Dr. Eugeniy E. Mikhailov

Department of Physics
College of William & Mary
P.O. Box 8795
Williamsburg, VA 23187-8795

Work Phone: 757-221-3571 (office)
Work Phone: 757-251-5467 (lab)
Fax: 757-221-3540
Email: eemikh@wm.edu

Education

Ph.D. in Physics (specialities in Atomic physics and Quantum optics), 1998–2003
Dissertation: Nonlinear properties of dense coherent media
Physics Department, Texas A&M University

Diploma in Physics (speciality in Quantum electronics), 1992–1998
Moscow State Engineering Physics Institute

Employment History

Professor of Physics, *2024–Present*
Department of Physics, College of William & Mary

Associate Professor, *2018–2024*
Department of Physics, College of William & Mary

Assistant Professor, *2013–2018*
Department of Physics, College of William & Mary

Research Assistant Professor, *2010–2013*
Department of Physics, College of William & Mary

Visiting Assistant Professor, *2006–2010*
Department of Physics, College of William & Mary

Postdoctoral Associate, *2003–2006*
Kavli Institute for Astrophysics and Space Research / LIGO Laboratory, Massachusetts Institute of Technology

Teaching/Research assistant, *1998–2003*
Physics Department, Texas A&M University

Research assistant, *1997–1998*
Frequency Standard Laboratory, Lebedev Physics Institute, Moscow, Russia

Awards

- **William Small Award for Faculty Excellence**, 2017
- **Named recipient of the Special Breakthrough Prize in Fundamental Physics**, 2016

Publications

1. *In preparation:* Robert Behary, Kevin Su, Nicolas DeStefano, Mykhailo Vorobiov, Todd Averet, Alexandre Camsonne, Shukui Zhang, Charlie Fancher, Neel Malvania, Eugeniy E. Mikhailov, Seth Aubin, Irina Novikova, "Electron beam characterization via fluorescence imaging of Rydberg states in atomic vapor", arXiv:2504.21144, (2025).
2. Kevin Su, Robert Behary, Seth Aubin, Eugeniy E. Mikhailov, Irina Novikova, "Two-photon Rydberg EIT resonances in non-collinear beam configurations", *JOSA B, Issue 4*, **42**, 757-762, (2025).
3. *In preparation:* Noah Schlossberger, Tate McDonald, Kevin Su, Rajavardhan Talashila, Robert Behary, Charles L. Patrick, Daniel Hammerland, Eugeniy E. Mikhailov, Seth Aubin, Irina Novikova, Christopher L. Holloway, Nikunjkumar Prajapati, "Two-dimensional imaging of electromagnetic fields via light sheet fluorescence imaging with Rydberg atoms", arXiv:2412.12568, (2024).
4. Nicolas DeStefano, Saeed Pegahan, Aneesh Ramaswamy, Seth Aubin, Todd Averet, Alexandre Camsonne, Svetlana Malinovskaya, Eugeniy E. Mikhailov, Gunn Park, Shukui Zhang, Irina Novikova, "Electron beam characterization via quantum coherent optical magnetometry", *Applied Physics Letter, Issue 26*, **125**, 264001, (2024).
5. Mario Gonzalez Maldonado, Owen Rollins, Alex Toyryla, James A. McKelvy, Andrey Matsko, Isaac Fan, Yang Li, Ying-Ju Wang, John Kitching, Irina Novikova, Eugeniy E. Mikhailov, "Sensitivity of a vector atomic magnetometer based on electromagnetically induced transparency", *Optics Express*, **32**, 25062-25073, (2024).
6. Rob Behary, Alex Gill, Aaron Buikema, Eugeniy E. Mikhailov, Irina Novikova, "Rydberg Raman-Ramsey resonances in atomic vapor", *Phys. Rev. A*, **109**, 053706, (2024).
7. James McKelvy, Mario Gonzalez, Irina Novikova, Eugeniy E. Mikhailov, Andrey Matsko, "Technical limits of sensitivity for EIT magnetometry", *Applied Optics, Issue 24*, **62**, 6518-6527, (2023).

