# Curriculum Vitae

Maxim Sukharev
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## 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*".

## PROFESSIONAL EXPERIENCE

| Year | Institution | Position |
|---|---|---|
| 05/2019 - present | Applied Sciences and Mathematics Faculty, College of Integrative Sciences and Arts, Arizona State University | Professor |
| 05/2014 – 04/2019 | Applied Sciences and Mathematics Faculty, College of Integrative Sciences and Arts, Arizona State University | Associate Professor |
| 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 *Endorsed to Chair* |
| 10/2008 – present | Department of Physics, Arizona State University | Graduate Faculty *Endorsed to Chair* |
| 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 |
|---|---|---|
| 03/2023 – 04/2023 | Weizmann Institute of Science, Israel | Visiting Professor |
| 01/2023 – 02/2023 | Department of Chemistry, University of Pennsylvania, Philadelphia | Invited Professor |
| 2020 | Centre de Recherche Paul-Pascal, Pessac, France (canceled due to COVID-19) | IdEx Bordeaux Visiting Professor |
| 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 |

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|---|---|---|
| 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 FAPESP Professor |
| 06/2011 | CNRS Laboratory of Molecular Photophysics, University of Paris South XI, Orsay, France | Invited CNRS Professor |

# HONORS AND AWARDS

- Journal of Chemical Physics Editor's Choice Award (2021) for the manuscript *JCP* **152**, 094706 (2020).
- IdEx Bordeaux Visiting Professor (canceled due to COVID-19), IdEx Bordeaux Scholarship, Centre de Recherche Paul-Pascal, France.
- 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).

# RESEARCH

## GRANTS

- **2022 – 2025**, Air Force Office of Scientific Research: *Nonlinear electrodynamics at plasmon-exciton interfaces: multiscale modeling and applications*. (PI: M. Sukharev, 100%, award amount: $296,262)
- **2018 – 2021**, Air Force Office of Scientific Research: *Understanding and controlling high harmonic generation processes in hybrid materials at the nanoscale*. (PI: M. Sukharev, 100%, award number: FA9550-19-1-0009, award amount: $251,201)
- **2015 – 2018**, Air Force Office of Scientific Research: *Optics of plasmon-exciton nanomaterials in the strong coupling limit: self-consistent studies*. (PI: M. Sukharev, 100%, award number: FA9550-15-1-0189, award amount: $228,423)
- **2015 – 2019**, United States–Israel Binational Science Foundation: *Photochemistry and photophysics at plasmonic interfaces*. Collaborative grant with Prof. Abraham Nitzan (Tel Aviv University, Israel). (US PI: M. Sukharev, 50%, award number: 2014113, award amount: $126,000)

# PUBLICATIONS AND PRESENTATIONS

## *SUBMITTED PAPERS UNDER REVIEW*

"Comparing semiclassical mean-field and 1-exciton approximations in evaluating optical response under strong light-matter coupling conditions", Bingyu Cui, Maxim Sukharev, and Abraham Nitzan, *Journal of Chemical Physics* (submitted, 2023).

## *PUBLISHED AND ACCEPTED PAPERS IN THE REFEREED JOURNALS*

1. "Short-time particle motion in a one-dimensional lattice with site disorder", Bingyu Cui, Maxim Sukharev, and Abraham Nitzan, *Journal of Chemical Physics* (accepted, 2023).
2. "Degenerate parametric down-conversion facilitated by exciton-plasmon polariton states in nonlinear plasmonic cavity", A. Piryatinski and M. Sukharev, *Nanotechnology* **34**, 175001 (2023).
3. "Dissociation slowdown by collective optical response under strong coupling conditions", M. Sukharev, J. Subotnik, A. Nitzan, (Editor's Choice) *Journal of Chemical Physics* **158**, 084104 (2023).
4. "Efficient parallel strategy for molecular plasmonics – a numerical tool for integrating Maxwell-Schrödinger equations in three dimensions", M. Sukharev, *Journal of Computational Physics* **477**, 111920 (2023).
5. "Advances in Modeling Plasmonic Systems: Editorial", F. Della Sala, R. Pachter, M. Sukharev, *Journal of Chemical Physics* **157**, 190401 (2022).
6. "Interplay between disorder and collective coherent response: superradiance and spectral motional narrowing in the time domain", H.-T. Chen, Z. Zhou, M. Sukharev, J. E. Subotnik, A. Nitzan, *Physical Review A* **106**, 053703 (2022).
7. "Fano plasmonics goes nonlinear", M. Sukharev, E. Drobnyh, R. Pachter, *Journal of Chemical Physics* **157**, 134105 (2022).
8. "High yield synthesis and quadratic nonlinearities of gold nanoprisms in solution: the role of corner sharpness", H. M. Ngo, E. Drobnyh, M. Sukharev, Q. K. Vo, J. Zyss, I. Ledoux-Rak, *Israel Journal of Chemistry* e202200009 (2022).
9. "Coupling, lifetimes, and "strong coupling" maps for single molecules at plasmonic interfaces", M. Mondal, M. A. Ochoa, M. Sukharev, A. Nitzan, *Journal of Chemical Physics* **156**, 154303 (2022).
10. "Strong coupling between an inverse bowtie nano-antenna and a J-aggregate", A. Weissman, M. Sukharev, A. Salomon, *Journal of Colloid and Interface Science* **610**, 438 (2021).
11. "Second harmonic generation by strongly coupled exciton-plasmons: the role of polaritonic states in nonlinear dynamics", M. Sukharev, A. Salomon, J. Zyss, *Journal of Chemical Physics* **154**, 244701 (2021).
12. **"**Second-harmonic generation in nonlinear plasmonic lattices enhanced by quantum emitter gain medium", M. Sukharev, O. Roslyak, A. Piryatinski, *Journal of Chemical Physics* **154**, 084703 (2021).
13. "Second harmonic generation from a single plasmonic nanorod strongly coupled to a $WSe_2$ monolayer", C. Li, X. Lu, A. Srivastava, S. D. Storm, R. Gelfand, M. Pelton, M. Sukharev, H. Harutyunyan, *Nano Letters* **21**, 1599 (2020).
14. "Wavelength and polarization dependence of second harmonic responses from gold nanocrescent arrays", H. Maekawa, E. Drobnyh, C. A. Lancaster, N. Large, G. C. Schatz, J. S. Shumaker-Parry, M. Sukharev, N.-H. Ge, *Journal of Physical Chemistry C* **124**, 20424 (2020).
15. "Plasmon enhanced second harmonic generation by periodic arrays of triangular nanoholes coupled to molecular emitters", E. Drobnyh and M. Sukharev, (Editor's Choice) *Journal of Chemical Physics* **152**, 094706 (2020).

