Viktoriia E. Babicheva, Senior Member of IEEE, Optica/OSA, and SPIE

Assistant Professor, School of Engineering, University of New Mexico

<<<<<< SUMMARY OF ACCOMPLISHMENTS >>>>>>

V.B. leads a research lab focused on nanophotonics, optics, and materials research. Her group investigates light-matter interactions at the nanoscale, focusing on designing optical components and metasurfaces to control light. She explores designed nanostructures to achieve strong field confinement and enhanced nonlinear effects. She employs numerical analysis and experimental characterizations to develop novel photonic structures.

Research

- 84 peer-reviewed journal articles, including
  29 peer-reviewed journal articles published since joining UNM in 2019
  (26 as corresponding author, 15 led by V.B.'s students, 5 with government labs AFRL/NRL/LANL)
- 65 refereed conference papers, including
  36 refereed conference papers published since joining UNM
- 1 teaching handbook, 2 book chapters, 1 monograph, 4 freely available online simulation tools, 5 editorials & special issue introductions, 22 invited conference talks, 14 UNM seminars, 39 invited seminars outside UNM
- Sole PI on $250K NSF LEAPS-MPS award, Sole PI on $200K DoD NRL contract, Co-PI on $7.4M DoD AFRL cooperative agreement ($352K for V.B.), Co-PI on $232K DoD AFOSR award, Co-PI on $38K DOE contract, and other senior personnel on $2M NSF instrumentation and $3M NSF student training awards; $100K+ internal UNM funding
- ONR Summer Research & Air Force Summer Faculty Fellowships in 2025 and 2024
- 9 user projects awarded by the Department of Energy to access shared facilities (*e.g.*, cleanroom & microscopy)
- 1 Ph.D. student graduated, 1 research M.S. student graduated, and 11 research undergraduate advisees
- 4 current Ph.D. students
- 4,100+ citations, H-index 37 (Google Scholar) on December 5, 2025

Select Teaching Accomplishments

- 5 Undergraduate and graduate courses developed and taught (ECE 563 Computational Methods for Electromagnetics, ECE 561 and AOP ECE 561 Engineering Electromagnetics, ECE 564 Guided Wave Optics, and ECE 203 Circuit Analysis I)
- Redesigned ECE 563 Computational Methods for Electromagnetics, ensuring it aligns with current advancements in the field, enhances student engagement, and better prepares graduates for emerging challenges in applied electromagnetics
- Developed ECE 561 Engineering Electromagnetics for M.S. Accelerated Online Program *Space Systems Engineering* (8-week term)
- All graduate courses taught were enhanced with fully online sections

Select Service Since Joining UNM

- As a core faculty member in the NSF-funded graduate program on Quantum Photonics and Quantum Technology QPAQT, V.B. reviews applications, participates in development course requirements for the program, organizes and delivers seminar presentations, and recruits students from existing graduate programs
- Associate Editor for SPIE Journal of Optical Microsystems, Nano Select (Wiley), and MRS Advances and Guest Editor for multiple special issues
- Co-organizer for nine MRS Symposia and committee member of nine other conferences

Viktoriia E. Babicheva

Assistant Professor, Senior Member of IEEE, SPIE, and Optica/OSA
School of Engineering, University of New Mexico

<<<<<< PERSONAL >>>>>>

Address	MSC01 1100, 1 University of New Mexico, ECE Bldg., Albuquerque, NM 87131	Phone Emails Website	765-714-3768 vbb@unm.edu https://nanometa.unm.edu/

Degrees

2013 DTU Fotonik, Technical University of Denmark, Denmark
Ph.D. in Photonics Engineering, Dissertation "Ultra-Compact Plasmonic Waveguide Modulators"

2009 Department of General and Applied Physics, Moscow Institute of Physics and Technology
Division of Physics and Astrophysics Problems at Lebedev's Physical Institute, led by V.L. Ginzburg
M.S. magna cum laude (5–10%), GPA 4.92 out of 5.00, Applied Mathematics and Physics
M.S. Thesis "Nanophotonics and Nanoplasmonics of Metal Structures"

2007 Department of General and Applied Physics, Moscow Institute of Physics and Technology
Division of Physics and Astrophysics Problems at Lebedev's Physical Institute, led by V.L. Ginzburg
B.S. magna cum laude (5–10%), GPA 4.91 out of 5.00, Applied Mathematics and Physics
B.S. Thesis "FDTD Method for Near-Field Microscopy"

Positions at UNM

August 2019 – present **Tenure-Track Assistant Professor**
Department of Electrical and Computer Engineering

Secondary Appointment
Department of Physics and Astronomy
University of New Mexico, NM

Positions at Other Institutions and Organizations

Nov 2017 – July 2019 **Postdoctoral Researcher**, College of Optical Sciences, University of Arizona
Project "Ultrafast Extreme Nonlinear Optics & Light-Matter Coupling at Nanoscale"
Team of Prof. Jerome Moloney

Feb 2015 – June 2017 **Postdoctoral Researcher**, Center for Nano-Optics, Georgia State University
Project "Optical Processes in Active, Random, and Nanostructured systems"
Team of Profs. Mark Stockman and Yohannes Abate

June 2014 – Dec 2014 **Visiting Scientist**, Birck Nanotechnology Center, Purdue University
Project "Plasmonic Waveguides Cladded by Hyperbolic Metamaterials"
Team of Prof. Vladimir Shalaev

Nov 2013 – May 2014 **Visiting Researcher**, DTU Fotonik, Technical University of Denmark
Project "Photoconductive Metamaterials for Photodetectors and Solar Cells"
Group of Prof. Andrei Lavrinenko

Feb 2013 – Aug 2013 **Visiting Scientist**, Birck Nanotechnology Center, Purdue University
Project "Plasmonic Waveguides and Modulators Based on Titanium Nitride"
Team of Prof. Vladimir Shalaev

Oct 2010 – Oct 2013	**Ph.D. Student**, DTU Fotonik, Technical University of Denmark, Denmark Project "Ultra-Compact Plasmonic Waveguide Modulators" Advisors Profs. Andrei Lavrinenko and Alexandra Boltasseva Committee Profs. Anatoly Zayats, Sergey Bozhevolnyi, Morten Willatzen
July 2010 – Sept 2010	**Visiting Scientist**, Zuse Institute Berlin, Berlin, Germany Project "Plasmonic Resonances in Composite Materials" Host Dr. Sven Burger
July 2009 – June 2010	**Research Assistant**, Moscow Institute of Physics and Technology, Russia

<<<<<< TEACHING >>>>>>

All Courses Taught at UNM

ECE 300 ECE 563 ECE 200 AOP ECE 561 ECE 561 ECE 564

Semester	Course Number	Course Title	UG/G	Enr.
Spring 2026	ECE 300-001	Advanced Engineering Mathematics	UG	46
Fall 2025	ECE 563-001	Computational Methods for Electromagnetics	Grad	3
	ECE 563-002 online-enhanced			4
Fall 2024	ECE 563-001	Computational Methods for Electromagnetics	Grad	7
	ECE 563-002 online-enhanced			5
Fall 2023	ECE 203-001	Circuit Analysis I	UG	102
Fall 2023	ECE 561-003 (AOP)	Engineering Electromagnetics (developed for Accelerated Online Prog., 8-week term)	Grad	6
Spring 2023	ECE 561-001	Engineering Electromagnetics	Grad	10
	ECE 561-002 online-enhanced			12
Fall 2022	ECE 563-001	Computational Methods for Electromagnetics	Grad	4
	ECE 563-002 online-enhanced			8
Fall 2021	ECE 563-001	Computational Methods for Electromagnetics	Grad	2
	ECE 563-002 online-enhanced			9
Spring 2021	ECE 561-001 online only	Engineering Electromagnetics	Grad	27
Fall 2020	ECE 563-001/003 online only	Computational Methods for Electromagnetics	Grad	9
Fall 2019	ECE 564-002 online-enhanced	Guided Wave Optics	Grad	7
Fall 2019	ECE 563-001	Computational Methods for Electromagnetics	Grad	10
	ECE 563-002 online-enhanced			13

Courses ECE 551/651 Problems (aka Independent Study), ECE 599 Thesis (M.S.), and ECE 699 Dissertation (Ph.D.)

In courses ECE 551/651 Problems, V.B. asks students to complete assignments involving computations more advanced than those she teaches in ECE 563. The students assist in preparing new ECE 563 assignments, including verifying that results reported in research articles can be reproduced (enabling the use of these articles as projects in ECE 563) and in developing new assignments on selected topics. In accordance with U.S.-wide standards, V.B. requires students to report additional productivity equivalent to 6-9 hours of out-of-class work for each 3 credit hours in these independent study courses and attend one extra weekly meeting with V.B. (equivalent of in-class time) in addition to the student's regular assignments as a Research Assistant on funded projects. In accordance with the requirements of the ECE graduate program, students submit comprehensive reports at the end of the semester.

ECE 551 (for M.S.) ECE 651 (for Ph.D.) ECE 599 (M.S.) ECE 699 (Ph.D.)

	F25	Su25	S25	F24	S24	Su23	S23	F22	Su22	S22	F21	S21	S20
Li Liu	699(9) 651(2)	551(3) 651(1)	551(3)	551(3)									
Vahid Karimi	699(12)	699(6)									651(3)	651(6)	
Haben Mekonnen	651(3)		651(3)		551(3)				551(3)				
Dominic Bosomtwi					699(6)	699(6)	699(12)						
Michael Illescas							599(1)	559(3)	559(3)	551(3)			
Md Sakibul Islam							551(3)	551(3)					
Kazi Ahmed											651(3)		
Hasan Ahmed													551(2)

Course Development & Teaching Innovation

- The content of ECE 563 Computational Methods for Electromagnetics has been substantially revised, and the course has been redesigned. The new content includes a number of assignments related to the practical applications of numerical modeling and exposure to several commercial packages for computational electromagnetics. The course maintains steady enrollment and attracts not only students required to take it but also students from the ECE Optoelectronics and Optical Science & Engineering programs. The course is elective in the Computational Science & Engineering (CSE) Certificate Program run by the Center for Advanced Research Computing (CARC).

  V.B. wrote a comprehensive course handbook that explains key concepts, provides step-by-step guidance on computational methods, and offers practical examples to help students translate their learning into real-world problems.

  The results of V.B.'s NSF LEAPS-MPS project were integrated into ECE 563 in F25. Besides lecture materials, a new course assignment uses a set of 3 nanoHUB tools, namely for isolated nanoantenna, their infinite array, and finite-size array (the latter two released in the summer of 2025).

