



My research interests are in finding efficient ways to control electromagnetic fields with complex structures and metamaterials for better antennas

STATUS (UPD. MAR 16, 2023)

35 years old, PhD, Leading Researcher, School of Physics and Engineering, ITMO University, St. Petersburg, Russia

R&D EXPERIENCE

Leading researcher ITMO University, 2014/04 - now

- › R&D, project management: metamaterials, antennas, RF-coils for MRI
- › MSc degree program coordinator

Junior Researcher - Senior Researcher / Electromagnetics Scientific Center of Applied Electrodynamics, 2010-2014

- › Antennas and RF Simulations, Arrays, Reflectors
- › Mathematical modeling, Software development, Computation

Visiting Scientist Fraunhofer Institute for Integrated Circuits, 2011/10 - 2012/02

- › Improvement of x-polarization properties of automotive GNSS antennas
- › Simulation and measurements, mathematical modeling

Trainee Fraunhofer Institute for Integrated Circuits, 2010/02 - 2010/05

- › Analytical investigation of curved microstrip lines
- › Theory and simulations

Trainee Fraunhofer Institute for Integrated Circuits, 2009/06 - 2009/08

- › Decoupling in low-profile antenna array using metamaterial structures
- › Simulations and measurements

TEACHING EXPERIENCE

Associate professor (part time) ITMO University, 2014/04 - now

- › Lectures (M.Sc): Antenna theory, Metamaterials, Special chapters on antennas
- › 12 M.Sc. graduated, 3 PhDs graduated, 2 PhD students supervised and 5 students supervised

CONTACT

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FIELDS

Antenna theory

Microwave measurements

Computational electromagnetics

Metamaterials

RF-coils for MRI

INDICATORS

Scopus: h-index 16, 1618 citations

Google Scholar: h-index 17, 2113 citations

TECHNOLOGIES

PCB, VNA, Anechoic chamber

CAD, EM Simulation, Programming

HPC, Cluster, GPU

3D printing, programmable machines

TOOLS

</> CST Studio Suite, HFSS, FEKO

</> NEC, Sim4Life, ADS

</> Matlab, Delphi, Fortran

🖱 Inkscape, CorelDraw, Photoshop

🖱 LaTeX, Office, Windows

ACTIVITIES

Photography, graphic design

Travel, swimming

LANGUAGE

Russian - mother Tongue

English - advanced

German - conversational

PROJECTS

Smart antennas for 6G

Priority 2023 program, Ministry of Education and Science of the Russian Federation, 2022/01 - now

- › Role: leader
- › Development of steerable MM-wave antennas based on Liquid Crystals

Combined GNSS/5G antennas

Topcon Positioning Systems, 2020/03 - 2022/02

- › Role: leader
- › Development of combine multi-element antennas for positioning and communication

Tunable metasurfaces for wireless technologies

Russian Science Foundation, 2021/01 - now

- › Role: principal research member
- › Intelligent reflective surfaces for 5G

Experimental demonstration of Huygens' surfaces in the THz range

Russian Science Foundation, 2019/06 - now

- › Role: leader
- › Optimization and experimental realization of metasurfaces for controlling wave beams in the THz range

Excitation methods in UHF MRI based on leaky-wave radiation

RFBR, 2019/10 - now

- › Role: principal research member
- › Investigation of leaky-wave antennas for MRI and non-resonant transmit coils

MetaMaterials antenna for ultra-high field MRI, EU Horizon 2020

European Union, 2017/01 - 2021/04

- › Role: research coordination in Work Package 4 (metasurfaces)
- › R&D on metasurface-based RF-coil for clinical and preclinical MRI

MRI antennas based on artificial magnetic shields

Russian Science Foundation, 2018/04 - 2020/12

- › Role: principal research member
- › R&D on metasurface-based RF-coil for clinical and preclinical MRI

Metamaterial-based microwave Luneburg lenses

Russian Foundation for Basic Research, 2016/01 - 2017/12

- › Role: leader
- › R&D on microwave Luneburg lenses based on artificial dielectrics

Development of metasurfaces for magnetic resonance imaging

Russian Science Foundation, 2015/01 - 2017/12

- › Role: principal research member
- › Research on metasurfaces for controlling RF fields in MRI scanner

Developments of metamaterial-based structure for suppression of surface waves and improvement of cross-polarization ratio of L-band antennas

Fraunhofer Institute for Integrated Circuits, 2016/06 - 2016/12

- › Role: principal research member
- › R&D on low-profile metamaterial-based structure for improvement of metal-mounted circularly polarized antennas

