



# CURRICULUM VITAE

**Dr. Alexander S. Shalin (Full Doctor of Sciences)**

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**Age:** 37

**Nationality:**  
Russian

## **Research interests:**

Theoretical near-field optics, optics of nanoobjects, nanophotonics, plasmonics, optical forces and tweezers, NEMs, optical properties of heterogeneous media and metamaterials, optical transparency, antireflection coatings, metasurfaces, light-trapping coatings.

## **Educational Background:**

- 1999-2004 - undergraduate student, Ulyanovsk State University, Department of Physics and Engineering
- June 2004 - M.S. degree (equivalent) in Solid State Physics (Diploma with honours). Subject of the diploma thesis: "Interaction of activated nano-particles in problems of optical near-field microscopy".
- 2004-2007 - PhD student, Ulyanovsk State University, Department of Physics and Engineering, Chair of Quantum Electronics and Optoelectronics, Supervisor - Prof. O.N.Gadomsky.
- November 2007 - **PhD in Physics** (Optics), Ph.D. Thesis: "Electromagnetic resonances in nano-structural systems", Supervisor - Prof. O.N.Gadomsky.
- September-October 2009 – qualification upgrade in the frame of work experience in Saratov State Technical University. Theme: "Investigation of optical transitions in metal nanoclusters dispersed in inorganic polymers based on titanium oxide".
- November-December 2009 – qualification upgrade in the frame of work experience in National University of Nuclear Research "Moscow Institution of Engineering Physics". Theme: "Investigation of optical properties of nano-structural composite materials".
- November 2010 - November 2013 - Doctor of Sciences student in Kotelnikov's Institute of Radiotechnics and Electronics, Moscow.
- May 2014 - **Doctor of Sciences** (Optics) - Saint-Petersburg University of Information Technologies, Mechanics and Optics.

## **Affiliations:**

- 2015-present – Head of "Nano-Opto-Mechanics" Laboratory, Principal Investigator (Professor) Saint-Petersburg University of Information Technologies, Mechanics and Optics.
- 2007-2014- Senior Scientific Researcher, Ulyanovsk Branch of Institute of Radio Engineering and Electronics of Russian Academy of Sciences.
- 2004-2007 - PhD student, Ulyanovsk State University.

- 2005-2006 – School teacher of physics and astronomy.
- 2002-2004 - student, Ulyanovsk State University.

**Language ability:** Russian (native), English (advanced)

**Awards:**

1. **Certificate of best report in section “Physics”** - International Conference of Undergraduate and Postgraduate Students and Young Scientists “Lomonosov-2006”, Moscow, 2006.
2. **Certificate of best report** – International Conference “Coherent Optics and Optical Spectroscopy”, Kazan, 2006.
3. **III-V prizes** on Young Scientists Competition named after I.V. Anisimkin, IRE RAS, Moscow, 2008.
4. **II prize** on Young Scientists Competition in the frame of International Conference “Opto-, nano-electronics, nanotechnology and Microsystems”, Ulyanovsk, 2008.
5. **III prize** on Young Scientists Competition named after I.V. Anisimkin, IRE RAS, Moscow, 2009.
6. **Certificate of best report** - International Conference “Opto-, nano-electronics, nanotechnology and Microsystems”, Ulyanovsk, 2010.
7. **II prize** on Young Scientists Competition named after I.V. Anisimkin, IRE RAS, Moscow, 2010.
8. **Acknowledge Letter** from Ministry of strategy development and innovations of Ulyanovsk region. 2012.
9. 2016-2017. **Stipend of Russian President for Young Scientists** SP-4248.2016.1.
10. 2017. **Best Young scientist in ITMO University.**