16. "Energy transfer and interference by collective electromagnetic coupling", M. Gómez-Castaño, A. R. Cubero, L. Buisson, J. L. Pau, A. Mihi, S. Ravaine, R. A. L. Vallée, A. Nitzan, M. Sukharev, *Nano Letters* **19**, 5790 (2019).
17. "Harmonic generation by metal nanostructures optically coupled to a few-layer thin transition metal dichalcogenides", E. Drobnyh, R. Pachter, M. Sukharev, *Journal of Physical Chemistry C* **123**, 6898 (2019).
18. "Modeling optical coupling of plasmons and inhomogeneously broadened emitters", T. Purcell, M. Sukharev, T. Seideman, *Journal of Chemical Physics* **150**, 124112 (2019).
19. "Ehrenfest+R Dynamics II: A semiclassical QED framework for Raman scattering", H.-T. Chen, T. E. Li, M. Sukharev, A. Nitzan, J. E. Subotnik, *Journal of Chemical Physics* **150**, 044103 (2019).
20. "Ehrenfest+R Dynamics I: A Mixed Quantum-Classical Electrodynamics Simulation of Spontaneous Emission", H.-T. Chen, T. E. Li, M. Sukharev, A. Nitzan, J. E. Subotnik, *Journal of Chemical Physics* **150**, 044102 (2019).
21. "A necessary tradeoff for semiclassical electrodynamics: accurate short-range Coulomb interactions versus the enforcement of relativistic causality?", T. E. Li, H.-T. Chen, A. Nitzan, M. Sukharev, J. E. Subotnik, *Journal of Physical Chemistry Letters* **9**, 5955 (2018).
22. "Mixed quantum-classical electrodynamics: understanding spontaneous decay and zero point energy", T. E. Li, A. Nitzan, M. Sukharev, T. Martinez, H.-T. Chen, J. E. Subotnik, *Physical Review A* **97**, 032105 (2018).
23. "Effects of exciton-plasmon strong coupling on third harmonic generation by two-dimensional $WS_2$ at periodic plasmonic interfaces", M. Sukharev, R. Pachter, *Journal of Chemical Physics* **148**, 094701 (2018).
24. "Topical Review: optics of exciton-plasmon nanomaterials", M. Sukharev, A. Nitzan, *Journal of Physics: Condensed Matter* **29**, 443003 (2017).
25. "Molecular plasmonics: strong coupling at the low concentration limit", L. Efremushkin, M. Sukharev, A. Salomon, *Journal of Physical Chemistry C* **121**, 14819 (2017).
26. "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).
27. "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).
28. "Photon echo in exciton-plasmon nanomaterials: a time-dependent signature of strong coupling", A. Blake, M. Sukharev, *Journal of Chemical Physics* **146**, 084704 (2017).
29. "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).
30. "Plasmon transmission through excitonic subwavelength gaps", M. Sukharev, A. Nitzan, *Journal of Chemical Physics* **144**, 144703 (2016).
31. "Surface plasmon-polaritons in periodic arrays of V-grooves strongly coupled to quantum emitters", A. Blake, M. Sukharev, *Physical Review B* **92**, 035433 (2015).
32. "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).
33. "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).
34. "Theoretical analysis of dipole-induced electromagnetic transparency", R. Puthumpally-Joseph, O. Atabek, M. Sukharev, E. Charron, *Physical Review A* **91**, 043835 (2015).

