

Vladimir M. Shalaev

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January 19, 2020; 126 pages

Education:

Ph.D. Krasnoyarsk State University (Russia), physics and mathematics (with honors), 1983
M.S. Krasnoyarsk State University (Russia), physics (with highest distinction), 1979

Professional Career:

Scientific Director for Nanophotonics, Birck Nanotechnology Center, Purdue	2011-pres
Founding co-Director of Purdue Quantum Center	2015
Bob and Anne Burnett Distinguished Professor of Electrical and Computer Engineering	2011-pres
Robert and Anne Burnett Professor of Electrical and Computer Engineering	2004-2011
Professor of Biomedical Engineering	2005-pres
Professor of Physics	2011-pres
Professor of ECE Department, Purdue University	2001-pres
George W. Gardiner Professor of Physics, New Mexico State University	1997–2001
Associate Professor, New Mexico State University	1993–1997
Research Associate Professor, University of Toronto (Canada)	1991–1993
Humboldt Foundation Fellow, University of Heidelberg (Germany)	1990–1991
Assistant Professor, Krasnoyarsk State University (Russia)	1983–1990
Research Fellow, Institute of Physics, Krasnoyarsk (Russia)	1983–1990

Professional Recognitions, Honors, and Awards

- American Physical Society 2020 Frank Isakson Prize for Optical Effects in Solids
- Honorary Doctorate from University of Southern Denmark, 2015
- IEEE Photonics Society William Streifer Scientific Achievement Award, 2015
- Rolf Landauer medal of the ETOPIIM (Electrical, Transport and Optical Properties of Inhomogeneous Media) International Association, 2015
- Selected to the Purdue Innovator Hall of Fame (2014)
- The 2014 Goodman Book Award from OSA and SPIE
- The 2012 Nanotechnology Award from UNESCO
- The 2010 Optical Society of America Max Born Award
- The 2010 Willis E. Lamb Award for Laser Science and Quantum Optics
- The 2006 Top 50 Nano Technology Award Winner for “Nanorod Material”
- The 2009 McCoy Award, Purdue's highest honor for scientific achievement
- The 2006 College of Engineering Research Award
- The Acorn Award: Seed for Success, 2007
- Fellow of the Institute of Electrical and Electronics Engineers (IEEE), 2010-
- Fellow of the American Physical Society (APS), 2002-
- Fellow of the Optical Society of America (OSA), 2003-

- Fellow of the International Society for Optical Engineering (SPIE), 2005-
- Fellow of Materials Research Society (MRS), 2015-
- Robert and Anne Burnett Professor of Electrical and Computer Engineering, 2004-pres
- George W. Gardiner Endowed Professorship, New Mexico State University, 1997–2001
- NSF/NRC photonics committee member (chaired by T. Heinz) aimed with assessing most important areas of science and technology for future development
- Member of the Steering Committee for MIT-Skolkovo Tech, 2011-2013
- Member of the Scientific Advisory Council for Skolkovo Innovation Center (Moscow, Russia)
- Member of the Scientific Advisory Board for the Russian Quantum Center
- Member of the Executive Committee for the Russian Quantum Center
- General co-Chair for the 2011 CLEO/QELS conference
- Program co-Chair for the 2009 CLEO/IQEC conference
- Chair of the OSA Technical Group “Photonic Metamaterials”, 2008-2010
- Chair of the OSA Topical Group: Photonic Metamaterials: from Random to Periodic, 2004-2007
- Vice-Chair of the OSA Topical Group: Waves in Random and Periodic Media, 2002-2004
- Reviewing Editor for *Science*
- Co-Editor of *Applied Physics B – Lasers and Optics*, 2006-2013
- Co-Editor for Advances in Nano-Optics and Nanophotonics book series (Elsevier), 2006-2008
- Co-Editor for Series in Nanooptics and Nanophotonics, Taylor & Francis Books, Inc.2008-
- Topical Editor for J. of Optical Society of America B, 2005-2011
- Editorial Board for “*Nanophotonics*” journal, 2012-
- Editorial Advisory Board Member for *Laser and Photonics Reviews*, 2008-
- Editorial Advisory Board Member for *Laser Physics Letters*, 2006-2016
- Editorial Board Member for “Metamaterials” Journal, 2006-2015
- Editorial Board Member for *Journal of Nanotechnology*, 2008-2017
- Editorial Advisory Board Member for *International Journal of Theoretical Physics, Group Theory, and Nonlinear Optics*
- Editorial Advisory Board Member for *The J. Nonlinear Optical Physics and Materials (JNOPM)*
- Editor for Special Issue “Optics on the Nanoscale: Principles, Instrumentation and Applications” of Applied Physics B, v. 84, ##1 and 2, July/Aug. 2006.
- Guest Editor for IEEE's Journal of Selected Topics in Quantum Electronics (JSTQE) on Negative Index and Metamaterials, 2009
- Guest Co-Editor for J. of Optics B: Quantum and Semiclassical Optics special issue on Metamaterials, 2005.
- Associate Guest Editor for IEEE's Journal of Selected Topics in Quantum Electronics (JSTQE) on Nonlinear Optics, 2005
- Guest Editor/Coordinator for Journal of Optical Society of America B (JOSA-B) Focus Issue on Metamaterials, 2005

- Editor for Feature Issue of J. of the Optical Society of America A and B on “Photonic Metamaterials”, v. 24, #10, 2007
- OSA Max Born Award Committee, Member, 2005, 2006
- Organizer of a number of symposia for ACS, OSA, APS, and CLEO/QELS Annual Meetings, 1997-2005
- Chair and Member of Program Committees and International Advisory Committees for a number of International Conferences, Symposia, and Schools
- Visiting Professorships (1999-2000; sabbatical year) at:
 - Ecole Supérieure de Physique et de Chimie Industrielles, Paris
 - University of Science and Technology, Hong Kong
 - Ludwig-Maximilians Universität, Munich
- The Associated Western Universities Faculty Fellowship (Sandia National Laboratories), 1995
- International Humboldt Foundation Scholar (Paris-Sud Université, France), 1991
- Humboldt Foundation Fellow (Heidelberg, Germany, and Paris, France), 1990-1991
- USSR Academy of Science Grant for Young Investigators, 1988-1990
- 2nd Prize in the USSR Academy of Science Competition on Fundamental Studies, 1983

Publication Summary (h-index is 100, as of January 2020, according to Google Scholar): Over 700 publications, in total, including 357 research papers in refereed journals, one monograph and two co-authored books, 7 edited/co-edited books, 29 invited book chapters, a number of invited review articles, and 316 conference proceedings and other publications; **47,000 citations**, in total. Over 450 invited presentations at International Conferences and leading research centers, including a number of plenary and keynote talks.

*The OPTICS category in the ISI Web of Science contains 94 journals; over 52,000 research articles, conference proceedings and book chapters are published each year in this category. Out of about 675,000 publications in total in the optics category of the Web of Science from January 2005 to January 2020, three papers from the Shalaev group are among the top 40 most cited publications and they are ranked, in terms of the number of citations, as #15 (V. M. Shalaev, “Optical negative-index metamaterials,” *Nature Photonics* 1, 41 (2007) – 2901 citations), #28 (W. Cai, U. K. Chettiar, A. V. Kildishev, and V. M. Shalaev, “Optical cloaking with metamaterials,” *Nature Photonics* 1, 224 (2007) – 1943 citations), and #38 (V. M. Shalaev et al, “Negative index of refraction in optical metamaterials,” *Optics Letts* 30, 3356 (2005) – 1892 citations). According to Google Scholar, there are 47,000 citations in total to Shalaev’s papers; his h-index is 100.*

Listed as “Highly Cited Researcher” (multiple highly cited papers that rank in the top 1% by citations for field and year in Web of Science) by the 2017, 2018 and 2019 Clarivate Analytics Essential Science Indicators (ESI) - <https://recognition.webofsciencetagroup.com/awards/highly-cited/2019/> and <https://recognition.webofsciencetagroup.com/awards/highly-cited/2019/methodology/>)

25 Most Cited papers and books (as of January 2020, according to Google Scholar)

1. Shalaev, V. M. Optical Negative-Index Metamaterials. *Nature photonics* 1, 41-48, (2007). -**2901 citations**
2. Noginov, M. Zhu, G. Belgrave, A. Bakker, R. Shalaev, V.M. et al. Demonstration of a Spaser-Based Nanolaser, *Nature* 460, 1110-1112, (2009). -**2085 citations**
3. Cai, W., Chettiar, U. K., Kildishev, A. V. & Shalaev, V. M. Optical Cloaking with Metamaterials. *Nature photonics* 1, 224-227, (2007). -**1943 citations**
4. Shalaev, V. M. et al. Negative Index of Refraction in Optical Metamaterials. *Optics Letters* 30, 3356-3358, (2005). -**1892 citations**
5. Kildishev, A. V., Boltasseva, A., Shalaev, V. M. Planar Photonics with Metasurface. *Science* 339 (6125), 1232009 (2013). -**1670 citations**
6. Cai, W. & Shalaev, V. M. *Optical Metamaterials*. Vol. 10 (Springer, 2010). -**1642 citations**
7. West, P. R. Ishii, S. Naik, G.V. Emani, N.K. Shalaev, V.M. Boltasseva, A. Searching for Better Plasmonic Materials. *Laser & Photonics Reviews* 4, 795-808, (2010). -**1466 citations**
8. Naik, G. Shalaev, V.M. Boltasseva, A. Alternative plasmonic materials: beyond gold and silver. *Advanced Materials* 25 (24), 3264-3294 (2013). **1240 citations**
9. Ni, X., Emani, N. K., Kildishev, A. V., Boltasseva, A. & Shalaev, V. M. Broadband Light Bending with Plasmonic Nanoantennas. *Science* 335, 427-427, (2012). -**1117 citations**
10. Xiao, S. et al. Loss-Free and Active Optical Negative-Index Metamaterials. *Nature* 466, 735-738, (2010). -**780 citations**.
11. Ni, X., Kildishev, A. V., & Shalaev, V. M. Metasurface Hologram for Visible Light. *Nature Communications* 4, 2807 (2007) - **775 citations**
12. Brongersma, M. & Shalaev, V. The Case for Plasmonics. *Science* 328, (2010). - **555 citations**
13. Shalaev, V. M. *Nonlinear Optics of Random Media: Fractal Composites and Metal-Dielectric Films*. (Springer, 2000). - **494 citations**
14. Ni, X., Ishii, S., Kildishev, A.V., Shalaev, V.M., Ultra-thin, planar, Babinet-inverted plasmonic metalenses, *Light: Science & Applications* 2 (4), e72, (2013). - **476 citations**
15. Shalaev, V. M. *Electromagnetic Properties of Small-Particle Composites*. *Physics Reports* 272, 61-137, (1996). - **458 citations**
16. Genov, D. A., Sarychev, A. K., Shalaev, V. M. & Wei, A. Resonant Field Enhancements from Metal Nanoparticle Arrays. *Nano Letters* 4, 153-158, (2004). -**448 citations**
17. S Grésillon, L Aigouy, AC Boccara, JC Rivoal, X Quelin, C Desmarest, P Gadenne, VA Shubin, AK Sarychev, Vladimir M Shalaev, Experimental Observation of Localized Optical Excitations in Random Metal-Dielectric Films. *Physical review letters* 82, 4520, (1999). -**414 citations**
18. Jacob, Z, Kim, JY, Naik, GV, Boltasseva, A, Narimanov, EE & Shalaev, V. M., Engineering photonic density of states using metamaterials, *Appl Phys B*, 100(1) (2010) – **386 citations**
19. Sarychev, A. K. & Shalaev, V. M. *Electrodynamics of Metamaterials*. (World Scientific, 2007). - **386 citations**
20. Cai, W., Chettiar, U. K., Kildishev, A. V., Shalaev, V. M. & Milton, G. W. Nonmagnetic Cloak with Minimized Scattering. *Applied Physics Letters* 91, 111105, (2007). -**377 citations**
21. Markel, V. et al. Near-Field Optical Spectroscopy of Individual Surface-Plasmon Modes in Colloid Clusters. *Physical Review B* 59, 10903, (1999). -**368 citations**

22. Sarychev, A. K. & Shalaev, V. M. Electromagnetic field fluctuations and optical nonlinearities in metal-dielectric composites, *Physics Reports* 335 (6), 275-371, (2000). **-358 citations**
23. Podolskiy, V., Sarychev, A. & Shalaev, V. Plasmon Modes and Negative Refraction in Metal Nanowire Composites. *Optics Express* 11, 735-745, (2003). **-349 citations**
24. Stockman, M. I., Shalaev, V. M., Moskovits, M., Botet, R. & George, T. F. Enhanced Raman Scattering by Fractal Clusters: Scale-Invariant Theory. *Physical Review B* 46, 2821, (1992). **-333 citations**
25. Tsai, D. P., Kovacs, J., Wang, Z., Moskovits, M., Shalaev, V. M., Suh, J. S., Botet, R. Photon scanning tunneling microscopy images of optical excitations of fractal metal colloid clusters, *Physical Review Letters* 72 (26), 4149, (1994). **- 321 citations**

Industry Engagement and Consulting Activities:

Co-founded a new startup company Q-Sensorix, where I am a CTO - 2019
 Member of the Scientific Advisory Council for Skolkovo Innovation Center (2012 -)
 Member of the Steering Committee for SkolTech-MIT (2012-2013)
 Executive Committee member for the Russian Quantum Center (2012-2013)
 International Advisory Board member for the Russian Quantum Center
 Co-Founder and scientific director for Nano-Meta Technologies, Inc. (NMTI), 2012-2019
 Member of Scientific Advisory Board for SOLARIS Nanosciences Inc., 2004-2011
 Member of Scientific Advisory Board for Array Bioscience Inc. (Berkley, CA) 1999-2001
 Consultant for Lasys Inc. (Las Cruces, NM) 2000-2003
 Consultant for Battelle Scientific Services Program, ARO, 1999-2009
 Consultant for Tienta Sciences Inc., 2006-2010
 Consultant for Science and Technology Corporation, 2009-2011

Research Grants and Contracts Received:

a. At Purdue University (since Fall 2001)

[1] “Plasmonic Nanophotonics and Optoelectronics” National Science Foundation, Nanoscale Interdisciplinary Research Team (NIRT), PI, NIRT#0210445, 07/01/02-06/30/06, \$1,300,000

[2] “Surface-Enhanced Optical Detection of Proteins”, Indiana Proteomics Consortium (co-funded by Eli Lilly Company, Indiana University, and Purdue University), co-PI (with Dor Ben-Amotz), 04/01/02-08/31/05, \$2,100,101.

[3] “Development of Novel Composite and Random Materials for Nonlinear Optics and Lasers”, NASA/Norfolk State University, PI (for Purdue) #: NCC5-514, 9/15/00-9/14/04. Total award \$2,000,000; PI for Purdue subcontract; Shalaev’s subcontract part: \$200,000.