**Participation in funded research projects:**

1. 2018-2020. Leader. Russian Science Foundation Grant No. 18-72-10127 «Nonlinear optomechanics».
2. 2018-2019. Leader. Russian Fund for Basic Research Grant within the project N 18-52-00005 Bel\_a «New methods for optical manipulations via localized waves on metallic, PT-symmetric, and metamaterial substrates».
3. 2017-2018. Leader. ITMO University grant «Optical forces in nanostructured systems».
4. 2017-2019. Leader. Grant of the Ministry of Science and Education of the Russian Federation (GOSZADANIE).
5. 2016-2017. Russian President Scholarship, SP-4248.2016.1.
6. 2016-2017. Leader. Russian Fund for Basic Research Grant within the project N 16-52-00112 “Novel approaches for opto-mechanical manipulation via tailoring multipole moments of nano-scale objects”.
7. 2015-2016. Leader. Grant of ITMO University “Optical forces in nanostructural systems”.
8. 2015-2016. Leader. ITMO University grant «The development of new methods for particles dynamics control, based on nonlinear effects».
9. 2015-2016. Leader. Russian Fund for Basic Research Grant within the project N 15-02-01344-a “The development of new nano-optomechanical systems and elements based on stochastic, thermo-optical processes”.
10. 2014-2016. Leader. Grant of the Ministry of Science and Education of the Russian Federation (GOSZADANIE 2014/190).
11. 2014-2016 Leader. Grant of Federal agency of scientific organizations of Russian Federations (FANO) “The development of nanostructured coating for photovoltaic cells”.
12. 2013-2014. Leader. Russian Fund for Basic Research Grant within the project N13-02-00623 – a “The development of new principles and methods for optical manipulation and controllable transportation of nanoobjects”.

13. 2013. Leader. Russian Fund for Basic Research Grant within the project 13-02-11508 "Tractor beams".

14. 2013. Leader. Russian Fund for Basic Research Grant within the project 13-02-90765 "The experimental investigation of broadband nanostructural antireflection coatings with frequency dispersion of effective optical thickness".

15. 2012-1013. Leader. Grant of The Ministry of Education and Science of the Russian Federation in the frame of Federal Special-Purpose Program "Personnel". Theme: "The development of universal nano-structured antireflection coatings with frequency dispersion of optical thickness" 2012-1.2.2-12-000-2013-063.

16. 2012. Leader. Russian Fund for Basic Research Grant within the project N12-02-97036-r\_povolzh'e\_a "Broadband optical antireflection of media with help of nano-structured antireflecting coatings".

17. 2018-2020. Performer. Russian Fund for Basic Research Grant within the project 18-02-00414-a «Nonlinear nanophotonics for next-generation optomechanical manipulators».

18. 2016-2018. Principal Investigator. Russian Science Foundation Grant No. 16-12-10287 "Multipolar all-dielectric metasurfaces for applications in optics and nanophotonics"

19. 2014-2016. Principal Investigator. Russian Science Foundation Grant No. 14-12-01227 "Optical forces in photonics and plasmonics".

20. 2012-1013. Principal Investigator. Russian Fund for Basic Research Grant within the project N12-02-31423-mol\_a "Development of nano-structured antireflection coatings and methods to define effective optical thickness of nano-composite films".

21. 2012-1013. Principal Investigator. Russian Fund for Basic Research Grant within the project N12-02-31828 -mol\_a "Purcell effect in tunnel conduction of super-lattices".

22. 2014-2016. Principal Investigator. Russian Fund for Basic Research Grant within the project 14-02-00290-a «Optical properties of functionalized nano-meta-films».

23. 2015-2017. Performer. Russian Fund for Basic Research Grant within the project 15-52-52006 NNS\_a «Optical properties of chiral nanostructures an their influence on radiation of fundamental quantum systems».

24. 2014-2015. Principal Investigator. Russian Fund for Basic Research Grant within the project 14-08-31730 – mol\_a «The development of antireflecting and light-trapping nanostructural coatings for increasing efficiency of thin film solar cells».

25. 2014-2015. Principal Investigator. Russian Fund for Basic Research Grant within the project 14-02-31765 – mol\_a «The development and investigation of broadband single-layer antireflection coatings based on 2D-periodical arrays of nanopores».

26. 2012-2013. Performer. Grant of The Ministry of Education and Science of the Russian Federation in the frame of Federal Special-Purpose Program "Personnel" 1.1. Theme: «The development of thin film solar cells with nanoantennae coating and increased efficiency».

27. 2012-2013. Performer. Grant of The Ministry of Education and Science of the Russian Federation in the frame of Federal Special-Purpose Program 1.9 «The development of optical nanoantennae for producing energy-effective elements for nanophotonics and increasing the effectiveness of thin film solar cells».

28. 2012-2013. Performer. Grant of The Ministry of Education and Science of the Russian Federation in the frame of Federal Special-Purpose Program "Personnel" 1.2.2 «The development of nanostructured hyperbolic metamaterials».

29. 2012-2013. Performer. Russian Fund for Basic Research Grant within the project 12-07-91703-NIF\_a «The investigation of magneto- (spin) photonic crystals and waves propagation in them».

