List of publications

Patents

1. **Plasmonic metamaterial structure.**

Book contributions

1. **Nonlinear plasmonic metasurfaces.** (Chapter)

2. **Nonlinear nanoplasmonics.** (Chapter)

3. **Hydrodynamic model for nonlinear plasmonics.** (Chapter)

4. **Active plasmonics.** (Chapter)
Journal articles

1. Lasing at the nanoscale: Coherent emission of surface plasmons by an electrically driven nanolaser.

2. Excitation of surface plasmons by inelastic electron tunneling.

3. Optoelectronic synapses based on hot-electron-induced chemical processes.

4. Tunneling-induced broadband and tuneable optical emission from plasmonic nanorod metamaterials.

5. Plasmonic metamaterials for nanochemistry and sensing.

6. Polarization dependence of second harmonic generation from plasmonic nanoprism arrays.

7. Anisotropic plasmonic CuS nanocrystals as a natural electronic material with hyperbolic optical dispersion.

8. Nanocone-based plasmonic metamaterials.


10. Metaparticles: dressing nano-objects with a hyperbolic coating.

11. Optomechanical manipulation with hyperbolic metasurfaces.

12. Imaging electric and magnetic modes and their hybridization in single and dimer AlGaAs nanoantennas.

13. Circular dichroism enhancement in plasmonic nanorod metamaterials.
   A. V. Krasavin, P. Segovia, R. Dubrovka, N. Olivier, G. A. Wurtz, P. Ginzburg, and A. V. Zayats,

15. Evidence of high-order nonlinearities in supercontinuum white-light generation from a gold
    nanofilm.

    G. Marino, P. Segovia, A. V. Krasavin, P. Ginzburg, N. Olivier, G. A. Wurtz, and A. V. Zayats,

17. Free-electron optical nonlinearities in plasmonic nanostructures: A review of the hydrodynamic
    description.

18. Reactive tunnel junctions in electrically driven plasmonic nanorod metamaterials.
    P. Wang, A. V. Krasavin, M. E. Nasir, W. Dickson, and A. V. Zayats, Nature Nanotechnology 13,

19. Spontaneous emission inside a hyperbolic metamaterial waveguide.
    D. J. Roth, A. V. Krasavin, A. Wade, W. Dickson, A. Murphy, S. Kéna-Cohen, R. Pollard, G. A.

20. Spontaneous emission in non-local materials.
    P. Ginzburg, D. Roth, M. E. Nasir, P. Segovia Olvera, A. V. Krasavin, J. Levitt, L. M. Hirvonen, B.
    Wells, K. Suhling, D. Richards, V. Podolskiy, and A. Zayats, Light: Science & Applications 6,
    e16273 (2017).


22. Benchmarking system-level performance of passive and active plasmonic components: integrated
    circuits approach.


    A. V. Krasavin, P. Ginzburg, G. A. Wurtz, and A. V. Zayats, Nature Communications 7, 11497
    (2016).

25. Spectral variation of fluorescence lifetime near single metal nanoparticles.
    J. Li, A. V. Krasavin, L. Webster, P. Segovia, A. V. Zayats, and D. Richards, Scientific Reports, 6,
    21349 (2016).

    P. Segovia, G. Marino, A. V. Krasavin, N. Olivier, G. A. Wurtz, P. A. Belov, P. Ginzburg, and A. V.
    Zayats, Optics Express 23, 30730 (2015).
27. **Purcell effect in hyperbolic metamaterial resonators.**  

28. **Active nanophotonic circuitry based on dielectric-loaded plasmonic waveguides.**  

29. **Non-perturbative hydrodynamic model for multiple harmonics generation in metallic nanostructures.**  

30. **Fluorescence axial nanotomography with plasmonics.**  

31. **Impact of nonradiative line broadening on emission in photonic and plasmonic cavities.**  

32. **Looking into “meta-atoms” of plasmonic nanowire metamaterial.**  

33. **Mechanical, electrostatic and electromagnetic manipulation of micro- and nanoobjects in electron microscopes.**  