35. "Collective effects in subwavelength hybrid systems: a numerical study", M. Sukharev and S. Malinovskaya, *Molecular Physics* **113**, 392 (2014).
36. "Dipole-induced electromagnetic transparency", R. Puthumpally-Joseph, M. Sukharev, O. Atabek, E. Charron, *Physical Review Letters* **113**, 163603 (2014).
37. "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).
38. "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).
39. "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).
40. "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).
41. "Molecular nanoplasmonics: self-consistent electrodynamics in current carrying junctions", A. White, M. Sukharev, and M. Galperin, *Physical Review B* **86**, 205324 (2012).
42. "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).
43. "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).
44. "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).
45. "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).
46. "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).
47. "Computational nano-optics: parallel simulations and beyond", M. Sukharev, *Optics and Photonics News* **22**, 29 – 33 (2011).
48. "Transport and optical response of molecular junctions driven by surface plasmon-polaritons", M. Sukharev and M. Galperin, *Physical Review B* **81**, 165307 (2010).
49. "One-dimensional long-range plasmonic-photonic structures", W. Mu, D. B. Buchkolz, M. Sukharev, J. Jang, R. P. H. Chang, and J. B. Ketterson, *Optics Letters* **35**, 550 (2010).
50. "Nonadiabatic photodissociation dynamics of $F_2$ in solid Ar", M. Sukharev, A. Cohen, R. B. Gerber, and T. Seideman, invited paper *Laser Physics* **19**, 1651 (2009).
51. "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).
52. "Optical properties of metal tips for tip-enhanced spectroscopies", M. Sukharev and T. Seideman, *Journal of Physical Chemistry A* **113**, 7508 (2009).
53. "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).
54. "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).

55. "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).
56. "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).
57. "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).
58. "Light trapping and guidance in plasmonic nanocrystals", M. Sukharev and T. Seideman, *Journal of Chemical Physics* **126**, 204702 (2007).
59. "Coherent control of light propagation via nanoparticle arrays", M. Sukharev and T. Seideman, *Journal of Physics B: Atomic, Molecular & Optical Physics* **40**, S283 (2007).
60. "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).
61. "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).
62. "Coherent control approaches to light guidance in the nanoscale", M. Sukharev and T. Seideman, *Journal of Chemical Physics*, **124**, 144707 (2006).
63. "Phase and polarization control as a route to plasmonics nanodevices", M. Sukharev and T. Seideman, *Nanoletters*, **6**, 715 (2006).
64. "Optical control of nonradiative decay in polyatomic molecules", M. Sukharev and T. Seideman, *Physical Review A*, **71**, 012509 *(2005)*.
65. "Optimal control approach to suppression of radiationless transitions", M. Sukharev and T. Seideman, *Physical Review Letters*, **93**, 093004 (2004).
66. "Influence of electron correlations on strong field ionization of calcium", E. Charron, M. Sukharev, and A. Suzor-Weiner, *Laser Physics Letters*, **1**, 18 (2004).
67. "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).
68. "Enhancement of strong-field two-electron ionization", M. Sukharev, E. Charron, and A. Suzor-Weiner, *Laser Physics*, **13**, 484 (2003).
69. "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).
70. "Quantum control of double ionization of calcium", M. Sukharev, E. Charron, and A. Suzor-Weiner, *Physical Review A*, **66**, 053407 (2002).
71. "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).
72. "Strong-field interference stabilization in molecules", M. Sukharev and M.V. Fedorov, *Laser Physics*, **12**, 491 (2002).
73. "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).

74. "Electrostrictive response in single-mode ring-index-profile fibers", E. M. Dianov, M. E. Sukharev, and A. S. Biriukov, *Optics Letters*, **25**, 390 (2000).
75. "Vibration, rotation, and dissociation of molecular ions in a strong laser filed", M. Sukharev and V. P. Krainov, *Journal of Optical Society of America B*, **15**, 2201 (1998).
76. "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).
77. "Dissociation of hydrogen and deuterium molecular ions by strong low-frequency laser field", M. Sukharev and V. P. Krainov, *Laser Physics*, **7**, 803 (1997).
78. "Field-dependent Franck-Condon factors for the ionization of molecular hydrogen and deuterium", M. Sukharev and V. P. Krainov, *Laser Physics*, **7**, 323 (1997).
79. "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).