30. 2009-2011. Performer. Grant of The Ministry of Education and Science of the Russian Federation in the frame of Federal Special-Purpose Program "Development of high-school scientific potential". Theme: "Thermodynamics and kinetics of molecules adsorption and carbon nano-tubes growing, and mechanisms of charge transport in them" N2.1.1/13153.

31. 2009. Working experience in Scientific and Educational Centre of Saratov State University in the frame of Grant of The Ministry of Education and Science of the Russian Federation, Federal Special-Purpose Program "Personnel, mobility of young scientists". Theme: "Investigation of optical transitions in metal nano-clusters, dispersed in non-organic polymers based on Titanium oxides".

32. 2009. Working experience in Scientific and Educational Centre of Moscow Engineering Physics Institute and P.N. Lebedev Physical Institute of the Russian Academy of Sciences in the frame of Grant of The Ministry of Education and Science of the Russian Federation, Federal Special-Purpose Program "Personnel, mobility of young scientists". Theme: "Investigation of optical properties of nano-structured composite materials".

33. 2008. Performer. Russian Fund for Basic Research Grant within the projects N08 - 02 - 97009 "r\_povolzh'e\_a "Theoretical modeling of optical properties of metal-dielectric composite media with gain on the base of strict numerical simulations".

34. 2008. Performer. Research contract with Governmental Scientific Centre of Russian Federation "Technology Centre" (Moscow National Research University of Electronic Technology) in the frame of theme "Development of methods to investigate special properties of carbon nano-tubes arrays".

35. 2005. Performer. Grant of The Ministry of Education and Science of the Russian Federation in the frame of Federal Special-Purpose Scientific and Technology Program "Investigations and developments in high-priority fields of science and technique" № 02.444.11.7082. Theme: "Investigation of optical properties of nano-structured materials on the base of colloidal gold" RI-111\001\125. The investigations were performed on the base of Institute of Radio-engineering and electronics RAS and Saratov Institute of biochemistry and physiology of plants and microorganisms RAS.

### **Most significant publications:**

1. O. N. Gadomskii and **A. S. Shalin**, "Optical Near-Field Resonances in the System of Interacting Nanoparticles", *The Physics of Metals and Metallography*, V. 101, N.5 (2006), p. 425.
2. **A. S. Shalin**, "Electrodynamic response of a colloid ensemble with allowance for the influence of distant nanoparticles", *Russian Physics Journal*, V. 49, N. 8 (2006), p. 791.
3. **A. S. Shalin**, "Light scattering by nanosized systems with different spatial organizations", *Journal of Applied Spectroscopy*, V. 73, N. 5 (2006), p. 719.
4. O. N. Gadomskii and **A. S. Shalin**, "Dimensional Magnetic Resonances in Nanostructure Systems", *Journal of Communications Technology and Electronics*, V. 52, N.2 (2007), p. 206.
5. O. N. Gadomskii and **A. S. Shalin**, "Electron States in Metal Clusters", *Journal of Experimental and Theoretical Physics*, V. 104, N. 1 (2007), p. 1.
6. O. N. Gadomskii and **A. S. Shalin**, "Effect of optical blooming of a nanocrystal monolayer and the interface between two media", *Journal of Experimental and Theoretical Physics*, V. 105, No 4 (2007), p. 761.
7. **A. S. Shalin**, "Radiative transitions in metallic nanoclusters", *The Physics of Metals and Metallography*, V. 105, N. 2 (2008), p. 126.
8. **A. S. Shalin** "Effective Optical Parameters of Ordered Nanocomposites", *Journal of Communications Technology and Electronics*, V. 54, N. 6 (2009). p. 729.
9. **A. S. Shalin** and S. G. Moiseev, "Optical Properties of Nanostructured Layers on the Surface of an Underlying Medium", *Optics and Spectroscopy*, V. 106, N. 6 (2009), p. 916.
10. **A. S. Shalin** "Effect of the Absolute Transparency of an Ordered Nanocomposite", *JETP Letters*, 90, N. 4 (2009), p. 257.
11. **A. S. Shalin** and S. G. Moiseev, "Controlling Interface Reflectance by a Monolayer of Nanoparticles", *Quantum Electronics*, V. 39, N. 12 (2009), p. 1175.
12. **A. S. Shalin**, "Broadband Blooming of a Medium Modified by an Incorporated Layer of Nanocavities", *JETP Letters*, V. 91, N. 12 (2010), p. 637.
13. **A. S. Shalin**, V. S. Gorelik, "Anomalies of Light Transmission In Structurally Ordered Nanocomposites", *Journal of Russian Laser Research*, V. 31, No. 4 (2010), p. 390.
14. **A. S. Shalin**, "Negative Effective Refractive Index of Metallic Nanoparticles in Disordered Nanocomposites", *The Physics of Metals and Metallography*, V. 110, N. 2 (2010), p. 119.
15. **A. S. Shalin**, "Microscopic theory of optical properties of composite media with chaotically distributed nanoparticles", *Quantum Electronics*, V. 40, N. 11 (2010), p. 1004.
16. **A. S. Shalin**, "Optical Properties of Nanocrystal Layers Embedded in a Carrier Medium", *Journal*