Metasurfaces for efficient controlling electromagnetic waves

Russian Foundation for Basic Research, 2015/01 - 2016/12

- › Role: principal research member
- › Research on metasurfaces for polarization conversion and routing surface waves

EDUCATION

Graduated as Candidate of Science (PhD equivalent) in Radio Science

Peter the Great St. Petersburg Polytechnic University, 2013/11

- › Thesis: Electrodynamics of radiating systems based on thin-wire meshes
- › Developed analytical and numerical models for reflector, microstrip and wire antennas with wire-mesh screens

Received M.Sc. degree

Peter the Great St. Petersburg Polytechnic University,
2010/06

- › Thesis: Image theory solutions for dipole and loop antennas over wire-mesh screens and underlying terrain
- › Made analytical investigation of dipole antennas in presence of isotropic and anisotropic wire-mesh screens

Received B.Sc. degree

Peter the Great St. Petersburg Polytechnic University,
2008/06

- › Thesis: Performance of an aircraft-based direction finder under the influence of electromagnetic wave diffraction
- › Made analytical description of diffraction of incident plane waves on a body of an aircraft

Received secondary education diploma

Physics and Mathematics Lyceum No.239, 2004/06

- › Specialization: mathematics
- › Specialization: programming

- [1] Marine A.C. Moussu, Redha Abdeddaim, Stanislav Glybovski, Stefan Enoch, and Luisa Ciobanu. *Ceramic Coils for MR Microscopy*, chapter 2, pages 25–47. John Wiley Sons, Ltd, 2022.