[4] "Nanooptics with Plasmonic Nanomaterials," National Science Foundation, PI, Grant No. DMR-0121814, Nov. 2001 – Nov. 2005, \$234,321.

[5] "Fractal Surface Enhanced Chemical and Biological Sensors" National Science Foundation, PI, DMR-0227473, 8/1/02-7/31/03, \$100,000

[6] "Instrumentation for Research on Plasmonic Nanomaterials and their Applications in Photonics", DoD: Defense University Research Instrumentation Program (DURIP), PI, DAAD19-02-1-0124, \$206,994

[7] "Nanostructured Metal-Dielectric Films: New Avenues for Photonics and Spectroscopy," Army Research Office/New Mexico State University, PI, DAAD19-01-1-0682, 10/1/01-6/30/04. Total award - \$330,000; Purdue part -\$120,000.

[8] "Nonlinear Optics of Nanocomposites in Microcavities", NSF/New Mexico State University, PI (for Purdue) DMR-0071901, 10/01/01-09/30/04. Total award - \$285,000; Purdue part - \$50,000.

[9] "Nanometer Laser Spectroscopy Using Fractal Template", PI (for Purdue) NASA/New Mexico State University, NAG8-1710, 9/1/01-3/31/03. Total award - \$300,000; Purdue Part - \$40,000.

[10] "Plasmonic Nano-Photonics", Purdue Research Foundation, PI, 4/7/01-4/7/03, \$26,000. PI

[11] "Systematic Study of Electromagnetic Absorption and Scattering by Fractal Aggregates," Battelle Research Triangle/ARO, PI, 03/01/02-07/01/03, \$38,775.

[12] "Metal-Dielectric Composite Filters with Spectral Windows of Transparency," Battelle Research Triangle/ARO, PI, 05/01/02-04/30/03, \$48,681. PI

[13] "Center for Research and Education in Advanced Materials," NASA NRA 02 OEP-01 (University Research Centers), with Norfolk State University; \$6,000,000 total for 5 years; PI for Purdue subcontract; the Purdue part is \$300K.

[14] "Center for Photonic Materials Research: Engineering basic physical and spectroscopic principals of random lasers and other nano-composite photonic materials", NSF-CREST, 9/1/03-02/28/09, with Norfolk State University, \$4,000,000 total for 5 years; PI (at Purdue); the Purdue part is \$300K.

[15] "Acquisition and Customization of a Facility for the In-situ X-ray Structural Analysis of Nanomaterials", NSF, co-PI, \$613,822, 10/01/03-09/30/06.

[16] "Innovative Nanotechnology Research at Purdue", DARPA (co-PI); Total \$2,000,000; Shalaev's part is \$500,000.

[17] Negative Refraction in the Optical Range and Left-Handed Photonics, ARO, 08/01/04-12/31/06, total costs: \$320,000. PI

[18] Engineering Basis Physical and Spectroscopic Principles of Random Lasers and other Nano-Composition Photonic Materials, 09/01/03-08/30/08; total \$4,000,000. With Norfolk State University. PI for Purdue subcontract. Shalaev's subcontract is \$300,000.

[19] Plasmonic Filters with Infrared Windows Transparency, ARO via Battelle Operations, 01/12/05-01/11/07, \$277,000. PI.

[20] Spectral Properties of Negative-Index Materials in Optics, ARO, Defense University Research Instrumentation Program (DURIP), \$200K. 04/01/2005/03/31/06. PI

[21] Tunable Super-Lens for Nanoscale Optical Bio-Imaging, Phase I STTR/ARO project with Tienta Inc., \$100,000; Sept 1., 2005- Aug. 31, 2006

[22] MURI-ARO Award "Tunable and Reconfigurable Optical Negative-Index Materials with Low Losses, \$5.4M. PI (May 1, 2006 to Apr 30, 2011).

[23] NSF-PREM Award for PREM Center "Photonic Metamaterials" (Aug. 2006-Aug 2011). PI for Purdue University subcontract. Total \$2M; Purdue's part \$500K.

[24] STTR-ARO Phase II Award "Super-Lens for Bio-Sensing" (with Tienta Sciences Inc.; Oct. 2006-Oct. 2008); \$800K. PI for Purdue; the Purdue part \$400K.

[25] MURI-ARO Award "Passive All-Optical Switching" (Aug. 2006-Aug. 2011). Total \$5M. PI for Purdue subcontract; the Purdue budget \$750K.

[26] ARO-Battelle Research Triangle Park Office "Long Pass Plasmonic-Molecular Filters for Mid-Infrared", 03/09/07-03/08/09, PI, \$111,000

[27] ARO, "Spectroscopic Ellipsometry of Optical Metamaterials", co-PI, 06/02/2009 – 02/01/2010, \$145K

[28] ARO-MURI, "Transformation Optical Metamaterials", co-PI (PI for Purdue), 09/28/2009 – 01/27/2011, \$2,153,250

[29] ARO, "Searching for Better Plasmonic Materials," co-PI, 09/15/2009 – 06/14/2010, \$50K

[30] Science and Technology Corp., "Bi-spectral Plasmonic onsurants," PI, 04/01/2009 – 12/31/2010, \$150K

- [31] ARO-DURIP, “Glancing Angle Deposition System for Transformation-Optics Devices”, co-PI, 08/10/2010-09/09/2011, \$150K
- [32] CIA, “A Planar Magnifying Hyperlens”, PI, 07/12/2010-07/11/2012, \$240K.
- [33] The Boeing Company, “Hyperbolic Metamaterials for Controlling Thermal Radiation: Feasibility Study”, co-PI, \$50K, 07/01/2010-12/17/2010
- [34] MURI-ONR, “Large-Area, 3D Optical Metamaterials with Tunability and Low Loss”, co-PI, \$1.3M (Shalaev’s part), 08/01/2010-07/31/2015
- [35] ARO, “Unlocking New Physics with Improved Plasmonic Materials”, co-PI, \$100K (Shalaev’s part), 08/01/2011-07/30/2014
- [36] MURI-AFOSR, “Intergrated Hybrid Nanophotonic Circuits”, co-PI, \$750K (Shalaev’s part), 06/01/2011-05/31/2016
- [37] NSF-MRSEC “Center for Photonic Materials (C-PHOM)”, co-PI, \$1M (Shalaev’s part), 8/01/2011-07/30/2016
- [38] co-PI, NSF-PREM Award for PREM Center “META-PREM” (Aug. 2012-Aug 2017). PI for Purdue University subcontract. Total \$3.4M; Purdue’s part \$900K; Shalaev’s part \$450K.
- [39] University of York, “Advnaced Transformation Optical Methods,” \$31K, 06/15/2013-06/14/2015.
- [39] PI, ARO, “Flat Photonics with Metasurfaces”, total \$1.4M; Shalaev’s part \$0.7M, 01/01/13-12/31/16
- [40] Co-PI, (PI: M. Stockman, Georgia State University), ONR-MURI, “Novel Nonlinear Optical Processes in Active, Random, and Nanostructured Systems” total \$6M; Shalaev’s part \$1.2M, 07/01/2013-06/30/2018
- [41] Co-PI, (PI: F. Capasso, Harvard), AFOSR-MURI, “Active Metasurfaces for Advanced Wavefront Engineering and Waveguiding” total \$6M; Shalaev’s part \$800K, July 2014-July 2019
- [42] Co-PI (PI: A. Boltasseva), NSF, “OP: Enabling High-Temperature Photonic Technologies with Plasmonic Ceramics,” total \$600,000; Shalaev’s part \$200,000, 9/1/2015-4/1/2019.
- [43] PI, ONR DURIP, “Time-Resolved Fluorescence Spectroscopy with Nanoscale Manipulation Capability for Novel On-Chip Nanophotonic Quantum Devices”, \$278,613, 07/15/2016-07/14/2017

- [44] Co-PI, (PI: E. Marinero, Purdue), ONR, “Merging Spintronics and Nanophotonics: The Confluence of Spin, Photons, Plasmons and Charge for Novel Hybrid Photonics and Nano---Electronics Devices”, Shalaev’s part: \$100,000; total \$300,000; 2016-2018.
- [45] Co-PI (PI: A. Boltasseva), DOE, “Control of light-matter interaction with epsilon-near-zero homogeneous alternative plasmonic materials,” total \$1,309,000, Shalaev’s part \$450k, 07/018/2017-076/30/2020
- [46] Co-PI (PI: A. Boltasseva), AFOSR, Hot-Electrons Generation in New Plasmonic Materials for Integrated On-Chip Devices, \$750,000, Shalaev’s part \$350k, period: 04/27/2017 – 04/26/2020
- [47] Co-PI (PI: A. Boltasseva), ONR, DURIP: Optical Characterization System for Novel On-Chip Nanoscale Light Sources, period: Total \$170,000, 06/01/2017-05/31/2018
- [48] PI, AFOSR, Space-Time Photonic Metamaterials: From Design and Materials to Device Concepts, total: \$795K, Shalaev’s budget \$100,000/year, period: 11/15/2017-11/14/2021
- [49] Co-PI (PI: Y. Chen, Purdue), Purdue University, Big Idea Challenge Research, Shalaev’s budget 40k, 04/01/2017-03/31/2019
- [50] PI, ONR, DURIP, Versatile Sputtering Tool for New Optical Materials for High-Temperature Plasmonics, Robust On-chip Nanophotonics, and Quantum Devices, \$456,000, 07/15/2018-07/14/2019
- [51] Co-PI, (PI: E. Marinero, Purdue), ONR, Topology and Magneto-Photonics: Novel Platform for Advanced Metasurface and Magnonic Devices, Total \$450,000, 07/01/2018-06/30/2021
- [52] Co-PI (PI: Upadhyaya), NSF, “EAGER: Enabling Quantum Leap: Electrically tunable, long-distance coherent coupling between room temperature qubits mediated by magnons in low-dimensional magnets”, total \$300k (Shalaev’s part \$100k), 07/15/2018-06/30/2020
- [53] PI, ONR, DURIP, “Advanced Pulsed Laser Deposition for Ultrafast, Tunable Metal and Magneto Oxide Nanophotonic Devices” 7/1/2019-6/30/2020 \$162,150
- [54] co-PI. ARO, MURI, “Near-Field Radiative Heat Transfer and Energy Conversion in Nanogaps of Nano and Meta-Structured Materials”, Shalaev’s part \$510K, 06/01/2019 -05/31/2022
- [55] Co-PI (PI: Boltasseva) ONR, “Extreme Nonlinear Optics with Low-Index Materials,” total \$300k, Shalaev’s part \$150k, 01/01/2020 -12/31/2021

[56] co-PI (PI: Boltasseva), AFOSR, "Trans-Dimensional Photonics: From Evolution of Material Properties to Exploring", total: \$800K, Shalaev's part \$400K, 01/01/2020 -12/31/2023

b. At New Mexico State University

[1] Principal Investigator, "Radiation Scattering by Fractal Clusters in Aerosols," Environmental Protection Agency, Grant No. R822658-01-0, 1995-97, 1994-1997, \$155,609.

[2] Principal Investigator, "Near-Field Optics of Fractal Surfaces, NATO, Grant No. CRG 950097, 1995-97, \$15,000

[3] Principal Investigator, "Near-Field Optics of Fractals," National Science Foundation, Grant No. DMR-9500258, 1995-98, \$200,000

[4] Co-principal Investigator (PI, R. Armstrong), "Nanocomposites in Microcavities," National Science Foundation, Grant No. DMR-9623663, 1996-2000, \$250,000. Professor Shalaev's share was \$125,000.

[5] Principal Investigator, "Optical Properties of Self-Affine Films, NATO, Grant No. CRG 970098, 1997-1998, \$15,000.

[6] Principal Investigator, "Culturally Diverse Traineeship Program to Develop Personnel for Career in Environmental Research," GEM Consortium, 1997-98, \$25,000

[7] Principal Investigator, "Fractal Surface Enhanced Nonlinear Optics & Spectroscopy," Petroleum Research Funds at the American Chemical Society, Grant No. 32319-AC5, 1997-99, \$50,000

[8] Principal Investigator, "Nonlinear Near-Field Optics of Fractal Thin Films." National Science Foundation, Grant No. DMR-9810183, 1998-2001, \$200,000.

[9] Co-principal Investigator (PI, R. Armstrong), "Light Control in Fractal Nanoparticles," Army Research Office, Grant No. DAAAG55-98-1-0425, 1998-2001, \$210,000. Professor Shalaev's share is \$105,000.

[10] Co-principal Investigator (PI, C. Ying), "Acquisition of a Femtosecond Laser System," National Science Foundation, Grant No. DMR-9977358, 1999-2000, \$139,000. Professor Shalaev's share was \$46,333.

[11] Principal Investigator, "Surface-Enhanced Optical Spectroscopy in Composite Materials." Petroleum Research Funds at the American Chemical Society, Grant No. 35028-AC5, 1999-2001, \$30,000.

[12] Co-principal Investigator (PI, R. Armstrong), "Nonlinear Optics of Nanocomposites in Microcavities." National Science Foundation, Grant No. DMR-0071901, 2000-03, \$285,000. Professor Shalaev's share is \$142,500.

[13] Co-principal Investigator (PI, C. Ying), "Nanometer Laser Spectroscopy Using Fractal Media." NASA, Grant No. AS00-0037, 2000-03, \$300,000. Professor Shalaev's share is \$150,000.

[14] Principal Investigator (of subcontract) "Development of Novel Composite & Random Materials." NASA, Agency proposal #: NCC5-514, 2000-04, \$4,000,000. \$400,000 subcontracted from Norfolk State University.

[15] Principal Investigator, " Nanostructured Metal-Dielectric Films: New Avenues for Photonics and Spectroscopy," Army Research Office, Grant No. DAAD19-01-1-0682, 2001-04, \$330,000.