## *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. Korkin, 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*

1. "Debunking pseudoscientific claims in the era of Internet and alternative news", M. Sukharev (2019), arXiv:1906.06165.
2. "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 100μm$^2$ 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

- "Pseudoscience is a danger, says ASU physics prof", Marshall Terrill, ASU Now, August 13 2019. **https://asunow.asu.edu/20190807-discoveries-asu-physics-professor-delves-depths-pseudo-scientific**
- "Why you should never go to the movies with a physicist", Maureen Roen, ASU Now, August 2018. **https://asunow.asu.edu/20180824-creativity-why-you-should-never-go-movies-physicist-0**
- 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. Invited colloquium, Bar-Ilan University, March 2023.
2. Invited colloquium, Tel Aviv University, March 2023.
3. Invited physical chemistry colloquium, University of Pennsylvania, February 2023.
4. Invited physical chemistry colloquium, University of California Irvine, November 2022.
5. Invited physical chemistry seminar, Northwestern University, October 10, 2022.
6. Invited colloquium, Western Kentucky University, Physics webinar, March 28, 2022.
7. Invited webinar, *Nonlinear optics at exciton-plasmon interfaces*, Polariton Chemistry Webinar, April 14, 2021.
8. Journal of Chemical Physics Editor's Choice Awards "*Plasmon enhanced second harmonic generation by periodic arrays of triangular nanoholes coupled to molecular emitters*", APS March meeting, March 16, 2021.
9. Invited physics webinar, Center for Photonics and Quantum Materials, Skolkovo Institute of Science and Technology, Moscow, Russia, November 25, 2020.
10. Invited physics webinar, Pabna University of Science and Technology, Bangladesh, October 28, 2020.
11. Western Kentucky University, Physics webinar, October 4, 2020.
12. Metamaterials 2020, virtual conference, September 28 – October 3, 2020.
13. *"Predicting and understanding optical properties of exciton-plasmon nanomaterials"*, invited talk, **Chemical Physics Seminar**, Tel Aviv University, December 19, 2019.

14. *"Optics of exciton-plasmon materials"*, invited talk, **Center for Integrated Nanotechnologies (CINT) 2019 Annual Meeting**, Los Alamos National Laboratory, September 22 – 24, 2019.
15. *"Electrodynamics of exciton-plasmon materials: strong coupling and beyond"*, invited talk, **Gordon Research Conference**, Quantum Control of Light and Matter, Salve Regina University, August 11 – 16, 2019.
16. *"Electrodynamics of exciton-plasmon materials: strong coupling and beyond"*, invited talk, **the Penn Conference on Theoretical Chemistry**, August 14 – 16, 2019.
17. *"Exciton-plasmon materials go nonlinear"*, invited talk, **TSRC Conference**, Nanophotonics out of equilibrium, Telluride, Colorado, July 16 – 20, 2019.
18. *"Crafting light-matter interactions at plasmonic interfaces: strong coupling and beyond"*, invited talk, **TSRC Conference**, Nonequilibrium Phenomena, Nonadiabatic Dynamics and Spectroscopy, Telluride, Colorado, July 16 – 20, 2019.
19. *"Crafting light-matter interactions at plasmonic interfaces: strong coupling and beyond"*, invited seminar, **Weizmann Institute of Science**, June 18, 2019.
20. "*Crafting the light-matter interactions at metal interfaces: strong coupling and beyond*", invited colloquium, **Nanoscience Seminar**, Arizona State University, March 18, 2019.
21. "*Exciton-plasmon nanosystems: modeling, understanding, and predicting new phenomena*", invited colloquium, **College of Optical Sciences, University of Arizona**, November 15, 2018.
22. "*Calculating optical response of hybrid materials at the nanoscale: the need for speed*", invited talk, **DOD HPC Users Meeting**, Wright-Patterson Air Force Base, September 24-28, 2018.
23. "*Optics of hybrid nanomaterials: from collective exciton resonances to nonlinear spectroscopy*", invited talk, **IEEE RAPID**, August 22-24, 2018.
24. "*Optics of exciton-plasmon nanomaterials beyond the strong coupling*", invited talk, **TSRC Conference**, Plasmon-Exciton Coupling, Telluride, Colorado, June 16, 2018.
25. "*Optical properties of exciton-plasmon nanomaterials: from collective exciton resonances to nonlinear spectroscopy*", invited colloquium, **Center for Nanoscale Materials, Argonne National Laboratory**, September 6, 2017.
26. "*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.
27. "*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.
28. "Modeling aspects of *molecular plasmonics*", invited seminar, **Department of Chemistry, University of California at San Diego**, December 13, 2016.
29. "*Molecular plasmonics: optics of molecular aggregates at plasmonic interfaces*", invited seminar, **Department of Chemistry, University of California at Los Angeles**, October 11, 2016.
30. "*Molecular plasmonics*", **Special seminar, Institute of Nanotechnology, Bar-Ilan University**, Rama-Gan, Israel, July 31, 2016.
31. "*Modeling aspects of optical phenomena in exciton-plasmon materials*", **Physics Colloquium, Department of Physics, Lehigh University**, Bethlehem, April 27, 2016.
32. "*Modeling aspects of optical phenomena in exciton-plasmon materials*", **Physical Chemistry Seminar, Department of Chemistry, University of Pennsylvania**, Philadelphia, April 21, 2016.
33. "*Optical functionality of plasmon-exciton nanomaterials in the strong coupling regime*", invited talk, **APS meeting**, Baltimore, March 14, 2016.