34. **Dipolar emission in trench metal-insulator-metal waveguides for short-scale plasmonic communications: numerical optimisation.**  

35. **Auxetic properties of cubic metal single crystals.**  

36. **Self-induced torque in hyperbolic metamaterials.**  

37. **Fabrication and optical properties of large-scale arrays of gold nanocavities based on rod-in-a-tube coaxials.**  

38. **Cascaded second-order surface plasmon solitons due to intrinsic metal nonlinearity.**  

39. **A mechanical model of cell segregation driven by differential adhesion.**  

40. **Photonic signal processing on electronic scales: electro-optical field-effect nanoplasmonic modulator.**  
41. Nonlinearly coupled localized plasmon resonances: Resonant second-harmonic generation.
   P. Ginzburg, A. Krasavin, Y. Sonnefraud, A. Murphy, R. J. Pollard, S. A. Maier, and A. V. Zayats,

42. Surface plasmon polariton amplification upon electrical injection in highly integrated plasmonic circuits.

43. Optically-programmable nonlinear photonic component for dielectric-loaded plasmonic circuitry.

44. Guiding light at the nanoscale: numerical optimization of ultrasubwavelength metallic wire plasmonic waveguides.

45. All-plasmonic modulation via stimulated emission of copropagating surface plasmon polaritons on a substrate with gain.

46. Experimental demonstration of dielectric-loaded plasmonic waveguide disk resonators at telecom wavelengths.

47. Electro-optic switching element for dielectric-loaded surface plasmon polariton waveguides.


49. Silicon-based plasmonic waveguides.

50. Amplified spontaneous emission of surface plasmon polaritons and limitations on the increase of their propagation length.

51. All-optical active components for dielectric-loaded plasmonic waveguides.

52. Wavelength selection by dielectric-loaded plasmonic components.

53. Wavelength-selective directional coupling with dielectric-loaded plasmonic waveguides.
54. Efficient excitation of dielectric-loaded surface plasmon-polariton waveguide modes at telecommunication wavelengths.

55. Bend- and splitting loss of dielectric-loaded surface plasmon-polariton waveguides.

56. Three-dimensional numerical modeling of photonic integration with dielectric-loaded SPP waveguides.

57. Optical modulation of surface plasmon-polariton coupling in a gallium/aluminium composite.

58. Passive photonic elements based on dielectric-loaded surface plasmon polariton waveguides.

59. Gallium/aluminum nanocomposite material for nonlinear optics and nonlinear plasmonics.

60. Generation of travelling surface plasmon waves by free-electron impact.

61. Broken enantiomeric symmetry for electromagnetic waves interacting with planar chiral nanostructures.

62. Extraordinary properties of light transmission through a small chiral hole in a metallic screen.

63. Polarization conversion and “focusing” of light propagating through a small chiral hole in a metallic screen.

64. Active control of surface plasmon-polariton waves.

65. High-contrast modulation of light with light by control of surface plasmon polariton wave coupling.

66. Active plasmonics: Controlling signals in Au/Ga waveguide using nanoscale structural transformations.
67. **Broken time reversal of light interaction with planar chiral nanostructures.**

Other articles

1. **Nonlocal nonlinear plasmonics.**

2. **Nonlinear plasmonics: controlling light with light.**
Conference presentations