- ECE 561 Engineering Electromagnetics for M.S. Accelerated Online Program (AOP) *Space Systems Engineering* (8-week term). The approval process included UNM AOP Certification. V.B. presented the course to the Online Course Best Practice Review Initiative for course peer-review based on the standards in the UNM Rubric. Advisory Council letter dated 12/08/2021 notes "As a review team we found ECE 561: Engineering Electromagnetics to be an exceptional online course. It can serve as a model for other instructors to follow." and "We found the following areas to be exceptional:
  - The scaffolding of materials, activities and assignments that lead to the final project
  - The wonderful resources, videos, and PowerPoints that you provide for the students
  - The course is beautifully designed with rich content
  - Your love and enthusiasm for the content really comes through"

  V.B. is the only Asst. Prof. in ECE who went through the approval process and teaches an AOP course
- V.B. developed and delivered a lecture with practical exercises, "Introduction to Computational Electromagnetics," at the Computation for Physicists Seminar Series (organized by Prof. H. Duan) in October 2021. This seminar, designed for participants interested in computational methods, provided foundational insights into computational electromagnetics for physicists and those working in related fields.

- All graduate courses taught were enhanced with fully online sections (online synchronous oSYNC), regardless of the pandemic. Students can take section -002 primarily remotely

Professional Development Activities

Fall 2024	Participated in the NSF Research Traineeship Annual Meeting in Washington, D.C., as well as the Quantum NRT Satellite Meeting. The latter was dedicated to sharing best practices, experiences, and guidelines in quantum engineering education.
Fall 2023	Invited a staff member from the Center for Teaching and Learning, J. Pollard, to conduct an observation of the teaching of the course ECE 203 Circuit Analysis I in Fall 2023. It included a Pre-Observation meeting, Observation, and Post-Observation meeting. In conclusion, J. Pollard's letter states, "I commend Dr. Babicheva for engaging in critical reflection on her teaching, her students' learning, and ways in which she could further improve her course, as such reflective practice is an essential ingredient to becoming an excellent instructor."
Summer 2023, 2022	Received training in ECURE (Expanding Course-Based Undergraduate Research Experiences) training. It is an NSF-funded initiative leveraging UNM's research mission to enrich undergraduate education in STEM general education and portal courses. Plan to develop and implement the ECURE project in the future 1st and 2nd year ECE courses.
Summer 2022	Took part in the Student Experience Project (SEP) cohort that aims to engage faculty, staff, and administrators in testing, implementing, and scaling innovative practices. The program seeks to transform college student experience into one in which all students can access the support and resources they need to succeed. Adopted numerous practices.
Summer 2021	Participated in Virtual Exchange – Connected Classrooms training run by Stevens Initiative. Faculty members connect students in Morocco, the United Arab Emirates, and the United States through virtual exchange, providing students with opportunities to develop skills and form lasting friendships.
Spring 2021	Completed Evidence-Based Practices for Teaching Online course, a 6-week program that extended beyond foundational concepts of online instruction to include an introduction to teaching online, examination of learner perceptions of online environments, and exploration of active-learning methodologies. Developed an online teaching portfolio, created assessment rubrics, and drafted measurable, specific course objectives (subsequently used in AOP ECE 561). Analyzed backward-design theory to inform course planning, constructed a strategy for embedding collaboration into course activities, and evaluated active-learning approaches to design and facilitate a collaborative activity (subsequently used in AOP ECE 561).

<<<<<< PUBLICATIONS >>>>>>

'IF' stands for the journal's *impact factor* at the time of article acceptance
* indicates the corresponding author
Superscript `G` indicates a graduate student mentored by V.B.
Superscript `U' indicates an undergraduate student mentored by V.B.

Peer-Reviewed Journal Articles

84. **V.E. Babicheva*** and M. Rumi, "Multipolar resonances in electro-optic metasurfaces with moderate refractive index," Advanced Photonics Research e202500146, 2025 [IF: 3.9]

83. L. Liu[G], A. Holzer[U], N. Raney[U], and **V.E. Babicheva***, "Nanoantennas and metasurfaces tailored by electron beam lithography and substrate conductivity," Scientific Reports 15, article number 29339, 2025 [IF: 3.9]

82. **V.E. Babicheva*** and C.-C. Chang, "Atomic layer deposition for enhanced light confinement in nonlinear metasurfaces," ACS Omega 10, 22, 23150–23160, 2025 [IF: 3.7]

81. **V.E. Babicheva**, "Magnetic Mie resonances in negative-index medium," APL Photonics 10, 046117, 2025 [IF: 5.4]

80. N. Raney[U] and **V.E. Babicheva***, "Mie-resonant metasurfaces with controlled silicon oxidation in electron-beam deposition," Advanced Materials Interfaces 12, 2500037, 2025 [IF: 4.3]

79. E.M. Arup[G], L. Liu[G], H. Mekonnen[G], D. Bosomtwi[G], and **V.E. Babicheva***, "Metasurfaces with multipolar resonances and enhanced light-matter interaction," Nanomaterials 15, 477, 2025 [IF: 4.4]

78. **V.E. Babicheva**, "Effective polarizability in near-field microscopy of phonon-polariton resonances," Nanomaterials 15, 458, 2025 [IF: 4.4]

77. V. Karimi[G], D. Bosomtwi[G], L. Liu[G], and **V.E. Babicheva***, "Enhancing MXene multipolar resonances through metasurface lattice engineering," Nano Select e70002, 2025 [IF: 3.5]

76. **V.E. Babicheva***, H. Kim, and A. Piqué, "Temperature-independent thermal radiation design using phase-change materials," Coatings 15, 38, 2025 [IF: 2.9]

75. **V.E. Babicheva*** and A.B. Evlyukhin, "Mie-resonant metaphotonics," Advances in Optics and Photonics 16, 539–658, 2024 [IF: 27.1]

74. V. Karimi[G] and **V.E. Babicheva***, "MXene-antenna electrode with collective multipole resonances," Nanoscale 16, 4656–4667, 2024 [IF: 6.7]

73. **V.E. Babicheva**, E. Lock, and H. Kim*, "Narrow-bandgap titanium sesquioxide with resonant metasurfaces for enhanced infrared absorption," Applied Physics Letters 125, 261101, 2024 [IF: 3.5]

72. **V.E. Babicheva*** and M. Rumi, "Chalcophosphate metasurfaces with multipolar resonances and electro-optic tuning," RSC Advances 14, 33906, 2024 [IF: 3.9]

71. **V.E. Babicheva**, "Resonant metasurfaces with van der Waals hyperbolic nanoantennas and extreme light confinement," Nanomaterials 14, 1539, 2024 [IF: 4.4]

70. A. Romero[U] and **V.E. Babicheva***, "Enhanced light confinement in nonlocal resonant metasurfaces with weak multipolar scatterers," Journal of Applied Physics 136, 083106, 2024 [*Editor's Pick*; IF: 2.7]

69. V. Karimi[G] and **V.E. Babicheva***, "Optical chirality in MXene nanoantenna arrays," MRS Advances 9, 557–564, 2024 [IF: 0.8]

68. M.S. Islam[G] and **V.E. Babicheva***, "Lattice Mie resonances and emissivity enhancement in mid-infrared iron pyrite metasurfaces," Optics Express 31, 40380–40392, 2023 [IF: 3.833]

67. V. Karimi[G] and **V.E. Babicheva***, "Multipole Mie resonances in MXene-antenna arrays," Journal of Physical Chemistry C 127, 17791–17801, 2023 [IF: 4.177]

66. V. Karimi[G] and **V.E. Babicheva***, "Dipole-lattice nanoparticle resonances in finite arrays," Optics Express 31, 16857–16871, 2023 [IF: 3.833]

65. M.S. Islam[G] and **V.E. Babicheva***, "Lattice resonances of lossy transition metal and metalloid antennas," MRS Advances 8, 138–147, 2023 [IF: 0.800]

64. D. Bosomtwi[G] and **V.E. Babicheva***, "Beyond conventional sensing: Hybrid plasmonic metasurfaces and bound states in the continuum," Nanomaterials 13, 1261, 2023 [IF: 5.719]

63. **V.E. Babicheva**, "Optical processes behind plasmonic applications," Nanomaterials 13, 1270, 2023 [*feature paper*; IF: 5.719]

62. A. Han, J.V. Moloney, **V.E. Babicheva***, "Applicability of multipole decomposition to plasmonic- and dielectric-lattice resonances," Journal of Chemical Physics 156, 114104, 2022 [*invited paper*; IF: 3.488]

61. Z.-X. Zhou, M.-J. Ye, M.-W. Yu, J.-H. Yang, K.-L. Su, C.-C. Yang, C.-Y. Lin, **V.E. Babicheva**, I.V. Timofeev, and K.-P. Chen*, "Germanium metasurfaces with lattice Kerker effect in near-infrared photodetectors," ACS Nano 16, 5994–6001, 2022 [IF: 13.903]

60. D. Bosomtwi[G], M. Osinski, and **V.E. Babicheva***, "Lattice effect for enhanced hot-electron generation in nanoelectrodes," Optical Materials Express 11, 3232, 2021 [IF: 3.442]

59. **V.E. Babicheva*** and A.B. Evlyukhin, "Multipole lattice effects in high refractive index metasurfaces," Journal of Applied Physics 129, 040902, 2021 [*invited perspective*; IF: 2.328]

58. V. Karimi[G] and **V.E. Babicheva***, "Semiconductor nanopillars for programmable directional lasing emissions," MRS Advances 6, 234, 2021 [IF: 0.800]

57. H. Ahmed[G] and **V.E. Babicheva***, "Nanostructured tungsten disulfide WS_2 as Mie scatterers and nanoantennas," MRS Advances 5, 1819–1826, 2020 [IF: 0.800]

56. A. Han*, C. Dineen, **V.E. Babicheva**, and J.V. Moloney, "Second harmonic generation in metasurfaces with multipole resonant coupling," Nanophotonics 9, 3545–3556, 2020 [IF: 6.950]

Before Joining UNM

55. J.-H. Yang, **V.E. Babicheva**, M.-W. Yu, T.-C. Lu, T.-R. Lin, and K.-P. Chen*, "Structural colors enabled by lattice resonance on silicon nitride metasurfaces," ACS Nano 14, 5678–5685, 2020 [IF: 13.903]

54. **V.E. Babicheva*** and J.V. Moloney, "Lattice Zenneck modes on subwavelength antennas," Laser & Photonics Reviews 13, 1800267, 2019 [IF: 8.529]

53. **V.E. Babicheva*** and J.V. Moloney, "Lattice resonances in transdimensional WS_2 nanoantenna arrays," Applied Sciences 9, 2005, 2019 [*invited paper*; IF: 1.689]

52. **V.E. Babicheva**, "Transition metal dichalcogenide nanoantennas lattice," MRS Advances 4, 2283, 2019 [IF: 0.800]

51. **V.E. Babicheva*** and A.B. Evlyukhin*, "Analytical model of resonant electromagnetic dipole-quadrupole coupling in nanoparticle arrays," Physical Review B 99, 195444, 2019 [IF: 3.813]

50. **V.E. Babicheva**, "Multipole resonances in transdimensional lattices of plasmonic and silicon nanoparticles," MRS Advances 4, 713–722, 2019 [IF: 0.800]

49. P.D. Terekhov*, **V.E. Babicheva**, K. Baryshnikova, A. Shalin, A. Karabchevsky*, and A.B. Evlyukhin*, "Multipole analysis of dielectric metasurfaces composed of nonspherical nanoparticles and lattice invisibility effect," Physical Review B 99, 045424, 2019 [IF: 3.813]

48. **V.E. Babicheva*** and J.V. Moloney, "Lattice effect influence on the electric and magnetic dipole resonance overlap in a disk array," Nanophotonics 7, 1663–1668, 2018 [*invited paper*; IF: 6.014]

47. **V.E. Babicheva**, "Lattice effect in Mie-resonant dielectric nanoparticle array under the oblique light incidence," MRS Communications 8, 1455–1462, 2018 [*invited paper*; IF: 3.010]

46. **V.E. Babicheva*** and A.B. Evlyukhin, "Resonant suppression of light transmission in high-refractive-index nanoparticle metasurfaces," Optics Letters 43, 5186–5189, 2018 [IF: 3.589]

45. **V.E. Babicheva*** and A.B. Evlyukhin, "Interplay and coupling of electric and magnetic multipole resonances in plasmonic nanoparticle lattices," MRS Communications 8, 712–717, 2018 [*invited prospective*; IF: 3.010]

    Highlighted in Materials360 Newsletters 18(13), 2018.