8. James McKelvy, Irina Novikova, Eugeniy E. Mikhailov, Mario Gonzalez, Isaac Fan, Yang Li, Ying-Ju Wang, John Kitching, Andrey Matsko, "Application of Kernel Principal Component Analysis for Optical Vector Atomic Magnetometry", *Machine Learning: Science and Technology*, ad0fa4, (2023).
9. Charris Gabaldon, Pratik J. Barge, Savannah L. Cuozzo, Irina Novikova, Hwang Lee, Lior Cohen, Eugeniy E. Mikhailov, "Quantum fluctuations spatial mode profiler", *AVS Quantum Science*, **5**, 025005, (2023).
10. Savannah L. Cuozzo, Charris Gabaldon, Pratik J. Barge, Ziqi Niu, Hwang Lee, Lior Cohen, Irina Novikova, Eugeniy E. Mikhailov, "Wave-Front Reconstruction via Single-Pixel Homodyne Imaging", *Optics Express, Issue 21*, **30**, 37938--37945, (2022).
11. Pratik J. Barge, Ziqi Niu, Savannah L. Cuozzo, Eugeniy E. Mikhailov, Irina Novikova, Hwang Lee, Lior Cohen, "Weak Thermal State Quadrature-Noise Shadow Imaging", *Optics Express, Issue 16*, **30**, 29401--29408, (2022).
12. David D. Smith, Hongrok Chang, Eugeniy E. Mikhailov, Selim M. Shahriar, "Beyond the Petermann limit: can exceptional points increase sensor precision?", *Phys. Rev. A*, **106**, 013520, (2022).
13. Savannah L. Cuozzo, Pratik J. Barge, Nikunjkumar Prajapati, Narayan Bhusal, Hwang Lee, Lior Cohen, Irina Novikova, Eugeniy E. Mikhailov, "Low-Light Shadow Imaging Using Quadrature-Noise Detection with a Camera", *Advanced Quantum Technologies*, 2100147, (2022).
14. Elisha S. Matekole, Savannah L. Cuozzo, Nikunjkumar Prajapati, Narayan Bhusal, Hwang Lee, Irina Novikova, Eugeniy E. Mikhailov, Jonathan P. Dowling, Lior Cohen, "Quantum-Limited Squeezed Light Detection with a Camera", *Phys. Rev. Lett.*, **125**, 113602, (2020).
15. Han Bao, Junlei Duan, Shenchao Jin, Xingda Lu, Pengxiong Li, Weizhi Qu, Mingfeng Wang, Irina Novikova, Eugeniy E. Mikhailov, Kai-Feng Zhao, Klaus Mølmer, Heng Shen, Yanhong Xiao, "Spin squeezing of 10^{11}atoms by prediction and retrodiction measurements", *Nature*, **581**, 159-163, (2020).
16. Jian Sun, Xichang Zhang, Weizhi Qu, Eugeniy E. Mikhailov, Irina Novikova, Heng Shen, Yanhong Xiao, "Spatial Multiplexing of Squeezed Light by Coherence Diffusion", *Phys. Rev. Lett.*, **123**, 203604, (2019).
17. Gaetano Frascella, Eugeniy E. Mikhailov, Naoto Takanashi, Roman V. Zakharov, Olga V. Tikhonova, Maria V. Chekhova, "Wide-field SU(1,1) interferometer", *Optica, Issue 9*, **6**, 1233-1236, (2019).
18. Ravn M. Jenkins, Eugeniy E. Mikhailov, Irina Novikova, "Transit Ramsey EIT resonances in a Rb vacuum cell", *JOSA B, Issue 4*, **36**, 890-895, (2019).
19. Savannah L. Cuozzo, Eugeniy E. Mikhailov, "Dispersion-enhanced tunability of the laser-frequency response to the cavity-length change", *Phys. Rev. A*, **100**, 023846, (2019).
20. LIGO Scientific Collaboration, VIRGO Collaboration, "Search for gravitational waves from Scorpius X-1 in the second Advanced LIGO observing run with an improved hidden Markov model", *Phys. Rev. D*, **100**, 122002, (2019).
21. LIGO Scientific Collaboration, VIRGO Collaboration, "Tests of general relativity with the binary black hole signals from the LIGO-Virgo catalog GWTC-1", *Phys. Rev. D*, **100**, 104036, (2019).
22. LIGO Scientific Collaboration, VIRGO Collaboration, "Directional limits on persistent gravitational waves using data from Advanced LIGO's first two observing runs", *Phys. Rev. D*, **100**, 062001, (2019).
23. LIGO Scientific Collaboration, VIRGO Collaboration, "GWTC-1: A Gravitational-Wave Transient Catalog of Compact Binary Mergers Observed by LIGO and Virgo during the First and Second Observing Runs", *Phys. Rev. X*, **9**, 031040, (2019).
24. LIGO Scientific Collaboration, VIRGO Collaboration, "All-sky search for continuous gravitational waves from isolated neutron stars using Advanced LIGO O2 data", *Phys. Rev. D*, **100**, 024004, (2019).
25. LIGO Scientific Collaboration, VIRGO Collaboration, "Tests of General Relativity with GW170817", *Phys. Rev. Lett.*, **123**, 011102, (2019).
26. LIGO Scientific Collaboration, VIRGO Collaboration, "Narrow-band search for gravitational waves from known pulsars using the second LIGO observing run", *Phys. Rev. D*, **99**, 122002, (2019).
27. LIGO Scientific Collaboration, "Searches for Gravitational Waves from Known Pulsars at Two Harmonics in 2015–2017 LIGO Data", *The Astrophys. J., Number 1*, **879**, 10, (2019).
28. LIGO Scientific Collaboration, "First Measurement of the Hubble Constant from a Dark Standard Siren using the Dark Energy Survey Galaxies and the LIGO/Virgo Binary–Black-hole Merger GW170814", *The Astrophys. J. Lett., Number 1*, **876**, L7, (2019).
29. LIGO Scientific Collaboration, "Search for Gravitational Waves from a Long-lived Remnant of the Binary Neutron Star Merger GW170817", *The Astrophys. J., Number 2*, **875**, 160, (2019).
30. LIGO Scientific Collaboration, "Searches for Continuous Gravitational Waves from 15 Supernova Remnants and Fomalhaut b with Advanced LIGO", *The Astrophys. J., Number 2*, **875**, 122, (2019).
31. LIGO Scientific Collaboration, "Search for Transient Gravitational-wave Signals Associated with Magnetar Bursts during Advanced LIGO's Second Observing Run", *The Astrophys. J., Number 2*, **874**, 163, (2019).
32. LIGO Scientific Collaboration, VIRGO Collaboration, "Search for the isotropic stochastic background using data from Advanced LIGO's second observing run", *Phys. Rev. D*, **100**, 061101(R), (2019).
33. LIGO Scientific Collaboration, VIRGO Collaboration, "Constraining the p-Mode–g-Mode Tidal Instability with GW170817", *Phys. Rev. Lett.*, **122**, 061104, (2019).