- of Communications Technology and Electronics*, V. 56, N. 1 (2011), p. 14.
17. **A. S. Shalin**, "Optical antireflection of a medium by nanocrystal layers", *Quantum Electronics*, V. 41, N. 2 (2011), p. 163.
  18. **A. S. Shalin**, "Metallodielectric Nanocomposites with Enhanced Transparency", *The Physics of Metals and Metallography*, V. 112, N. 1 (2011), p. 1.
  19. **A. S. Shalin**, "Optically Induced Forces in a Nanoparticle-on-Substrate System", *The Physics of Metals and Metallography*, V. 112, N. 1 (2011), p. 36.
  20. **A. S. Shalin**, "Optical Antireflection of a Medium by Nanostructural Layers", *Progress in Electromagnetic Research B*, V. 31 (2011), p. 45.
  21. **A. S. Shalin**, "Optical Accelerator of Nanoparticles", *Journal of Communications Technology and Electronics*, V. 56, N. 8 (2011), p. 976.
  22. **A. S. Shalin**, A. S. Kadochkin, "Effect of Argon buffer gas and the dimer component on the optical properties of sodium vapor", *Journal of Applied Spectroscopy*, V. 79, N. 1 (2012), p. 113.
  23. **A.S. Shalin**, S.V. Sukhov, "Optical forces in plasmonic nanoantennas", *Quantum Electronics*, V. 42, N. 4 (2012), p. 355.
  24. **Shalin A. S.**, Sukhov S. V. Plasmonic Nanostructures as Accelerators for Nanoparticles: Optical Nanocannon // *Plasmonics*. 2013. Vol. 8. Issue 2. P. 625-629.
  25. **Shalin A. S.**, Nikitov S. A. Approximate Model for Universal Broadband Antireflection Nano-Structure // *Progress in Electromagnetic Research B*. 2013. V. 47. P. 127-144.
  26. Constantin R. Simovski, **Alexander S. Shalin**, Pavel M. Voroshilov, and Pavel A. Belov. Photovoltaic absorption enhancement in thin-film solar cells by non-resonant beam collimation by submicron dielectric particles // *J. Appl. Phys.* V.114. 103104 (2013).
  27. **A.S. Shalin**, S.V. Sukhov, A.E. Krasnok, S.A. Nikitov. Plasmonic nanostructures for local field enhancement in the UV region // *Photon. Nanostruct.: Fundam. Appl.* <http://dx.doi.org/10.1016/j.photonics.2013.08.004>.
  28. **A. S. Shalin**, Pavel Ginzburg, Pavel A. Belov, Yuri S. Kivshar, and Anatoly V. Zayats. Nano-opto-mechanical effects in plasmonic waveguides // *Laser Photonics Rev.* – 2014. –Vol. 8. – Issue 1. – P. 131–136. (*Laser Photonics Rev.*, 1–6 (2013) / DOI 10.1002/lpor.201300109)