44. **V.E. Babicheva**, "Lattice Kerker effect in the array of hexagonal boron nitride antennas," MRS Advances 3, 2783–2788, 2018 [IF: 0.800]

43. **V.E. Babicheva**, S. Gamage, L. Zhen, S.B. Cronin, V.S. Yakovlev, and Y. Abate*, "Near-field surface waves in few-layer MoS_2," ACS Photonics 5, 2106, 2018 [IF: 6.756]

42. **V.E. Babicheva*** and A.B. Evlyukhin, "Metasurfaces with electric quadrupole and magnetic dipole resonant coupling," ACS Photonics 5, 2022, 2018 [IF: 6.756]

41. C.-Y. Yang, J.-H. Yang, Z.-Y. Yang, Z.-X. Zhou, M.-G. Sun, **V.E. Babicheva**, K.-P. Chen*, "Nonradiating silicon nanoantenna metasurfaces as narrow-band absorbers," ACS Photonics 5, 2596, 2018 [IF: 6.756]

40. **V.E. Babicheva**, "Directional scattering by the hyperbolic-medium antennas and silicon particles," MRS Advances 3, 1913, 2018 [IF: 0.800]

39. **V.E. Babicheva*** and A.B. Evlyukhin, "Resonant lattice Kerker effect in metasurfaces with electric and magnetic optical responses," Laser & Photonics Reviews 11, 1700132, 2017 [IF: 8.434]

38. **V.E. Babicheva**, "Long-range propagation of plasmon and phonon polaritons in hyperbolic-metamaterial waveguides," Journal of Optics 19, 124013, 2017 [*invited paper* in SI Emerging Leaders; IF: 1.741]

37. **V.E. Babicheva***, S. Gamage, M.I. Stockman, and Y. Abate*, "Near-field edge fringes at sharp material boundaries," Optics Express 25, 23935–23944, 2017 [IF: 3.307]

36. **V.E. Babicheva***, M.I. Petrov, K. Baryshnikova, and P.A. Belov, "Reflection compensation mediated by electric and magnetic resonances of all-dielectric metasurfaces [Invited]," Journal of the Optical Society of America B 34, D18–D28, 2017 [*invited paper*; IF: 1.731]

35. A. Boulesbaa*, **V.E. Babicheva**, K. Wang, I.I. Kravchenko, M.-W. Lin, M. Mahjouri-Samani, C. Jacob, A.A. Puretzky, K. Xiao, I. Ivanov, C.M. Rouleau, D.B. Geohegan, "Ultrafast dynamics of metal plasmons induced by 2D semiconductor excitons in hybrid nanostructure arrays," ACS Photonics 3, 2389, 2016 [IF: 5.404]

34. Y. Abate*, D. Seidlitz, A. Fali, S. Gamage, **V. Babicheva**, V. Yakovlev, M. Stockman, R. Collazo, D. Alden, and N. Dietz, "Nanoscopy of phase separation in InxGa1-xN alloys," ACS Applied Materials & Interfaces 8, 23160–23166, 2016 [IF: 7.145]

33. Y. Abate*, S. Gamage, L. Zhen, S.B. Cronin, H. Wang, **V. Babicheva**, M.H. Javani, M.I. Stockman*, "Nanoscopy reveals metallic black phosphorus," Light: Science & Applications 5, e16162, 2016 [IF: 14.603]

32. K.V. Baryshnikova*, M.I. Petrov, **V.E. Babicheva**, and P.A. Belov, "Plasmonic and silicon spherical nanoparticle antireflective coatings," Scientific Reports 6, 22136, 2016 [IF: 5.078]

31. A.V. Chebykin, **V.E. Babicheva**, I.V. Iorsh, A.A. Orlov, P.A. Belov, and S.V. Zhukovsky, "Enhancement of the Purcell factor in multiperiodic hyperboliclike metamaterials," Physical Review A 93, 033855, 2016 [IF: 2.991] (no corresponding author; Chebykin handled submission)

30. S.V. Zhukovsky, I.E. Protsenko, R. Sh. Ikhsanov, I.V. Smetanin, **V.E. Babicheva**, and A.V. Uskov*, "Transition absorption as a mechanism of surface photoelectron emission from metals," Physica Status Solidi (RRL)-Rapid Research Letters 9, 570–574, 2015 [IF: 2.343]

29. **V.E. Babicheva**, M.Y. Shalaginov, S. Ishii, A. Boltasseva, and A.V. Kildishev*, "Long-range plasmonic waveguides with hyperbolic cladding," Optics Express 23, 31109–31119, 2015 [IF: 3.525]

28. **V.E. Babicheva***, A. Boltasseva, and A.V. Lavrinenko, "Transparent conducting oxides for electro-optical plasmonic modulators," Nanophotonics 4, 165–185, 2015 [*invited review* in SI Emerging Materials for Nanophotonics; top 10 most downloaded papers of 2015; IF: 5.689]

27. **V.E. Babicheva**, M.Y. Shalaginov, S. Ishii, A. Boltasseva, and A.V. Kildishev*, "Finite-width plasmonic waveguides with hyperbolic multilayer cladding," Optics Express 23, 9681–9689, 2015 [IF: 3.525]

26. **V.E. Babicheva***, R.Sh. Ikhsanov, S.V. Zhukovsky, I.E. Protsenko, I.V. Smetanin, and A.V. Uskov*, "Hot electron photoemission from plasmonic nanostructures: Role of surface photoelectric effect and transition absorption," ACS Photonics 2, 1039–1048, 2015 [IF: 5.404]

25. K.V. Baryshnikova*, M.I. Petrov, **V.E. Babicheva**, A.V. Chebykin, P.A. Belov, "Influence of plasmonic and dielectric inclusions on antireflective properties of homogeneous coatings for silicon photovoltaic structures," Scientific & Technical Journal of Information Technologies, Mechanics & Optics 15, 767, 2015

24. R.Sh. Ikhsanov*, **V.E. Babicheva**, I.E. Protsenko, A.V. Uskov, and M.E. Guzhva, "Bulk photoemission from metal films and nanoparticles," Quantum Electronics 45, 50–58, 2015 [IF: 0.886]

23. **V.E. Babicheva***, S.V. Zhukovsky, and A.V. Lavrinenko, "Bismuth ferrite as low-loss switchable material for plasmonic waveguide modulator," Optics Express 22, 28890–28897, 2014 [IF: 3.525]

22. S.V. Zhukovsky*, **V.E. Babicheva**, A.B. Evlyukhin, I.E. Protsenko, A.V. Lavrinenko, and A.V. Uskov, "Giant photogalvanic effect in noncentrosymmetric plasmonic nanoparticles," Physical Review X 4, 031038, 2014 [IF: 9.043]

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2. **V.E. Babicheva*** and Yu.E. Lozovik, "Surface Plasmon Polariton Excitation and Extraordinary Optical Transmission in Metallic Grating Structures with Subwavelength Slits," SPIE Photonics Europe, Brussels, Belgium, SPIE Proceedings, vol. 7712, 77122Y, doi: 10.1117/12.854649, 2010
1. **V.E. Babicheva** and Yu.E. Lozovik, "Extraordinary Transmission Through Slit Arrays in Metal Films," Theoretical and Computational Nanophotonics (TaCoNa-Photonics 2009), Bad Honnef, Germany, AIP Conference Proceedings, vol. 1176, pp. 99–101, doi: 10.1063/1.3253957, 2009 (corresponding author N/A)

Video Presentations in Conference Proceedings

Before Joining UNM

2. C.Y. Yang, J.H. Yang, Z.Y. Yang, Z.X. Zhou, M.G. Sun, **V.E. Babicheva**, and K.P. Chen, "Absorption Enhancement of Dielectric Metasurfaces with the Kerker Effect," SPIE Optics + Photonics, Nanoscience + Engineering, Plasmonics: Design, Materials, Fabrication, Characterization, and Applications XVI, paper #OP18N-OP104-56, SPIE Proceedings, vol. 10722, 107221v (2018), doi: 10.1117/12.2320406, 2018
1. A. Boulesbaa, K. Wang, **V.E. Babicheva**, I.I. Kravchenko, M.-W. Lin, M. Mahjouri-Samani, M. Tian, A.A. Puretzky, I.N. Ivanov, C.M. Rouleau, B.G. Sumpter, and D.B. Geohegan, "Ultrafast Charge and Energy Exchanges at Hybrid Interfaces Involving 2D Semiconductors," SPIE Photonics West LASE, Conference on Synthesis and Photonics of Nanoscale Materials XIV, SPIE Proceedings, vol. 10093, 1009308, doi: 10.1117/12.2253659, 2017

Editorials (Special/Feature Issue Introductions)

5. **V.E. Babicheva***, Y.-J. Lu, A. Shalin, and D. Late, "Introduction to Advances in nanophotonics, plasmonics, and nano-optics," Nanoscale Advances, doi: 10.1039/d5na90067k, 2025 [IF: 4.6]

4. **V.E. Babicheva**, "Advances in photonic metasurfaces and metastructures," Nanomaterials 15, 153, 2025 [IF: 4.4]

3. A. Krasnok, **V.E. Babicheva**, and C. Rockstuhl, "Physics of complex photonic media and metamaterials: feature issue introduction," Optical Materials Express 13, 2446–2448, 2023 [IF: 3.074]

2. **V.E. Babicheva***, Y. Sivan, K.-P. Chen, and A. Evlyukhin, "Plasmonics and hot electrons: feature issue introduction," Optical Materials Express 11, 3686–3687, 2021 [IF: 3.442]

Before Joining UNM

1. **V.E. Babicheva**, I. Staude, and D. Gerard, "Collective effects and coupling phenomena in resonant optical metasurfaces: introduction," J. Optical Society of America B 36, CEC1, 2019 [IF: 2.048]

Contributions to Online Simulation Tools and Instructional Videos (All *Since Joining UNM*)

- The **nanoHUB** portal is based on nanotechnology community contributions and is geared toward education, professional networking, and interactive simulation tools that are run domestically and internationally.