LIST OF JOURNAL PAPERS

- [2] Andrey Sayanskiy, Andrei Belov, Ruslan Yafasov, Andrey Lyulyakin, Alexander Sherstobitov, Stanislav Glybovski, and Vladimir Lyashev. A 2d-programmable and scalable reconfigurable intelligent surface remotely controlled via digital infrared code. *IEEE Transactions on Antennas and Propagation*, 71(1):570–580, 2023.
- [3] Rustam Balafendiev, Georgiy Solomakha, Marc Dubois, Redha Abdeddaim, Stefan Enoch, Constantin R. Simovski, and Stanislav Glybovski. An antenna based on three coupled dipoles with minimized e-field for ultra-high-field mri. *IEEE Transactions on Antennas and Propagation*, 70(10):9083–9092, 2022.
- [4] Vsevolod Vorobyev, Alena Shchelokova, Alexander Efimtcev, Juan D. Baena, Redha Abdeddaim, Pavel Belov, Irina Melchakova, and Stanislav Glybovski. Improving homogeneity in abdominal imaging at 3 t with light, flexible, and compact metasurface. *Magnetic Resonance in Medicine*, 87(1):496–508, 2022.
- [5] Oleh Yermakov, Vladimir Lenets, Andrey Sayanskiy, Juan Baena, Enrica Martini, Stanislav Glybovski, and Stefano Maci. Surface waves on self-complementary metasurfaces: All-frequency hyperbolicity, extreme canalization, and te-tm polarization degeneracy. *Phys. Rev. X*, 11:031038, Aug 2021.
- [6] C.C. van Leeuwen, B.R. Steensma, S.B. Glybovski, M.F.J. Lunenburg, C. Simovski, D.W.J. Klomp, C.A.T. van den Berg, and A.J.E. Raaijmakers. Potential reduction of peripheral local sar for a birdcage body coil at 3 tesla using a magnetic shield. *Frontiers in Physics*, 9, 2021.
- [7] G. Solomakha, J.T. Svejda, C. van Leeuwen, A. Rennings, A.J. Raaijmakers, S. Glybovski, and D. Erni. A self-matched leaky-wave antenna for ultrahigh-field magnetic resonance imaging with low specific absorption rate. *Nature Communications*, 12(1), 2021.
- [8] S.A. Kuznetsov, V.A. Lenets, M.A. Tumashov, A.D. Sayanskiy, P.A. Lazorskiy, P.A. Belov, J.D. Baena, and S.B. Glybovski. Self-complementary metasurfaces for designing terahertz deflecting circular-polarization beam splitters. *Applied Physics Letters*, 118(13), 2021.
- [9] J.P. Del Risco, I.S. Mikhalka, V.A. Lenets, M.S. Sidorenko, A.D. Sayanskiy, S.B. Glybovski, A.L. Samofalov, S.A. Khakhomov, I.V. Semchenko, J.D. Ortiz, and J.D. Baena. Optimal angular stability of reflectionless metasurface absorbers. *Physical Review B*, 103(11), 2021.
- [10] V.A. Lenets, S.A. Kuznetsov, A.D. Sayanskiy, P.A. Lazorskiy, J.D. Baena, and S.B. Glybovski. A focusing circular-polarization thz beam splitter based on a self-complementary metasurface. *IEEE Transactions on Terahertz Science and Technology*, 11(2):165–174, 2021.
- [11] A. Hurshkainen, M.S.M. Mollaei, M. Dubois, S. Kurdjumov, R. Abdeddaim, S. Enoch, S. Glybovski, and C. Simovski. Decoupling of closely spaced dipole antennas for ultrahigh field mri with metasurfaces. *IEEE Transactions on Antennas and Propagation*, 69(2):1094–1106, 2021.
- [12] K. Lezhennikova, C. Simovski, R. Abdeddaim, R. Balafendiev, and S. Glybovski. Extending a birdcage coil for magnetic resonance imaging of a human head with an artificial magnetic shield. *Photonics and Nanostructures - Fundamentals and Applications*, 43, 2021.
- [13] V. Vorobyev, A. Shchelokova, I. Zivkovic, A. Slobozhanyuk, J.D. Baena, J.P. del Risco, R. Abdeddaim, A. Webb, and S. Glybovski. An artificial dielectric slab for ultra high-field mri: Proof of concept. *Journal of Magnetic Resonance*, 320, 2020.
- [14] M.A.C. Moussu, S.B. Glybovski, R. Abdeddaim, C. Craeye, S. Enoch, D. Tihon, S. Kurdjumov, M. Dubois, E. Georget, A.G. Webb, P. Belov, and L. Ciobanu. Imaging of two samples with a single transmit/receive channel using coupled ceramic resonators for mr microscopy at 17.2 t. *NMR in Biomedicine*, 33(11), 2020.
- [15] M. Song, P. Smirnov, E. Puhtina, E. Zanganeh, S. Glybovski, P. Belov, and P. Kapitanova. Multi-mode metamaterial-inspired resonator for near-field wireless power transfer. *Applied Physics Letters*, 117(8), 2020.
- [16] M.A.C. Moussu, R. Abdeddaim, M. Dubois, E. Georget, A.G. Webb, E. Nenasheva, P. Belov, S. Glybovski, L. Ciobanu, and S. Enoch. A semi-analytical model of high-permittivity dielectric ring resonators for magnetic resonance imaging. *IEEE Transactions on Antennas and Propagation*, 68(8):6317–6329, 2020.
- [17] K. Lezhennikova, R. Abdeddaim, A. Hurshkainen, A. Vignaud, M. Dubois, M. Dubois, P. Jomin, D. Berrahou, A. Raaijmakers, N. Avdievich, I. Melchakova, S. Enoch, P. Belov, C. Simovski, C. Simovski, and S. Glybovski. Constructive near-field interference effect in a birdcage mri coil with an artificial magnetic shield. *Physical Review Applied*, 13(6), 2020.
- [18] A. Hurshkainen, M. Dubois, A. Nikulin, C. Vilmen, D. Bendahan, S. Enoch, S. Glybovski, and R. Abdeddaim. Radio frequency coil for dual-nuclei mr muscle energetics investigation based on two capacitively coupled periodic wire arrays. *IEEE Antennas and Wireless Propagation Letters*, 19(5):721–725, 2020.

