mentoring

- Obama Scholar³ mentor – undergraduate student James Harris, Arizona State University at the Polytechnic Campus (Fall 2010).
- Obama Scholar⁶ mentor – undergraduate student Starr Worthy, Arizona State University at the Polytechnic Campus (Fall 2010).
- Mentoring high school teachers via the Research Experience for Teachers (RET) NSF program (summer 2006, summer 2007).

Courses developed and taught at Arizona State University

- **Fall 2008**

PHY101⁴ “Introduction to Physics”, enrollment 28 students. *New course developed and first time taught at the Polytechnic Campus. In addition to lectures I utilized online system developed by Pearson for homework assignments.*

PHY111⁵ “General Physics”, enrollment 75 students. *New course developed and first time taught at the Polytechnic Campus. Due to anticipated high enrollment I utilized Mastering Physics to deliver homework assignments. In order to engage such a large group of students more efficiently I used CPS (class performance system) clickers for quizzes during lectures.*

PHY111 “General Physics” (recitation), enrollment 24 students.

- **Spring 2009**

PHY101 “Introduction to Physics”, enrollment 29 students. *In addition to using materials developed in the previous semester I also developed and used quizzes at Blackboard.*

PHY111 “General Physics”, enrollment 71 students.

- **Fall 2009**

PHY101 “Introduction to Physics”, enrollment 52 students.

PHY111 “General Physics”, enrollment 49 students.

³ Obama Scholarship is provided to outstanding undergraduate students from low-income families. A mentor’s job is to guide a student through his/her university life both academically and personally.

⁴ PHY101 is an introductory level (conceptual) physics course for non-science majors.

⁵ PHY111/112 is a two-semester sequence in introductory algebra-based physics offered to students who are not majoring in physics or engineering. This sequence is intended for students in pre-medicine, pre-architecture, pre-dentistry, pre-law, construction, psychology, life sciences, etc.

- **Spring 2010**
 - PHY111 “General Physics”, enrollment 96 students.
 - ABS489 “Mechanics of Biology”, enrollment 2 students. *New course developed and first time taught at the Polytechnic Campus. This course was developed and taught in collaboration with the biology professor Heather Bateman. The idea was to combine both classical mechanics and biology of living organisms to give a wider perspective to students.*
- **Fall 2010**
 - PHY101 “Introduction to Physics”, enrollment 49 students.
 - PHY111 “General Physics”, enrollment 117 students. *This was the first physics class at the Polytechnic campus with an enrollment above 100 students.*
- **Spring 2011**
 - PHY101 “Introduction to Physics”, enrollment 22 students.
 - PHY111 “General Physics”, enrollment 96 students.
 - PHY111 “General Physics” (recitation), enrollment 24 students. *Due to unforeseen circumstances I had to take over this class in the middle of semester (for approximately 7 weeks).*
- **Fall 2011**
 - PHY111 “General Physics”, enrollment 186 students. *The enrollment went above 150 students and I had to utilize the only suitable auditorium available at the Polytechnic campus. It should be noted that this auditorium was designed for speeches, public lectures, but not for teaching. In order to accommodate all students and yet deliver efficient lectures I used animated Power Point lectures where solutions of problems appear step-by-step.*
 - ABS494 “Advanced Laser Laboratory”, enrollment 4 students. *New course developed and first time taught at the Polytechnic Campus. This is the first laser laboratory at ASU developed solely for undergraduate students. I obtained internal funding (~\$80,000) and assembled the lab from scratch at the Polytechnic campus. The idea of this course is to expose students with diverse background to laser physics experiments by means of hands-on projects.*
- **Summer 2012**
 - Crash course on computational nano-optics, enrollment 20 graduate students. *This course was developed and taught as a part of the Visiting Professor position during summer of 2012 at University of São Paulo (Brazil).*
- **Spring 2012**
 - PHY111 “General Physics”, enrollment 97 students.
- **Fall 2012**
 - PHY111 “General Physics”, enrollment 137 students.
- **Spring 2013**
 - PHY112 “General Physics”, enrollment 86 students. *This course was developed from scratch. I utilized both TurningPoint Clickers (for quizzes during lectures) and Mastering Physics (for homework assignments).*
 - ABS494 “Laser Optics”, enrollment 8 students (full enrollment). *This is the second time the course was taught. Class had 5 physics majors and 3 biology majors. After completion of preparatory labs (necessary to acquire important technical skills to be able to operate laser optics effectively) students were divided in to two groups and developed their own project. One group worked on building a fiber laser while the other used laser radiation to estimate plant*