34. "*Optical phenomena at plasmonic interfaces*", invited seminar, **Center de Recherche Paul Pascal, CNRS**, Pessac, France, February 19, 2016.
35. "*Optical phenomena at plasmonic interfaces*", invited seminar, **ISMO, University Paris-SUD**, Orsay, France, February 17, 2016.
36. "*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.
37. "*Optics of hybrid nanomaterials*", invited talk, **Seminar on Multiphoton Processes**, General Physics Institute of Russian Academy of Sciences, Moscow, Russia, December 24, 2014.
38. "*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.
39. "*Optical properties of nanoscale hybrid materials*", invited talk, **Nano and Giga Challenges in Electronics, Photonics, and Renewable Energy**, Tempe, March 10 – 14, 2014.
40. "*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.
41. "*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.
42. "*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.
43. "*Optics of hybrid nano-materials: merging electromagnetics with quantum dynamics*", invited seminar, **Department of Chemistry, Northwestern University**, Evanston, April 19, 2013.
44. "*Optics of hybrid nano-materials: merging electromagnetics with quantum dynamics*", invited seminar, **Department of Chemistry, University of Illinois at Chicago**, Chicago, April 18, 2013.
45. "*Optics of hybrid nano-materials: merging electromagnetics with quantum dynamics*", invited Nanoscale Seminar Series, **Department of Physics, Arizona State University**, Tempe, April 4, 2013.
46. "*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.
47. "*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.
48. "*Optics of hybrid nano-materials: self-consistent studies*", invited University seminar, **Nanotechnology Program Seminar Series, Stevens Institute of Technology**, Hoboken, September 26, 2012.
49. "*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.
50. "*Electrodynamics of quantum many-body systems optically coupled to plasmonic materials*", invited seminar, **ISMO at University Paris South XI**, Orsay, France, June 10, 2011.
51. "*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.
52. "*Optics at the nanoscale: computational studies*", invited seminar, **Seagate Technology, Research Division**, Bloomington, Minnesota, February 4, 2011.

53. "*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.
54. "*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.
55. "*Computational aspects of nano-optics*", invited colloquium, **Department of Physics and Astronomy, Western Kentucky University**, April 12, 2010.
56. "*Optimal design of advanced plasmonic materials for nano-optics optics*", plenary lecture, **2009 NanoBiophotonics Summer School, University of Illinois at Urbana-Champaign**, June 2009.
57. "*Optimal design of advanced plasmonic materials for subwavelength optics*", Nanotechnology Program Seminar Series**, Stevens Institute of Technology**, Hoboken, February 11, 2009.
58. "*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.
59. "*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.
60. "*Plasmon resonance assisted manipulation of light in nanoscale*", invited colloquium, **Department of Physics and Astronomy, Western Kentucky University**, April 30, 2007.
61. "*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.
62. "*Optics of nanomaterials: coherent and optimal control of light in nanoscale*", invited colloquium, **Department of Physics and Astronomy, Northwestern University**, August 11, 2006.
63. "*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 contractors meeting**, Theoretical Nonlinear Optics, review talk, March 1, 2023.
2. **AFOSR annual contractors meeting**, Theoretical Nonlinear Optics, review talk, March 1, 2022.
3. **AFOSR annual contractors meeting**, Theoretical Nonlinear Optics, review talk, March 2, 2021.
4. **AFOSR annual contractors meeting**, Theoretical Nonlinear Optics, review talk, March 3, 2020.
5. **AFOSR annual contractors meeting**, Theoretical Nonlinear Optics, review talk, March 6, 2019.
6. **AFOSR annual contractors meeting**, Theoretical Nonlinear Optics, review talk, March 7, 2018.
7. **MRS 2018**, contributed talk, April 2018.
8. **AFOSR annual contractors meeting**, Theoretical Nonlinear Optics, review talk, March 7, 2017.
9. Poster presentation: "*Optics of molecular aggregates at plasmonic interfaces*", Maxim Sukharev (presenter), **Gordon Research Conference: Plasmonics & Nanophotonics**, Sunday River, July 7 – July 15, 2016.
10. "*Nonlinear optics of hybrid nano-materials under strong coupling conditions*", Maxim Sukharev (presenter), **APS meeting**, Denver, March, 2014.
11. 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.

12. "*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.
13. "*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.
14. "*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.
15. 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.
16. Poster presentation: "*Coherent and optimal control of light at the nanosca*le", 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.
17. "*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.
18. (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.
19. "*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.
20. 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.
21. 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.
22. "*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.
23. 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.
24. 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.
25. (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.
26. "*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.

27. "*Strong-field interference stabilization in molecules*", Maxim Sukharev (speaker), Mikhail Fedorov (co-author), **10th International Laser Physics Workshop**, Moscow, Russia, July 3 – 7, 2001.
28. "*Electrostriction-induced acoustic response in single-mode ring-index profile fibers with larger than 100 $\mu m^2$ 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.
29. 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.
30. 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.