  29. Sergey Krasikov, Ivan V. Iorsh, **Alexander Shalin**, and Pavel A. Belov. Levitation of finite-size electric dipole over epsilon-near-zero metamaterial // *Phys. Status Solidi RRL*, 1–4 (2014) / DOI 10.1002/pssr.201409396
  30. Sergey Sukhov, **Alexander Shalin**, David Haefner, and Aristide Dogariu. *Actio et reactio* in optical binding // *OPTICS EXPRESS*, Vol. 23, No. 1, DOI:10.1364/OE.23.000247
  31. **Alexander S. Shalin**, Pavel Ginzburg, Alexey A. Orlov Ivan Iorsh, Pavel A. Belov, Yuri S. Kivshar, and Anatoly V. Zayats. Scattering suppression from arbitrary objects in spatially dispersive layered metamaterials // *Physical Review B* (in press).
  32. **Alexander S. Shalin**, Pavel Ginzburg, Alexey A. Orlov, Ivan Iorsh, Pavel A. Belov, Yuri S. Kivshar, and Anatoly V. Zayats. Scattering suppression from arbitrary objects in spatially dispersive layered metamaterials // *Phys. Rev. B*, vol. 91, pp. 125426, 2015.
  33. D. A. Baranov, P. A. Dmitriev, I. S. Mukhin, A. K. Samusev, P. A. Belov, C. R. Simovski and **A. S. Shalin**. Broadband antireflective coatings based on two-dimensional arrays of subwavelength nanopores // *Appl. Phys. Lett.* 106, 171913 (2015); <http://dx.doi.org/10.1063/1.4919589>.
  34. A. V. Chebykin, A. A. Orlov, **A. S. Shalin**, A. N. Poddubny, and P. A. Belov. Strong Purcell effect in anisotropic epsilon-near-zero metamaterials // *Phys. Rev. B* 91, 205126 (2015).
  35. Pavel M. Voroshilov, Constantin R. Simovski, Pavel A. Belov and **Alexander S. Shalin**. Light-trapping and antireflective coatings for amorphous Si-based thin film solar cells // *J. Appl. Phys.*, vol. 117, pp. 203101, 2015 (DOI: 10.1063/1.4921440).
  36. **Alexander S. Shalin**, Sergey V. Sukhov, Andrey A. Bogdanov, Pavel A. Belov, and Pavel Ginzburg. Optical pulling forces in hyperbolic metamaterials // *Physical Review A*, vol. 91, p. 063830, 2015 (DOI: 10.1103/PhysRevA.91.063830).
  37. K. V. Baryshnikova, A. S. Kadochkin, and **A. S. Shalin**, Nanostructural Antireflecting Coatings: Classification Analysis (A Review) *Optics and Spectroscopy*, 2015, Vol. 119, No. 3, pp. 343–355.