34. LIGO Scientific Collaboration, "A Fermi Gamma-Ray Burst Monitor Search for Electromagnetic Signals Coincident with Gravitational-wave Candidates in Advanced LIGO's First Observing Run", *The Astrophys. J., Number 1*, **871**, 90, (2019).
35. LIGO Scientific Collaboration, VIRGO Collaboration, ANTARES Collaboration, IceCube Collaboration, "Search for Multimessenger Sources of Gravitational Waves and High-energy Neutrinos with Advanced LIGO during Its First Observing Run, ANTARES, and IceCube", *The Astrophys. J., Number 2*, **870**, 134, (2019).
36. LIGO Scientific Collaboration, VIRGO Collaboration, "Binary Black Hole Population Properties Inferred from the First and Second Observing Runs of Advanced LIGO and Advanced Virgo", *The Astrophys. J. Lett., Number 2*, **882**, L24, (2019).
37. LIGO Scientific Collaboration, VIRGO Collaboration, "Properties of the Binary Neutron Star Merger GW170817", *Phys. Rev. X*, **9**, 011001, (2019).
38. R. Nicholas Lanning, Zhihao Xiao, Mi Zhang, Irina Novikova, Eugeniy E. Mikhailov, Jonathan P. Dowling, "Quantized nonlinear Gaussian-beam dynamics: Tailoring multimode squeezed-light generation", *Phys. Rev. A*, **98**, 043824, (2018).
39. Eugeniy E. Mikhailov, "Programming with matlab for scientists: A Beginner's Introduction", CRC Press, Taylor & Francis, (2018).
40. Melissa A. Guidry, Elena Kuchina, Irina Novikova, Eugeniy E. Mikhailov, "Characterization of frequency stability in electromagnetically induced transparency-based atomic clocks using a differential detection scheme", *JOSA B, Issue 10*, **34**, 2244-2249, (2017).
41. Zhihao Xiao, R. Nicholas Lanning, Mi Zhang, Irina Novikova, Eugeniy E. Mikhailov, Jonathan P. Dowling, "Why a hole is like a beam splitter: A general diffraction theory for multimode quantum states of light", *Phys. Rev. A*, **96**, 023829, (2017).
42. R. Nicholas Lanning, Zhihao Xiao, Mi Zhang, Irina Novikova, Eugeniy E. Mikhailov, Jonathan P. Dowling, "Gaussian-beam-propagation theory for nonlinear optics involving an analytical treatment of orbital-angular-momentum transfer", *Physical Review A*, **96**, 013830, (2017).
43. Mi Zhang, Melissa A. Guidry, R. Nicholas Lanning, Zhihao Xiao, Jonathan P. Dowling, Irina Novikova, Eugeniy E. Mikhailov, "Multipass configuration for improved squeezed vacuum generation in hot Rb vapor", *Physical Review A*, **96**, 013835, (2017).
44. Demetrious T. Kutzke, Owen Wolfe, Simon M. Rochester, Dmitry Budker, Irina Novikova, Eugeniy E. Mikhailov, "Tailorable dispersion in a four-wave mixing laser", *Optics Letters, Issue 14*, **42**, 2846, (2017).
45. ANTARES Collaboration, IceCube Collaboration, LIGO Scientific Collaboration, VIRGO Collaboration, "Search for high-energy neutrinos from gravitational wave event GW151226 and candidate LVT151012 with ANTARES and IceCube", *Phys. Rev. Lett.*, **96**, 022005, (2017).
46. LIGO Scientific Collaboration, "GW170104: Observation of a 50-Solar-Mass Binary Black Hole Coalescence at Redshift 0.2", *Phys. Rev. Lett.*, **118**, 221101, (2017).
47. LIGO Scientific Collaboration, Virgo Collaboration, "First search for gravitational waves from known pulsars with Advanced LIGO", *The Astrophysical Journal*, **839**, IOP Publishing, 12, (2017).
48. LIGO Scientific Collaboration, Virgo Collaboration, "Directional limits on persistent gravitational waves from Advanced LIGO's first observing run", *Physical review letters*, **118**, American Physical Society, 121102, (2017).
49. LIGO Scientific Collaboration, Virgo Collaboration, "Upper limits on the stochastic gravitational-wave background from Advanced LIGO's first observing run", *Physical review letters*, **118**, American Physical Society, 121101, (2017).
50. LIGO Scientific Collaboration, "Calibration of the Advanced LIGO detectors for the discovery of the binary black-hole merger GW150914", *Physical Review D*, **95**, American Physical Society, 062003, (2017).
51. LIGO Scientific Collaboration, Virgo Collaboration, "All-sky search for short gravitational-wave bursts in the first Advanced LIGO run", *Physical Review D*, **95**, American Physical Society, 042003, (2017).
52. LIGO Scientific Collaboration, Virgo Collaboration, "Search for gravitational waves from Scorpius X-1 in the first Advanced LIGO observing run with a hidden Markov model", *Physical Review D*, **95**, American Physical Society, 122003, (2017).
53. LIGO Scientific Collaboration, Virgo Collaboration, "Search for intermediate mass black hole binaries in the first observing run of Advanced LIGO", *Physical Review D*, **96**, American Physical Society, 022001, (2017).
54. LIGO Scientific Collaboration, Virgo Collaboration, "All-sky search for periodic gravitational waves in the O1 LIGO data", *Physical Review D*, **96**, American Physical Society, 062002, (2017).
55. LIGO Scientific Collaboration, Virgo Collaboration, "First low-frequency Einstein@Home all-sky search for continuous gravitational waves in Advanced LIGO data", *Physical Review D*, **96**, American Physical Society, 122004, (2017).
56. LIGO Scientific Collaboration, Virgo Collaboration, "First narrow-band search for continuous gravitational waves from known pulsars in advanced detector data", *Physical Review D*, **96**, American Physical Society, 122006, (2017).
57. LIGO Scientific Collaboration, Virgo Collaboration, "GW170814: A Three-Detector Observation of Gravitational Waves from a Binary Black Hole Coalescence", *Physical Review Letters*, **119**, American Physical Society, 141101, (2017).
58. LIGO Scientific Collaboration, Virgo Collaboration, "GW170817: Observation of Gravitational Waves from a Binary Neutron Star Inspiral", *Physical Review Letters*, **119**, American Physical Society, 161101, (2017).
59. LIGO Scientific Collaboration, Virgo Collaboration, The 1M2H Collaboration, The Dark Energy Camera GW-EM Collaboration and the DES Collaboration, The DLT40 Collaboration, The Las Cumbres Observatory Collaboration, The