  4. "Dipolar Collective Resonances in Nanoantenna Arrays" by V. Karimi (graduate student) and V.E. Babicheva, https://nanohub.org/tools/finitarray/. The tool analytically calculates lattice resonances accounting for the same- and cross-dipolar coupling of nanospheres. Released 08/2025. Used 35+ users, 470+ simulation runs, and one of the assignments in ECE 563 Computational Methods for Electromagnetics.

  3. "Multipolar Lattice Resonances in Nanoantenna Arrays" by V. Karimi (graduate student) and V.E. Babicheva, https://nanohub.org/tools/infarray/. The tool analytically calculates lattice resonances accounting for the same- and cross-multipolar coupling of nanosphere dipoles and quadrupoles. Released 07/2025. Used 35+ users, 360+ simulation runs, and one of the assignments in ECE 563 Computational Methods for Electromagnetics.

  2. "Electron-Beam Lithography Exposure Effect on Nanoantennas and Metasurfaces" by L. Liu (graduate student) and V.E. Babicheva, https://nanohub.org/tools/nanoant/. The tool calculates nanoantenna dimensions for different exposure doses, substrates, and array densities. Released 04/2025. Used 55+ users, 170+ simulation runs, and in V.B.'s sessions at UNM Engineering and Computing Summer Academy for high school students in 2025.

  1. "Mie Calculations of Single Nanosphere Cross-Sections" by V. Karimi (graduate student) and V.E. Babicheva, https://nanohub.org/tools/extcs/. The tool uses optical theory to calculate nanoparticle properties and determine the wavelength of their resonances. Released 03/2021. Used 370+ users, 3,000+ simulation runs, one of the assignments in ECE 563 Computational Methods for Electromagnetics, and in V.B.'s sessions at UNM Engineering and Computing Summer Academy for high school students in 2021 and 2025.

- V.B.'s YouTube channel has 29 short educational videos, 101+ subscribers, and 6,800+ views. These videos offer in-depth explanations of electromagnetics, illustrating both fundamental concepts and their practical applications through numerical simulations for complex scenarios.

Teaching Handbook

Handbook "Nanophotonic Simulations: Methods, Diffraction, and Multipolar Resonances" by **V.E. Babicheva**, accompanies course ECE 563 Computational Methods for Electromagnetics. The handbook portions are drawn from V.B.'s NSF-funded research on optical resonances and are part of integrating research results into course content.

Research and Career Highlights

- "Pioneering multipolar metasurfaces and tools for the scientific community," University of New Mexico, 2025, webpage: https://ece.unm.edu/news/2025/09/researchers-develop-new-metasurface-simulation-tools.html
- "Viktoriia Babicheva works in nanophotonics, optics, electromagnetics, and materials research," Optica Stories, video, 2023, webpage: https://www.optica.org/history/multimedia/video_audio/watch/?id=6340237472112
- "Plasmonics Team Shares New COVID Tool," University of New Mexico, 2021, webpage: https://ece.unm.edu/news/2021/08/plasmonics-team-shares-new-covid-tool.html
- University of Arizona Postdoctoral Association – Spotlight, Dr. Viktoriia Babicheva – Optical Sciences, 2018, webpage: http://uapostdocs.weebly.com/spotlight/archives/06-2018
- "Challenging academic career: knowledge, initiative, mobility, and flexibility" in "Women in Photonics – Solving Societal Problem," DTU Fotonik, Department of Photonics Engineering, Technical University of Denmark, 2014

<<<<<< SELECT TALKS presented by V.B.* >>>>>>
***Contributed talks at the conferences are not included in this document**

Invited Conference Talks

22. "Novel Material Platforms for Metasurfaces and Metaphotonic Devices," invited talk at 2024 Pacific Rim Meeting on Electrochemical and Solid State Science (PRiME), Honolulu, HI, October 2024
21. "Mie-Resonant Metasurfaces and Metaphotonics with Collective Effects," online, invited talk at 2024 Meta-Optics, From Science to Technology, Samarkand Scientific Renaissance, Samarkand, Uzbekistan, October 2024
20. "Plasmonic Lattice Resonances and Cross-Multipolar Coupling in Nanoantenna Arrays," invited talk at SPIE Optics + Photonics, Nanoscience + Engineering, Plasmonics: Design, Materials, Fabrication, Characterization, and Applications XXI, San Diego, CA, August 2024
19. "Multipole Mie and Lattice Resonances in Metasurfaces with Nanoantenna Arrays," invited talk at SPIE Optics + Photonics, Nanoscience + Engineering, Plasmonics: Design, Materials, Fabrication, Characterization, and Applications XXI, San Diego, CA, August 2023
18. "Multipole Mie Resonances in Lattices of Lossy Materials," invited talk at the 2023 MRS Spring Meeting, Symposium: Controlling Thermal Emission with Nanostructure and Active Control Plasmonic Devices, San Francisco, CA, April 2023
17. "High-Index Metastructures with Lattice Multipole Resonances," invited talk at 2022 MRS Fall Meeting, Symposium: Plasmonics, Nanophotonics & Metamaterials – From Design to Applications, Boston, MA, December 2022
16. "Nonlinear Effects in Mie Resonant Plasmonic Lattices," invited talk at 2022 IEEE Research and Applications of Photonics in Defense Conference (RAPID), Miramar Beach, FL, September 2022
15. "Mie Lattice Resonance with Coupled Multipoles," online, invited talk at the 12th International Conference on Metamaterials, Photonic Crystals and Plasmonics (META), July 2022
14. "Multipole-Engineered Van der Waals and High-Refractive-Index Nanostructures," invited talk at the 2021 MRS Fall Meeting, Symposium: Infrared and Thermal Photonic Materials & Applications, Boston, MA, December 2021
13. "Controlling Light with High-Index Nanoparticle Lattices," online, invited talk at Conference on Smart Nanomaterials (SNAIA), Section "All-Dielectric Nanostructures for Light Governing," December 2021
12. "Collective Resonances in Layered and High-Index Material Nanoparticle Arrays," online, invited talk at VI International Conference on Metamaterials and Nanophotonics (METANANO), Session: Graphene and 2D Materials, September 2021
11. "Ultra-Compact Photonic Modulator based on Accumulation-Layer Surface Plasmons," online, invited talk at 11th International Conference on Metamaterials, Photonic Crystals and Plasmonics (META), July 2021

10. "Transdimensional Photonics," online, invited talk at 2021 IEEE International Conference on Nanotechnology (IEEE-NANO), July 2021
9. **"Multipole Resonances for Directional Lasing and Wavefront Shaping," online, invited talk at Conference on Lasers and Electro-Optics (CLEO), FS8 Subcommittee: Metamaterials and Complex Media, May 2021** (Reputable and highly selective international conference)
8. "Nanoparticle Resonances for Controlling Light Emission with High-Index Transdimensional Lattices," online, invited talk at Conference on Smart Nanomaterials (SNAIA), Section "All-Dielectric Nanostructures for Light Governing," December 2020
7. "Transdimensional Photonic Lattices with Multipole Mie-Resonant Nanoantennas," online, invited talk at the 2020 IEEE International Conference on Nanotechnology (IEEE-NANO), July 2020
6. "Van der Waals Transdimensional Photonic Lattices with Strong Coupling to Substrate Layers," online, invited talk at University Day, Nano and Photonics, Doolittle Institute, May 2020
5. "Multipole Resonances in Transdimensional Van der Waals Antenna Lattices," invited talk at the 2019 MRS Fall Meeting, Emerging Material Platforms and Approaches for Plasmonics, Metamaterials and Metasurfaces, Boston, MA, December 2019
4. "Van der Waals Metasurfaces Based on Hyperbolic-Medium Antennas," invited talk at SPIE Optics + Photonics, Nanoscience + Engineering, Active Photonic Platforms XI, San Diego, CA, August 2019

Before Joining UNM

3. "Van der Waals Metasurfaces and Transdimensional Photonic Lattices," invited talk at the 10th International Conference on Metamaterials, Photonic Crystals and Plasmonics (META), Advanced Passive and Active Metasurfaces, Lisbon, Portugal, July 2019
2. "Plasmonic Resonances and Light Generation in Nanoparticle Dimers," invited talk at the International Applied Computational Electromagnetics Society (ACES) Symposium, Advanced Time Domain Solvers for Multiphysics Modeling in Photonics, Miami, FL, April 2019
1. "Photoemission of Hot Electrons from Plasmonic Nanoantennas," invited talk at the Days on Diffraction'2014, St. Petersburg, Russia, May 2014

Invited Seminars

39. University of North Carolina at Charlotte, November 2025, invited by Prof. V. Astratov
"Controlling Light through Multipolar Resonant Nanoantenna Design"
38. University of Georgia, February 2025, invited by Dr. S. Gamage
"Multipolar Nanoantennas for Advanced Nanophotonics," online
37. U.S. Naval Research Laboratory, June 2024, invited by Dr. H. Kim
"Multipolar Mie Resonances in Metasurfaces and Metaphotonics"
36. U.S. Air Force Research Laboratory, May 2024, invited by Dr. M. Rumi
"Mie-Resonant Metasurfaces and Metaphotonics"
35. University of Central Florida, September 2022, invited by Prof. K. Renshaw
"High-Index Metastructures with Lattice Multipole Resonances"
34. California State University, Northridge, October 2020, invited by Prof. A. Bezryadina
"Plasmonic Effects in Lattices and Van der Waals Metasurfaces," online

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33. Donostia International Physics Center, Spain, July 2019, invited by Dr. A. Nikitin
"Van der Waals Transdimensional Lattices for Nanophotonic Devices"
32. University of Miami, April 2019, invited by Prof. Sung Kim
"Multipole Resonances in Transdimensional hBN Arrays"
31. University of Nevada, Las Vegas, March 2019, invited by Prof. D. Shelton
"Transition Metal Dichalcogenide Nanoparticle Lattices with Mie Resonances"
30. University of Michigan–Dearborn, March 2019, invited by Prof. Ya Sha Yi
"Novel Material Platforms and Transdimensional Lattices for Metaphotonic Devices"
29. Wichita State University, February 2019, invited by Prof. H. Hamdeh