- [19] A.A. Hurshkainen, B. Steensma, S.B. Glybovski, I.J. Voogt, I.V. Melchakova, P.A. Belov, C.A.T. van den Berg, and A.J.E. Raaijmakers. A parametric study of radiative dipole body array coil for 7 Tesla MRI. *Photonics and Nanostructures - Fundamentals and Applications*, 39, 2020.
- [20] A. Sayanskiy, S.A. Kuznetsov, D.S. Tanygina, J.P. Del Risco, S. Glybovski, and J.D. Baena. Frequency-controllable polarization rotation of thz waves with an scms. *IEEE Transactions on Antennas and Propagation*, 68(3):1491–1502, 2020.
- [21] F.S. Cuesta, V.S. Asadchy, A.D. Sayanskiy, V.A. Lenets, M.S. Mirmoosa, X. Ma, S.B. Glybovski, and S.A. Tretyakov. Nonscattering metasurface-bound cavities for field localization, enhancement, and suppression. *IEEE Transactions on Antennas and Propagation*, 68(3):1689–1703, 2020.
- [22] A. Markvart, M. Song, S. Glybovski, P. Belov, C. Simovski, and P. Kapitanova. Metasurface for near-field wireless power transfer with reduced electric field leakage. *IEEE Access*, 8:40224–40231, 2020.
- [23] M.A.C. Moussu, L. Ciobanu, S. Kurdjumov, E. Nenasheva, B. Djemai, M. Dubois, A.G. Webb, S. Enoch, P. Belov, R. Abdeddaim, and S. Glybovski. Systematic analysis of the improvements in magnetic resonance microscopy with ferroelectric composite ceramics. *Advanced Materials*, 31(30), 2019.
- [24] T.S. Vergara Gomez, M. Dubois, S. Glybovski, B. Larrat, J. de Rosny, C. Rockstuhl, M. Bernard, R. Abdeddaim, S. Enoch, and F. Kober. Wireless coils based on resonant and nonresonant coupled-wire structure for small animal multinuclear imaging. *NMR in Biomedicine*, 32(5), 2019.
- [25] G. Solomakha, C.V. Leeuwen, A. Raaijmakers, C. Simovski, A. Popugaev, R. Abdeddaim, I. Melchakova, and S. Glybovski. The dual-mode dipole: A new array element for 7t body imaging with reduced sar. *Magnetic Resonance in Medicine*, 81(2):1459–1469, 2019.
- [26] M. S.M. Mollaei, A. Hurshkainen, S. Kurdjumov, S. Glybovski, and C. Simovski. Passive electromagnetic decoupling in an active metasurface of dipoles. *Photonics and Nanostructures - Fundamentals and Applications*, 32:53–61, 2018.
- [27] A. Hurshkainen, A. Nikulin, E. Georget, B. Larrat, D. Berrahou, A.L. Neves, P. Sabouroux, S. Enoch, I. Melchakova, P. Belov, S. Glybovski, and R. Abdeddaim. A novel metamaterial-inspired rf-coil for preclinical dual-nuclei mri. *Scientific Reports*, 8(1), 2018.
- [28] S. Kosulnikov, V. Zalipaev, A. Shchelokova, I. Melchakova, S. Glybovski, A. Slobozhanyuk, and P. Belov. Mode hopping in arrays of resonant thin wires over a dielectric interface. *Physical Review B*, 98(17), 2018.
- [29] O.Y. Yermakov, A.A. Hurshkainen, D.A. Dobrykh, P.V. Kapitanova, I.V. Iorsh, S.B. Glybovski, and A.A. Bogdanov. Experimental observation of hybrid te-tm polarized surface waves supported by a hyperbolic metasurface. *Physical Review B*, 98(19), 2018.
- [30] M. Sharifian Mazraeh Mollaei, A. Hurshkainen, S. Kurdjumov, S. Glybovski, and C. Simovski. Decoupling of two closely located dipole antennas by a split-loop resonator. *Radio Science*, 53(11):1398–1405, 2018.
- [31] A.V. Shchelokova, C.A.T. van den Berg, D.A. Dobrykh, S.B. Glybovski, M.A. Zubkov, E.A. Brui, D.S. Dmitriev, A.V. Kozachenko, A.Y. Efimtcev, A.V. Sokolov, V.A. Fokin, I.V. Melchakova, and P.A. Belov. Volumetric wireless coil based on periodically coupled split-loop resonators for clinical wrist imaging. *Magnetic Resonance in Medicine*, 80(4):1726–1737, 2018.
- [32] M. Londono, A. Sayanskiy, J.L. Araque-Quijano, S.B. Glybovski, and J.D. Baena. Broadband huygens' metasurface based on hybrid resonances. *Physical Review Applied*, 10(3), 2018.
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- [34] E.A. Brui, A.V. Shchelokova, M. Zubkov, I.V. Melchakova, S.B. Glybovski, and A.P. Slobozhanyuk. Adjustable subwavelength metasurface-inspired resonator for magnetic resonance imaging. *Physica Status Solidi (A) Applications and Materials Science*, 215(5), 2018.
- [35] A.V. Shchelokova, A.P. Slobozhanyuk, I.V. Melchakova, S.B. Glybovski, A.G. Webb, Y.S. Kivshar, and P.A. Belov. Locally enhanced image quality with tunable hybrid metasurfaces. *Physical Review Applied*, 9(1), 2018.
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- [37] J.D. Baena, S.B. Glybovski, J.P. Del Risco, A.P. Slobozhanyuk, and P.A. Belov. Broadband and thin linear-to-circular polarizers based on self-complementary zigzag metasurfaces. *IEEE Transactions on Antennas and Propagation*, 65(8):4124–4133, 2017.