VINROUGE Collaboration , The MASTER Collaboration, "A gravitational-wave standard siren measurement of the Hubble constant", *Nature*, **551**, 85-88, (2017).
60. LIGO Scientific Collaboration, Virgo Collaboration, "Search for continuous gravitational waves from neutron stars in globular cluster NGC 6544", *Physical Review D*, **95**, American Physical Society, 082005, (2017).
61. LIGO Scientific Collaboration, Virgo Collaboration, "Effects of waveform model systematics on the interpretation of GW150914", *Classical and Quantum Gravity*, **34**, 104002, (2017).
62. LIGO Scientific Collaboration, "Exploring the Sensitivity of Next Generation Gravitational Wave Detectors", *Classical and Quantum Gravity*, **34**, 044001, (2017).
63. LIGO Scientific Collaboration, Virgo Collaboration, "Search for Gravitational Waves Associated with Gamma-Ray Bursts during the First Advanced LIGO Observing Run and Implications for the Origin of GRB 150906B", *The Astrophysical Journal*, **841**, IOP Publishing, (2017).
64. LIGO Scientific Collaboration, Virgo Collaboration, "Upper Limits on Gravitational Waves from Scorpius X-1 from a Model-based Cross-correlation Search in Advanced LIGO Data", *The Astrophysical Journal*, **847**, IOP Publishing, (2017).
65. LIGO Scientific Collaboration, Virgo Collaboration, "Gravitational Waves and Gamma-Rays from a Binary Neutron Star Merger: GW170817 and GRB 170817A", *The Astrophysical Journal Letters*, **848**, IOP Publishing, L13, (2017).
66. LIGO Scientific Collaboration, Virgo Collaboration, "Multi-messenger Observations of a Binary Neutron Star Merger", *The Astrophysical Journal Letters*, **848**, IOP Publishing, L12, (2017).
67. LIGO Scientific Collaboration, Virgo Collaboration, "Estimating the Contribution of Dynamical Ejecta in the Kilonova Associated with GW170817", *The Astrophysical Journal Letters*, **850**, IOP Publishing, L39, (2017).
68. LIGO Scientific Collaboration, Virgo Collaboration, "On the Progenitor of Binary Neutron Star Merger GW170817", *The Astrophysical Journal Letters*, **850**, IOP Publishing, L40, (2017).
69. LIGO Scientific Collaboration, Virgo Collaboration, "Search for High-energy Neutrinos from Binary Neutron Star Merger GW170817 with ANTARES, IceCube, and the Pierre Auger Observatory", *The Astrophysical Journal Letters*, **850**, IOP Publishing, L35, (2017).
70. LIGO Scientific Collaboration, Virgo Collaboration, "Search for Post-merger Gravitational Waves from the Remnant of the Binary Neutron Star Merger GW170817", *The Astrophysical Journal Letters*, **851**, IOP Publishing, L16, (2017).
71. Antares Collaboration, IceCube Collaboration, LIGO Scientific Collaboration, Virgo Collaboration, "High-energy neutrino follow-up search of gravitational wave event GW150914 with ANTARES and IceCube", *Physical Review D*, **93**, APS, 122010, (2016).
72. LIGO Scientific Collaboration, Virgo Collaboration, "Directly comparing GW150914 with numerical solutions of Einstein's equations for binary black hole coalescence", *Physical Review D*, **94**, American Physical Society, 064035, (2016).
73. LIGO Scientific Collaboration, Virgo Collaboration, "The rate of binary black hole mergers inferred from Advanced LIGO observations surrounding GW150914", *The Astrophysical Journal Letters*, **833**, IOP Publishing, L1, (2016).
74. LIGO Scientific Collaboration, Virgo Collaboration, "Supplement: The Rate of Binary Black Hole Mergers Inferred from Advanced LIGO Observations Surrounding GW150914", *The Astrophysical Journal Supplement Series*, **227**, IOP Publishing, 14, (2016).
75. LIGO Scientific Collaboration, Virgo Collaboration, "Properties of the binary black hole merger GW150914", *Physical Review Letters*, **116**, American Physical Society, 241102, (2016).
76. LIGO Scientific Collaboration, Virgo Collaboration, "Improved analysis of GW150914 using a fully spin-precessing waveform model", *Physical Review X*, **6**, American Physical Society, 041014, (2016).
77. LIGO Scientific Collaboration, Virgo Collaboration, "First targeted search for gravitational-wave bursts from core-collapse supernovae in data of first-generation laser interferometer detectors", *Physical Review D*, **94**, American Physical Society, 102001, (2016).
78. LIGO Scientific Collaboration, Virgo Collaboration, "Search for transient gravitational waves in coincidence with short-duration radio transients during 2007--2013", *Physical Review D*, **93**, American Physical Society, 122008, (2016).
79. LIGO Scientific Collaboration, Virgo Collaboration, "Comprehensive all-sky search for periodic gravitational waves in the sixth science run LIGO data", *Physical Review D*, **94**, American Physical Society, 042002, (2016).
80. LIGO Scientific Collaboration, Virgo Collaboration, "Upper limits on the rates of binary neutron star and neutron star--black hole mergers from advanced LIGO's first observing run", *The Astrophysical Journal Letters*, **832**, IOP Publishing, L21, (2016).
81. LIGO Scientific Collaboration, Virgo Collaboration, "Results of the deepest all-sky survey for continuous gravitational waves on LIGO S6 data running on the Einstein@Home volunteer distributed computing project", *Physical Review D*, **94**, American Physical Society, 102002, (2016).
82. LIGO Scientific Collaboration, Virgo Collaboration, "The basic physics of the binary black hole merger GW150914", *Annalen der Physik*, **529**, 1600209, (2016).
83. LIGO Scientific Collaboration, Virgo Collaboration, "Binary black hole mergers in the first Advanced LIGO observing run", *Physical Review X*, **6**, American Physical Society, 041015, (2016).
84. LIGO Scientific Collaboration, "Localization and broadband follow-up of the gravitational-wave transient GW150914", *The Astrophysical journal letters*, **826**, IOP Publishing, L13, (2016).