Professional Society Activities:

Organizations:

Materials Research Society (MRS), Fellow: 2015-present
IEEE(Institute of Electrical and Electronics Engineers), Fellow: 2010-present
APS (American Physical Society). Fellow: 2002—present
OSA (Optical Society of America). Fellow: 2003-present
The International Society for Optical Engineering (SPIE) Fellow: 2005-present
OSA Max Born Award Committee, Member, 2005, 2006
APS (American Physical Society). Member: 1992—present
OSA (Optical Society of America). Member: 1995-present
Vice-Chair for OSA Topical Group “Waves in random and periodic structures”, 2002- 2004
Chair of the OSA Topical Group: Photonic Metamaterials: from Random to Periodic, 2004-2006
ACS (American Chemical Society). Member: 1997-99
MRS (Materials Research Society). Member: 1996-99, 2002-
SPIE (International Society for Optical Engineers). Member 2002-
IEEE-Senior Member, 2005-
IEEE LEOS Nanophotonics Member Committee, 2004-2007
Chair of OSA Technical Group “Photonic Metamaterials”, 2008-2010

Activities:

i. Conference Committees and Conference Chair Positions

- [1] Session Organizer and Chair, "Nanostructured Materials: Clusters, Composites, and Thin Films," at the 213th American Chemical Society Meeting, San Francisco, CA, April 13-17, 1997.
 - Editor of a book developed from this session (with the same title), published by the ACS Symposium Series, Vol. 679, ACS Books, 1997.
- [2] Member of the Program Committee and Chair of a session at XI International Vavilov Conference on Nonlinear Optics, Novosibirsk, Russia, June 24-28, 1997.
- [3] Member of the International Advisory Committee and Chair of a Session at the Fifth International Conference on Electrical Transport and Optical Properties of Inhomogeneous Media (ETOPIM5), Hong Kong, June 1999
- [4] Organizer and Chair, "Nonlinear Optics of Random Media," Symposia at the Annual Optical Society of America meetings in Baltimore, October 1998 and California in 1999
 - Editor of a book based on the 1999 symposia (with the same title) in the Springer Verlag series *Topics in Applied Physics*, to be published 2001.
- [5] Member of the Program Committee, Sixth International Conference on Electrical Transport and Optical Properties of Inhomogeneous Media (ETOPIM6), Salt Lake City, UT, July 2002.
- [6] Member of the International Program Committee for VIII International Conference "Laser and Laser-Information Technology", Sept. 27-Oct. 1, 2003, Plovdiv, Bulgaria.
- [7] Member of the International Program Committee for The 4th Asia-Pacific Conference on Near-Field Optics, Taipei, Taiwan, October 14 -17, 2003.
- [8] Chair of Sub-Committee "Fundamental Optics in Periodic and Random Media" for Quantum Electronics and Laser Science 2003 Conference, Baltimore
- [9] Co-Chair for Symposium "Waves in Random and Periodic Media" for 2002 Annual OSA Meeting in Orlando, FL.
- [10] Co-Chair for Symposium "Waves in Random and Periodic Media" for 2004 Annual OSA Meeting in Rochester

- [11] Program Committee Member for Symposium “Plasmonics: Metallic Nanostructures and Their Optical Properties” at SPIE 48th Annual Meeting, August 2003, San Diego, Ca.
- [12] Co-Chair for Technical Group “Waves in Random and Periodic Media” for 2004 “Frontiers in Optics” OSA Meeting in Rochester, NY.
- [13] Program Committee Member for Symposium “Complex Mediums IV” at SPIE 48th Annual Meeting, August 2003, San Diego, Ca.
- [14] Program Committee Member for Symposium “Complex Mediums V: Light and Complexity” at SPIE 49th Annual Meeting, 4-5 August 2004, Denver, Co.
- [15] Chair for Technical Group “Photonic Metamaterials: from Random to Periodic,” for 2005 “Frontiers in Optics” OSA Meeting in Tucson, AZ
- [16] Member of International Advisory Board for Asia-Pacific Conference on Near-Field Optics (AP-NFO05), Niigata City, Japan, Nov. 15-17, 2005.
- [17] Program Committee Member for Symposium “Complex Mediums V: Light and Complexity” at SPIE 50th Annual Meeting, 2005, San Diego, CA
- [18] Co-Chair for Symposium “Plasmonic Nano-imaging and Nanofabrication” at SPIE 50th Annual Meeting
- [19] Co-Chair for OSA Topical Meeting “Photonic Metamaterials: from Random to Periodic” held on Bahamas, June 2006
- [20] Member of the Program Committee, Seventh International Conference on Electrical Transport and Optical Properties of Inhomogeneous Media (ETOPIM7), Sydney, Australia, July 2006.
- [21] Co-Chair and Member of the Program Committee for MRS Symposium “Plasmonics – Nanoscale Optics and Photonics Based on Metals”, Materials Research Society Fall Meeting, Nov. 28-Dec. 2, 2005, Boston, MA (2005).
- [22] Member of the Advisory and Program Committee of The Annual International Workshop Laser Physics, LPHYS’06.
- [23] Program Committee Member for International Conference on Nanophotonics and Metamaterials (NanoMeta 2007) held in Seefeld in Austria in January 2007.
- [24] Co-Chair for Symposium “Plasmonic Nano-imaging and Nanofabrication” at SPIE Annual Meeting in August, 2006, San Diego, CA

- [25] Co-Chair of a Symposium on Metamaterials at the American Physical Society March Meeting in 2006.
- [26] International Program Committee Member for a conference “Laser and Laser-Informational Technologies: Fundamental Problems and Applications” 2004, Bulgaria, and 2006, Smolian, October 4-7, 2006, Bulgaria.
- [27] International Program and Steering Committee Member for 1-st International Congress “Metamaterials” October 2007, Rome, Italy
- [28] Program Committee Member for Symposium “Complex Mediums V: Light and Complexity” at SPIE Annual Meeting, 2006, San Diego, CA
- [29] Co-Chair for Symposium “Plasmonic Nano-imaging and Nanofabrication” at SPIE Annual Meeting, 2007, San Diego, CA
- [30] Program Committee Member for Symposium “Plasmonics: Metallic Nanostructures and their Optical Properties IV” at SPIE Annual Meeting, 2006, San Diego, CA
- [31] Chair of OSA Topical Group “Photonic Metamaterials: from Random to Periodic”, Division of Optical Sciences, 2006.
- [32] Program Committee Member for Symposium “Plasmonics: Metallic Nanostructures and their Optical Properties IV” at SPIE Annual Meeting, 2007, San Diego, CA
- [33] Program Committee Member for Symposium “Complex Mediums V: Light and Complexity” at SPIE Annual Meeting, 2006, San Diego, CA
- [34] Co-Chair for Symposium “Plasmonic Nano-imaging and Nanofabrication” at SPIE Annual Meeting, 2008, San Diego, CA
- [35] Program Committee Member for Symposium “Complex Mediums VII: Light and Complexity” at SPIE Annual Meeting, 2008, San Diego, CA
- [36] Program Committee Member for Symposium “Plasmonics: Metallic Nanostructures and their Optical Properties VI” at SPIE Annual Meeting, 2008, San Diego, CA
- [37] International Steering Committee Member for the 2-nd International Congress “Metamaterials” 2008, Pamplona, Spain
- [38] Program Chair of OSA Topical Meeting: Photonic Metamaterials: from Random to Periodic, Jackson Hole, Wy, June 4-7, 2007.

- [39] Co-Chair for Symposium “Plasmonic Nano-imaging and Nanofabrication” at SPIE Annual Meeting, 2009, San Diego, CA
- [40] Program Committee Member for Symposium “Complex Mediums VIII: Light and Complexity” at SPIE Annual Meeting, 2009, San Diego, CA
- [41] Program Committee Member for Symposium “Plasmonics: Metallic Nanostructures and their Optical Properties VII” at SPIE Annual Meeting, 2009, San Diego, CA
- [42] Program Committee Member for International Conference on Nanophotonics and Matamaterials (NanoMeta 2009) held in Seefeld, Austria, in January 2009.
- [43] International Steering Committee Member for the 3-nd International Congress “Metamaterials” 2009, London, UK.
- [44] Program Committee Member of 5th International Conference on Materials for Advanced Technologies 2009, Singapore, 28 June – 3 July, 2009.
- [45] Member of the Advisory and Program Committee for Laser Physics Workshop, Trondheim, Norway. June 30 - July 4, 2008.
- [46] Member of the Advisory and Program Committee for Laser Physics Workshop, Barcelona, Spain, July 13-17, 2009.
- [47] Electrical Transport and Optical Properties of Inhomogeneous Media (ETOPIM) Association Committee Member; the eighth International Conference. Crete, Greece, June 8-12, 2009.
- [48] Member of the Program Committee for The 8th Pacific Rim Conference on Lasers and Electro-Optics (CLEO / Pacific Rim); Aug. 30 – Sep. 3, 2009, Shanghai, China.
- [49] Program co-Chair for the 2009 CLEO/IQEC conference
- [50] Symposium Organizer, 2009 MRS Fall Meeting.
- [51] Sub-committee co-chair for the program topic “Nanophotonics and Plasmonics” of ICONO-2010 conference (International Conferences on Coherent and Nonlinear Optics); August 23-27, 2010, Kazan, Russia
- [52] Program Committee Member for Symposium “Thin Films” at SPIE Annual Meeting, 2010, San Diego, CA
- [53] Program Committee Member for Symposium “Metamaterials” at SPIE Annual Meeting, 2010, San Diego, CA

- [54] Program Committee Member for Symposium “Plasmonics VIII” at SPIE Annual Meeting, 2010, San Diego, CA
- [55] Member of the Advisory and Program Committee for Laser Physics Workshop, Foz do Iguacu, Brazil, July 5 - 9, 2010
- [56] Co-Chair of International conference ICMAT 2011, Singapore
- [57] A member of the International Program Committee (IPC) for the IASTED International Conference on Antennas, Radar and Wave Propagation (ARP 2009)
- [58] A member of the International Program Committee (IPC) for the IASTED International Conference on Antennas, Radar and Wave Propagation (ARP 2010; Cambridge, Massachusetts, USA from November 01, 2010 to November 03, 2010)
- [59] A member of Technical Program Committee of CLEO Europe-EQEC 2011 (Munich)
- [60] General co-Chair for the 2011 CLEO/QELS conference
- [61] International Adviser Board Member for Symposium “Smart & Adaptive Optics” at 4th CIMTEC Conference (Montecatini Terme, Italy, 2012)
- [62] Program Committee Member for the SPIE conference LA112 on Synthesis and Photonics of Nanoscale Materials IX (21-26 January 2012, San Francisco, CA)
- [63] International Program and Steering Committee Member for International Congress “Metamaterials” in 2012 (St. Petersburg)
- [64] International Program and Steering Committee Member for International Congress “Metamaterials” in 2013 (Bordeaux, France)
- [65] Member of the International Advisory Committee for a conference Modern Problems of Laser Physics, MPLP-21013 to be held in Novosibirsk, Russia, Aug. 25-31, 2013
- [66] International Program and Steering Committee Member for International Congress “Metamaterials” in 2014 (Copenhagen, Denmark)
- [67] International Adviser Board Member for Symposium “Smart & Adaptive Optics” at 4th CIMTEC Conference (Montecatini Terme, Italy, 2013)
- [68] International Advisory Committee member for META’14, Singapore, May 20-23, 2014

- [69] Program Committee Member for the SPIE conference 9163 Plasmonics: Metallic Nanostructures and Optical Properties XII (17-21 August 2014, San Diego, CA)
- [70] Advisory Board Member for the 9-th International Congress “Metamaterials” 2014, 25-30 August, Copenhagen, Denmark
- [71] Gordon Conference on Plasmonics, July 6-11, 2014. Discussion leader.
- [72] Member of the International Advisory Committee the 6th International Conference "Frontiers of Nonlinear Physics", a boat cruising from Nizhny Novgorod to St.-Petersburg from July 17 through July 23, 2016
- [73] Advisory Board Member for International Congress “Metamaterials” in 2015 (Oxford, UK)
- [74] International Advisory Committee member for META’15, NYC, NY, Aug 3-7, 2015
- [75] Program Committee Member for the SPIE conference 9163 Plasmonics: Metallic Nanostructures and Optical Properties XIII (August 2015, San Diego, CA)
- [76] Advisory Board Member for International Congress “Metamaterials” in 2016 (Crete, Greece)
- [77] International Adviser Board Member for Symposium “Smart & Adaptive Optics” at 4th CIMTEC Conference (Perugia, Italy, June 5-9, 2016)
- [78] Member of International Advisory Committee, META’16 Malaga, Spain, July 25-28, 2016
- [79] Member of Advisory & Program Committee, International Laser Physics Workshop, July 17-21, 2017, Kazan, Russia
- [80] Member of Program Committee, Plasmonics Conference, SPIE, 6-10 August 2017, San Diego, CA, USA
- [81] Scientific Advisory Board Member, Metamaterials Congress, 28 Aug – 2 Sept, 2017, Marseille, France
- [82] Advisory Board Member for International Congress “Metamaterials” in 2018 (Finland)
- [83] International Advisory Committee member for META’18, Marseille, France, June 24-30, 2018

- [84] International Advisory Board and Program Committee, Electrical Transport and Optical Properties of Inhomogeneous Media (ETOPIM) 2018 (Prague, Czech)
- [85] Program Committee Member for Symposium “PLASMONICS” at SPIE Annual Meeting, August 2018, San Diego, CA
- [86] Program Committee Member for International Conference “Novel Optical Materials and Applications (NOMA)”, Cetraro, Italy, June 2019.
- [87] Scientific Advisory Committee member, META 2019, Lisbon, Portugal, July 2019.
- [88] Program Committee member, SPIE Optics and Photonics Plasmonics: Design, Materials, Fabrication, Characterization, and Applications XVII, San Diego, CA, August 2019.
- [89] Technical Program Committee member, Metamaterial Congress, Rome, Italy, September 2019.

ii. Conference Seminar Organization

- [1] Organizer and Chair of eight seminar sessions on "Novel Optics," "Nano-Optics," and "Plasmonic Nanophotonics," at International Winter Colloquia on the Physics of Quantum Electronics (PQE) in Snowbird, UT, January 1998, 1999, 2000, 2001, 2002, 2003, 2004, and 2005.
- [2] Co-chair of seminar "Modern Trends in Laser Physics," at the International Laser Physics Workshop (LPHYS'01), Moscow, Russia, July 3-7, 2001.
- [3] Co-chair of seminar "Modern Trends in Laser Physics," at the International Laser Physics Workshop (LPHYS'02), Bratislava Slovak Republic, July 1-5, 2002.
- [4] Co-chair of seminar "Modern Trends in Laser Physics," at the International Laser Physics Workshop (LPHYS'03), Federal Republic of Germany, Hamburg, August 25-29, 2003.
- [5] Co-chair of seminar "Modern Trends in Laser Physics," at the International Laser Physics Workshop (LPHYS'04), Italy, Trieste, July 12-16, 2004
- [6] Co-chair of seminar "Modern Trends in Laser Physics," at the International Laser Physics Workshop (LPHYS'05), Kyoto, Japan. July 4-9, 2005
- [7] Organizer and Chair of “Photonic Metamaterials” Symposia at International Winter Colloquium on the Physics of Quantum Electronics (PQE) in Snowbird, UT, January 2006, and January 2008.