genome size. The ultimate outcome of this class was a presentation by each group about their project.

- **Fall 2013**
PHY101 “Introduction to Physics”, enrollment 50 students.
PHY111 “General Physics”, enrollment 118 students.
- **Spring 2014**
PHY112 “General Physics”, enrollment 66 students.
PHY494 “Laser Optics”, enrollment 7 students (full enrollment). *This course is offered for the third time and the second time the class is full.*
- **Summer 2014 A session (5 weeks)**
PHY112 “General Physics”, enrollment 21 students.
- **Fall 2014**
PHY101 “Introduction to Physics”, enrollment 42 students.
PHY131 “University Physics II: Electricity and Magnetism”, enrollment 25 students. *New course developed.*
- **Spring 2015**
PHY101 “Introduction to Physics”, enrollment 42 students.
PHY121 “University Physics I: Mechanics”, enrollment 59 students. *New course developed.*
- **Summer 2015 B session (5 weeks)**
PHY121 “University Physics I: Mechanics”, enrollment 35 students.
- **Fall 2015**
PHY121 “University Physics I: Mechanics”, enrollment 60 students.
PHY131 “University Physics II: Electricity and Magnetism”, enrollment 38 students.
- **Spring 2016**
On sabbatical leave.
- **Fall 2016**
PHY121 “University Physics I: Mechanics”, enrollment 60 students.
PHY131 “University Physics II: Electricity and Magnetism”, enrollment 45 students.
- **Spring 2017**
PHY121 “University Physics I: Mechanics”, enrollment 90 students.
PHY131 “University Physics II: Electricity and Magnetism”, enrollment 45 students.

SERVICE

Professional service

- Organizing Committee Co-Chair, *Nanophotonic, Optoelectronics, and Plasmonics*, Nano and Giga Challenges in Electronics, Photonics, and Renewable Energy, Phoenix, March 10 – 14, 2014.
- Organizing Co-Chair, *Division of Chemical Physics, American Physics Society*, 2014 APS Meeting, Denver, March 3 – 7, 2014.
- Section editor: *Nano-optical devices* in *Encyclopedia of Nanotechnology*, ISBN 978-90-481-9751-4, Springer, 2012.
- Organizing Committee Member, *Workshop on Nano-Optics, Plasmonics, and Advanced Materials*, Center for Nanoscale Science and Technology at NIST, Gaithersburg, Maryland, April 19 – 22, 2010.

- Proposal reviewer: DOE, NASA, NSF (panelist).
- Referee: Applied Physics Letters, Journal of Chemical Physics; Journal of Optics A: Pure and Applied Optics; Journal of Optics; Optics Express; Optics Letters; Physical Review A/B; Physical Review Letters; New Journal of Physics.

Service to University

- College personal committee, Spring 2016 – present.
- Physics Program Leader: coordinate physics program at the Polytechnic campus (2010 – present). The duties include managing teaching load/assignments for physics instructors, physics courses scheduling, proposals for new physics courses, developing physics minor at the Polytechnic campus.
- Articulation task force (ATF) for Physics: member, statewide committee responsible for helping students navigate higher education options in the State of Arizona (2010 – present).
- Committee member: the search committee for Dean of College of Letters and Sciences (Fall 2014).
- Departmental Curriculum development committee (2010 – 2012).
- Departmental Awards committee (2009 – 2012).
- University Faculty coordinating committee for Physics: member, representing the physics program at the Polytechnic campus (2010 – 2012).