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- [40] S.Y. Kosulnikov, M.S. Mirmoosa, D.A. Vovchuk, S.A. Tretyakov, S.B. Glybovski, and C.R. Simovski. Enhancement of radiation with irregular wire media. *IEEE Transactions on Antennas and Propagation*, 64(12):5469–5474, 2016.
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- [43] S.B. Glybovski, S.A. Tretyakov, P.A. Belov, Y.S. Kivshar, and C.R. Simovski. Metasurfaces: From microwaves to visible. *Physics Reports*, 634:1–72, 2016.
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- [46] S. Kosulnikov, D. Filonov, S. Glybovski, P. Belov, S. Tretyakov, and C. Simovski. Wire-medium hyperlens for enhancing radiation from subwavelength dipole sources. *IEEE Transactions on Antennas and Propagation*, 63(11):4848–4856, 2015.
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- [51] G. Solomakha, N. Egorova, R. Balafendiev, C. Simovski, and S. Glybovski. Wideband coil based on microstrip line for multi-heteronuclear magnetic resonance spectroscopy. *Journal of Physics: Conference Series*, 2015(1):012146, nov 2021.
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- [53] M A Tumashov, J P del Risco, S B Glybovski, A D Sayanskiy, S A Kuznetsov, and J D Baena. Comparison of angular-selective metasurfaces as tools for sub-thz single-frequency sensing. volume 2015, page 012158. IOP Publishing, nov 2021.
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- [55] M. Sigantov, S. Glybovski, and D. Tatarnikov. A mode decoupling method for circular patch antennas. volume 2015, page 012140. IOP Publishing, nov 2021.
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- [57] G. Solomakha, R. Balafendiev, and S. Glybovski. A method for current phase manipulation in rf-cols for uhf mri using individually driven slots. *AIP Conference Proceedings*, 2300(1):020121, 2020.
- [58] V. Vorobyev, A. Shchelokova, I. Zivkovic, A. Slobozhanyuk, J. D. Baena, J. P. del Risco, R. Abdeddaim, A. Webb, and S. Glybovski. Artificial dielectric for 7t mri. *AIP Conference Proceedings*, 2300(1):020132, 2020.
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- [60] A. Sayanskiy, V. Lenets, S. Kuznetsov, S. Glybovski, and J.D. Baena. Floquet analysis of non-uniform self-complementary metasurface. volume 2300, 2020.
- [61] R. Balafendiev, G. Solomakha, M. Dubois, R. Abdeddaim, C. Simovski, and S. Glybovski. A method for e-field reduction using a surface coil based on three coupled dipoles. volume 2300, 2020.
- [62] K. Lezhennikova, A. Raaijmakers, C. Simovski, R. Abdeddaim, and S. Glybovski. An extended birdcage coil for 7t mri with a high-impedance shield. volume 2300, 2020.
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- [64] G. Solomakha, R. Balafendiev, and S. Glybovski. A method for current phase manipulation in rf-cols for uhf mri using individually driven slots. volume 2300, 2020.
- [65] V.A. Lenets, S.A. Kuznetsov, A.D. Sayanskiy, P.A. Lazorskiy, J.D. Baena, and S.B. Glybovski. Manipulation with terahertz wave fronts using self-complementary metasurfaces. pages 294–296, 2020.
- [66] E.A. Koreshin, M.A. Zubkov, and S.B. Glybovski. Rf-resonator for clinical mr imaging in urology and andrology. volume 1461, 2020.
- [67] O. Yermakov, A. Hurshkainen, D. Dobrykh, P.V. Kapitanova, I.V. Iorsh, S.B. Glybovski, and A.A. Bogdanov. Polarization hybridization of surface waves on anisotropic metasurface. volume 1461, 2020.
- [68] B. Okorn, A. Sayanskiy, V. Lenets, S. Glybovski, and S. Hrabar. Preliminary investigation of b-dot wire concept. 2020.
- [69] V. Lenets, A. Sayanskiy, S. Glybovski, E. Martini, J. Baena, and S. Maci. Investigation of surface waves on anisotropic self-complementary metasurfaces. 2020.
- [70] S. Kurdjumov, L. Ciobanu, B. Djemai, P. Belov, S. Glybovski, E. Nenasheva, A. Webb, M. Moussu, M. Dubois, S. Enoch, and R. Abdeddaim. Efficient probes for ultra-high-field magnetic resonance microscopy based on coupled ceramic resonators. 2019.
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- [72] A.C. Escobar, A. Sayanskiy, J.L. Araque-Quijano, S.B. Glybovski, and J.D. Baena. Quasi-isotropic huygens resonant scatterer in microwaves. pages X053–X055, 2019.
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- [74] A. Sayanskiy, V. Lenets, S. Kuznetsov, S. Glybovski, and J.D. Baena. Self-complementary metasurfaces as efficient tools for polarization sensitive control of thz beams. pages X369–X371, 2019.

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