1. Highly tunable Aluminium metamaterials for hot carrier generation.

2. Electrically-driven plasmonic nanorod metamaterials.

3. Hot-electron effects in electrically-driven plasmonic nanostructures: Light, sensing and artificial synapses.

4. Electrically driven chemical reactions.

5. Hot-electron effects in electrically-driven plasmonic nanostructures. (Keynote)

6. Plasmonic metamaterials for sensing applications.

7. Optoelectronic memristors based on reactive tunnel junctions.

8. Taming ultrafast nonlinear response of plasmonic nanostructures. (Invited)


10. Hot-electron effects in plasmonic heterostructures. (Invited)

11. Plasmonic metamaterials for high-sensitivity sensing applications. (Invited)

12. Memristive plasmonic tunnel junctions. (Invited)


15. Electro-photo-chemistry in plasmonic tunnel junctions.


17. Scattering of radially polarized light: Generalization of the optical theorem.

18. On the plasmonic metamaterials for photovoltaics by controlling field enhancement.


20. Plasmonic metamaterials.

21. Fabrication, characterization and applications of a gradient refractive index plasmonic metamaterial.

22. Nonlinearities in plasmonic nanostructures: hydrodynamic description. (Invited)

23. Electrically driven plasmonic nanorod metamaterials. (Invited)

24. Nonlinear Kerr-optics with plasmonic nanorod metamaterials. (Invited)

25. Generalization of optical theorem for complex vectorial beams. (Invited)

26. Electrically-driven nanoscale chemistry with plasmonic nanorod metamaterials. (Invited)

27. Electrical generation of hot electrons in plasmonic nanorod metamaterials. (Invited)
28. Waveguided modes, nonlinearity and magnetooptics in self-assembled metamaterials. (Invited)

29. Large area self-assembled split-nanorod metamaterials. (Invited)

30. Engineering optical responses of plasmonic objects with a hyperbolic coating.

31. Chemistry and light with tunnelling electrons. (Invited)

32. Mind the nanoscale gap: tunnel junctions beyond electronic transport. (Invited)

33. Hot electrons in electrically driven plasmonic nanorod metamaterials.

34. Structured hyperbolic metamaterials for control of spontaneous emission.

35. Controlling light at the nanoscale: from metallic nanoparticles to novel artificial materials.

36. Electrically-driven metamaterials. (Invited)

37. Nonlinear components for polarization control. (Invited)

38. Field enhancement in strongly-coupled plasmonic nanocone metamaterials.

39. Macroscale ultrasharp nanocone metamaterials - optical properties and applications. (Invited)

40. Controlling field enhancement with plasmonic nanocone metamaterials.
41. **Accelerating spontaneous emission with metamaterials. (Invited)**

42. **Engineering ultrafast nonlinearities with metamaterials and metasurfaces. (Invited)**

43. **Investigation of cathodoluminiscence emission from Si and Au/Si nanostructures.**

44. **Switchable dielectric trapping of plasmonic and magnetic nanoparticles.**

45. **Nonlocal nonlinear plasmonics in hydrodynamic description.**

46. **Benchmarking active and passive plasmonic components for nanophotonic circuitry.**
   A. V. Krasavin and A. V. Zayats, in The 8th International Conference on Surface Plasmon Photonics, paper P-07-86 (2017).

47. **Electrically-driven plasmonic nanorod metamaterials.**

48. **Nonlinear optics of plasmonic metamaterials. (Invited)**

49. **Engineering optical density of states with nonlocal metamaterials. (Invited)**

50. **Nonlinear plasmonics in nonperturbative hydrodynamic model. (Invited)**

51. **Electrically-driven plasmonic nanorod metamaterials.**

52. **Metallic nanostructures for active control of light. (Invited)**
   A. V. Krasavin and A. V. Zayats, in OSA Subwavelength Photonics Incubator (2016).

53. **Shape matters: tuning plasmonic resonances in single nanoparticles and their arrays.**

54. **Spontaneous emission and non-radiative processes inside a hyperbolic metamaterial. (Invited)**
55. Figures of merit for passive and active plasmonic circuits. (Invited)
A. V. Krasavin and A. V. Zayats, in Progress In Electromagnetics Research Symposium (2016).