85. LIGO Scientific Collaboration, "Supplement: Localization and broadband follow-up of the gravitational-wave transient GW150914", *Astrophysical Journal Supplement*, **225**, University of Chicago Press, 1--15, (2016).
86. LIGO Scientific Collaboration, Virgo Collaboration, "Characterization of transient noise in Advanced LIGO relevant to gravitational wave signal GW150914", *Classical and Quantum Gravity*, **33**, IOP Publishing, 134001, (2016).
87. LIGO Scientific Collaboration, Virgo Collaboration, "Search of the Orion spur for continuous gravitational waves using a loosely coherent algorithm on data from LIGO interferometers", *Physical Review D*, **93**, American Physical Society, 042006, (2016).
88. LIGO Scientific Collaboration, Virgo Collaboration, "First low frequency all-sky search for continuous gravitational wave signals", *Physical Review D*, **93**, American Physical Society, 042007, (2016).
89. LIGO Scientific Collaboration, Virgo Collaboration, "Observing gravitational-wave transient GW150914 with minimal assumptions", *Physical Review D*, **93**, American Physical Society, 122004, (2016).
90. LIGO Scientific Collaboration, Virgo Collaboration, "Tests of general relativity with GW150914", *Physical review letters*, **116**, American Physical Society, 221101, (2016).
91. LIGO Scientific Collaboration, Virgo Collaboration, "GW150914: Implications for the Stochastic Gravitational-Wave Background from Binary Black Holes", *Physical review letters*, **116**, American Physical Society, 131102, (2016).
92. LIGO Scientific Collaboration, Virgo Collaboration, "GW150914: The Advanced LIGO detectors in the era of first discoveries", *Physical review letters*, **116**, American Physical Society, 131103, (2016).
93. LIGO Scientific Collaboration, "Prospects for observing and localizing gravitational-wave transients with Advanced LIGO and Advanced Virgo", *Living Reviews in Relativity*, **19**, Springer International Publishing, 1, (2016).
94. LIGO Scientific Collaboration, Virgo Collaboration, "All-sky search for long-duration gravitational wave transients with initial LIGO", *Physical Review D*, **93**, American Physical Society, 042005, (2016).
95. LIGO Scientific Collaboration, "Astrophysical implications of the binary black hole merger GW150914", *The Astrophysical Journal Letters*, **818**, IOP Publishing, L22, (2016).
96. LIGO Scientific Collaboration, "GW151226: Observation of Gravitational Waves from a 22-Solar-Mass Binary Black Hole Coalescence", *Phys. Rev. Lett.*, **116**, 241103, (2016).
97. LIGO Scientific Collaboration, "Observation of Gravitational Waves from a Binary Black Hole Merger", *Phys. Rev. Lett.*, **116**, 061102, (2016).
98. Elena Kuchina, Eugeniy E. Mikhailov, Irina Novikova, "Effect of atomic diffusion on the Raman-Ramsey coherent population trapping resonances", *JOSA B, Issue 4*, **33**, 610-614, (2016).
99. Mi Zhang, R. Nicholas Lanning, Zhihao Xiao, Jonathan P. Dowling, Irina Novikova, Eugeniy E. Mikhailov, "Spatial multimode structure of atom-generated squeezed light", *Phys. Rev. A*, **93**, 013853, (2016).
100. Alexander M. Akulshin, Irina Novikova, Eugeniy E. Mikhailov, Sergey A. Suslov, Russell J. McLean, "Arithmetic with optical topological charges in stepwise-excited Rb vapor", *Optics Letters, Issue 6*, **41**, 1146, (2016).
101. LIGO Scientific Collaboration, Virgo Collaboration, "GW150914: First results from the search for binary black hole coalescence with Advanced LIGO", *Phys. Rev. D*, **93**, 122003, (2016).
102. Irina Novikova, Eugeniy E. Mikhailov, Yanhong Xiao, "Excess optical quantum noise in atomic sensors", *Phys. Rev. A*, **91**, 051804(R), (2015).
103. Alexander M. Akulshin, Russell J. McLean, Eugeniy E. Mikhailov, Irina Novikova, "Distinguishing nonlinear processes in atomic media via orbital angular momentum transfer", *Optics Letters, Issue 6*, **40**, 1109, (2015).
104. LIGO Scientific Collaboration, "Searches for Continuous Gravitational Waves from Nine Young Supernova Remnants", *The Astrophysical Journal, Issue 1*, **813**, 39, (2015).
105. LIGO Scientific Collaboration, "Advanced LIGO", *Classical and Quantum Gravity Volume, Issue 11*, **32**, 074001, (2015).
106. LIGO Scientific Collaboration, Virgo Collaboration, "Directed search for gravitational waves from Scorpius X-1 with initial LIGO data", *Phys. Rev. D*, **91**, 062008, (2015).
107. LIGO Scientific Collaboration, "Narrow-band search of continuous gravitational-wave signals from Crab and Vela pulsars in Virgo VSR4 data", *Phys. Rev. D*, **91**, 022004, (2015).
108. LIGO Scientific Collaboration, "Characterization of the LIGO detectors during their sixth science run", *Classical and Quantum Gravity Volume, Issue 11*, **32**, 115012, (2015).
109. LIGO Scientific Collaboration, "Searching for stochastic gravitational waves using data from the two colocated LIGO Hanford detectors", *Phys. Rev. D*, **91**, 022003, (2015).
110. LIGO Scientific Collaboration, "Multimessenger search for sources of gravitational waves and high-energy neutrinos: Initial results for LIGO-Virgo and IceCube", *Phys. Rev. D*, **90**, 102002, (2014).
111. LIGO Scientific Collaboration, "Improved Upper Limits on the Stochastic Gravitational-Wave Background from 2009–2010 LIGO and Virgo Data", *Phys. Rev. Lett.*, **113**, 231101, (2014).
112. LIGO Scientific Collaboration, "First all-sky search for continuous gravitational waves from unknown sources in binary systems", *Phys. Rev. D*, **90**, 062010, (2014).
113. LIGO Scientific Collaboration, "Methods and results of a search for gravitational waves associated with gamma-ray bursts using the GEO 600, LIGO, and Virgo detectors", *Phys. Rev. D*, **89**, 122004, (2014).
114. LIGO Scientific Collaboration, "Search for gravitational radiation from intermediate mass black hole binaries in data from the second LIGO-Virgo joint science run", *Phys. Rev. D*, **89**, 122003, (2014).