- [8] Chair of OSA Topical Meeting: Photonic Metamaterials: from Random to Periodic, Jackson Hole, Wyoming, June 4-7, 2007.
- [9] Chair for CLEO/QELS Joint Symposium on Nanophotonics, Baltimore, MD, May 6-11, 2007
- [10] Chair for QELS Symposium on Nanophotonics with Metamaterials, San Jose, CA, May 16-21, 2010
- [11] Chair for 2009 Fall MRS Symposium “Excitons and Plasmon Resonances in Nanostructures II”, Boston, MA, November 30 – December 4, 2009
- [12] Chair for 2012 International Workshop “Novel Ideas in Optics”, West Lafayette, IN, Purdue University, May 31 – June 2, 2102
- [13] Organizer and co-Chair of “Metamaterials” Sessions at International Winter Colloquium on the Physics of Quantum Electronics (PQE) in Snowbird, UT, January 2014.
- [14] Organizer and co-Chair of “New Material Platforms for Nanophotonics” Session at International Winter Colloquium on the Physics of Quantum Electronics (PQE) in Snowbird, UT, January 2016
- [15] Organizer and co-Chair of “Quantum Control of Light and Matter” International Workshop, Purdue, West Lafayette, IN, Oct 14-15, 2015
- [16] Organizer and co-Chair of “Coherent Phenomena in Physics and Chemistry”, April 2017, Purdue, West Lafayette
- [17] Organizer and Program Committee Member of International Symposium on Quantum Science and Technology, April 21-23, 2019, Purdue University, West Lafayette, IN

PhD Thesis Supervision Completed:

i. At Krasnoyarsk State University, Russia

- [1] V. A. Butenko, “Nonlinear Optics of Fractal Composites.” Physics Department, Krasnoyarsk University, Russia. 1996.

ii. At New Mexico State University

- [1] V. A. Markel, “Optical Properties of Clusters and Nanocomposites.” Physics Department, New Mexico State University, 1995.
- [2] E. Y. Poliakov, “Optical Phenomena in Fractal Clusters and Self-Affine Films.” Physics Department, New Mexico State University, 1998.

[3] V. A. Podolskiy, “Optical Properties of Metal-Dielectric Composites”, Physics Department, New Mexico State University, 2002

iii. At Purdue University

[1] Dentcho Genov, “Electromagnetic Properties of Complex Media: Nano-Structured Semicontinuous Films and Fractal Aggregates, 2005

[2] Eldar Khaliullin, “Quantum Size and Nonlinear Effects in Metal Nanostructures and Bio-Applications with SERS, 2005

[3] Wenshan Cai, “Optical Metamaterials: Basic Structures and Potential Applications” May 2008

[4] Hsiao-Kuan Yuan, “Optical metamaterials, July 2008

[5] Uday Chettiar, “Simulation, modeling, and design of optical metamaterials”, December 2008.

[6] Reuben Bakker, “Optical Nanoantennae: Enhanced Electromagnetic Fields and Enhanced Fluorescence”, August 2008.

[7] Piotr Nyga, “Plasmonic Nanomaterials for Midinfrared and their Photomodification”, December 2008.

[8] Mark Thoreson, “Metal-Dielectric Composite Plasmonic Films and their Applications”, December 2009

[9] Shumin Xiao, Tunable and Active Optical Negative Index Metamaterials, August 2010

[10]Zhengtong Liu, Modeling and Characterization of Plasmon Nanostructures, August 2010

[11] Joshua Borneman, Optical Metamaterials: Linear and Nonlinear Characterization and Applications to Optical Limiting, May 2010

[12] Ji Young Kim, Near-field Optical Microscopy and Spontaneous Emission Engineering with Plasmonic Metamaterials, December 2010

[13] Kuo Ping Chen, December 2010

[14] Xingjie Ni, October, 2012

[15] Satoshi Ishii, November, 2012

[16] Guru Naik, Summer 2013 (co-advisor)

[17] Urcan Guler, December 2013

- [18] Jingjing Liu, August 2015
- [19] Amr Shaltout, November 2015
- [20] Rohith Chandrashekhar, Spring 2016
- [21] Jieran Fang (co-advisor), Summer 2016
- [22] Mikhail Shalaginov, Summer 2017
- [23] Zhuoxian Wang, PhD (co-adviser), 2018
- [24] Clayton Devault, December 2018
- [25] Di Wang, October 2019

Master's Thesis Supervision Completed:

i. At Krasnoyarsk State University, Russia

- [1] V. Gomer, “Self-Affine Surfaces”. Physics Department, Krasnoyarsk University, Russia. 1993.
- [2] A. Butenko, “Numerical Simulations of Fractal Clusters,” Physics Department, Krasnoyarsk University, Russia. 1990.

ii. At New Mexico State University

- [1] V. Shubin, “Optical properties of Percolation Films”, Physics Department, New Mexico State University, 1999.

iii. At Purdue University

- [1] T. Goyani, “Detection of Bio-Chemical Warfare Agents with Surface-Enhanced Raman Spectroscopy,” Purdue University, 2004.
- [2] Reuben Bakker, “Imaging of Engineered Plasmonic Nanostructures with Near-Field Scanning Optical Microscopy” 2004
- [3] Mark D. Thoreson, “Adaptive Surface-Enhanced Raman Scattering Substrates: Fabrication and Characterization” 2004.
- [4] Weiqiang Chen, “Study of Ultra-Thin Ultra-Smooth and Low-Loss Silver and Silver-Silica Composite Films for Superlensing Applications”, November 2009
- [5] Ranga Koswatta, 3D FDTD Numerical Modeling of Optical

Metamaterials, May 2010.

[6] Vashista de Silva, May 2011

[7] Jieran Fang, 2012

Master's and PhD Students Currently Being Supervised:

[1] James Stewart, PhD (co-adviser)

[2] Harshavardhanareddy Eragamreddy, PhD

[3] Deesha Shah, PhD

[4] Soham Saha, PhD (co-adviser)

[5] Samuel Peana, PhD (co-adviser)

[6] Bruce Ding, PhD

[7] Zach Martin, PhD

[8] Aveek Dutta, PhD (co-adviser)

[9] Deesha Shah, PhD (co-adviser)

[10] Xiaohui Xu, PhD (co-adviser)

Courses Developed:

Phys. 573/673 Optics of Advanced Nanomaterials (Spring 1999; at New Mexico State)

ECE 695S "Nanophotonics and Metamaterials" (Fall 2004, Fall 2006, Spring 2008, Fall 2009, Fall 2011, Fall 2013, Fall 2015, Fall 2017)

Courses "In Charge Of":

Phys. 472/572 Nonlinear Optics (Spring 1994-2001; at New Mexico State)

ECE 695S Nanophotonics and Metamaterials

ECE552 Introduction to Lasers

ECE 615 Nonlinear Optics

Teaching Evaluation (based on evaluable reports; mean scores):

“Nanophotonics and Metamaterials” was recorded on nanoHUB. It has been viewed by nearly 70,000 times with nearly perfect readers rating and very positive comments, including such as this one: “Prof. Shalaev is terrific in explaining difficult concepts...I got way more than I expected out of this course!” “As a new researcher in the field of Plasmonics and Metamaterials, I think this is the best resource available so far to get a pedagogical development in the field. Thank you for everyone who participated in making this work available for everyone :)” This course has also been adopted by his colleagues and taught with great success at various international institutions including universities in Denmark and Germany.

School Committee Activities (at Purdue only):

Co-Founder, co-Chair of Purdue Quantum Center (now Purdue Quantum Science and Engineering Institute); currently, founding chair 2015-

Committee: ECE Named and Distinguished Professorship
Activity: Member, current

Committee: Arden Bement Award
Activity: Member, 2016-2017

Committee: McCoy Award
Activity: Member, 2014-2017

Committee: BNC Strategic Committee
Activity: Member

Committee: Search for faculty for “Quantum Photonics” preeminent team
Activity: Chair – 2014-2015

Committee: Advisory Committee for Birck Nanotechnology Center
Activity: Member

Committee: Search for faculty for “Quantum Photonics” preeminent team
Activity: Chair - 2013

Committee: Search for BNC Deputy Director
Activity: Member - 2013

Committee: Purdue University’s Global Council
Activity: an Inaugural Member - 2012

Committee: External Awards
Activity: Chair (interim) 2007

Committee: College of Engineering “Eric” Program
Activity: Member

Committee: Nanotechnology Cluster Hire Steering Committee
Activity: Member

Committee: Sub-cluster on hire in Nanophotonics/Photonics area
Activity: Chair, 2005-07

Committee: Dean’s Advisory Committee
Activity: Member, 2003-2004

Committee: Graduate Committee
Activity: Member, 2001 – 2004

Committee: Graduate Admission
Activity: Member, 2003-2006

Committee: Director Search for BNC Committee
Activity: Member, 2006

Committee: Global Portfolio strategy area for the College of Engineering strategic plan, 2009.
Activity: ECE Head Search Committee, 2009-2010

Research Books and Book Contributions:

a. Authored and Edited Books

- [7] W. Cai and Vladimir M. Shalaev, *Optical Metamaterials: Fundamentals and Applications*, Springer, 2010. - Winner of the 2014 Joseph W. Goodman Book Writing Award from OSA and SPIE.
- [6] S. Kawata and V. M. Shalaev (Editors), *Tip Enhancement (Advances in Nano-Optics and Nano-Photonics)*, Elsevier, 2007.
- [5] V. M. Shalaev and S. Kawata (Editors), *Nanophotonics with Surface Plasmons (Advances in Nano-Optics and Nano-Photonics)*, Elsevier, 2007.
- [4] A. K. Sarychev and V. M. Shalaev, *Electrodynamics of Metamaterials*, World Scientific, Singapore, 2007.

- [3] V. M. Shalaev (Editor), *Optical Properties of Random Nanostructures*, Springer Verlag, Topics in Applied Physics, Berlin Heidelberg 2002.
- [2] V. M. Shalaev and M. Moskovits (Editors), *Nanostructured Materials: Clusters, Composites, and Thin Films*, ACS Symposium Series v. 679, ACS Books, 1997.
- [1] V. M. Shalaev, *Nonlinear Optics of Random Media: Fractal Composites and Metal-Dielectric Films*, Springer Tracts in Modern Physics, v.158, Springer, Berlin Heidelberg 2000.

b. Book Chapters

- [29] K. Chaudhuri, Z. Wang, M. Alhabeab, K. Maleski, Y. Gogotsi, V. Shalaev, A. Boltasseva, “Optical Properties of MXenes”, chapter in “2D Metal Carbides and Nitrides (MXenes): Structures, Properties and Applications”; Eds: B. Anasori, Y. Gogotsi, Springer Nature Switzerland AG, ISBN 978-3-030-19025-5, pp. 327-346 (2019).
- [28] M. Y. Shalaginov, R. Chandrasekar, S. Bogdanov, Z. Wang, X. Meng, O. A. Makarova, A. Lagutchev, A. V. Kildishev, A. Boltasseva, V. M. Shalaev, "Hyperbolic Metamaterials for Single-Photon Sources and Nanolasers", chapter in the book "Quantum Plasmonics"; Eds: S. I. Bozhevolnyi, L. Martin-Moreno, F. J. Garcia-Vidal, Springer International Publishing, ISBN 978-3-319-45819-9, pp. 97-120 (2017).
- [27] M. Y. Shalaginov, S. Bogdanov, V. V. Vorobyov, A. S. Lagutchev, A. V. Kildishev, A. V. Akimov, A. Boltasseva, and V. M. Shalaev, Enhancement of Single-Photon Sources with Metamaterials, chapter in "From Atomic to Mesoscale: The Role of Quantum Coherence in Systems of Various Complexities"; Eds: S. A. Malinovskaya and I. Novikova, World Scientific Publishing Co. PTE. LTD, ISBN: 978-981-4678-69-8, pp. 123-148 (2015).
- [26] N. M. Litchinitser, V. M. Shalaev, *Metamaterials: State of the Art and Future Directions*, Chapter 3 in *Photonics, Nanophotonic Structures and Materials*, Eds: David L. Andrews, John Wiley & Sons 2015.
- [25] Satoshi Ishii, Xingjie Ni, Vladimir P. Drachev, Mark D. Thoreson, Vladimir M. Shalaev, and Alexander V. Kildishev, “Active and Tuneable Metallic Nanoslit Lenses”, *Active Plasmonics and Tuneable Plasmonic Metamaterials*, Wiley, 2013.
- [24] S. Xiao and V. M. Shalaev, *Tunable and Active Optical Negative Index Metamaterials*, Chapter 9 in *World Scientific Series in Nanoscience and Nanotechnology - Vol. 4, PLASMONICS AND PLASMONIC METAMATERIALS - Analysis and Applications*, edited by G. Shvets & I. Tsukerman (2012). Pp. 255-284.

- [23] N. M. Litchinitser, I. R. Gabitov, A. I. Maimistov, and V. M. Shalaev, Linear and Nonlinear Metamaterials and Transformation Optics, pp. 1-27, in book "Tutorials in Metamaterials", Eds. M. A. Noginov and V. A. Podolskiy; series in Nano-Optics and Nanophotonics, Series Eds. S. Kawata and V. M. Shalaev; CRC Press, Taylor & Francis Group, New York, NY, 2012.
- [22] A. Boltasseva, R. B. Nelson, C. Jeppesen, A. Kristensen, R. Bakker, Z. Liu, H.-K. Yuan, A. V. Kildishev, and V. M. Shalaev, Fabricating Plasmonic Components for Nano- and Meta-Photonics, chapter in "Metamaterials and Plasmonics: Fundamentals, Modelling, Applications", NATO Science for Piece and Security Series B: Physics and Biophysics; Eds: S. Zouhdi, A. Sihvola, and A. P. Vinogradov, Springer, pp. 209-221, 2009.
- [21] N. M. Litchinitser and V. M. Shalaev, Optical Metamaterials: Invisibility in Visible and Nonlinearities in Reverse, in Nonlinearities in Periodic Structures and Metamaterials: Springer Series in Optical Sciences, Vol. 150, edited by C. Denz, S. Flach, and Yu. S. Kivshar (Springer, 2009).
- [20] N. M. Litchinitser and V. M. Shalaev, Negative refraction, The McGraw-Hill 2008 Yearbook of Science & Technology, pp. 230-233.
- [19] N. M. Litchintser, I. R. Gabitov, A. I. Maimistov, V. M. Shalaev. Negative Refractive Index Metamaterials in Optics, Progress in Optics, V. 51, Chapter 1, pp 1-68 (2008).
- [18] A.V. Kildishev, T.A. Klar, V.P. Drachev, and V.M. Shalaev, Thin metal-dielectric nanocomposites with a negative index of refraction, Chapter 9 in: Nanophotonics with Surface Plasmons, ed. by V.M. Shalaev and S. Kawata, Elsevier, 2007.
- [17] M.A. Noginov, G. Zhu, V.P. Drachev, and V.M. Shalaev, Surface plasmons and gain media, Chapter 5 in: Nanophotonics with Surface Plasmons, ed. by V.M. Shalaev and S. Kawata, Elsevier, 2007.
- [16] V.P. Drachev, M. D. Thoreson, and V.M. Shalaev, Sensing Proteins with Adaptive Metal Nanostructures, Chapter 14 in: Surface Plasmon Nanophotonics, Springer Series in Optical Sciences, Vol. 131, ed. by M.L. Brongersma, and P.G. Kik (2007).
- [15] A. K. Sarychev, G. Shvets, and V. M. Shalaev, Magnetic Plasmon Resonance, chapter 1 in Nanoplasmics: From Fundamanetals to Applications, Handai Nanophotonics, volume 2, pp.3-13, Eds: S. Kawata and H. Masuhara, Elsevier (2006).
- [14] V.P. Drachev and V.M. Shalaev, Biomolecule sensing with adaptive plasmonic nanostructures, Surface Enhanced Raman Scattering - Physics