"Transdimensional Photonic Lattice and Van der Waals Meta-Optics"
28. Oklahoma State University, February 2019, invited by Prof. A. Rosenberger
"Van der Waals Meta-Optics"
27. Wake Forest University, February 2019, invited by Prof. D. Kim-Shapiro
"Transdimensional Lattices for Metaphotonic Devices"
26. Tulane University, January 2019, invited by Prof. D. Talbayev
"Towards Metaphotonic Devices: Novel Material Platforms for Metasurfaces"
25. Stanford University, May 2018, invited by Prof. J. Dionne
"Emerging Material Platforms and Approaches for Metamaterials and Metasurfaces"
24. Queens College, City University of New York, April 2018, invited by Prof. A. Lisyansky
"All-Dielectric Nanostructures, Metamaterials, and Metasurfaces"
23. University of California, Riverside, March 2018, invited by Prof. A. Balandin
"Lattice-Induced Kerker Effect in All-Dielectric Nanoparticle Arrays"
22. University of California, Davis, February 2018, invited by Prof. S. J. B. Yoo
"Nanoscopy of Layered Materials, Metasurfaces, and Metaphotonic Devices"
21. University of Nebraska–Lincoln, February 2018, invited by Prof. F. Choobineh
"Metasurfaces and Metaphotonic Devices with All-Dielectric Nanostructures"
20. University of Arizona, January 2018, invited by Prof. J. Moloney
"All-Dielectric Nanostructures for Directional Scattering and Enhanced Absorption"
19. University of Delaware, January 2018, invited by Prof. M. Doty
"Novel Material Platforms for Metasurfaces and Metaphotonic Devices"
18. Massachusetts Institute of Technology, November 2017, invited by Prof. J. Hu
"Kerker Effect with Collective Multipole Resonances in Nanoparticle Lattices"
17. Texas A&M University, April 2017, invited by Prof. R. Harris
"Metasurfaces and Metaphotonic Devices with Novel Material Platforms"
16. University of Colorado Boulder, March 2017, invited by Prof. W. Park
"Nanoscopy of Metasurfaces and Metaphotonic Devices"
15. Hofstra University, March 2017, invited by Prof. G. Levine
"Near-Field Characterization of Metasurfaces"
14. Alabama A&M University, March 2017, invited by Prof. A. Sharma
"Near-Field Techniques and Material Platforms for Metasurfaces"
13. University of Arkansas, February 2017, invited by Prof. H. Churchill
"Towards Metaphotonic Devices: Near-Field Nanoscopy and Novel Material Platforms for Metasurfaces"
12. University of Rochester, January 2017, invited by Prof. N. Vamivakas
"Novel Material Platforms for Metasurfaces and Metaphotonic Devices"
11. University of Texas at San Antonio, January 2017, invited by Prof. A. Ayon
"Unconventional Materials for Metamaterials and Metasurfaces"
10. University of Notre Dame, December 2016, invited by Prof. J. Furdyna
"Novel Approaches and Material Platforms for Metamaterials and Metasurfaces"
9. Jackson State University, November 2016, invited by Prof. T. Shahbazyan
"All-Dielectric Metamaterials and Metasurfaces"
8. St. John's University, November 2016, invited by Prof. M. Sadoqi
"Novel Approaches and Material Platforms for Metamaterials and Metasurfaces"
7. Vanderbilt University, November 2016, invited by Prof. J. Valentine
"Directional Scattering in All-Dielectric Metasurfaces"
6. National Institute for Materials Science, Tsukuba, Japan, September 2016, invited by Dr. Satoshi Ishii
"Huygens' Metasurfaces: Substrate-Mediated Directional Scattering and Lattice Resonances"
5. Technion – Israel Institute of Technology, Haifa, Israel, June 2015, invited by Prof. M. Orenstein
"Ultra-Compact Plasmonic Waveguide Modulators"
4. University of Utah, September 2014, invited by Prof. B. Sensale-Rodriguez
"Plasmonics for Ultra-Compact Waveguide Modulators and Enhanced Hot-Electron Photoemission"
3. Aalto University, Finland, February 2014, invited by Prof. C. Simovskii

"Nanophotonic Interconnects and Plasmonic Solutions for Photonic Waveguide Modulators"

2. ITMO University, St. Petersburg, Russia, December 2013, invited by Prof. P. Belov
"Plasmonic Enhancement of Photoelectron Emission"

1. University of Illinois Urbana–Champaign, August 2013, invited by Prof. D. Wasserman
"Plasmonic Solutions for Nanophotonic Interconnects and Enhancement of Photoelectron Emission"

Seminars at the University of New Mexico

14. ECE Graduate Seminar, October 2025, organized by Prof. B. Santhanam
"Designing Multipolar-Resonant Nanoantennas for Adaptive Nanophotonics"

13. Engineering and Computing Summer Academy for high school students, June 2025, organized by Aidira Macias Gonzalez
"Numerical Computations in Electromagnetics"

12. Quantum Photonics Graduate Seminar, February 2025, organized by Prof. V. Acosta
"Navigating Ph.D. Program Requirements"

11. Nano/Microsystems Graduate Seminar, February 2025, organized by Prof. N. Jackson
"Optical Materials, Nanoscience, and Engineering Applications"

10. Mechanical Engineering Graduate Seminar, January 2025, organized by Prof. S. Chabi
"Engineering Multipolar Resonant Nanoantennas for Tunable Nanophotonic Applications"

9. Optical Sciences and Engineering Seminar Series, October 2023, organized by Prof. T. Busani
"Resonating Light: Nanofabrication and Functionality of Optical Nanostructures"

8. Optical Sciences and Engineering Seminar Series, January 2023, organized by Prof. T. Chakraborty
"High-Refractive-Index Metastructures with Lattice Multipole Resonances"

7. Computation for Physicists Seminar Series, October 2021, organized by Prof. H. Duan
"Introduction to Computational Electromagnetics"

6. ECE Graduate Seminar, August 2021, organized by Prof. M. Osinski
"Multipole Resonances in Plasmonic and High-Index Dielectric Nanoparticle Arrays"

5. Engineering and Computing Summer Academy for high school students, July 2021, organized by Elsa Castillo
"Electromagnetics and Numerical Modeling"

4. ECE Graduate Seminar, September 2020, organized by Prof. M. Osinski
"Photonic Lattices Based on Layered Van der Waals Materials"

3. Optical Sciences and Engineering Seminar Series, August 2020, organized by Prof. G. Balakrishnan
"Lattice Effects in Plasmonic and Van der Waals Metasurfaces," online

2. ECE Graduate Seminar, September 2019, organized by Prof. M. Osinski
"Material Platforms and Transdimensional Lattices for Metaphotonic Devices"

1. Department of Electrical and Computer Engineering, January 2019, organized by Prof. P. Zarkesh-Ha
"Novel Material Platforms for Metaphotonic Lattices and Devices"

Talks at the University of New Mexico

3. "Thermally Tunable Metasurfaces for Heat Regulation and Emissivity Control," UNM Research & Discovery Week at Sustainable Space Research Symposium, November 2025

2. "NANOMETA group: Controlling Light at Nanoscale," Quantum Photonics Graduate Seminar, January 2025

1. "Phase-Change Materials for Thermal Management & Controlled Emissivity," UNM Space Day, November 2024

<<<<<< MENTORING >>>>>>

Mentoring Graduate Students

Research presentations and contributions to publications

Li Liu, current Ph.D. student, Ph.D. defense planned for Spring 2026

Led one journal article, co-authored two other articles, led one conference paper, and co-authored another one

4. Oral on-site, The 35th Rio Grande Symposium on Advanced Materials (RGSAM), Albuquerque, NM, 11/2025, "Multipolar Resonances in Nanoantenna Arrays and Metasurfaces"
3. Poster on-site, 2025 Center for Integrated Nanotechnologies Annual Meeting, Santa Fe, NM, 09/2025, "Multipolar Resonances and Purcell-Enhanced Emission in Nanoantenna Arrays"
2. Poster on-site, The 34th Rio Grande Symposium on Advanced Materials (RGSAM), Albuquerque, NM, 10/2024, "Enhanced Optical Resonances in Transition Metal Dichalcogenide Metasurface"
1. Poster on-site, 2024 Center for Integrated Nanotechnologies Annual Meeting, Santa Fe, NM, 09/2024, "Enhancing Light-Matter Interactions with Van der Waals Materials in Mie Resonant Metasurfaces"

Vahid Karimi, current Ph.D. student, Ph.D. defense planned for Spring 2026

Led 6 journal articles, led 8 conference papers, co-authored other 2, and led 3 online simulation tools

9. Oral on-site, The 35th Rio Grande Symposium on Advanced Materials (RGSAM), Albuquerque, NM, 11/2025, "Optical Collective Resonances for Polarization Control, Chiral Metasurfaces, and Photodetection"
8. Oral on-site, The 34th Rio Grande Symposium on Advanced Materials (RGSAM), Albuquerque, NM, 10/2024, "Optical Response of MXene Nanoantennas Under Left and Right Circularly Polarized Illumination"
7. Oral online, 2023 MRS Fall Meeting, 12/2023, "Multimode Coupling and Bound States in the Continuum in High-Index Metasurface"
6. Oral on-site, The 33rd Rio Grande Symposium on Advanced Materials (RGSAM), Albuquerque, NM, 10/2023, "Tailoring Optics in Periodic Arrays Through Size-Dependent Lattice Resonances"
5. Poster on-site, The 33rd Rio Grande Symposium on Advanced Materials (RGSAM), Albuquerque, NM, 10/2023, "Enhancing Light-Material Interactions: MXene Antennas and the Path to Advanced Nanophotonic Devices" (his second contribution to the 33rd RGSAM)
4. Oral online, 2021 MRS Spring Meeting, 04/2021, "High Refractive Index Nanopillar Metasurfaces for Control of Coherent Light States"
3. Oral online, 2020 MRS Spring/Fall Meeting, 11/2020, "Late News: Mie Resonances in High-Index Nanoparticle Arrays for Control of Coherent Light States", accepted as Late Breaking News
2. Poster online, The Third Photonics Online Meetup, 11/2020, "Rapid Phase Changes in Resonant Response of High Refractive Index Nanopillars"
1. Oral online, 2020 Annual Meeting of the APS Four Corners Section, 10/2020, "High Refractive Index Metasurfaces for Programmable Laser Emission"

Atsu Atitsogbui, current Ph.D. student, Ph.D. defense planned for Fall 2026

Led one journal article submitted and one conference paper submitted

1. Oral on-site, The 35th Rio Grande Symposium on Advanced Materials (RGSAM), Albuquerque, NM, 11/2025, "Nonlinear Metasurfaces with Lattice-Enhanced Fundamental and Second-Harmonic Resonances"
2. Oral on-site, LoboBITES at UNM, Albuquerque, NM, 10/2025, "Lattice Second-Harmonic Resonances"

Dominic Bosomtwi, Ph.D. awarded in Summer 2024

Led 2 journal articles, co-authored other 2, led 8 conference papers, and co-authored other 3

7. Oral online, 2023 MRS Spring Meeting, 04/2023, "Light Trapping and Directional Scattering in Hybrid Metasurfaces"
6. Oral online, 2022 MRS Fall Meeting, 12/2022, "Directional Scattering and Quasi-Bound States in the Continuum in All-Dielectric Nano-Antenna Metasurfaces"
5. Poster on-site, 2021 UNM Shared Knowledge Conference, Albuquerque, NM, 11/2021, "Optical Responses of Layered Nanostructures"
4. Oral online, 2021 MRS Spring Meeting, 04/2021, "Coupling and Rabi Splitting of Plasmonic Modes in Nanopillar Array"