56. Second-harmonic generation in hyperbolic plasmonic nanorod metamaterials. (Invited)

57. Nonlocal nonlinear plasmonics. (Invited)

58. Nonlinear optics and optomechanics with plasmonic metamaterials. (Invited)

59. Tuning plasmonic resonances in single nanoparticles and their arrays.

60. Shape matters: tuning plasmonic resonances in single nanoparticles and their arrays.

61. Electrically-driven emission from plasmonic nanorod metamaterials.

62. Frequency tuneable second-harmonic generation in plasmonic nanorod metamaterial slab.

63. Field enhancement in Au nanocone metamaterials.

64. Ultrafast coherent nonlinear response in arrays of multipolar plasmonic resonators.

65. Frequency tuneable second-harmonic generation in plasmonic nanorod metamaterial slab.

66. Electrically driven plasmonic nanorod metamaterials.

67. Plasmonic modulators based on bismuth ferrite for low-loss optical switching.

68. Nonlinearities in hyperbolic plasmonic metamaterials.
69. **Control of ultrafast coherent nonlinear response of plasmonic metasurfaces. (Invited).**

70. **Hydrodynamic model for nonlinear plasmonics: From nonlinear mode coupling to supercontinuum generation. (Invited)**

71. **Ultrafast all-optical switching of surface plasmon polariton modes via Fano resonances.**

72. **Active plasmonic circuitry.**

73. **Second harmonic generation from uniaxial plasmonic metamaterials: From elliptical to hyperbolic dispersion regimes.**

74. **Ultrafast coherent nonlinear response in arrays of multipolar plasmonic resonators.**

75. **Electrolytically pumped coherent surface plasmon polariton source integrated on a chip.**
   D. Fedyanin, A. V. Krasavin, A. Arsenin, and A. Zayats, in *The 7th International Conference on Surface Plasmon Photonics*, paper Mo-01-P-33 (2015).

76. **Hydrodynamic model for nonlinear plasmonics: From harmonic generations to coherent supercontinuum.**

77. **Hybrid plasmonic nanophotonics. (Invited)**

78. **Comparing plasmonic waveguides: a comprehensive figure of merit.**

79. **Modelling coherent nonlinearity in nanostructured plasmonic metamaterials.**

80. **Fluorescence axial nanotomography with plasmonics.**

81. **Electrically driven coherent surface plasmon polariton source at the nanoscale.**
82. **Nonlinear plasmonics in nonperturbative hydrodynamic description.**  

83. **Directional excitation of surface plasmon polaritons by vertical-cavity surface emitting lasers.**  

84. **Second harmonic generation from plasmonic metamaterials in the vicinity of epsilon-near-zero.**  

85. **Experimental demonstration of plasmonic switching via optical cavity resonances.**  

86. **Nonlinear plasmonics for nanoscale light manipulation and imaging.**  

87. **Lossless surface plasmon polariton guiding in electrically driven nanowaveguides.**  

88. **Guiding, switching and sensing with nanorod metamaterials. (Invited)**  

89. **Plasmonic and metamaterial devices based on opto-mechanical interactions.**  

90. **Surface Nonlinearities in Plasmonics.**  

91. **Classical and quantum opto-mechanics with plasmonics and metamaterials.**  

92. **Nonlinearities in plasmonics and metamaterials. (Invited)**  

93. **Nonlinear plasmonics. (Invited)**  

94. **Photonics at the nanoscale: from novel phenomena to promising applications. (Invited)**  
95. Plasmonics and metamaterials meet opto-mechanical applications. (Invited)

96. Anisotropic plasmonic metamaterials. (Invited)

97. Experimental demonstration of plasmonic switching via optical cavity resonances.

98. Coherent surface plasmon polariton emission from a nanodiode.

99. Quantum opto-mechanical phenomena in hyperbolic metamaterials.

100. Arrays of plasmonic nanocavities for nonlinear light interactions.

101. Active plasmonic circuitry.


103. Nanoscale nonlinear plasmonics.

104. Quantum opto-mechanical phenomena on the nano-scale. (Invited)

105. A plasmonic switch based on electrically controlled cavity resonances

106. Plasmonics for the design of active nanodevices. (Invited)

107. Active functionalities with hybrid plasmonic nanostructures. (Invited)
108. Metamaterial counterpart of baron Munchhausen: self-induced electromagnetic forces.