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*The OPTICS category in the ISI Web of Science contains 94 journals; over 52,000 research articles, conference proceedings and book chapters are published each year in this category. Out of about 675,000 publications in total in the optics category of the Web of Science from January 2005 to January 2020, three papers from the Shalaev group are among the top 40 most cited publications and they are ranked, in terms of the number of citations, as #15 (V. M. Shalaev, "Optical negative-index metamaterials," *Nature Photonics* 1, 41 (2007) – 2901 citations), #28 (W. Cai, U. K. Chettiar, A. V. Kildishev, and V. M. Shalaev, "Optical cloaking with metamaterials," *Nature Photonics* 1, 224 (2007) – 1943 citations) and #38 (V. M. Shalaev et al, "Negative index of refraction in optical metamaterials," *Optics Letts* 30, 3356 (2005) – 1892 citations). According to Google Scholar, there are 47,000 citations in total to Shalaev's papers; his h-index is 100.*

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- [2] R.L. Armstrong, V.M. Shalaev, T.M. Shay, W.-T. Kim, Z.C. Ying, V.P. Drachev, V.P. Safonov, Optical Enhancement with Nanoparticles and Microcavities, Australian patent No. 767234
- [3] R.L. Armstrong, V.M. Shalaev, H.V. Smith, Sensors Employing Nanoparticles and Microcavities, U.S. Patent 6,781,690 B2, Aug. 24, 2004.
- [4] "Optical Structures Employing Semicontinuous Metal Films," U.S. Provisional Patent Application Serial No. 60/233,804.
- [5] "Plasmonic and/or Microcavity Enhanced Optical Protein Sensing" US Patent #7,298,474, issued Nov 20, 2007
- [6] "Metal Tip-Substrate Nanoantennas and Molecule Counting for Bio-Molecule Raman Imaging and Sensing", P-03033

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- [8] V.P. Drachev, V.M. Shalaev, A.K. Sarychev, Raman imaging and sensing apparatus employing nanoantennas, International patent application PCT/US2004/006361, filed March 2, 2004, US Patent 6,985,223 B2, January 10, 2006.
- [9] A.K. Sarychev, V.A. Podolskiy, A.M. Dykhne, and V.M. Shalaev, Plasmonic nanophotonics methods, materials, and apparatuses, US Patent # 6,977,767 B2, Dec. 20, 2005.
- [10] A.V. Kildishev, V.M. Shalaev, Planar Lens, US Patent #8,094,378 B2, Jan. 10, 2012.
- [11] Smolyaninov I.I., Smolyaninova V.N., Kildishev A.V., Shalaev V.M. Anisotropic Metamaterials Emulated By Tapered Waveguides: Application To Electromagnetic Cloaking, US Patent # 8,509,578 B2, Aug. 13, 2013.
- [12] Vladimir M. Shalaev, Alexander V. Kildishev, Vladimir P. Drachev, Wenshan Cai, Near-field Raman imaging, US patent # 8,599,489 B2, Dec. 3, 2013.
- [13] W. Cai, V. M. Shalaev, U. K. Chettiar, A. V. Kildishev, System, method and applications for modifying the visibility properties of an object, US patent # 8,488,247 B2, Jan 16, 2013.
- [14] Gururaj V. Naik, Bivas Saha, Timothy D Sands, Vladimir Shalaev, Alexandra Boltasseva, Titanium nitride based metamaterial, US patent #20150285953 A1, Oct. 9, 2013.
- [15] Vladimir M Shalaev, Alexandra Boltasseva, Mark Brongersma, Alexander V Kildishev, Nathaniel Kinsey, Solar-cell efficiency enhancement using metasurfaces, US patent #20150040978 A1, Aug. 7, 2014.
- [16] Alexander Kildishev, Ishii Satoshi, Vladimir Shalaev, Holey Optical Device, US patent # 20150247960, Sep. 3, 2015.
- [17] Urcan Guler, Alexander Kildishev, Vladimir M Shalaev, Alexandra Boltasseva, Donald Stocks, Gururaj Naik, Near Field Transducer for Heat-Assisted Magnetic Recording, US patent # 20150287425, Oct. 8, 2015.
- [18] Urcan Guler, Alexander Kildishev, Vladimir M Shalaev, Alexandra Boltasseva, Gururaj Naik, Refractory Plasmonic Metamaterial Absorber and Emitter for Energy Harvesting, US patent # 20150288318, Oct. 8, 2015.

- [19] Vladimir Shalaev, Alexander Kildishev, Xingjie Ni, Satoshi Ishii, Ultra-Thin, Planar, Plasmonic Metadevices, US patent # 20150309218, Oct. 29, 2015.
- [20] Xiangeng Meng, Jingjing Liu, Alexander V Kildeshev, Vladimir M Shalaev, Laser with Sub-Wavelength Hole Array in Metal Film, US patent # 20150309218, Dec. 17, 2015.
- [21] U. Guler, A. Kildishev, V. M. Shalaev, A. Boltasseva, D. Stocks, G. Naik, Near field transducer for heat-assisted magnetic recording, Application number 14/401917, US Patent number 9343088 (May 17, 2016)
- [22] A. Kildishev, V.M. Shalaev, A. Shaltout, Time-varying metasurface structure, Application number 15/209,737 (July 13, 2016)
- [23] J. C. Ndukaife, A. Boltasseva, A. A. Nnanna, S. T. Wereley, A. Kildishev, V. M. Shalaev, Systems and methods for manipulation of particles, US Patent office; Patent number 20160370316, US Patent US9778400 B2, publication date: Oct 3, 2017, priority date: Jun 18, 2015
- [24] Alexander V Kildishev, Urcan Guler, Krishnakali Chaudhury, Shaimaa Azzam, Esteban E Marinero-Caceres, Harsha Reddy, Alexandra Boltasseva, Vladimir M Shalaev, Metamaterial device and method of making the same, application number 15978548, publication date: Nov 18, 2018
- [25] Vladimir Shalaev, Alexander Kildishev, Xingjie Ni, Satoshi Ishii, "Ultra-thin, planar, plasmonic metadevices" application number: 16000843, publication date: Oct 11, 2018
- [26] Amr Shaltout, Sajid Choudhury, Alexander V Kildishev, Alexandra Boltasseva, Vladimir M Shalaev, "System for producing ultra-thin color phase hologram with metasurfaces" US Patent office Application number 15/152,535 (2018/4/24)
- [27] A. Shaltout, A. V. Kildishev, V. M. Shalaev, J. Liu, [Sub-millimeter real-time circular dichroism spectrometer with metasurfaces](#), US Patent 10161797B2, granted Dec 25, 2018
- [28] A. Kildishev, S. Ishii, V. Shalaev, Holey Optical Device, US Patent 20190033496A1, publication date: Jan 31, 2018
- [29] J. C. Ndukaife, A. V. Kildishev, A. A. Nnanna, A. Boltasseva, V. M. Shalaev, S. T. Wereley, Multi-site particle sensing system, US Patent 10436780B2, granted: Oct 8, 2019
- [30] A. Dutta, V. M. Shalaev, A. Boltasseva, E. E. Marinero-Caceres, Surface-plasmon opto-magnetic field enhancement for all-optical magnetization switching, US Patent 20190331598A, publication date: Oct 31, 2019

- [31] A. V. Kilidshev, D. Wang, Z. A. Kudyshev, M. Song, A. Boltasseva, V. M. Shalaev, Tunable plasmonic color device and method of making the same, US Patent 20190353830A1, publication date: Nov 21, 2019

Conference Presentations:

(¥ Plenary; ** Invited or keynote)

[322] ¥ -the 50-th Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, Jan 5-10, 2020

[321] ¥ Novel Concepts in Photonics Research 2019 conference, Ein Gedi, Israel, February 10 – 15, 2019

[320]* V. Shalaev, XX, USA-Middle East Science symposium, New York City, USA, November 4-6, 20

[319] ¥ The International Symposium on Plasmonics and Nanophotonics, Kobe, Japan, Nov 11-14, 2019

[318]** Northrop Grumman University Research Symposium, Anaheim, CA, USA, October 23-24, 2019

[317]** IEEE Nanophotonics symposium, San Antonio, September 29-October 3, 2019 (tutorial)

[316]** The 13th International Congress on Artificial Materials for Novel Wave Phenomena, Metamaterials, Rome, Italy, September 16-21, 2019 – 2 talks

[315] CLEO: QELS_Fundamental Science proceedings, paper JTh2A. 119, San Jose, California, USA, May 5-10 2019 – 10 talks from the Shalaev group

[314] 2019 International Applied Computational Electromagnetics Society Symposium (ACES), April 14, 2019 – 2 talks

[313] American Physical Society Annual meeting, abstract id.B41.006 Boston, MA, USA, March 4–8, 2019

[312] SPIE OPTO "Photonic and Phononic Properties of Engineered Nanostructures IX" conference, paper number 10927-54, San Francisco, California, United States, February 2-7, 2019 – 5 talks

[311] ¥ IEEE RAPID Conference, Miramar Beach, FL, USA, 19-21 August 2019

[310]** SPIE Optics and Photonics, San Diego, CA, Aug 11-15, 2019; 2 keynote and 2 invited talks

- [309]** META 2019, Lisbon, Portugal, July 23-36, 2019
- [308]¥ 5th International Conference on Quantum Technologies, Moscow, Russia, July 15-19, 2019
- [307]** International Workshop “Harnessing Light with Structured Materials conference, Florence, Italy, July 9-12, 2019
- [306]¥ Workshop on Topological Photonics and Beyond, Tianjin, China, June 30 – July 2, 2019
- [305]** Artificial Intelligence in Nanophotonics workshop, International Work-Conference on Artificial Neural Networks (IWANN2019), Gran Canaria, Canary Islands, Spain, June 12-14, 2019
- [304]¥ 14th Meditterrenian Workshop and Topical Meeting “Novel Optical Materials and Applications” NOMA2019, Cetraro, Italy, June 2-9, 2019
- [303]** The 9th International Conference on Surface Plasmon Photonics (SPP9), Copenhagen, Denmark, May 26-31, 2019
- [302] 2019 International Applied Computational Electromagnetics Society Symposium (ACES), April 14, 2019 – 2 talks
- [301]¥ -the 49-th Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, Jan 7-12, 2019
- [300]** Nano-Meta-2019 International Conference, Seefeld, Austria Jan 3-7, 2019
- [299]** Metamaterials Congress, ESPOO, Finland, Aug 27 – Sept 1, 2018.
- [298]** UCF Workshop in memory of George Segeman, March 12-13, 2018
- [297] Conference on Lasers and Electro-Optics (OSA, San Jose, CA , May 14-18, 2018)
- [296]** SPIE, Optics and Photonics, Aug 19-23, 2018, San Diego, CA (keynote and 2 invited talks)
- [295]** Metamaterials Films for in-Space Propulsion by Radiation Pressure Incubator, Oct 7-9, 2018, OSA Headquarters, Washington DC
- [294]** A Nature Conference on Nanophotonics and Integrated Photonics (NIP), Nov 9-11, 2018, Nanjing, China

- [293]** iNOW: International Nano-Optoelectronics Workshop, Berkeley, July 21-28, 2018
- [292] Plasmonics and Nanophotonics, Gordon Research Conference, July 8-13, 2018, Newry, ME; Discussion leader
- [291] ¥ META: The 9-th International Conference on Metamaterials, Photonic Crystals and Plasmonics, June 24-July 1, 2018, Marseille, France
- [290] ¥ EOQ Topica Meeting on Waves in Complex Media: Fundamentals and Device Applications, June 4-7, 2018, Capri, Italy
- [289] ¥ NanoPlams: New Frontiers in Plasmonics and Nano-Photonics, Cetraro, Italy, June 10-15, 2018
- [288] ¥ 2018 HIT Shenzhen Symposium of Nano-Optics, Shenzhen, China, May 22-24, 2018
- [287] ¥ The International Symposium on Plasmonics and Nanophotonics, May 24-27, 2018, Hangzhou, China
- [286]** Workshop on Topological Nanophotonics, University of Southern Denmark, Odense, Denmark, May 28-29, 2018
- [285]**Lasers in Micro, Nano and Bio Systems, Gordon Research Conference, June 17-22, 2018, Waterville Valley, NH
- [284]** SPIE Photonics West, San Francisco, CA, USA, January 28 – February 2, 2018
- [283] ¥ -the 48-th Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, Jan 7-12, 2018
- [282] Materials Research Society Meeting, March 16-20, 2017
- [281]** International Conference on Quantum Photonics, Benasque, Spain, Feb 26-March 2, 2017
- [280]** SPIE Optics & Photonics, 6-10 Aug, 2017, San Diego, CA (one invited and one keynote talk)
- [279] ¥ The 8th International Conference on Surface Plasmon Photonics, May 22-26, 2017, Taipei, Taiwan

- [278] ¥ 13th Mediterranean Workshop “Novel Optical Materials and Applications”, Cetraro, Italy, June 4-10, 2017
- [277]** 26th International Laser Physics Workshop, July 17-21, 2017, Kazan, Russia
- [276] ¥ 4th International Conference on Quantum Technologies, Moscow, Russia, July 12-16, 2017
- [275] [CLEO: QELS_Fundamental Science proceedings, San Jose, CA (May 14-19, 2017) – co-author on 12 contributed talks
- [274]** OSA Frontiers in Optics, Laser Science APL/DLS, 17-21 Sept 2017, Washington DC (invited ‘visionary lecture’)
- [273] ¥ 11-th International Congress on Metamaterial, Marseille, 28 Aug – 2 Sept. 2017s
- [272] ¥ Gordon Conference on Plasmonics, July 2016
- [271] ¥ Frontiers of Nonlinear Physics 2016, Nizhny Novgorod-St. Petersburg, Russia, July 17 -23, 2016
- [270]** OSA Subwavelength Photonics Incubator, 21-23 Sept, Washington DC
- [269]** OSA Science & Applications of Nanolasers Incubator, 7-9 Sept, 2016, Washington DC
- [268]** META’16, Malaga, Spain, July 25-28, 2016 – 1 keynote and 5 invited talks
- [267] ¥ NanoPlasm conference proceedings, p. 16-17, Cetraro, Italy (June 17, 2016)
- [266] ¥ The International Midwest Symposium on Nano-Optics and Plasmonics (2016) (IMSNP16’ Hengyang); 24-26 June Hengyang, China
- [265]** SPIE Photonics Europe, Brussels, 4-7 April 2016; 2 invited talks
- [264]** 13th International Conference on Nanosciences & Nanotechnologies – NN16, Thessaloniki, Greece, 5-8 July 2016 – 2 keynote talks
- [263]** SPIE Photonics West 2016 Conference, 17-18 February 2016
- [262]** NANOMETA 2017: 6th International Topical Meeting on Nanophotonics and Metamaterials, Seefeld (Tirol), Austria (January 4-7, 2017) – two invited talks
- [261]** SPIE Optics and Photonics, Aug 28 – Sep 1, 2016, San Diego, CA – 2 keynote talks