# STUDENT MENTORING AND SUPERVISORY

### Current graduate/undergraduate students

- Michael Clark, Arizona State University (Fall 2022 – present). Tentative Ph.D. Thesis: *Semiclassical models of light-matter interaction at nanoscale interfaces.*
- Alec Serra, Arizona State University (Fall 2022 - present). Undergraduate research.

### Former graduate/undergraduate students

- Hung Nguen, Arizona State University (Fall 2022). Undergraduate research.
- Maximus Smith, Arizona State University (Fall 2022). Undergraduate research.
- Elena Drobnyh, Arizona State University (Fall 2018 – Fall 2022), Ph.D. Thesis: *Second harmonic generation at plasmonic interfaces and its interactions with quantum emitters under strong coupling conditions*. Elena successfully defended her thesis on November 1st, 2022.
- Annyun Das, Arizona State University (Fall 2022). Ph.D research rotation: *Superfluorescence at plasmonic interfaces*.
- Austin Bartunek, Arizona State University (Spring 2022 – Fall 2022), Undergraduate research project: *many-body physics in strong coupling regime*.
- Noa Freifeld, Tel Aviv University (Fall 2014 – Fall 2022), co-advising with Prof. Abraham Nitzan (University of Pennsylvania & Tel Aviv University). Ph.D. Thesis: *Energy transfer processes in coupled exciton-plasmon systems*.
- Addison Olsen, Arizona State University (Spring 2022), Undergraduate research project: *superfluorescence in resonant optical cavities*. Addison is currently working as an engineer at ThorLabs.
- Chao Ji, Arizona State University (Spring 2022). Ph.D research rotation: *entangled systems in 1D optical cavities*.
- Undergraduate student Tanner Saadi, Arizona State University (Fall 2021 – Spring 2022). Honors Thesis: *Dynamics of a Gaussian wavepacket in different optical environments.* Tanner successfully defended his Honors thesis in April 2020.
- Undergraduate student Alexander Gavrilov, Arizona State University (Fall 2021 – Spring 2022). Honors Thesis: *Boltzmann Dilemma and the Kac ring simulations.* Alex successfully defended his Honors thesis in April 2022.
- Undergraduate student Alia Gilbert, Arizona State University (Spring 2019 – Spring 2020). Honors Thesis: *Slit groove diffraction*. Alia successfully defended her Honors thesis in April 2020. Alia has been accepted to the graduate program at University of Michigan.
- Undergraduate students Dana Miller and Madelyn Shrum, Arizona State University (Spring 2019 – Spring 2020). Honors Thesis: *Factors influencing science attitudes and beliefs.* Dana and Madelyn successfully defended their Honors thesis in April 2020.

- Undergraduate student Brandon Thornton, Arizona State University (Spring 2015 – Spring 2018). Honors Thesis: *Computational electrodynamics – applying CPML to dispersive media*. Brandon successfully defended his Honors thesis in May 2018. Brandon is currently a graduate student at Arizona State University.
- Andre Brewer, Arizona State University. Master's Thesis: *Surface plasmon-polariton enhanced lasing: numerical studies*. Andre successfully defending his thesis on April 7th, 2017. Andre worked at Photonics Engineer at Optilab LLC. Now he is at Chemours. Andre also defending an honors thesis in 2016 as an undergraduate student with me before he was admitted to the graduate program.
- Adam Blake, Arizona State University. Ph.D. Thesis: *Optical properties of hybrid nanomaterials*. Adam successfully defended his thesis on November 2nd, 2016. Adam is currently employed as a physics teacher at Mesa Highschool.
- Raijumon Puthumpally Joseph, Université Paris Sud (Orsay, France), co-advising with Prof. Eric Charron (Université Paris Sud). Ph.D. Thesis: *Quantum interferences in the dynamics of atoms and molecules in electromagnetic fields*. Raiju successfully defended his thesis on February 29th, 2016. Raiju is currently a postdoctoral fellow at The Weizmann Institute of Science (Israel).
- Undergraduate student Jordan Swenson, 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 May 2014. Jordan is currently a science high school teacher at Mountain View High School (Arizona).
- Undergraduate student Thomas Nagy, Arizona State University (Fall 2011 – Spring 2012). Honors Thesis: *curriculum development – advanced laser laboratory for engineering students*. Tom has successfully defended his thesis in November 2012.