110. Optical computing. (Invited)

111. Surface plasmon polariton amplification upon electrical injection: towards deep-subwavelength active plasmonic devices.

112. Active plasmonics: the current challenges. (Invited)

113. A plasmonic switch based on an optically controlled nonlinear cavity.

114. Surface plasmon polariton amplification upon electrical injection: towards active plasmonic interconnects.

115. Active plasmonics for the design of nanodevices. (Invited)

116. Active nanodevices: on the use of plasmonics to manipulate optical signals at the nanoscale. (Invited)

117. Active plasmonics: manipulation of light at the nanoscale. (Invited)

118. Fabrication of self-assembled gold coaxial nanorod-tube arrays for nanoscale light interactions.

119. Nano-optics. (Keynote)

120. Plasmon amplification and nonlinear plasmonic waveguides.

121. All-optical and electro-optical active plasmonic telecom components.
122. **Nanoscale photonic transistor.**  

123. **All optical and electro optical active plasmonic telecom components.**  

124. **Nanoscale integrated field-effect SPP modulator.**  

125. **Nanoscale Si-SPP waveguides.**  

126. **Novel plasmonic platform based on nanorod metamaterials. (Invited)**  

127. **Active plasmonic device.**  

128. **Nanoscale Si-SPP waveguides**  

129. **Active plasmonic circuitry.**  

130. **High-density photonic integration with nanowire plasmonic waveguides. (Invited)**  

131. **Active plasmonic components for integrated circuits.**  

132. **Amplifying surface plasmon polaritons in active metallo-dielectric waveguides.**  

133. **Active components for integrated plasmonic circuits.**  

134. **Modeling and near-field studies of photonic integration with dielectric-loaded plasmonic waveguides. (Keynote)**  
135. **Photonic integration with dielectric-loaded SPP waveguides.**

136. **Excitation and characterization of dielectric-loaded surface plasmonpolariton waveguides at telecommunication wavelengths.**

137. **Full 3D numerical simulations of dielectric-loaded SPP waveguides.**

138. **Generating plasmon waves by electron beam excitation**

139. **Generation of travelling surface plasmon waves by free-electron impact.**

140. **Nonlinear plasmonics in a gallium/aluminium nano-composite.**

141. **New material for nonlinear plasmonics: a gallium/aluminium nano-composite.**

142. **Gallium/Aluminium nano-composite for nonlinear-optical and plasmonic switching applications.**

143. **Generation of propagating plasmonic waves on unstructured gold surface by an electron beam.**

144. **Polarization properties of planar chiral nanostructures.**

145. **Planar chiral meta-materials. (Invited)**

146. **Polarization conversion and “focusing” of light propagating through a small chiral hole in a metallic screen, geometrical chirality and the Rayleigh-Wien patadox. (Invited)**

147. **Active switching of SPP signals using nanoscale structural transformations.**
148. **Optical properties and geometrical chirality of 2D nano-patterns and their ensembles.**  

149. **Ga-Al and Ga-Ag nano-structured films for active plasmonics applications.**  

150. **Polarization-controlled nano-focusing.**  

151. **Active switching of surface plasmon polariton waves in Ga-Al and Ga-Ag layered structures.**  

152. **Polarization conversion and polarization-controllable nano-focusing of light propagating through a small chiral hole in a metallic screen.**  

153. **3N: Nanowatt Nanosecond Nanophotonics. (Invited)**  

154. **Nano³ photonics. (Invited)**  

155. **Active plasmonics.**  

156. **Planar chirality in nanostructures: Polarization conversion and “focusing” of light propagating through small chiral holes.**  

157. **Active plasmonics: a new concept for “optical chips”.**  

158. **Active plasmonics: A new concept for controlling surface plasmon-polariton waves.**  

159. **Dynamics of an electron wave packet in Rydberg atom under the influence of a circularly polarised electromagnetic wave.**  