115. LIGO Scientific Collaboration, "Search for Gravitational Waves Associated with γ-ray Bursts Detected by the Interplanetary Network", *Phys. Rev. Lett.*, **113**, 011102, (2014).
116. LIGO Scientific Collaboration, "Search for gravitational wave ringdowns from perturbed intermediate mass black holes in LIGO-Virgo data from 2005–2010", *Phys. Rev. D*, **89**, 102006, (2014).
117. LIGO Scientific Collaboration, LIGO Scientific Collaboration, "Implementation of an F-statistic all-sky search for continuous gravitational waves in Virgo VSR1 data", *Classical and Quantum Gravity Volume, Issue 16*, **31**, 165014, (2014).
118. LIGO Scientific Collaboration, Virgo Collaboration, NINJA-2 Collaboration, "The NINJA-2 project: Detecting and characterizing gravitational waveforms modelled using numerical binary black hole simulations", *Classical and Quantum Gravity Volume, Issue 11*, **11**, 115004, (2014).
119. LIGO Scientific Collaboration, "Application of a Hough search for continuous gravitational waves on data from the fifth LIGO science run", *Classical and Quantum Gravity Volume, Issue 8*, **31**, 085014, (2014).
120. LIGO Scientific Collaboration, "Gravitational waves from known pulsars: results from the initial detector era", *The Astrophysical Journal, Issue 2*, **785**, 119, (2014).
121. LIGO Scientific Collaboration, "Constraints on cosmic strings from the LIGO-Virgo gravitational-wave detectors", *Phys. Rev. Lett.*, **112**, 131101, (2014).
122. LIGO Scientific Collaboration, "First searches for optical counterparts to gravitational-wave candidate events", *The Astrophysical Journal Supplement Series, Issue 1*, **211**, 7, (2014).
123. Eugeniy E. Mikhailov, Jesse Evans, Dmitry Budker, Simon M. Rochester, Irina Novikova, "Four-wave mixing in a ring cavity", *Optical Engineering, Issue 10*, **53**, 102709, (2014).
124. Gleb Romanov, Travis Horrom, Irina Novikova, Eugeniy E. Mikhailov, "Propagation of a squeezed optical field in a medium with superluminal group velocity", *Optics Letters, Issue 4*, **39**, 1093-1096, (2014).
125. LIGO Scientific Collaboration, Virgo Collaboration, "Parameter estimation for compact binary coalescence signals with the first generation gravitational-wave detector network", *Phys. Rev. D*, **88**, 062001, (2013).
126. LIGO Scientific Collaboration, "Search for long-lived gravitational-wave transients coincident with long gamma-ray bursts", *Phys. Rev. D*, **88**, 122004, (2013).
127. LIGO Scientific Collaboration, Virgo Collaboration, "Directed search for continuous gravitational waves from the Galactic center", *Phys. Rev. D*, **88**, 102002, (2013).
128. Mi Zhang, Joseph Soultanis, Irina Novikova, Eugeniy E. Mikhailov, "Generating squeezed vacuum field with nonzero orbital angular momentum with atomic ensembles", *Optics Letters, Issue 22*, **38**, 4833-4836, (2013).
129. Nathaniel B. Phillips, Irina Novikova, Eugeniy E. Mikhailov, Dmitry Budker, Simon Rochester, "Controllable steep dispersion with gain in a four-level N-scheme with four-wave mixing", *Journal of Modern Optics, Issues 1*, **60**, 64-72, (2013).
130. Travis Horrom, Gleb Romanov, Irina Novikova, Eugeniy E. Mikhailov, "All-atomic generation and noise-quadrature filtering of squeezed vacuum in hot Rb vapor", *Journal of Modern Optics, Issues 1*, **60**, 43-49, (2013).
131. Travis Horrom, Robinjeet Singh, Jonathan P. Dowling, Eugeniy E. Mikhailov, "Quantum-enhanced magnetometer with low-frequency squeezing", *Physical Review A*, **86**, 023803, (2012).
132. Travis Horrom, Irina Novikova, Eugeniy E. Mikhailov, "All-atomic source of squeezed vacuum with full pulse-shape control", *Journal of Physics B: Atomic, Molecular and Optical Physics, Issue 12*, **45**, 124015, (2012).
133. Eugeniy E. Mikhailov, Yuri V. Rostovtsev, George R. Welch, "Classical, Semi-classical and Quantum Noise", **Chapter 11:** "Electromagnetically Induced Transparency with Fields Spectrally Broadened by Phase Noise", Springer (1 edition) , 131-143, (2012).
134. *Non-refereed:* Gleb Romanov, Travis Horrom, Eugeniy E. Mikhailov, Irina Novikova, "Slow and stored light with atom-based squeezed light", *Proceedings SPIE*, **8273**, 827307, (2012).
135. Travis Horrom, Arturo Lezama, Salim Balik, Mark Havey, Eugeniy E. Mikhailov, "Quadrature noise in light propagating through a cold ^{87}Rb atomic gas", *Journal of Modern Optics, Issues 21*, **58**, 1936-1941, (2011).
136. Travis Horrom, Salim Balik, Arturo Lezama, Mark Havey, Eugeniy E. Mikhailov, "Polarization self-rotation in ultracold atomic ^{87}Rb", *Physical Review A*, **83**, 053850, (2011).
137. Kevin Cox, Valery I. Yudin, Alexey V. Taichenachev, Irina Novikova, Eugeniy E. Mikhailov, "Measurements of vector magnetic field using multiple electromagnetically induced transparency resonances in Rb vapor", *Physical Review A*, **83**, 015801, (2011).
138. Eugeniy E. Mikhailov, Travis Horrom, Nathan Belcher, Irina Novikova, "Performance of a prototype atomic clock based on linlllin coherent population trapping resonances in Rb atomic vapor", *JOSA B, Issue 3*, **27**, 417-422, (2010).
139. Eugeniy E. Mikhailov, Arturo Lezama, Thomas W. Noel, Irina Novikova, "Vacuum squeezing via polarization self-rotation and excess noise in hot Rb vapors", *Journal of Modern Optics, Issues 18&19*, **56**, 1985-1992, (2009).
140. Eugeniy E. Mikhailov, Irina Novikova, M. D. Havey, F. A. Narducci, "Magnetic field imaging with atomic Rb vapor", *Optics Letters, Issue 22*, **34**, 3529-3531, (2009).
141. Nathan Belcher, Eugeniy E. Mikhailov, Irina Novikova, "Atomic clocks and coherent population trapping: Experiments for undergraduate laboratories", *American Journal of Physics, Issue 11*, **77**, 988-998, (2009).