38. Andrey A. Bogdanov, **Alexander S. Shalin**, Pavel Ginzburg Optical forces in nanorod metamaterial // *Scientific Reports* 5:15846 | DOI: 10.1038/srep15846.
39. Alexey P. Slobozhanyuk, Pavel Ginzburg, David A. Powell, Ivan Iorsh, **Alexander S. Shalin**, Paulina Segovia, Alexey V. Krasavin, Gregory A. Wurtz, Viktor A. Podolskiy, Pavel A. Belov, and Anatoly V. Zayats, Purcell effect in hyperbolic metamaterial resonators // *Phys. Rev. B*, 92, 195127 (2015), DOI: 10.1103/PhysRevB.92.195127.
40. Mihail I. Petrov, Sergey V. Sukhov, Andrey A. Bogdanov, **Alexander S. Shalin**, and Aristide Dogariu, Surface plasmon polariton assisted optical pulling force // *Laser Photonics Rev.* 10, No. 1, 116–122 (2016) / DOI 10.1002/lpor.201500173.
41. Vasily V. Klimov, Ilya V. Treshin, **Alexander S. Shalin**, Pavel N. Melentiev, Artur A. Kuzin, Anton E. Afanasiev, and Victor I. Balykin, Optical Tamm state and giant asymmetry of light transmission through an array of nanoholes // *Physical Review A*, 92, 063842 (2015), DOI: 10.1103/PhysRevA.92.063842.
42. Dmitry Markovich, Kseniia Baryshnikova, **Alexander Shalin**, Anton Samusev, Alexander Krasnok, Pavel Belov, Pavel Ginzburg, Enhancement of artificial magnetism via resonant bianisotropy // *Scientific Reports* 6:22546 | DOI: 10.1038/srep22546
43. A. V. Yulin, A. Aladyshkina, and **A. S. Shalin**, Motion of dissipative optical fronts under the action of an oscillating pump // *Physical Review E*, 94, 022205 (2016), DOI: 10.1103/PhysRevE.94.022205.
44. V.A. Milichko, **A.S. Shalin**, I.S. Mukhin, A.E. Kovrov, A.A. Krasilin, A.V. Vinogradov, P.A. Belov, C.R. Simovskii, Solar photovoltaics: current state and trends // *Phys. Usp.* V. 59, Iss. 8, 2016
45. Dmitry S. Filonov, **Alexander S. Shalin**, Ivan Iorsh, Pavel A. Belov, and Pavel Ginzburg, Controlling electromagnetic scattering with wire metamaterial resonators // *Journal of the Optical Society of America A*, Vol. 33, No. 10, pp. 1910-1916 (2016), <http://dx.doi.org/10.1364/JOSAA.33.001910>.
46. Vitali Kozlov, Dmitry Filonov, **Alexander S. Shalin**, Ben Z. Steinberg and Pavel Ginzburg, Asymmetric Backscattering from the Hybrid Magneto-Electric Meta Particle // *Applied Physics Letters*, 109, 203503 (2016); doi: 10.1063/1.4967238.
47. K. V. Baryshnikova, A. B. Evlyukhin and **A. S. Shalin**, Magnetic hot-spots in hollow silicon cylinders // *Journal of Physics: Conference Series* 741 (2016) 012156. doi:10.1088/1742-6596/741/1/012156
48. Angeleene S. Ang, Sergey V. Sukhov, Aristide Dogariu and **Alexander S. Shalin**, Scattering Forces within a Left-Handed Photonic Crystal // *Scientific Reports*, 7: 41014 (2017), doi:10.1038/srep41014.
49. Pavel D. Terekhov, Kseniia V. Baryshnikova, **Alexander S. Shalin**, Andrey B. Evlyukhin, Resonant forward scattering of light by high refractive-index dielectric nanoparticles with toroidal dipole contributions // *Optics Letters*, 42, 4, p. 835-838 (2017).
50. Aliaksandra Ivinskaya, Mihail I. Petrov, Andrey A. Bogdanov, Ivan Shishkin, Pavel Ginzburg and **Alexander S. Shalin**, Plasmon-assisted optical trapping and anti-trapping // *Light: Science and Applications* (2017) 6, e16258; doi:10.1038/lsa.2016.258.
51. Kseniia V. Baryshnikova, Andrey Novitsky, Andrey B. Evlyukhin and **Alexander S. Shalin**, Magnetic field concentration with coaxial silicon nanocylinders in optical spectral range // *JOSA B*, Vol. 34, No. 7, July 2017, P. D36 - D41.  
<https://doi.org/10.1364/JOSAB.34.000D36>
52. Andrey Novitsky, **Alexander S. Shalin**, and Andrei V. Lavrinenko, Spherically symmetric inhomogeneous bianisotropic media: Wave propagation and light scattering // *Phys. Rev. A*, 95, 053818 (2017). DOI: 10.1103/PhysRevA.95.053818
53. Pavel D. Terekhov, Kseniia V. Baryshnikova, Yuriy A. Artemyev, Alina Karabchevsky, **Alexander S. Shalin**, and Andrey B. Evlyukhin, Multipolar response of nonspherical silicon nanoparticles in the visible and near-infrared spectral ranges // *Phys. Rev. B* 96, 035443, 2017 (Published 31 July 2017); <https://doi.org/10.1103/PhysRevB.96.035443>
54. Alexey S. Kadochkin, **Alexander S. Shalin** and Pavel Ginzburg, Granular permittivity representation in extremely near-field light-matter interactions processes // *ACS Photonics*, 2017; DOI: 10.1021/acsp Photonics.7b00605.