### Additional mentoring

- Undergraduate student Austin Bullock, Arizona State University (Fall 2017). Project: *Quantum electrodynamics of coupled emitters*.
- Graduate student Clark Miller, Arizona State University (Fall 2017 – Summer 2018). Project: *Second harmonic generation by periodic nanohole arrays*.
- Graduate student Thomas Purcell, Northwestern University (Fall 2016), co-advising with Prof. T. Seideman (Northwestern University). Project: *Modeling of optical coupling between surface plasmons and inhomogeneously broaden quantum emitters.* Tom visited my lab for 1 month and completed his project. We recently submitted a manuscript based on his work.
- Graduate student Andrew White, Arizona State University (Fall 2015). Project: *Optical bistability enhanced by plasmon resonances*.
- Graduate student Cody Petrie, Arizona State University (Spring 2015). Research rotation project: *Optics of silver nano-islands deposited on silica substrate*.
- Undergraduate student Anthony Angus, Arizona State University (Fall 2014 – Spring 2015). Project: *Optimization of FDTD algorithm for massively parallel computers.* Tony successfully completed this project and presented a highly efficient FDTD code, which is now partially used in my research.
- Undergraduate student Jacqueline Shortridge, Arizona State University (Fall 2015). Project: *Simulations of photon echo dynamics in dense systems.*
- Undergraduate student Andrew Knapp, Department of Physics, Arizona State University (Spring 2011 – Fall 2011). Project: *Parallel simulations of atomic clusters coupled to metal nanostructures*.
- Graduate student Qiushi Mou, Arizona State University, Tempe (Summer 2010). Research rotation project: *Nonlinear optics of atomic clusters near metal interface*.
- Graduate student Yanan Zhao, Arizona State University, Tempe (Spring 2009). Research rotation project: *Classical dynamics of atoms near metal surfaces*.
- 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, Arizona State University at the Polytechnic Campus (Spring 2009 – Spring 2011). Project: *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.
- Obama Scholar[1] mentor – undergraduate student James Harris, Arizona State University (Fall 2010).
- Obama Scholar mentor – undergraduate student Starr Worthy, Arizona State University (Fall 2010).
- Undergraduate student Anton Bashnev, Arizona State University (Fall 2008). Project: *Simulations of electromagnetic wave propagation at the nanoscale*.
- Undergraduate student Margaret Stucky, Arizona State University (Fall 2008). Project: *Classical dynamics of a dielectric particle near plasmonic materials*.
- Graduate student Matt Reuter, Northwestern University (2007-2008). Project: *Nonadiabatic alignment of organic molecules influenced by metal tips*.
- Undergraduate student Joseph Yelk, Northwestern University (2005 – 2008). Project: *Optimal control of light at the nanoscale*.
- Mentoring high school teachers via the Research Experience for Teachers (RET) NSF program (summer 2006, summer 2007).

# TEACHING

## Courses developed and taught at Arizona State University

- **Spring 2023**
  On sabbatical leave.

- **Fall 2022**
  PHY314 "Quantum Mechanics II".
  PHY460 "Numerical methods in modern physics".

- **Spring 2022**
  PHY121 "University Physics I: Mechanics", enrollment 42 students.
  PHY131 "University Physics II: Electricity and Magnetism", enrollment 23 students.

- **Fall 2021**
  PHY121 "University Physics I: Mechanics", enrollment 55 students.
  PHY460 "Numerical methods in modern physics", enrollment 6 students. *New course developed.*

- **Spring 2021**
  PHY131 "University Physics II: Electricity and Magnetism", enrollment 36 students.
  PHY315 "Quantum Mechanics II", enrollment 3 students.

- **Fall 2020**
  PHY314 "Quantum Mechanics I", enrollment 5 students.
  PHY314 "Quantum Mechanics III", enrollment 4 students. *New course developed.*

- **Summer 2020 B session (5 weeks)**
  PHY111 "General Physics", enrollment 33 students.
  PHY121 "University Physics I: Mechanics", enrollment 56 students.

- **Spring 2020**
  PHY131 "University Physics II: Electricity and Magnetism", enrollment 32 students.

[1] 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.

PHY315 "Quantum Mechanics II", enrollment 5 students. *New course developed.*

- **Fall 2019**
  PHY131 "University Physics II: Electricity and Magnetism", enrollment 45 students.
  PHY314 "Quantum Mechanics I", enrollment 8 students.
- **Summer 2018 B session (5 weeks)**
  PHY111 "General Physics", enrollment 21 students.
  PHY121 "University Physics I: Mechanics", enrollment 19 students.
- **Spring 2019**
  PHY121 "University Physics I: Mechanics", enrollment 76 students.
  PHY131 "University Physics II: Electricity and Magnetism", enrollment 34 students.
- **Fall 2018**
  PHY131 "University Physics II: Electricity and Magnetism", enrollment 28 students.
  PHY314 "Quantum Mechanics I", enrollment 4 students. *New course developed.*
- **Summer 2018 B session (5 weeks)**
  PHY111 "General Physics", enrollment 20 students.
  PHY121 "University Physics I: Mechanics", enrollment 45 students.
- **Spring 2018**
  PHY121 "University Physics I: Mechanics", enrollment 55 students.
  PHY131 "University Physics II: Electricity and Magnetism", enrollment 41 students.
- **Fall 2017**
  PHY121 "University Physics I: Mechanics", enrollment 94 students.
  PHY131 "University Physics II: Electricity and Magnetism", enrollment 38 students.
- **Summer 2017**
  Crash course on computational nano-optics. *This course was developed and taught as a part of the IdEx Bordeaux Scholarship*, *during summer of 2018 at CNRS Centre de Recherche Paul-Pascal*, *(France).*
- **Spring 2017**
  PHY121 "University Physics I: Mechanics", enrollment 87 students.
  PHY131 "University Physics II: Electricity and Magnetism", enrollment 42 students.
- **Fall 2016**
  PHY121 "University Physics I: Mechanics", enrollment 44 students.
  PHY131 "University Physics II: Electricity and Magnetism", enrollment 35 students.
- **Spring 2016**
  On sabbatical leave.
- **Fall 2015**
  PHY121 "University Physics I: Mechanics", enrollment 55 students.
  PHY131 "University Physics II: Electricity and Magnetism", enrollment 35 students.
- **Summer 2015 B session (5 weeks)**
  PHY121 "University Physics I: Mechanics", enrollment 35 students.
- **Spring 2015**
  PHY101 "Introduction to Physics", enrollment 42 students.
  PHY121 "University Physics I: Mechanics", enrollment 48 students. *New course developed.*
- **Fall 2014**
  PHY101 "Introduction to Physics", enrollment 42 students.