142. Eugeniy E. Mikhailov, Irina Novikova, "Low-frequency vacuum squeezing via polarization self-rotation in Rb vapor", *Optics Letters, Issue 11*, **33**, 1213-1215, (2008).
143. Keisuke Goda, Osamu Miyakawa, Eugeniy E. Mikhailov, Shailendhar Saraf, Rana Adhikari, Kirk McKenzie, Robert Ward, Stephen Vass, Alan Weinstein, Nergis Mavalvala, "A quantum-enhanced prototype gravitational-wave detector", *Nature Physics*, **4**, 472-476, (2008).
144. Keisuke Goda, Eugeniy E. Mikhailov, Osamu Miyakawa, Shailendhar Saraf, Stephen Vass, Alan Weinstein, Nergis Mavalvala, "Generation of a stable low-frequency squeezed vacuum field with periodically poled $KTiOPO_4$ at 1064 nm", *Optics Letters, Issue 2*, **33**, 92-94, (2008).
145. LIGO Scientific Collaboration, "Search for gravitational waves associated with 39 gamma-ray bursts using data from the second, third, and fourth LIGO runs", *Physical Review D*, **77**, 062004, (2008).
146. LIGO Scientific Collaboration, "Search for gravitational waves from binary inspirals in S3 and S4 LIGO data", *Physical Review D*, **77**, 062002, (2008).
147. LIGO Scientific Collaboration, "All-sky search for periodic gravitational waves in LIGO S4 data", *Physical Review D*, **77**, 022001, (2008).
148. AURIGA Collaboration, LIGO Scientific Collaboration, "A joint search for gravitational wave bursts with AURIGA and LIGO", *Classical and Quantum Gravity*, **25**, 095004, (2008).
149. Kentaro Somiya, Yanbei Chen, Keisuke Goda, Eugeniy E. Mikhailov, "Utility investigation of artificial time delay in displacement-noise-free interferometers", *Physical Review D*, **76**, e022002, (2007).
150. Kentaro Somiya, Keisuke Goda, Yanbei Chen, Eugeniy E. Mikhailov, "Isolation of gravitational waves from displacement noise and utility of a time-delay device", *Journal of Physics: Conference Series*, **66**, 012053, (2007).
151. LIGO Scientific Collaboration, "Upper limit map of a background of gravitational waves", *Physical Review D*, **76**, 082003, (2007).
152. LIGO Scientific Collaboration, "Searches for periodic gravitational waves from unknown isolated sources and Scorpius X-1: Results from the second LIGO science run", *Physical Review D*, **76**, 082001, (2007).
153. LIGO Scientific Collaboration, "Search for gravitational wave radiation associated with the pulsating tail of the SGR 1806-20 hyperflare of 27 December 2004 using LIGO", *Physical Review D*, **76**, 062003, (2007).
154. LIGO Scientific Collaboration, "Upper limits on gravitational wave emission from 78 radio pulsars", *Physical Review D*, **76**, 042001, (2007).
155. LIGO Scientific Collaboration, ALLEGRO Collaboration, "First cross-correlation analysis of interferometric and resonant-bar gravitational-wave data for stochastic backgrounds", *Physical Review D*, **76**, 022001, (2007).
156. Yanbei Chen, Archana Pai, Kentaro Somiya, Seiji Kawamura, Shuichi Sato, Keiko Kokeyama, Robert L. Ward, Keisuke Goda, Eugeniy E. Mikhailov, "Interferometers for Displacement-Noise-Free Gravitational-Wave Detection", *Physical Review Lett.*, **97**, 151103, (2006).
157. Eugeniy E. Mikhailov, Keisuke Goda, Nergis Mavalvala, "Noninvasive measurements of cavity parameters by use of squeezed vacuum", *Physical Review A*, **74**, 033817, (2006).
158. Eugeniy E. Mikhailov, V. Sautenkov, Y. Rostovtsev, Aihua Zhang, M. Suhail Zubairy, Marlan O. Scully, G. Welch, "Spectral narrowing via quantum coherence", *Physical Review A*, **74**, 013807, (2006).
159. Eugeniy E. Mikhailov, Keisuke Goda, Thomas Corbitt, Nergis Mavalvala, "Frequency-dependent squeeze-amplitude attenuation and squeeze-angle rotation by electromagnetically induced transparency for gravitational-wave interferometers", *Physical Review A*, **73**, 053810, (2006).
160. LIGO Scientific Collaboration, TAMA Collaboration, "Joint LIGO and TAMA300 search for gravitational waves from inspiralling neutron star binaries", *Physical Review D*, **73**, 102002, (2006).
161. LIGO Scientific Collaboration, "Search for gravitational waves from binary black hole inspirals in LIGO data", *Physical Review D*, **73**, 062001, (2006).
162. LIGO Scientific Collaboration, "Upper Limits on a Stochastic Background of Gravitational Waves", *Phys. Rev. Lett.*, **95**, 221101, (2005).
163. LIGO Scientific Collaboration, TAMA Collaboration, "Upper limits from the LIGO and TAMA detectors on the rate of gravitational-wave bursts", *Physical Review D*, **72**, 122004, (2005).
164. LIGO Scientific Collaboration, "First all-sky upper limits from LIGO on the strength of periodic gravitational waves using the Hough transform", *Physical Review D*, **72**, 102004, (2005).
165. LIGO Scientific Collaboration, "Upper limits on gravitational wave bursts in LIGOs second science run", *Physical Review D*, **72**, 062001, (2005).
166. Kirk McKenzie, Eugeniy E. Mikhailov, Keisuke Goda, Ping Koy Lam, Nicolai Grosse, Malcolm B. Gray, Nergis Mavalvala, David McClelland, "Quantum noise locking", *J. Opt. B: Quantum Semiclass. Opt.*, **7**, S421, (2005).
167. Keisuke Goda, Kirk McKenzie, Eugeniy E. Mikhailov, Ping Koy Lam, David McClelland, Nergis Mavalvala, "Photothermal fluctuations as a fundamental limit to low-frequency squeezing in a degenerate optical parametric oscillator", *Physical Review A*, **72**, 043819, (2005).
168. Eugeniy E. Mikhailov, I. Novikova, Y. Rostovtsev, G. Welch, "Buffer-gas-induced absorption resonances in Rb vapor", *Physical Review A*, **70**, 033806, (2004).