3. Oral online, 2020 Annual Meeting of the APS Four Corners Section, 10/2020, "Mode Coupling, Fano Resonances, and Rabi Splitting in Hybrid Nanostructure"
2. Oral online, 2020 ASEE GSW (Gulf Southwest Section) Conference, Albuquerque, NM, 04/2020, "Fano Resonances and Rabi Splitting in Plasmonic-Dielectric Metasurfaces"
1. Oral on-site, 2020 UNM STEM Research Symposium, Albuquerque, NM, 02/2020, "Fano Resonances in Plasmonic-Dielectric Metasurfaces"

Md Sakibul Islam, former Ph.D. student

Led 2 journal articles, led 7 conference papers, and co-authored other 8

8. Oral online, 2023 MRS Fall Meeting, 12/2023, "Engineering Multipole Resonances in Metasurface of Lossy and Low-Loss Dielectric Materials"
7. Poster on-site, 2023 UNM Shared Knowledge Conference, Albuquerque, NM, 11/2023, "Excitation of Lattice Resonances in Periodic Antenna Arrays"
6. Poster online, 2023 Photonics Online Meetup, 11/2023, "Multipole Resonance Engineering in Periodic Antenna Arrays"
5. Oral on-site, The 33rd Rio Grande Symposium on Advanced Materials (RGSAM), Albuquerque, NM, 10/2023, "Multipole Resonance Control in High-Refractive-Index Antennas"
4. Poster on-site, 2023 Center for Integrated Nanotechnologies Annual Meeting, Santa Fe, NM, 09/2023, "Resonating Light: Nanofabrication and Functionality of Optical Nanostructures"
3. Oral online, 2023 MRS Spring Meeting, 04/2023, "Multipole Coupling in Nanoparticle Lattices with Quasi-Bound States"
2. Oral online, 2022 MRS Fall Meeting, 12/2022, "Mie Metasurfaces with Multipole Resonances in the Lattice"
1. Oral on-site, The 32rd Rio Grande Symposium on Advanced Materials (RGSAM), Albuquerque, NM, 10/2022, "Lattice Multipole Resonances in Periodic Nanostructures and Metasurfaces"

Hasan Ahmed

Led one journal article and one conference paper

2. Oral online, 2020 ASEE GSW (Gulf Southwest Section) Conference, Albuquerque, NM, 04/2020, "Metasurfaces Based on Periodically Arranged MXene Nanoantennas"
1. Oral on-site, 2020 UNM STEM Research Symposium, Albuquerque, NM, 02/2020, "Transparent Conduction Oxide Based Electro-Optic Modulator: Accumulation Layer Surface Plasmons"

Fatih Furkan Ince

Co-authored one conference paper

2. Poster on-site, the Southwest regional meeting of the ECE Department Heads Association, Career Fair, Denton, TX, 11/2019, travel covered by the ECE Department, "Heavily Doped Semiconductors and Layered Materials for Light Scattering Control"
1. Poster on-site, Joint Transition Office MRI Annual Meeting at UNM, Albuquerque, NM, 10/2019, "High-Index Nanostructures and 2D Materials for Light Scattering Control"

Training and access to the Department of Energy's shared facilities

CINT in ABQ (basic training to access the cleanroom and optical laboratories):

Evan Modak Arup, Md Sakibul Islam, Lubaba Billah, Dominic Bosomtwi, Kazi Ahmed, Hasan Ahmed, Fatih Ince

CINT at LANL: Li Liu (optical laboratories, 20+ sessions of general safety training)

Mentoring Undergraduate Students

Research presentations and contributions to publications

Raphael Landau, Poster on-site, Quantum Undergraduate Research Experience, 08/2025, "Processing Techniques for Graphene Oxide on Metasurfaces"

Neal Raney, Poster on-site, Quantum Undergraduate Research Experience, 08/2023, "Impact of Pressure and Deposition Rate on Amorphous Silicon Optical Constants"
+ *Led one journal article, co-authored another one, and four conference papers*

Aaron Holzer, Poster on-site, Quantum Undergraduate Research Experience, 08/2023, "Effect of Substrate Material and Dosage Multiplier on the Radius and Period of Nanoparticles on Arrays"
+ *Co-authored one journal article and two conference papers*

Erik Boldt, Poster on-site, Quantum Undergraduate Research Experience, 08/2022, "Fabrication Techniques for Optical Resonances in Nanostructures for Quantum Sensors and Simulators"
+ *Co-authored two conference papers*

James Toomey, Poster on-site, Quantum Undergraduate Research Experience, 08/2022, "Impact of Substrate Size and Resist Thickness on Metasurface Nanofabrication"
+ *Led one conference paper and co-authored another one*

Amanda Romero, Oral on-site, 2022 CINT Summer Research Symposium, 07/2022, "Optical Resonances in Nanostructures with Periodicity and Multipole Excitations"
+ *Led one journal article, 3 conference papers, and co-authored two others*

Training and access to the Department of Energy's shared facilities

CINT in ABQ (basic training to access the cleanroom and optical laboratories):
Raphael Landau, Neal Raney, Aaron Holzer, Colton Purdy, Erik Boldt, James Toomey, Amanda Romeo

<<<<<< GRANTS & CONTRACTS >>>>>>

External to UNM (PI, Co-PI, Other Senior Personnel)

Current

1. Agency/Title of Grant	U.S. Naval Research Laboratory: "Adaptive Electro-Optic Modulators with Smart Materials for Resilient Operations"
2. Duration of Funding	12/10/2025 – 02/09/2027
3. Total amount of award	$200,000
4. Your role & amount for which you are directly responsible	Sole PI, $200,000
5. Co-investigators & their roles	N/A

1. Agency/Title of Grant	U.S. National Science Foundation: DMR-2418519 "LEAPS-MPS: Multipole-Engineered Mie-Resonance Metasurfaces" NSF webpage
2. Duration of Funding	08/15/2024 – 07/31/2026
3. Total amount of award	$249,980
4. Your role & amount for which you are directly responsible	Sole PI, $249,980
5. Co-investigators & their roles	N/A

1. Agency/Title of Grant	U.S. Air Force Research Laboratory: FA9451-22-2-0016 "Directed Energy Center for Lasers and Microwaves"
2. Duration of Funding	10/21/2021 – 05/21/2026
3. Total amount of award	$7,365,000
4. Your role & amount for which you are directly responsible	Co-PI, $352,000
5. Co-investigators & their roles	Ganesh Balakrishnan (PI) and Edl Schamiloglu (Co-PI)

1. Agency/Title of Grant	U.S. National Science Foundation: ECCS-2320098 "NSF MRI Track 2: Acquisition of an Electron Beam Lithography and Imaging System for Research, Education, & Training" NSF webpage
2. Duration of Funding	09/01/2023 – 08/01/2026
3. Total amount of award	$1,944,433
4. Your role & amount for which you are directly responsible	Other Senior Personnel, N/A, Instrumentation Grant
5. Co-investigators & their roles	Francesca Cavallo (PI), Tara Drake (Co-PI, Physics & Astronomy), Tito Busani (Co-PI), Ganesh Balakrishnan (Co-PI), Victor Acosta (Co-PI, Physics & Astronomy), Marek Osinski (Other Senior Personnel), Martin Kirk (Other Senior Personnel, Chemistry & Chemical Biology), Terefe Habteyes (Other Senior Personnel, Chemistry & Chemical Biology), Sang M. Han (Other Senior Personnel, Chemical & Biological Engineering), Sang Eon Han (Other Senior Personnel, Chemical & Biological Engineering), Nathan Jackson (Other Senior Personnel, Mechanical Engineering)

1. Agency/Title of Grant	U.S. National Science Foundation: DGE-2244462 "NRT-QL: Quantum Photonics interdisciplinary training to Advance Quantum Technologies" NSF webpage, QPAQT Program
2. Duration of Funding	07/01/2023 – 06/01/2028
3. Total amount of award	$2,999,976
4. Your role & amount for which you are directly responsible	Other Senior Personnel, N/A, Graduate Program
5. Co-investigators & their roles	Victor Acosta (PI, Physics & Astronomy), Francisco Elohim Becerra Chavez (Co-PI, Physics & Astronomy), Tara Drake (Co-PI, Physics & Astronomy), Ganesh Balakrishnan (Co-PI), Terefe Habteyes (Co-PI, Chemistry & Chemical Biology), Keith Lidke (Other Senior Personnel, Physics), Susan Atlas (Other Senior Personnel, Chemistry & Chemical Biology)

Completed

1. Agency/Title of Grant	U.S. Air Force Office of Scientific Research: FA9550-23-1-0379 "Nanoscopic Infrared Imaging and Spectroscopy of Materials and Physicochemical Processes"
2. Duration of Funding	07/01/2023 – 12/01/2024
3. Total amount of award	$232,320
4. Your role & amount for which you are directly responsible	Co-PI, N/A, Instrumentation Grant

5. Co-investigators & their roles	Terefe Habteyes (PI, Chemistry & Chemical Biology), Francesca Cavallo (Co-PI), Sang Eon Han (Co-PI, Chemical & Biological Engineering), Dongchang Chen (Co-PI, Chemistry & Chemical Biology), Jeremy Edwards (Co-PI, Chemistry & Chemical Biology)

1. Agency/Title of Grant	National Technology & Engineering Solutions of Sandia LLC: Award 2375849 "CINT Summer Research Initiative"
2. Duration of Funding	05/01/2022 – 09/01/2022
3. Total amount of award	$38,048
4. Your role & amount for which you are directly responsible	Co-PI, $13,500
5. Co-investigators & their roles	Edl Schamiloglu (PI), Shuya Wei (Co-PI, Chemical & Biological Engineering), Terry Loring (Co-PI, Mathematics & Statistics)

Internal to UNM

Current

1. Agency/Title of Grant	QNM-I Fellowship: "Purcell-Enhanced Single-Photon Emitters in Multipolar Metasurfaces"
2. Duration of Funding	Fall'25 and Spring'26
3. Total amount of award	$34,965
4. Your role & amount for which you are directly responsible	Sole PI, $34,965
5. Co-investigators & their roles	N/A

Completed

1. Agency/Title of Grant	Sustainable Space Research Grand Challenge Program: "Phase-Transition Materials for Thermal Management and Controlled Emissivity"
2. Duration of Funding	08/19/2024 – 06/30/2025
3. Total amount of award	$5,000
4. Your role & amount for which you are directly responsible	Sole PI, $5,000
5. Co-investigators & their roles	N/A