PHY131 "University Physics II: Electricity and Magnetism", enrollment 22 students. *New course developed.*

- **Summer 2014 A session (5 weeks)**
  PHY111 "General Physics", enrollment 21 students.

- **Spring 2014**
  PHY112 "General Physics", enrollment 63 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.*

- **Fall 2013**
  PHY101 "Introduction to Physics", enrollment 49 students.
  PHY111 "General Physics", enrollment 112 students.

- **Spring 2013**
  PHY112 "General Physics", enrollment 82 students. *New course developed. I utilized both TurningPoint Clickers (for quizzes during lectures) and Mastering Physics (for homework assignments).*
  ABS494 "Laser Optics", enrollment 7 students (full enrollment). *This is the second time the course was taught. Class had 4 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 2012**
  PHY111 "General Physics", enrollment 124 students.

- **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 2011**
  PHY111 "General Physics", enrollment 157 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 and assembled the lab from scratch.*

- **Spring 2011**
  PHY101 "Introduction to Physics", enrollment 20 students.
  PHY111 "General Physics", enrollment 79 students.
  PHY111 "General Physics" (recitation), enrollment 18 students. *Due to unforeseen circumstances I had to take over this class in the middle of semester (for approximately 7 weeks).*

- **Fall 2010**
  PHY101 "Introduction to Physics", enrollment 44 students.

PHY111 "General Physics", enrollment 106 students. *This was the first physics class at the Polytechnic campus with an enrollment above 100 students.*

- **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 2009**
  PHY101 "Introduction to Physics", enrollment 52 students.
  PHY111 "General Physics", enrollment 49 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 2008**
  PHY101 "Introduction to Physics", enrollment 28 students, an introductory level (conceptual) physics course for non-science majors. *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.*
  PHY111 "General Physics", enrollment 75 students, introductory algebra-based physics offered to students who are not majoring in physics or engineering. This class is intended for students in pre-medicine, pre-architecture, pre-dentistry, pre-law, construction, psychology, life sciences, etc.. *New course developed and first time taught at the Polytechnic Campus. Due to anticipated high enrollment I utilized Mastering Physics for 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.

# SERVICE

## PROFESSIONAL SERVICE

- Organizing Committee Co-Chair, TSRC Conference, Nanophotonics out of equilibrium, Telluride, Colorado, June 2023.
- Proposal reviewer: BSF, DOE, ISF, NASA, NSF, RGC.
- Referee: ACS Photonics, Applied Physics Letters, Journal of Chemical Physics, Journal of Optics A: Pure and Applied Optics, Journal of Optics, Journal of Physical Chemistry A/C, New Journal of Physics, Optica, Optics Express, Optics Letters, Physical Review A/B, Physical Review Letters, Scientific Reports.
- 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.

## UNIVERSITY SERVICE

- Physics Program Lead (2010 – present): coordinating Applied Physics program at the Polytechnic campus. The duties include managing teaching load/assignments for physics instructors/faculty, **physics courses *scheduling***,

proposals for new physics courses, developing/promoting Applied Physics major and Physics minor at the Polytechnic campus.
  - Unit personnel committee, (Spring 2021 – Spring 2022).
- Articulation task force (ATF) for Physics (2010 – present): member, statewide committee responsible for helping students navigate higher education options in the State of Arizona.
- College awards committee (Spring 2020).
- College grievance committee (Spring 2018 – Spring 2021).
- College personnel committee, (Spring 2016 – Spring 2018).
- Search committees:
  Physics Instructor (chair, 2023),
  Physics Lecturer (member, 2021).
  Physics Instructional Professional (member, 2012; chair, 2014; chair, 2017),
  Physics Lab coordinator (chair, 2014),
  Physics Instructor (chair, 2015),
  Physics Lecturer (chair, 2017).
- 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 (2010 – 2012): member, representing the physics program at the Polytechnic campus.

## OUTREACH

- Organizing visiting tours for high school students from ASU Prep Phoenix (fall 2022).
- Science fair judge (both at state fairs and local high schools).
- Public lectures:
  (2017, 2020) Debunking pseudoscientific claims: science in the era of alternative facts and Internet.
  (2018) The spookiness of the quantum world.