169. Eugeniy E. Mikhailov, V. Sautenkov, I. Novikova, G. Welch, "Large negative and positive delay of optical pulses in coherently prepared dense Rb vapor with buffer gas", *Physical Review A*, **69**, 063808, (2004).
170. Eugeniy E. Mikhailov, V. Sautenkov, Y. Rostovtsev, G. Welch, "Absorption resonance and large negative delay in rubidium vapor with a buffer gas", *JOSA B, Issue 2*, **21**, 425-428, (2004).
171. Eugeniy E. Mikhailov, Y. Rostovtsev, G. Welch, "Group velocity study in hot ^{87}Rb vapour with buffer gas", *Journal of Modern Optics*, **50**, 2645-2654, (2003).
172. Eugeniy E. Mikhailov, Y. Rostovtsev, G. Welch, "Experimental study of Stokes fields linewidth in resonant four-wave mixing in hot Rb vapour", *Journal of Modern Optics*, **49**, 2535-2542, (2002).
173. V. Sautenkov, M. D. Lukin, C. J. Bednar, I. Novikova, Eugeniy E. Mikhailov, M. Fleischhauer, V. L. Velichansky, G. Welch, M. O. Scully, "Enhancement of magneto-optic effects via large atomic coherence in optically dense media", *Physical Review A*, **62**, 023810, (2000).
174. A.V. Milkov, R. Sassen, I. Novikova, Eugeniy E. Mikhailov, "Gas hydrate stability at minimum water depth in the Gulf of Mexico: Significance to geohazard assessment", *Gulf Coast Association of Geological Societies Transactions*, **50**, 217-224, (2000).