1. Agency/Title of Grant	WeR1 PERC: "Infrared Spectrometer for Electromagnetic and Photonic Characterizations" Program for Enhancing Research Capacity (PERC) is part of the OVPR Faculty Success Program WeR1
2. Duration of Funding	12/12/2022 – 06/11/2023
3. Total amount of award	$41,000
4. Your role & amount for which you are directly responsible	Sole PI, $41,000
5. Co-investigators & their roles	N/A

1. Agency/Title of Grant	UNM Research Allocations Committee (RAC): "Collective Optical Resonances in Lossy Materials"
2. Duration of Funding	12/01/2022 – 05/30/2024
3. Total amount of award	$4,000
4. Your role & amount for which you are directly responsible	Sole PI, $4,000
5. Co-investigators & their roles	N/A

1. Agency/Title of Grant	WeR1 SuRF: "Ultra-Thin Nanostructures with Light Enhancement" Summer Research for Faculty (SuRF) is part of the OVPR Faculty Success Program WeR1
2. Duration of Funding	05/01/2022 – 12/31/2022
3. Total amount of award	$4,980
4. Your role & amount for which you are directly responsible	Sole PI, $4,980
5. Co-investigators & their roles	N/A

1. Agency/Title of Grant	WeR1 FaST: "Enhanced Light- and Electron-Emission in Nanomaterials" Faculty Scholarship Time (FaST) is part of the OVPR Faculty Success Program WeR1
2. Duration of Funding	Spring'22 semester
3. Total amount of award	$5,300 (transferred directly to the ECE Department)
4. Your role & amount for which you are directly responsible	Sole PI, Course buy-out
5. Co-investigators & their roles	N/A

1. Agency/Title of Grant	WeR1 SuRF: "Light Concentration in Nanostructures with Multipole Resonances" Summer Research for Faculty (SuRF) is part of the OVPR Faculty Success Program WeR1
2. Duration of Funding	08/01/2021 – 12/31/2021
3. Total amount of award	$2,000
4. Your role & amount for which you are directly responsible	Sole PI, $2,000
5. Co-investigators & their roles	N/A

1. Agency/Title of Grant	UNM Research Allocations Committee (RAC): "Machine Learning Design for Laser Devices"
2. Duration of Funding	12/01/2020 – 05/30/2022
3. Total amount of award	$3,500
4. Your role & amount for which you are directly responsible	Sole PI, $3,500
5. Co-investigators & their roles	N/A

Summer Fellowships

ONR Summer Faculty Research, "Reconfigurable Electro-Optic Modulators and Controllable Waveguide-Coupled Light Emitters," Naval Research Laboratory, Washington D.C., 10 weeks, 2026, submitted

ONR Summer Faculty Research, "Tunable Electro-Optic Modulators and Switchable Waveguide-Integrated Emitters," Naval Research Laboratory, Washington D.C., 10 weeks, 2025, $24K stipend

Air Force Summer Faculty Fellowship, "Electro-Optic Multipolar Resonant Nanoantennas," AFRL Materials and Manufacturing Directorate, Wright-Patterson Air Force Base, OH, 10 weeks, 2025, $12K stipend

ONR Summer Faculty Research, "Electro-Optic Modulator Based on Oxide Films with Large Pockels Coefficient," Naval Research Laboratory, Washington D.C., 8 weeks, 2024, $24K stipend

Air Force Summer Faculty Fellowship, "Nonlinear and Electro-Optic Properties of Chalcophosphates for Mid-Infrared Photonics," AFRL Materials and Manufacturing Directorate, Wright-Patterson Air Force Base, OH, 8 weeks, 2024, $17K stipend

Equipment and Facility Time Awards

The Department of Energy's national user facilities provide capabilities for nanoscale science research at no cost to approved user proposals for non-proprietary research. The comprehensive suite of world-leading capabilities includes technical expertise, instrumentation, and software.

Since Joining UNM

Center for Integrated Nanotechnologies (CINT), Sandia & Los Alamos National Laboratories (jointly operated)

V.E. Babicheva is the sole PI in all of them

10. Near-Field Imaging and Nonlinear Response of Multipolar Metasurfaces, *Submitted*
    #2025BC0001, 01/2026 – 06/2027
9. Directional Light Scattering of Moderate-Refractive-Index Nanoantennas Enabled by Additive Manufacturing
    #2024BU0039, 01/2025 – 06/2026
8. Thin-Film Conformal Coatings for Controlled Secondary Electron Emission and Ferroelectric Capacitors
    #2024AU0038, 07/2024 – 12/2025
7. Subwavelength Light Manipulation Using Metasurfaces and Hybrid Nanostructures
    #2023BC0001, 01/2024 – 06/2025
6. Multipole Resonances in Van der Waals Nanoparticles
    #2023AC0001, 07/2023 – 12/2024
5. Multipole Mie and Fano Resonances in Nanostructures with Complex Unit Cells
    #2022AC0093, 07/2022 – 12/2023
4. Multipole Mie Resonances in Nanoparticle Arrays and Metasurfaces
    #2021BC0006, 01/2022 – 06/2023
3. Optical Resonances in Nanostructures with Periodicity and Multipole Excitations
    #2022ARA0014, 05/2022 – 08/2022
2. Fano Resonances and Rabi Splitting in Layered Nanostructure
    #2020AU0201, 07/2020 – 06/2022
1. Multipole Mie Resonances in Nanoparticle Arrays and Metasurfaces
    #2019BU0099, 01/2020 – 12/2021

Before Joining UNM

Oak Ridge National Laboratory, Center for Nanophase Materials Sciences, "Huygens' Metasurfaces with Directional Scattering and Lattice Resonances," #CNMS2016-R84, Rapid Access, 2016 – 2017, PI V. Babicheva, and "Room Temperature Infrared Spaser (Nanolaser)," #CNMS2016-384, 2016 – 2017, PI V. Babicheva

Brookhaven National Laboratory, Center for Functional Nanomaterials, "Low-Threshold Plasmonic Nanolaser," #35412, 2016 – 2017, PI V. Babicheva, co-PIs M. Stockman, Y. Abate

Before Joining UNM: Awards and Scholarships

2019	Department of Energy $5K, symposium award
2018	**Optica/OSA Outstanding Reviewer Award**
2016	AVS Electronic Materials & Photonics Division $500, postdoctoral fellow travel award
2014	Kaj og Hermilla Ostenfeld Foundation $6K, research award
2013	Otto Mønsteds Foundation $3K, research award
2013	Thomas B. Thriges Foundation $1.8K, research award
2013	Oticon Foundation $800, conference travel award
2012	**SPIE Scholarship in Optics and Photonics** $3K, recognition for potential long-range contributions to optical science and engineering
2012	Otto Mønsteds Foundation $800, conference travel award
2012	Oticon Foundation $650, conference travel award
2010	DTU Fotonik Scholarship, 3-year Ph.D. funding, including cleanroom expenses
2010	**German Academic Exchange Service (DAAD)** award $4.5K for doctoral candidates and young academics and scientists (funded 3 months at Zuse Institute Berlin)
2009	Best Student Scientific Work (the highest award), National Contest of Student Scientific Works on Nanotechnology and Metamaterials, Ministry of Education and Science of the Russian Federation
2009	Research award $2K, #NK-346P-09, Ministry of Education & Science of the Russian Federation, Moscow State Institute of Radiotechnics, Electronics, and Automatics – Technical University
2008 – 2009	Scholarship, Educational and Scientific Center of the Lebedev Physical Institute, Russia
2005 – 2009	Scholarship, Academic Committee of Moscow Institute of Physics and Technology, Russia

<<<<<< SERVICE >>>>>>

Service to the Department

ECE Standing and Search Committees

Spring 2024 – present	ECE Undergraduate Committee member (meetings once or twice a semester, revisions of curriculum, transfer process, educational objectives)
Fall 2021 – present	ECE Workload Committee member (active primarily in the first year)
AYs 24/25 & 25/26	ECE Faculty Search Committee member in Quantum Science and Computing (completed required training, reviewed 40+ applications, participated in meetings)

Qualifying/Comprehensive/Ph.D./M.S./Internship Exam Committees

Ph.D. Dissertation Committee Chair:	Dominic Bosomtwi (S24)
M.S. Thesis Committee Chair:	Michael Illescas (with distinction, S23)
Comprehensive Exam Committee Chair:	Li Liu (Su25) Vahid Karimi (Su25) Dominic Bosomtwi (S23)

Ph.D. Defense Committee Member:	Shu Wang (F20)
Comprehensive Exam Committee Member:	Thomas Christian (S25) Nishan Shrestha (F24) Shu Wang (F19)
Internship Exam (OSE Program Requirement):	Zadid Shifat (S25)
Qualifying Exam Committee:	Vahid Karimi (S24), Zachary Bergstedt (S24), Thomas Christian (committee chair, S24), Shakiba Haji Sadeghi (F23), Alexander Glick (S23), Dejan Nikic (F22)

Service to the School and University

Graduate Program

Fall 2022 – present

Core faculty and program committee member at the Quantum Photonics and Quantum Technology (QPAQT) graduate program funded by the NSF Research Traineeship (NRT) award. Completing the program is accompanied by a transcripted Graduate Certificate in Quantum Science & Technology, and some students receive fellowships. The first batch consists of 14 students, primarily from the Physics, Optics, Chemistry, and ECE programs, as well as other engineering graduate programs. Activities included holding regular monthly meetings to coordinate efforts, reviewing applications of students to the program, developing and refining course requirements to meet program goals, organizing and delivering seminar presentations to share knowledge, recruiting students from existing graduate programs by working with the academic advisers and reviewing applications of incoming students, and engaging in a variety of additional tasks to support and enhance the program's overall effectiveness. V.B. independently prepared and delivered the talk "Navigating Ph.D. Program Requirements," drawing on and synthesizing materials from multiple graduate programs at the Quantum Photonics Graduate Seminar (organized by Prof. V. Acosta) in February 2025.

Student advisement in the QPAQT Program

Name	**Program**	**Dates**
Jose Castro	Ph.D., NMSE, pre-qualifier	F25 – present
Nader Rady	Ph.D., NMSE, pre-qualifier	S25 – present
Sajib Chakraborty	Ph.D., ECE, pre-qualifier	S25 – present

*NMSE is Nanoscience & Microsystems Engineering Program

Summer Undergraduate Program

2022, 2023, 2025

Committee member for Quantum Undergraduate Research Experience QU-REACH. Activities: review applications (~30 per cycle), evaluation of final poster presentations

Mentoring Undergraduate Students

Fall 2021, Fall 2022, Spring 2023	STEM Mentoring Program, semester-long weekly meetings with a student
Fall 2021 – Fall 2023, Fall 2025	Student Research Experience, semester-long research work with undergraduate students

Engineering and Computing Summer Academy

Summer 2021, 2025 The sessions were conducted as part of the Summer Academy for high school students and focused on the topic "Numerical Modeling and Computations in Electromagnetics." They included lectures that introduced fundamental concepts while emphasizing practice with computational tools available at nanoHUB. The activities incorporated several tools developed by V.B. and her graduate students, alongside other widely used simulation tools, allowing participants to explore a range of approaches. These sessions provided students with practical experience in modeling electromagnetic phenomena, helping them develop computational skills, deepen their understanding of theoretical concepts, and gain early exposure to tools commonly used in research and engineering.