- [260]** SPIE Optics and Photonics, Aug 28 – Sep 1, 2016, San Diego, CA – author/co-author on 4 invited talks
- [259]¥ The Fifth Annual Symposium Schawlow-Townes Symposium on Photonics, Ottawa, October 6, 2016
- [258] CLEO: QELS_Fundamental Science proceedings, JW2A. 85 (June 5, 2016) – co-author on 12 contributed talks
- [257] ¥ Physics of Quantum Electronics Colloquium, PQE 2016, Jan 3-7, Snowbird, Utah
- [256]** Material Research Society Fall meeting, Dec 1 – 4, 2015, Boston, MA (2 invited talks)
- [255]** OSA's Incubator on Nonlinear Metamaterials, Oct 1-2, 2015, Washington DC
- [254]** IEEE Photonics Conference, 4 – 8 Oct, 2015, Reston, Virginia (invited tutorial)
- [253]** Metacongress, Sept 6 – 11, 2015, Oxford, UK
- [252]** SPIE Optics and Photonics, Aug 9 – 14, 2015, San Diego, CA
- [251]¥ META15, the 6-th International Conference on Metamaterials, Photonic Crystals and Plasmonics, NYC, Aug 4-8, 2015
- [250]** Enrico Fermi School on Complex Photonics, July 12 – 18, 2015, Varenna, Italy
- [249]** International Workshop on Quantum Plasmonics, March 8-12, 2015, Benasque, Spain
- [248]** Minisymposium on Plasmonics and Nanophotonics, Odense June 19, 2015
- [247]** Metamaterials Science & Technology Workshop, 20 – 22 July 2015, San Diego, CA
- [246]¥ Electron Transport and Optical Properties of Inhomogeneous Media (ETOPIM 10), June 21 - 26, 2015 Tel Aviv, Israel
- [245]** Progress In Electromagnetic Research Symposium (PIERS), July 6-9, 2015, Prague, Czech Republic (3 invited talks)
- [244]¥ 8-th International Conference on Materials for Advanced Technologies (ICMAT), 28 June- 3 July 2015, Singapore

- [243]** Surface Plasmon Photonics 7, May 31-June 5, 2015, Jerusalem, Israel
- [242] CLEO:2015, 10-15 May 2015, San Jose, CA (11 presentations from our research group)
- [241]** Faraday Discussions 178, 16-18 February, 2015, London UK
- [240]** Nanometa 2015, Seefeld, Tirol, Austria, January 5-8, 2015
- [239]** SPIE Conference, San Diego, CA, August 19-21, 2014 (4 invited talks)
- [238]¥ 2014 Summer Topicals Meeting Series, Montreal, Quebec, Canada, July 14-16, 2014
- [237]¥Nanoplasm 2014, Cetraro, Italy, June 16-20, 2014
- [236]** Photonics North 2014, Montreal, Canada, May 28-30, 2014 (keynote)
- [235]** META-2014, International Conference, Singapore, May 20-23, 2014
- [234]** SPIE Photonics Europe 2014, Brussels, Belgium, April 14-17, 2014
- [233]** From Atomic to Mesoscale: The Role of Quantum Coherence in Systems of Various Complexities, Cambridge, MA, March 10-12, 2014
- [232]¥Active Nanoplasmonics and Metamaterial Dynamics, Germany, January 19-22, 2014
- [231]** Meta-2013, International Conference, Dubai, OAE, March 19-22, 2013 (keynote talk)
- [230]** Structured Light in Structured Media: From Classical to Quantum Optics, OSA Incubator Meeting, 29 Sept – 1 Oct, 2013, Washington DC, USA`
- [229]** The 6th International Conference on Surface Plasmon Photonics, Ottawa, Canada, May 26-31, 2013.
- [228]¥Frontiers of Nonlinear Physics, Nizhny Novgorod, Russia, July 28 – August 2, 2013.
- [227]**2nd International Conference on Quantum Technologies, Moscow, Russian, July 20-24, 2013.
- [226]** 2013 Materials Research Society (MRS) Fall Meeting, December 1-6, 2013, Boston, MA.

- [225]** CLEO:2013, Laser Science to Photonic Applications, 9-14 June 2013, San Jose, CA, USA (short course)
- [224] CLEO:2013, Laser Science to Photonic Applications, 9-14 June 2013, San Jose, CA, USA (7 contributed talks)
- [223]** 7-th International Congress on Advanced Electromagnetic Materials in Microwave and Optics, Metamaterials 2013, 16-21 September, 2013, Bordeaux, France (2 invited talks)
- [222]** Nano-Meta Conference, Seefeld, Austria, Jan 2-6, 2013 (keynote)
- [221]¥ Croucher Advanced Study Institute, “New Materials and new Concepts for Controlling Light and Waves”, Oct. 3-7, 2012, Hong Kong.
- [220]** Metamaterials Congress, St. Petersburg, Russia, Sept. 17-21, 2012
- [219]¥ SPIE conference, Aug. 11-16, 2012, San Diego, CA
- [218]** International Workshop “Microchip Plasmonics”, Erlangen, Germany, Aug. 29-31, 2012
- [217]** Advances in Nanophotonics IV, Erice, Sicily, July 23-29, 2012
- [216]¥ OSA Topical Meeting on nanophotonics, ColoraDO Springs, CO, June 17-20, 2012
- [215]** Gordon “Plasmonics” Conference, June 10-15, 2012, Waterville, ME
- [214]** CLEO 2012, San Jose, CA, May 6-11, 2012 (short course)
- [213]** SPIE’s Europe Photonics Europe International Symposium, April 15-19, 2012 (keynote)
- [212]** MRS Spring Meeting, San Fransisco, CA, April 2012.
- [211]¥ Metamaterials Symposium, March 8-10, 2012, Tokyo, Japan
- [210]** Workshop on Nanophotonics, ICTP, Trieste, 3-7 December, 2012
- [209]¥ The Exciting Science of Light with Metamaterials, 2012 SPIE Conference, San Diego, CA, Aug 5-10, 2012
- [208]** NRC at National Academy of Science, Washington DC, October 3, 2011.
- [207]** Quantum Metamaterials, Buffal, NY, Sept6. 19-20, 2011

- [206]** DoD Technologies Workshop, Dallas, April 20, 2011
- [205]¥ SPIE, Optics+Photonics, San Diego, CA, August 21-26, 2011
- [204]¥ NanoMeta International Conference, Jan 3-6, 2011, Seefeld, Austria
- [203]** Quantum Optics International Conference, Moscow, Russia, July 13-16, 2011
- [202]** CLEO/QELS, Baltimore, MD, May 1-6, 2011. Short Course
- [201]** Materials Research Society Fall Meeting, Boston, MA, Nov 29-Dec 3, 2010
- [200]** Materials Research Society Spring Meeting, San Francisco, CA, April 5-9, 2010
- [199]** SPIE, Optics+Photonics, San Diego, CA, August 1-5, 2010
- [198]** Federation of Analytical Chemistry and Spectroscopy Societies Conference (37th FACSS), Raleigh, NC October 17 - 21, 2010.
- [197]** 4th International Congress on Advanced Electromagnetic Materials, Karlsruhe, Germany, Sept. 13-17, 2010
- [196]** International Conference on Coherent and Nonlinear Optics, ICONO, Kazan', Russia, August 23-26, 2010
- [195]** Workshop on Metamaterials (organized by Sandia NL and Los Alamos NL), August 11-13, 2010
- [194]¥ The 4th International Conference "Frontiers of Nonlinear Physics" on the boat traveling from Nizhny Novgorod to St.-Petersburg, 2010
- [193]¥ 19th International Laser Physics Workshop (LPHYS'07), Brazil, July 5-9, 2010
- [192]** USA JASON Workshop, La Jolla, CA, June 28-29, 2010
- [191]¥ OSA International School for Young Scientists, Moscow, Russia, June 20-23, 2010
- [190]** 5th Forum on New Materials, CIMTEC, Tuscany, Italy, June 14-18, 2010
- [189]** CLEO/QELS, San Jose, CA, May 16-21, 2010. Short Course
- [188]** CLEO/QELS, San Jose, CA, May 16-21, 2010. Tutorial
- [187]** SPIE-Europe, Brussels, Belgium, April 12-16, 2010

- [186]^Y German Physical Society Meeting, Hannover, Germany, March 8-12, 2010
- [185]** META'10, the 2nd International Conference on Metamaterials, Photonic Crystals and Plasmonics, 22-25 February 2010, Cairo, Egypt
- [184]^Y The 40th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, Jan. 2-8, 2010
- [183]** Workshop on Metamaterials, Washington DC, Nov 16-17, 2009
- [182]^Y Heraeus Seminar: Nanostructures for Photonics, Bad Honnef, Oct 26-30, 2009.
- [181]** NanoForum, Moscow, Oct 5-8, 2009
- [180]** Invited lecture series at School on Advance Materials for Young Researchers, Hamburg, Sept 21-25, 2009
- [179]** Congress on Metamaterials, Londoin Aug 30 – Sept 4, 2009; two invited talks.
- [178]** SPIE Optics + Photonics, Aug 2-7, 2009, San Diego, CA. Three invited talks.
- [177]** Laser Physics International Workshop, Barcelona, Spain, July 13-17, 2009
- [176]** Spring 2009 MRS Meeting, San Francisco, CA, April 13-17
- [175]** 6th Annual CRI Conference, UNC Charlotte, May 27-31, 2009
- [174]** International Conference on Materials for Advanced Technologies 2009, Symposium G: Plasmonics and Applications, 28 June – 3 July, 2009, Singapore
- [173]** Short Course: Metamaterials, CLEO/IQEC-2009, May 31 – June 5, 2009, Baltimore, MD
- [172]** The 8th International Meeting on the Electrical Transport and Optical Properties of Inhomogeneous Media (ETOPIM-8), June 7-12, 2009, Crete, Greece
- [171]** APS March 2009 Meeting
- [170]** NanoMeta, International Conference, Seefeld, Austria, 5-8 January, 2009
- [169]** Frontiers in Optics, OSA Annual Meeting, Rochester, Oct. 19-23, 2008.
- [168]^Y A*STAR Metamaterials Workshop, Singapore, Dec. 10-12, 2008

- [167][¥] International Workshop “Nanotechnology Revolution (NTR)” Marseille, France, October 5-10, 2008.
- [166][¥] International Workshop “Meta-materials and Plasmonics,” Fudan University, Shanghai, China, Nov 12-15, 2008.
- [165][¥] NATO Advanced Study Institute: Workshop on Photonics, Ottawa, Canada, Nov. 25-Dec. 2, 2008
- [164]**Metamaterials-2008, International Congress, Pamplona, Spain, 21-26 September, 2008
- [163]** Photon08 International Conference, Edinburgh, Scotland, 26-29 August (2008)
- [162]** SPIE Optics+Photonics, 26-30 August 10-15, 2008, San Diego, Ca (two invited talks)
- [161]** Gordon Research Conference “Plasmonics” July 27-Aug. 1, Tilton, NH (2008)
- [161]** International Conference “Laser Optics 2008”, St. Petersburg, Russia, June 23-28 (2008)
- [160]** OSA Topical Meeting “Slow and Fast Light”, July 13-16, Boston, (2008)
- [159]** Moscow International Symposium on Magnetism, June 20-25, Moscow, Russia, 2008
- [158]** Quantum Electronics and Laser Science Conference (CLEO/QELS), San Jose, May 4-9, San Jose, Ca, 2008
- [157]**NATO Advanced Research Workshop: Metamaterials for Secure Information and Communication Technologies, 7-10 May, 2008, Marrakesh, Morocco
- [156]**SPIE Europe, Photonics Europe, April 7-10, 2008, Strasbourg, France; two invited talks
- [155]** NATO Workshop on Cloaking, April 10-12, Strasbourg, France.
- [154]**ICCES08, Computational and Experimental Aspects of Electromagnetic Metamaterials, Honolulu, Hawaii, March 17-22, 2008.
- [153]** Heraeus Seminar: Periodic Nanostructures for Photonics, Bad Honnef, Feb. 27-29, 2008.
- [152]** SPIE Photonics West Conference, January 19-24, 2008, San Jose, CA.

- [151]¥ The 38th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, Jan. 6-10, 2008
- [150]¥ The 5-th International Conference on Advanced Materials and Devices, Dec. 12-14, 2007, Jeju, Korea
- [149]¥**Metamaterials 2007, The First International Congress on Advanced Electromagnetic Materials in Microwaves and Optics, Rome, Italy, 22-26 October 2007 (plenary talk and tutorial).
- [148]** Plasmonics Workshop, IEEE LEOS (Boston branch), MIT Lincoln Lab, Oct. 10, 2007
- [147]** Symposium on Photonics in the Translational Era, Duke University, Durham, NC, Oct. 11-12, 2007.
- [146]** MORIS 2007: Workshop on Thermal and Optical Magnetic Materials and Devices, Sept. 24-26, 2007, Carnegie Mellon University, Pittsburgh, PA.
- [145]** Frontiers in Optics, OSA 91-st Annual Meeting, San Jose, CA, Sept 16-20, 2007
- [144]** Los Alamos National Lab Workshop on Metamaterials, Sept. 5-6, 2007, Los Alamos, NM
- [143]** SPIE Optics+Photonics, 26-30 August, 2007, San Diego, Ca (two invited talks)
- [142]¥** 16th International Laser Physics Workshop (LPHYS'07), August 20-24, 2007, Leon, Mexico (plenary and two invited talks).
- [141]** 5-th Symposium on Photonics, Networking and Computing, July 18-19, Salt Lake City, Utah, 2007
- [140]** Third International Conference on Surface Plasmon Photonics (SPP-III), Dijon, June 17-22, 2007.
- [139]** CLEO/Europe IQEC Conference, Munich, June 17-22, 2007
- [138] OSA Topical Meeting: Photonic Metamaterials: from Random to Periodic, Jackson Hole, Wyoming, June 4-7, 2007; 4 contributed talks
- [137]¥ ICONO 2007 (International Conference on Coherent and Nonlinear Optics), May 28- June 1, 2007, Minsk, Belarus
- [136]** CLEO/QELS 2007 Conference, May 6-11, Baltimore, Maryland (invited talk and tutorial)