55. Igor S. Nefedov and **Alexander S. Shalin**, Radiative pulling forces, exerted by evanescent fields along a hyperbolic metamaterial slab // *Phys. Status Solidi RRL*, 1700219, 2017. DOI: 10.1002/pssr.201700219
56. P D Terekhov, K V Baryshnikova, A B Evlyukhin and **A S Shalin**, Destructive interference between electric and toroidal dipole moments in TiO<sub>2</sub> cylinders and frustums with coaxial voids // *Journal of Physics: Conference Series*, **929** (2017) 012065; doi :10.1088/1742-6596/929/1/012065
57. Denis Zhigunov, Andrey B. Evlyukhin, **Alexander Sergeevich Shalin**, Urs Zywietz, and Boris N. Chichkov, Femtosecond laser printing of single Ge and SiGe nanoparticles with electric and magnetic optical resonances // *ACS Photonics*, Just Accepted Manuscript • DOI: 10.1021/acsp Photonics.7b01275 • Publication Date (Web): 12 Jan 2018.
58. Liyang Yue, Oleg Minin, Zengbo Wang, James Monks, **Alexander Shalin**, Igor Minin // *Photonic hook: A new curved light beam* // *Optics Letters*, Vol. 43, No. 4, 15 February 2018.
59. Angeleene S. Ang, Alina Karabchevsky, Igor V. Minin, Oleg V. Minin, Sergey V. Sukhov & **Alexander S. Shalin**, 'Photonic Hook' based optomechanical nanoparticle manipulator // *Scientific Reports*, 8:2029, (2018), DOI:10.1038/s41598-018-20224-4. <https://doi.org/10.1364/OL.43.000771>
60. Olga E. Glukhova, Igor S. Nefedov, **Alexander S. Shalin** and Michael M. Slepchenkov, New 2D-graphene hybrid composites as an effective elemental base of optical nanodevices // *Beilstein Journal of Nanotechnology* 2018 (accepted).
61. D. Vestler, I. Shishkin, E. A. Gurvitz, M. E. Nasir, A. Ben-Moshe, A. P. Slobozhanyuk, A. V. Krasavin, T. Levi-Belenkova, A. S. Shalin, P. Ginzburg, G. Markovich, And A. V. Zayats, Circular Dichroism Enhancement in Plasmonic Nanorod Metamaterials // *Optics Express*, Vol. 26, Issue 14, pp. 17841-17848 (2018).  
<https://doi.org/10.1364/OE.26.017841>.
62. Alexey S. Kadochkin, Ivan I. Shishkin, Alexander S. Shalin, Pavel Ginzburg, Quantum sensing of motion in colloids via time-dependent Purcell effect // *Laser and Photonic Reviews*, 1800042, 2018. <https://doi.org/10.1002/lpor.201800042>
63. Aleksandr Kovrov, Andrey Novitsky, Alexander S. Shalin, Photonic nanojet as a tunable and polarization sensitive optical tweezer // *Annalen der Physik*, 1800129, 2018. <https://onlinelibrary.wiley.com/doi/epdf/10.1002/andp.201800129>
64. Denis V. Novitsky, Alina Karabchevsky, Andrei V. Lavrinenko, Alexander S. Shalin, Andrey Novitsky, PT symmetry breaking in multilayers with resonant loss and gain locks light propagation direction // *Physical Review B*, **98**, 125102, 2018.  
<https://doi.org/10.1103/PhysRevB.98.125102>
65. Kseniia Baryshnikova, Dmitriy Filonov, Constantin Simovski, Andrey Evlyukhin, Alexey Kadochkin, Elizaveta Nenasheva, Pavel Ginzburg, and Alexander S. Shalin, Giant magnetoelectric field separation via anapole-type states in high-index dielectric structures // *Phys. Rev. B* **98**, 165419, 2018.  
<https://doi.org/10.1103/PhysRevB.98.165419>
66. Aliaksandra Ivinskaya, Natalia Kostina, Alexey Proskurin, Mihail I. Petrov, Andrey A. Bogdanov, Sergey Sukhov, Alexey V. Krasavin, Alina Karabchevsky, Alexander S. Shalin, and Pavel Ginzburg, Optomechanical Manipulation with Hyperbolic Metasurfaces // *ACS Photonics*, 2018, 5 (11), pp 4371–4377, DOI: 10.1021/acsp Photonics.8b00775
67. Alexey Kucherik, Stella Kutrovskaya, Anton Osipov, Miron Gerke, Igor Chestnov, Sergei M. Arakelian, Alexander Shalin, Andrey Evlyukhin, and Alexey Kavokin, Nano-antennas based on silicon-gold nanostructures // *Scientific Reports*, 2019 9:338 | DOI:10.1038/s41598-018-36851-w.
68. Denis V. Novitsky and Alexander S. Shalin, All-Optical Transmission Modulation Due to Inelastic Interactions of Ultrashort Pulses in a Disordered Resonant Medium // *Ann. Phys. (Berlin)* 2019, 1800405, DOI: 10.1002/andp.201800405.
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### Patents

1. **Shalin A.S.**, Kadochkin A.S., Broadband nanostructural antireflection coating. Patent number 138049. Priority date 05.11.2013.

### Participation in conferences:

I've participated more than **50** international and all-Russian conferences. Over **150** published abstracts and proceedings.