Reviewing UNM Proposals

Fall 2023 Program for Enhancing Research Capacity PERC, 10 proposals

Service to the Discipline

Review of Proposals for Agencies (Grants, Scholarships, and Facility Access)

U.S. National Science Foundation (Q2 2025, Q1 2025, Q4 2024, Q2 2023, Q2 2020)

U.S. Department of Defense (Q2 2023, Q4 2022)

U.S. Department of Energy (Office of Basic Energy Sciences Q3 2024, Theoretical Condensed Matter Physics Program Q2 2020)

Center for Integrated Nanotechnologies CINT, U.S. Department of Energy (04/2022–present, 7 cycles in total, 5–6 proposals per cycle)

International Society for Optics and Photonics SPIE Scholarship Committee, 2024–present (36 applications in 2024 and 33 in 2025; 3 meetings annually)

Oak Ridge Associated Universities (Q1 2025)

Canada Natural Sciences and Engineering Research Council, Discovery Grants Division (Q1 2021)

European agencies: European Research Council (Q3 2025, Q4 2022), French National Research Agency (Q2 2020, Q1 2019), Croatian Science Foundation (Q3 2020, Q2 2019), Polish National Science Center (Q4 2021), Flemish Research Foundation – Flanders (Q4 2023)

Editorial Service

Associate Editor, SPIE Journal of Optical Microsystems (SPIE Society, IF: 1.7), 2025 – present
Primary tasks include assessing manuscripts for suitability, assigning potential reviewers, and making decisions about manuscripts after peer review. Associate Editors are also encouraged and expected to attend regular editorial board meetings and to submit papers to this journal.

Associate Editor, Nano Select (Wiley, IF: 3.5), 2024 – present
Handling peer review of manuscripts.

Associate Editor, MRS Advances (Materials Research Society, IF: 0.9), 2021 – 2025
Handled peer review of ~110 manuscripts in total.

Principal Editor, MRS Advances (Materials Research Society, IF: 0.9), 2015 – 2020

Handled peer review of ~30 manuscripts in total.

Lead Guest Editor, Nanomaterials (Multidisciplinary Digital Publishing Institute, IF: 4.4), 03/2025 – 02/2026
Special Issue "State-of-the-Art Optical Nanostructures, Metasurfaces, and Photonic Devices"
Sole Guest Editor. Drafted *Call for Papers*.

Lead Guest Editor, Nanoscale Advances (Royal Society of Chemistry, IF: 4.6), 07/2024 – 04/2025
Themed Collection "Advances in Nanophotonics, Plasmonics, and Nano-Optics"
Drafted the initial version of *Call for Papers* and coordinated invitations of other guest editors and *Call for Papers* revisions. Led the writing of the Themed Collection Introduction.

Lead Guest Editor, Nanomaterials (Multidisciplinary Digital Publishing Institute, IF: 5.719), 07/2023 – 08/2024
Special Issue "Advances in Photonic Metasurfaces and Metastructures"
Sole Guest Editor. Drafted *Call for Papers*. Handled peer review of 5 manuscripts. Wrote the Special Issue Introduction.

Guest Editor, Optical Materials Express (Optica/OSA, IF: 3.074), 09/2022 – 02/2023
Feature Issue "Physics of Complex Photonic Media and Metamaterials"
Supported drafting *Call for Papers* and handled the peer review of 2 manuscripts. Contributed to the writing of the Feature Issue Introduction.

Lead Guest Editor, Optical Materials Express (Optica/OSA, IF: 3.442), 01/2021 – 08/2021
Feature Issue "Plasmonics and Hot Electrons"
Drafted the initial version of *Call for Papers* and coordinated invitations of other guest editors and *Call for Papers* revisions. During submission, assigned manuscripts to other guest editors. Handled peer review of 3 manuscripts. Led the writing of the Feature Issue Introduction.

Before Joining UNM

Guest Editor, Journal of the Optical Society of America B (Optica/OSA, IF: 2.048), 12/2018 – 08/2019
Feature Issue "Collective Effects and Coupling Phenomena in Resonant Optical Metasurfaces"

Lead Guest Editor, Symmetry (Multidisciplinary Digital Publishing Institute, IF: 1.256), 09/2018 – 12/2019
Special Issue "Symmetry in Nano-Optics and Nanophotonics"

Symposium Organizer for Materials Research Society (MRS) Meetings

2024 MRS Fall Meeting, Boston, MA; Organizers: Y. J. Lu, H. Lee, **V. Babicheva**, M. Li; Symposium EL07 "Emerging Material Platforms & Fundamental Approaches for Plasmonics, Nanophotonics & Metasurfaces," #15

2023 MRS Fall Meeting, Boston, MA; Organizers: Y. J. Lu, H. Lee, **V. Babicheva**, B. Vest
Symposium EL08 "Plasmonics, Nanophotonics and Metasurfaces – From Design to Applications," #14

2023 MRS Spring Meeting, San Francisco, CA; Organizers: S. Neretina, **V. Babicheva**, A. Dutt, C. Ricci
Symposium EL05 "Molecular and Colloidal Plasmonics – From Synthesis to Applications," #13

2022 MRS Fall Meeting, Boston, MA; Organizers: **V. Babicheva** (***Lead***), G. Tagliabue, C. W. Qiu, A. Ambrosio; Symposium EQ02 "Emerging Materials – Light-Based Quasiparticles, Mie-Tronics & Metasurfaces," #12

2022 MRS Spring Meeting, Honolulu, HI; Organizers: H. Lee, A. Kuznetsov, **V. Babicheva**, J. Rho
Symposium EQ10 "Advances in Metasurfaces, Metamaterials and Plasmonics – Materials Design, Manufacturing, Applications and Industrial Aspects," #11

2021 MRS Fall Meeting, Boston, MA; Organizers: Y. J. Lu, H. Lee, **V. Babicheva**, G. Tagliabue
Symposium EQ05 "Plasmonics, Nanophotonics and Metaphotonics – Design, Materials and Applications," #10

2021 MRS Spring Meeting, Online; Organizers: S. Neretina, **V. Babicheva**, Y. K. Mishra, C. Xue
Symposium EL06 "Molecular and Colloidal Plasmonics – Synthesis and Applications," #9

2020 MRS Fall Meeting, Online; Organizers: A. Davoyan, **V. Babicheva**, H. Altug, P. Hon
Symposium NM01 "Nanophotonics – Emerging Hybrid Platforms, Materials, and Functions," #8

2020 MRS Spring Meeting, Canceled; Organizers: S. Neretina, **V. Babicheva**, H. Lee, C. Ricci; Symposium EL03 "Novel Approaches – Material Platforms for Enhanced Light-Matter Interaction, Plasmonics, & Metasurfaces,"#7

Before Joining UNM

2019 MRS Spring Meeting, Phoenix, AZ; Organizers: **V. Babicheva** (***Lead***), M. Leite, P.J. Schuck, K.-P. Chen
Symposium EP12 "Emerging Materials for Plasmonics, Metamaterials, and Metasurfaces," #6

2018 MRS Fall Meeting, Boston, MA; Organizers: J. Munday, A. Alu, **V. Babicheva**, K.-P. Chen
Symposium EP04 "Novel Photonic and Plasmonic Materials Enabling New Functionalities," #5

2018 MRS Spring Meeting, Phoenix, AZ; Organizers: **V. Babicheva** (***Lead***), A. Boltasseva, I. Staude, J. Caldwell
Symposium NM09 "Novel Approaches and Material Platforms for Plasmonics and Metamaterials," #4

2017 MRS Fall Meeting, Boston, MA; Organizers: S. Law, **V. Babicheva**, S. Boriskina, F. Neubrech
Symposium EM3 "Novel Materials and Architectures for Plasmonics: From the Ultraviolet to the Terahertz," #3

2017 MRS Spring Meeting, Phoenix, AZ; Organizers: **V. Babicheva** (***Lead***), A. Boltasseva, P. Ginzburg, H. Giessen; Sympos. ED10 "Materials for Plasmonics and Metamaterials: Novel Approaches & Practical Applications," #2

2015 MRS Fall Meeting, Boston, MA; Organizers: V. Sorger, **V. Babicheva**, S. Fathpour, J. Hu
Symposium GG "Emerging Materials and Platforms for Optoelectronics," #1

Program Committee Member and Organizer

- Optica Advanced Photonics Congress – Nonlinear Photonics Conference
  Nonlinear Nanophotonics, Metamaterials, 2D Materials, and Plasmonics
  2024 ***Subcommittee Chair***
  2022 Subcommittee member
- Program subcommittee member on CLEO (Conference on Lasers and Electro-Optics)
  2025, 2024, 2023 Subcommittee FS6: Plasmonics and Nano-Optics
  Before Joining UNM: 2018, 2017 Subcommittee FS3: Metamaterials and Complex Media
- 2023 Program committee member on ICOPS (IEEE International Conference on Plasma Science), Santa Fe
- 2023 Co-organizer of Mathematical Theory and Applications of Multiple Wave Scattering of Isaac Newton Institute for Mathematical Sciences (United Kingdom), MWSW01 Canonical Scattering Problems
- 2025, 2023, 2021 Program committee member on EQEC (European Quantum Electronics Conference)
  EJ Subcommittee: Theoretical and Computational Photonics and Optical Computing
- 2020 Program committee member on CLEO Pacific Rim (Conference on Lasers and Electro-Optics)
  Symposium S2: Frontiers of Theoretical Optics and Photonics
- ***Before Joining UNM***: 2016 Poster Session at the Scientific Computing Day at Georgia State University

Panels

- 2023 Impact: Redefining Electrical and Computer Engineering Faculty (iREDEFINE), NSF-sponsored workshop, part of the Electrical and Computer Engineering Department Heads Association (ECEDHA) Annual Conference & ECExpo, Albuquerque, NM

Before Joining UNM

- 2019 Annual Student Showcase organized by the Graduate & Professional Student Council of the University of Arizona, Tucson, AZ
- 2018 Graduate College, University of Arizona, "Seven Keys to Finding and Obtaining the Right Postdoc," Tucson, AZ
- 2018 Graduate College Seminar Series, University of Arizona, “Reducing Time to Doctoral Degree," Tucson, AZ
- 2018 Launching Your Career Symposium, University of Arizona, "Supporting women in STEM across all career stages," Tucson, AZ
- 2016 STEM Conference at Georgia State University, "Career path, the challenges that have been faced on the way, and related success stories," Atlanta, GA

Non-UNM Ph.D. Committees

Timo Stolt, Tampere University, Finland, Pre-Examiner of Doctoral Dissertations, 2024

Aoxue Han, University of Arizona, AZ, Ph.D. Defense Committee Member, 2023