- [135]** “Metamaterials and Nonlinear Materials” Conference, Redstone Arsenal, Alabama, April 4-5, 2007.
- [134]** International Workshop on Nonlinear Physics in Periodic Structures and Metamaterials, Dresden, Germany, March 19-30, 2007
- [133]** DARPA Workshop on Metamaterials, March 5-7, 2007.
- [132] American Physical Society March Meeting, Denver, CO, March 5-9, 2007
- [131]** Nanophotonics Accessibility and Applicability, National Research Council, The National Academies, Washington DC, Jan 23-24, 2007.
- [130]** SPIE Photonics West, January 22-26, 2007
- [129]** NanoMeta 2007, First European Topical Meeting on Nanophotonics and Metamaterials, Seefeld, Austria, Jan 8-11, 2007
- [128]** International Workshop on Plasmonics and Applications in Nanotechnologies, Singapore, Dec. 5-7, 2006
- [127]** Materials Research Society Meeting, Boston MA, Nov. 27-Dec. 1, 2006.
- [126]** Institute for Mathematics and its Applications (IMA) Workshop on Negative Index Metamaterials, University of Minnesota, October 2-4, 2006
- [125]** European Optical Society Meeting, Paris, October 16-18, 2006.
- [124]** The 19th Annual Meeting of the IEEE Lasers & Electro-Optics Society, 29 Oct-2 Nov, 2006, Montreal, Canada.
- [123]** International Symposium on Biophotonics, Nanophotonics and Metamaterials, Hangzhou, China, October 16-18, 2006 (plenary talk and tutorial)
- [122]** Frontiers in Optics, The 90th OSA Annual Meeting, Rochester, October 8-12, 2006 (one invited and two contributed talks)
- [121]** Photonic Crystals and Metamaterials, Heraeus Workshop, Bad Honnef, Germany, Sept. 17-22, 2006.
- [120]** Quantum Electronics and Photonics (QEP-17) International Conference, 4-7 September 2006, Manchester UK
- [119]** SPIE Optics & Photonics, San Diego Convention Center, San Diego, CA, Aug. 13-17, 2006 (one invited talk and four contributed talks)

- [118]** Gordon Conference on Plasmonics, Keene, July 23-28, 2006
- [117]** Electron Transport and Optical Properties of Inhomogeneous Media (ETOPIM7) International Conference, Sydney, Australia, July 2006 (one invited and one contributed talks)
- [116] Photonic Metamaterials: from Random to Periodic, Bahamas, June 3-7, 2006 (two contributed talks)
- [115]** Materials Research Society Meeting, April 2006, San Francisco
- [114]** German Physical Society Meeting, Dresden, March 2006.
- [113] International Workshop on Multifunctional Materials III, March 2006, San Carlos de Bariloche, Argentina
- [112]** a) MITRE/DARPA Nanophotonics Workshop, McLean VA, Feb. 2006
b) MITRE Workshop “Principles of Advanced Electromagnetic Materials, 26-27 July 2006, McLean, VA
- [111]^Y “Physics of Quantum Electronics” (PQE) Winter Colloquium, Snowbird, Utah, January 3-7, 2006.
- [110]** IEEE/LEOS, Lasers & Electro-Optics Society 2005 Annual Meeting, 23-27 October 2005, Sydney, Australia.
- [109]** Frontiers in Optics, The 89th OSA Annual Meeting, October 16-20, 2005, Tucson, AZ.
- [108]^Y Summer School “Photonic Metamaterials: from Micro to Nano Scale”, Erice, Italy, 1-7 August, 2005.
- [107]** The International Society for Optical Engineering (SPIE) Meeting, San Diego, CA, 1-5 August, 2005; 2 invited talks
- [106]** International Workshop on Metamaterials for Microwave and Optical Technologies, July 18-20, 2005, San Sebastian, Spain.
- [105]** 14th International Laser Physics Workshop, July 4-8, 2005, Kyoto, Japan
- [104]** PECS-VI: International Symposium on Photonic and Electromagnetic Crystal Structures, Crete, Greece, June 19-24 (2005)
- [103]** 7th Mediterranean Workshop and Topical Meeting “Novel Optical Materials and Applications” Cetraro, Italy, May 29-June 4, 2005.

- [102]** Conference on Lasers and Electro-Optics and International Quantum Electronics Conference, CLEO/IQEC, Baltimore, May 22-27, 2005. Tutorial: “Plasmonic Nanophotonics”
- [101]**International Conference “Surface Plasmon Photonics 2”, Graz, Austria, May 21-26, 2005.
- [100]** International Conference on Coherent and Nonlinear Optics (ICONO-2005), 11–15 May 2005 St. Petersburg, Russia, "Plasmonic Nanophotonics”
- [99]** International Conference on Coherent and Nonlinear Optics (ICONO-2005), 11–15 May 2005 St. Petersburg, Russia, "Protein sensing with plasmonic nanostructures".
- [98]** Second International Conference on Advanced Materials and Nanotechnology, 6-11 Febr., 2005, Queenstown, New Zealand.
- [97]^Y “Physics of Quantum Electronics” (PQE) Winter Colloquium, Snowbird, Utah, January 3-7, 2005.
- [96]** LEOS 2004, Annual Meeting of the IEEE Lasers & Electro-Optics Society, November 7-11, 2004, Rio Grande, Puerto Rico. 2 invited talks
- [95] “Frontiers in Optics” OSA Meeting, Rochester, NY, 2004. 5 contributed talks.
- [94]** Joint Workshop: "Nanoscience: linking disciplines", Venice, Italy, Sept. 27 - Oct. 1, 2004.
- [93]**The International Society for Optical Engineering (SPIE) Meeting, Denver, CO, 2-6 August, 2004; 4 invited talks
- [92]**Plasmonics from Fundamentals to Applications, 2nd International Nanophotonics Symposium, Handai (INPS 2004), Osaka, July 26-28, 2004.
- [91]**2004 Gordon Research Conference on Nanostructure Fabrication, discussion leader for Nanophotonics Session, Tilton, NH, 2004
- [90]**Laser Physics 2004 International Workshop, Trieste, Italy, July 12-16, 2004.
- [89]**Conference on Lasers and Electro-Optics and International Quantum Electronics Conference, CLEO/IQEC, San Francisco, CA, May 16-21, 2004.
- [88]**"From Photonics Crystals to Metamaterials", International WE-Heraeus Seminar, Bonn, April 26-30, 2004.
- [87]**Materials Research Society Meeting, San Francisco, CA, April 12-16, 2004.

- [86]** American Physical Society March Meeting, Montreal, Canada, March 22-26, 2004.
- [85]** Nanophotonics Workshop at Stanford Photonics Research Center, January 24, 2004
- [84]** Bi-national USA-Mexico Workshop on Nanostructure Optics, University of Arizona, Tucson, Jan. 10-12, 2004
- [83]** Physics of Quantum Electronics Winter Colloquium, Snowbird, Utah, January 5-10, 2004
- [82]** NSF-NIRT Workshop, December 16, 2003, Arlington, VA
- [81]** Progress in Electromagnetic Research Symposium (PIERS), Honolulu, Hawaii, October 2003 (3 papers presented).
- [80]** Optical Society of America Annual Meeting, Frontiers in Optics, Tucson, AZ, October 2003 (3 papers presented, including 2 invited)
- [79]** VIII International Conference “Laser and Laser-Information Technologies”, Smolyan, Bulgaria, September 2003.
- [78]** Surface Plasmon Photonics, Europhysics conference on Nano-Optics, Granada, Spain, Sept. 2003
- [77]** International Workshop “Novel Optical Materials and Applications (NOMA)”, Cetraro, Italy, June, 2003.
- [76]** 12th International Laser Physics Workshop (LPHYS’03), Hamburg, Germany, Aug. 25-29, 2003 (2 papers presented)
- [75]** SPIE 48th Annual Meeting, San Diego, CA, 3-8 August, 2003 (3 papers presented by the Shalaev group)
- [74]** 8th International Meeting on Hole Burning, Single Molecule, and Related Spectroscopies: Science and Applications, Bozeman, Montana, July 27-31, 2003.
- [73]** XI International Conference on Laser Physics, St. Petersburg, June 30-July 4, 2003.
- [72]** Workshop on Bio-Inspired Progress for Design, Assembly, and Repair of Electromagnetic and Structural Composites, Atlanta, Georgia, August 19-20, 2003.
- [71]** DIPC International Workshop “Optical Properties of Complex Materials over Different Length Scales”. San Sebastian, Spain, July 7-11, 2003.

- [70] American Physical Society March Meeting, 6 papers presented by the Shalaev group, March 3-7, 2003, Austin TX
- [69]** Physics of Quantum Electronics (PQE) Winter Colloquium, Snowbird, Utah, January 5-10, 2003
- [68]** Materials Research Society annual meeting, Boston, MA, Dec. 2-6, 2002.
- [67]** Optical Society of America annual meeting, Sept. 27 – Oct. 2, 2002, Orlando, FL
- [66] International Workshop on Multifunctional Materials, Oct. 26-30, 2002, Pucon, Chile
- [65]** Electron Transport and Optical Properties of Inhomogeneous Media (ETOPIM6) International Conference, July 12-19, 2002, Snowbird, Utah; invited and 2 contributed talks
- [64]**Progress in Electromagnetics Research Symposium, PIERS 2002, Boston, July 1-5, 2002; 4 invited talks in different sessions
- [63]** Laser Physics'02 International Workshop, Bratislava, Slovak Republic, July 1-5, 2 invited talks.
- [62]** International Quantum Electronics Conference (IQEC/LAT) Moscow, Russia, June 24-27, 2002; one invited and 3 contributed talks.
- [61] “Wave Scattering in Complex Media” NATO Advanced Science Institute International School, Cargese, Corsica, France, 10-22 June 2002.
- [60]** Optical Science and Technology SPIE 47th Annual Meeting, Seattle, WA, 7-11 July, 2002.
- [59]** Quantum Electronics & Laser Science Conference (CLEO/QELS), Long Beach, CA, May 19-24, 2002
- [58] American Physical Society Meeting, Indianapolis, IN, March 18-22, 2002 (4 presentations)
- [57]**Physics of Quantum Electronics (PQE) Winter Colloquium, Snowbird, Utah, January 10-15, 2002.
- [56]** American Physical Society 3-Corner Meeting, November 2001.
- [55] Optical Society of America Meeting, October, 2001, Long Beach, California.
- [54]** Electromagnetic Crystal Structures, International Conference, St. Andrews, Scotland, June 9-14, 2001.

[53]** XVII International Conference on Coherent and Nonlinear Optics, Minsk, Belarus, June 26 -July 1, 2001.

[52]** 10th International Laser Physics Workshop (LPHYSTTM01), Moscow, Russia, July 3-7, 2001.

[51]** 5th Mediterranean Workshop and Topical Meeting Novel Optical Materials and Applicationsle (NOMA,01), Grand Hotel San Michele, Cetraro, Italy, May 20-26, 2001.

[50] The American Physical Society March Meeting, March 12-16, 2001, Seattle (4 talks)

[49]** The Optical Society of America Annual Meeting, October 22-26, 2000, Providence,Rhode Island,

[48]** Winter Colloquium on the Physics of Qunatum Electronics, Snowbird, Utah, January, 2001.

[47]^Y**Invited Lecturer at the NATO Summer School "Linear and Nonlinear Optics." Ericie, Sicily, Italy, 2-14 July 2000

[46]** 9th Annual International Laser Physics Workshop (LPHYSTTM2000) Bordeaux, France, July 17-21, 2000

[45] Photonic Crystals and Light Localization, NATO Advanced Study Institute, June 19-30, 2000, Crete, Greece.

[44]^Y**Winter Colloquium on the Physics of Qunatum Electronics, Snowbird, Utah, January, 2000.

[43]^Y**Fifth International Conference on Electrical Transport and Optical Properties of Inhomogeneous Media, Hong Kong, June, 1999.

[42]** SPIE Meeting, Denver, Co, July (1999).

[41]** 4th Mediterranean Workshop "Novel Optical Materials and Applications," Cetraro, Italy, June 4-10, 1999.

[40]** 8th International Laser Physics Workshop, Lphy'99, Budapest, July 2-6, 1999.

[39] Conference on Lasers and Electro-Optics (CLEO), Baltimore, Maryland, May 23-28, 1999.

[38]** Winter Colloquium on the Physics of Qunatum Electronics, Snowbird, Utah, January, 1999.

- [37] 1998 OSA Annual Meeting, Baltimore, 4-9 October, 1998.
- [36] Nonlinear Optics '98, Kauai, Hawaii, 10-14 August 1998.
- [35] International Conference on Percolation and Disordered Systems, Giessen, Germany, 14-17 July, 1998.
- [34]***XVI International Conference on Coherent and Nonlinear Optics, Moscow, June 29-July 8, 1998.
- [33] Conference on Lasers and Electro-Optics (CLEO), San Francisco, California, May 3-8, 1998.
- [32] Winter Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, January, 1998.
- [31]** XI International Vavilov Conference on nonlinear optics, Novosibirsk, Russia, June 24-28, 1997.
- [30] 3rd Mediterranean Workshop on Novel Optical Materials and Applications, Cetraro, Italy, June 8-13, 1997.
- [29] 213th American Chemical Society Meeting, San Francisco, CA, April 13-17, 1997.
- [28] 4th International Multidisciplinary Conference Fractals in the Natural and Applied Sciences, 8-11 April 1997, Denver, Colorado, USA.
- [27]***International Conference "Electron Transport and Optical Properties of Inhomogeneous Media," Moscow-St. Petersburg, July 23-30 (1996).
- [26] XX International Quantum Electronics Conference, Sydney, 14-19 July (1996)
- [25] Summer Topical Meeting, Nonlinear Optics: Materials, Fundamentals, and Applications, Maui, Hawaii, July 8-12 (1996).
- [24] The American Physical Society March Meeting, St. Louis, Mi (1996).
- [23] The American Physical Society March Meeting, San Jose, CA (1995).
- [22] The Materials Research Society Fall Meeting, Boston (1994).
- [21] The Optical Society Meeting, Dallas, October, 1994.
- [20] The Materials Research Society Spring Meeting, San Francisco (1994).

- [19] The American Physical Society March Meeting, Seattle (1993).
- [18]** 67th Colloid and Surface Science Symposium, Toronto, June, 1993.
- [17]** Third International Conference on Electrical Transport and Optical Properties of Inhomogeneous Media, Guanajuato, Mexico, August, 1993.
- [16] The American Physical Society March Meeting, Indianapolis, Indiana (1992).
- [15] Int. Conf. loFractals and Disordered Systemsle, Hamburg, July, 1992.
- [14] 7th Symposium on Chemical Physics, Waterloo, Canada, October, 1992.
- [13] Fractals in Engineering, Montreal, Canada, June, 1992.
- [12] Int. Conf. on Complex systems: Fractals, Spin Glasses and Neural Networks, Trieste, Italy, July, 1991.
- [11] 6th Symposium on Chemical Physics, Waterloo, Canada, Oct. 1991.
- [10] European Conf. on Quantum Optics, Davos, Switzerland, Sept. 1990.
- [9]** Xth International Vavilov's Conference on Nonlinear Optics, Novosibirsk, Russia, June, 1990.
- [8]** European Int. Conf. on Quantum Electr., Dresden, Germany (1989).
- [7]** Int. School "Laser and its applications", Sayanogorsk, USSR, April, 1989.
- [6]** International Conf. on Quantum Electronics and Nonlinear Optics KINO, Minsk, Belorussia, September, 1988.
- [5]** 3-rd Int. Conf. "Trends in Quantum Electronics." Bucharest, Romania, Aug.-Sept. (1988).
- [4]** IXth Vavilov's International Conferences on Nonlinear Optics, Novosibirsk, Russia (1988).
- [3] VIIIth Vavilov's International Conferences on Nonlinear Optics, Novosibirsk, Russia (1985).
- [2] VIIth Vavilov's International Conferences on Nonlinear Optics, Novosibirsk, Russia (1981).
- [1] VIth VavilovTMs International Conferences on Nonlinear Optics, Novosibirsk, Russia (1979).

Invited Lectures:

- [129] University of Oklahoma, OU Inaugural Research Distinguished Lecture Series, November 2019
- [128] University of Illinois Urbana – Champaign, September 2019 (Distinguished Lecture)
- [127] UCF Workshop in memory of George Segeman, March 12-13, 2018
- [126] SUNY Polytechnic, March 2, 2018
- [125] Technion, Israel, December 2017
- [124] Technical University of Denmark, Copenhagen, April 2017
- [123] Siberian Federal University, Krasnoyarsk, Russia, July 2017
- [122] University of Southampton, UK, July 2016
- [121] University of Copenhagen, Denmark, April 2016
- [120] Technical University of Denmark, April 2016
- [119] IFCO, The Institute of Photonic Sciences, Barcelona, Spain, May 2016
- [118] Series of lectures in Southern University of Denmark, May-June 2016
- [117] Harriot-Watt University, Edinburg, Scotland, March 2016
- [116] Workshop organized by Southampton University in Chamonie, France, March 2016
- [115] MIT, February 2016
- [114] Harvard, February 2016
- [113] Data Storage Institute, Singapore, Dec 2015
- [112] National University of Singapore, Dec 2015
- [111] Boston University, December 2015.
- [110] Harvard University, March 4, 2015
- [109] Northwestern University, Distinguished lecturer of ECE, Jan 21, 2015
- [108] Kazan Federal University, Russia, June 2014 (series of invited lectures)

- [107]Krasnoyarsk Insitute of Physics, Russia, June 2014.
- [106]Raytheon, Los Angeles, CA, Nov 12, 2013.
- [105]Technion, Haifa, Israel, Oct 16, 2013
- [104]St. Petersburg ITMO (Russia), Sept. 26, 2013
- [103]AMOLF, Amsterdam, The Netherlands, Sept. 23, 2013
- [102]MITRE Corporation, JASON Program, McLean, VA, April 27-28, 2012
- [101]UC Berkeley, April 11, 2012
- [100]Skolkovo, Russia, Days of Quantum Physics, December, 2012
- [99] Russian Quntum Center, Moscow, Russia, December, 2012
- [98] Krasnoyarsk Institute of Physics, Russia, Dec 9, 2011.
- [97] Dayton University, Sept. 9, 2011.
- [96] Instrument Technology Research Center (ITRC), National Applied Research Laboratories, Taipei, Taiwan, Dec. 13, 2010
- [95] National Taiwan University, Taipei, Taiwan, Dec. 14, 2010
- [94] The Lebedev Institute of Physics of the Russian Academy of Science (FIAN), October 13, 2010
- [93] Kirensky Institute of Physics, Siberian Branch of Russian Academy of Science, OJune 23, 2010
- [92] Kirensky Institute of Physics, Siberian Branch of Russian Academy of Science, October 14, 2009
- [91] SAOT/MIPT and Erlangen University, Germany, May 12, 2009
- [90] University of Illinois, Urbana-Champaign, Feb. 26, 2009.
- [89] Northwestern University, Jan. 27, 2009
- [88] MIT, October 29, 2008.
- [87] Harvard University, October 31, 2008
- [86] Ohio State University, Physics Department, Nov. 25, 2008
- [85] Yale University, April 30, 2008.

- [84] Bordeaux University, France, April 2008.
- [83] Max Plank Institute, Erlangen, Germany, April 2008.
- [82] Indiana University, Physics Department, April 2008
- [81] CREOL, University of Central Florida, Febr. 15, 2008
- [80] Weizmann University, Tel Aviv, Dec. 25, 2007 (colloquium in Physics Department)
- [79] Bar-Ilan University, Tel Aviv, Israel, Dec. 23, 2007 (colloquium in Physics Department)
- [78] Technion University, Haifa, Israel, Dec. 20, 2007 (colloquium in EE Department).
- [77] Siberian Federal University, Krasnoyarsk, Russia, Dec 1-6, 2007 (series of invited lectures on nanophotonics and metamaterials)
- [76] University of Florida, (colloquium in Physics Department) Nov. 8, 2007
- [75] CalTech, October 31, 2007.
- [74] Hannover Laser Center, Hannover, Germany, Nov. 14, 2007
- [73] IBM Watson Lab, March 16, 2007.
- [72] Queens College, New York City, May 2006.
- [71] Technical University of Denmark, Copenhagen, Denmark, May 2006.
- [70] University of Connecticut, Physics Department, April 2006.
- [69] Stony Brook University, Physics Department, February 2006.
- [68] AFRL/MLBP Colloquium, WPAFB, Dayton, OH, February 2006
- [67] IUPUI Colloquium, Physics Department, Feb. 2006.
- [66] Colorado University, January 2006
- [65] Princeton University, December, 2005
- [64] Versailles University, France, July 2005.
- [63] Krasnoyarsk Institute of Physics, Russia, May, 2005
- [62] University of Texas, Austin, Physics Department, February 2005.

- [61] Los Alamos National Lab, June 2004.
- [60] Columbia University, Electrical Engineering, May 2004
- [59] Rochester University, Chemistry Department, April 2004
- [58] Chicago University, Physics Department, February 2004.
- [57] Northwestern University, Chemistry Department, October 2003
- [56] Toyohashi University, Toyohashi, Japan, Jan. 28, 2003
- [55] Lehigh University, Dec. 16, 2002
- [54] CNRS, Ottawa, Canada, Dec. 20, 2002
- [53] ARO Workshop, Oct. 15-16, 2002
- [52] Norfolk State University, Nov. 8, 2002, Norfolk, VA
- [51] Ecole Normale Supérieure de Physique et de Chimie Industrielles, Paris, France, June 2002.
- [50] Université de Versailles, Versailles, France, June 2002.
- [49] Ecole Normale Supérieure de Cachan, Cachan, France, June 2002.
- [48] Purdue University, Chemistry Department, January 2002.
- [47] University of Arizona, Chemistry Department, February 2002.
- [46] Purdue University, Graduate Seminar Series, January 2002.
- [45] Purdue University, Nanotechnology Seminar, November 2001.
- [44] New Mexico State University, Physics Department, November 2001.
- [43] Northwestern University, Physics Department, April 2001.
- [42] Purdue University, ECE, April 2001.
- [41] Princeton University, EE, February 2001.
- [40] University of Oregon, Physics Department, January 2001.
- [39] City University of New York, Hunter College, January 2001.
- [38] New Mexico State University, Physics Department and Chemistry Department, February 2001.

- [37] Ludwig-Maximilians University and Center for NanoScience, Munich, May, 2000.
- [36] Hong Kong University of Science and Technology, February 2000 (Hong Kong).
- [35] Ecole Supérieure de Physique et de Chimie Industrielles, October 1999 and December 2000 (Paris, France).
- [34] Institute de Optique, December 1999 (Orsay, France) .
- [33] University of Bonn, December 1999 (Bonn, Germany)
- [32] University of Taiwan, June 1999, Taiwan.
- [31] Université de Versailles Saint-Quentin, Versailles, France, July, 1998.
- [30] Institute of Optics, University of Rochester, Rochester, NY, October 1998.
- [29] Cornell University, Applied Physics, October 1998.
- [28] Sandia National Laboratory, Albuquerque, April, 1998.
- [27] University of New Mexico, Albuquerque, March, 1998.
- [26] Los Alamos National Laboratory, Los Alamos, May, 1998.
- [25] Washington State University, Pullman, WA, September, 1997.
- [24] Université de Versailles Saint-Quentin, Versailles, France, June, 1997.
- [23] I.U.S.T.I., Université de Provence, Marseille, France, May, 1997.
- [22] Aalborg University, Institute of Physics, Denmark, May, 1997.
- [21] Institute of Physics, Krasnoyarsk, Russia, July, 1996.
- [20] Université Montpellier, France, June, 1995.
- [19] Krasnoyarsk State University, Russia, June, 1995.
- [18] University of New Mexico, January, 1995.
- [17] Yale University, November, 1994.
- [16] University of California, Irvine, April, 1994.
- [15] Sandia National Laboratory, January, 1994.
- [14] Los Alamos National Laboratory, November, 1993.
- [13] Iowa State University, March, 1993.

- [12] Washington State University, March, 1993.
- [11] Ontario Laser & Lightwave Research Centre, March, 1992.
- [10] Department of Chemistry, University of Toronto, Canada, October 1991.
- [9] Max-Planck-Institut für Kernphysik, Heidelberg, Germany, May, 1991.
- [8] Université Claude Bernard, Lyon, France, March, 1991.
- [7] Ecole Polytechnique, Paris, France, March, 1991.
- [6] Paris-Sud Université, Orsay, France, January, 1991.
- [5] Huygens Laboratory, University of Leiden, Netherland, December, 1990.
- [4] Chalmers University of Technology, Gothenburg, Sweden, December, 1990.
- [3] H.H.Wills Phys. Lab., University of Bristol, United Kingdom, November, 1990.
- [2] De L'Ecole Normale Supérieure, Paris, France, October 1990.
- [1] Heidelberg University, Germany, Aug. 1990.

Activities as a Referee:

1993-present. Reviewing editor for Science. Referee for funding agencies (NSF, ACS-PRF, ARO, DoD, DOE, and others) and numerous research journals, such as Science, Nature, Nature Photonics, Nature Materials, Physical Review and Physical Review Letters, Surface Science, Journal of Physical Chemistry, Physica A, Applied Physics B, Applied Physics Letters, Optical Communications, Metamaterials, Laser Physics Letters, and several other journals. Regularly participate in various NSF and European Research Council (ERC) panels. Invited many times to serve as an external referee for PhD thesis defenses in different countries. Served several times as a referee for evaluating European conference projects. Member of NSF and NIH Committees for site visits of various Centers.

Editorial Positions:

- [1] Editorial Advisory Board, *International Journal of Theoretical Physics, Group Theory and Nonlinear Optics*, 2000-2015
- [2] *Optical Properties of Random Nanostructures*, Editor: V. M. Shalaev, Springer Verlag, Topics in Applied Physics, Berlin 2001.

[3] Nanostructured Materials: Clusters, Composites, and Thin Films, V. M. Shalaev and Martin Moskovits (eds.), ACS Symposium Series v. 679, ACS Books, 1997.

[4] Editorial Board Member for International Journal Laser Physics Letters

[5] Editorial Board Member for J. Nonlinear Optical Physics and Materials (JNOPM)

[6] Co-Editor of Applied Physics B – Lasers and Optics 2006-2013

[7] Co-Editor for Advances in Nano-Optics and Nanophotonics book series (Elsevier)

[8] Guest Co-Editor for J. of Optics B: Quantum and Semiclassical Optics special issue on Metamaterials, 2005.

[9] Associate Guest Editor for IEEE's Journal of Selected Topics in Quantum Electronics (JSTQE) on Nonlinear Optics, 2005

[11] Guest Editor for Journal of Optical Society of America B (JOSA-B) Focus Issue on Metamaterials, 2005

[12] Topical Editor for J. of Optical Society of America B, 2005-2011

[13] Editor for Special Issue of Applied Physics B on Optics on the Nanoscale, July-Aug. 2006

[14] Editorial Board Member for “Metamaterials” Journal, 2006-2013

[15] S. Kawata and V. M. Shalaev (Editors), Tip Enhancement (Advances in Nano-Optics and Nano-Photonics), Elsevier, 2007.

[16] V. M. Shalaev and S. Kawata (Editors), Nanophotonics with Surface Plasmons (Advances in Nano-Optics and Nano-Photonics), Elsevier, 2007.

[17] Editor for Feature Issue of J. of the Optical Society of America A and B on “Photonic Metamaterials”, v. 24, #10, 2007

[18] Co-Editor for Series in Nanooptics and Nanophotonics, Taylor & Francis Books, Inc.2008-

[19] Editorial Advisory Board Member for Laser and Photonics Reviews, 2008-

[20] Editorial Board Member for Journal of Nanotechnology, 2008-2016

[21] Guest Editor for IEEE's Journal of Selected Topics in Quantum Electronics (JSTQE) on Negative Index and Metamaterials, 2009

[22] Reviewing Editor for Science, 2011-

[23] Editorial Board member for Nanophotonics, 2012-

Special Projects, Short Courses, etc. – Contribution:

- [1] Invited lecturer for NATO Summer School "Linear and Nonlinear Optics", Erice, Sicily, Italy, July 2-14, 2000.
- [2] Lecture in the 2002 Industrial Workshop at Purdue University, March 2002.
- [3] Scientific Secretary, International School (workshop) on Laser and Its Applications, Sayanogorsk, Russia, April 1989.
- [4] Outreach Community Lecture: "Fractals Around Us," presented to the Las Cruces, NM, community, April 1998.
- [5] Organizer and moderator for Nanophotonics Session for Gordon Conference (2004)
- [6] Invited lecturer for Summer School "Photonic Metamaterials: from Micro to Nano Scale", Erice, Italy, 1-7 August, 2005.
- [7] International Symposium on Biophotonics, Nanophotonics and Metamaterials, Hnagzhou, China, October 16-18, 2006 (tutorial)
- [8] Siberian Federal University, Krasnoyarsk, Russia, Dec 1-6, 2007 (series of invited lectures on nanophotonics and metamaterials)
- [9] Invited Lecturer for International School on Metamaterials, Crete, Greece, June 12-13, 2009.
- [10] Invited Expert on evaluating the Strategic Effort on Metamaterials in Singapore; December 10-12, 2008, Singapore.
- [11] Invited Expert on evaluating projects on Metamaterials in Singapore, June 29-30, 2009, Singapore.
- [12] Invited expert on metamaterials for JASON, an advisory group that works for the U.S. government on issues of science and technology.
- [13] In 20013, served on the photonics sub-committee organized by NSF and NRC to assess most important areas of science and technology for future support (chaired by T. Heinz).

- [14] Short course on nanophotonics in Kazan Federal University, Russia, June 2014.
- [15] Short course in CLEO conference, June 8, 2014, San Jose, CA.
- [16] Series of invited lectures on nanophotonics, metamaterials and quantum photonics in University of Southern Denmark, May – June 2016.
- [17] Organizer and co-Chair of “Coherent Phenomena in Physics and Chemistry”, April 2017, Purdue, West Lafayette
- [18] Organizer and Program Committee Member of International Symposium on Quantum Science and Technology, April 21-23, 2019, Purdue University, West Lafayette, IN