**ALENA SHCHELOKOVA**

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| Date of birth: 29 January 1991  K. Zaslonova st. 9/29, St. Petersburg, 191119, Russian Federation | Mobile phone:+7 911 014 83 82  a.schelokova@metalab.ifmo.ru |

https://metalab.ifmo.ru/people/~shchelokova

My principal research interests are in the field of applied electromagnetics and photonics with the focus on the investigation and development of novel devices based on metamaterials, particularly applicable for medical imaging. I have authored and co-authored more than 20 scientific contributions published in peer-reviewed journal papers and conference proceedings. I have won several international and local awards, including an SPIE Educational Scholarship, the ISMRM Research Exchange Program and Russian Federation President Scholarship to study abroad. I also contribute to the organization of several annual international conferences and give lectures to senior pupils and Master students.

**EDUCATION BACKGROUND**

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| **Name of organization:** Saint PetersburgNational Research University of Information Technologies, Mechanics and Optics (ITMO University)  **Contact data:** 49 Kronverkskiy av*.*, Saint Petersburg, 197101, Russian Federation  **Website:** <http://en.ifmo.ru/> **Title of qualification:** Ph.D. in Physics  **Title of thesis:** Metasurfaces for controlling near electromagnetic fields with particular applications for magnetic resonance imaging  **Graduation date:** 18.12.2018 | **September 2014 – August 2018** |
| **Name of organization:** ITMO University  **Title of qualification:** MSc in Photonics and Optical Informatics (cum laude)  **Title of thesis: Investigation of hyperbolic metamaterials based on two-dimensional transmission lines** | **September 2012 –**  **June 2014** |
| **Name of organization:** ITMO University  **Title of qualification:** [BSc](https://www.multitran.ru/c/m.exe?a=118&t=1698350_1_2) in Photonics and Optical Informatics (cum laude)  **Title of graduation work:** Modeling of hyperbolic media using artificial transmission lines | **September 2008 –**  **June 2012** |

**ADDITIONAL EDUCATION**

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| **Research Traineeship at the Leiden University Medical Center**  ***research topic ‘Body array coil based on novel materials for***  ***ultra-high field MRI’***  under supervision of Prof. Andrew Webb | **January 9 –**  **April 5, 2019**  Leiden, the Netherlands |
| **Research Traineeship at the Nonlinear Research Centre of**  **Australian National University**  ***research topic ‘******Nonlinear metasurface for applications in***  ***magnetic resonance imaging’***  under supervision of Prof. Ilya Shadrivov | **November 14 –**  **December 17, 2017** Canberra, Australia |
| **Educational intensive courses within ISMRM 25th Annual Meeting & Exhibition (7.5 hours)**  ***‘Physics for Physicists’ & ‘MR Systems Engineering’***  organized by The International Society for Magnetic Resonance in Medicine | **April 22, 2017** Honolulu, USA |
| **Research Traineeship at the Nonlinear Research Centre of**  **Australian National University**  ***research topic ‘Study of metasurfaces for controlling near electromagnetic fields with particular applications for magnetic resonance imaging’***  under supervision of Prof. Ilya Shadrivov | **October 14, 2016 –**  **April 9, 2017**  Canberra, Australia |
| **Pre-EUC Compact Seminar**  ***‘Measurement meets Simulation’***  organized by CST-Computer Simulation Technology | **April 27, 2015**  Darmstadt, Germany |
| **Educational and Research Traineeship at the Department of Radiotherapy,**  **University Medical Centre Utrecht**  ***educational topic ‘Basics of MRI’***  ***research topic ‘Switchable Dipole Antenna for 7 T MRI machine’***  under supervision of Dr. Ir. Nico van den Berg and Dr. Alexander Raaijmakers | **July 26 – August 23,**  **2014**  Utrecht, Netherlands |
| **EUPROMETA – 24th Doctoral School on Metamaterials**  ***‘Metamaterials for microwave components and systems’***  organized by ‘Roma Tre’ University and METAMORPHOSE VI AISBL | **March 24-27, 2014** Rome, Italy |
| **Intensive course *‘MRI Safety and Numerical Simulation’***  organized by Dr. Mikhail Kozlov, MRComp and ITMO University | **October 28-30, 2013**  St. Petersburg, Russia |
| **16th European Doctoral School on Metamaterials**  ***‘Bringing gain to metamaterials’***  operated by the Metamorphose Virtual Institute held in conjunction with the Metamaterials 2010 Congress and co-organized with the Karlsruhe School of Optics & Photonics (KSOP) | **September 17-18, 2010**  Karlsruhe, Germany |

**EMPLOYMENT HISTORY**

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| **Title:** Research Fellow **Work place:** [The International Research Centre for](http://phoi.ifmo.ru/metamaterials/people/index.php) Nanophotonics and Metamaterials, ITMO University  **Contact data:** 14 Birjevaja line V.O., Saint Petersburg, 199034, Russian Federation  **Main activities and responsibilities:** experimental and numerical studies of hyperbolic metamaterials, wire metamaterials and metamaterials for Magnetic Resonance Imaging. | **March 2010 –**  **present time** |

**LIST OF PUBLISHED AND ACCEPTED JOURNAL PAPERS**

14. **Near-field imaging of spin-locked edge states in all-dielectric topological metasurfaces**A. Slobozhanyuk, A. V. Shchelokova, X. Ni, S. H. Mousavi, D. A. Smirnova, P. A. Belov, A.  
Alù, Y. S. Kivshar, A. B. Khanikaev, *Appl. Phys. Lett.*, **114**, 31103 (2019)

[DOI: 10.1063/1.5055601] [IF: 3.411, SJR: 1.132]

13. **Volumetric Wireless Coil Based on Periodically Coupled Split-Loop Resonators for Clinical Wrist Imaging**

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, P.A. Belov, *Magn. Reson. Med.,* **80**, 1726–1737 (2018)

[DOI: [10.1002/mrm.27140](http://onlinelibrary.wiley.com/doi/10.1002/mrm.27140/full)] [IF: 4.082, SJR: 1.867**]**

12. **Mode hopping in arrays of resonant thin wires over a dielectric interface**

S. Kosulnikov, V. Zalipaev, A. Shchelokova, I. Melchakova, S. Glybovski, A. Slobozhanyuk, P. Belov

*Phys. Rev. B*, 98, 174302 (2018)

[DOI: 10.1103/PhysRevB.98.174302] [IF: 3.813, SJR: 1.939]

11. **Magnetic resonance spectroscopy at 1.5 T with a hybrid metasurface**

E. A. Brui, A. V. Shchelokova, A. V. Sokolov, A. P. Slobozhanyuk, A. E. Andreychenko, V. A. Fokin, P. A. Belov, I. V. Melchakova  
*JETP Letters*, **108** (6), 423-427, (2018)

[DOI: <10.1134/S0370274X18180157>][IF: 1.363, SJR: 0.844]

10. **A new quadrature annular resonator for 3 T MRI based on artificial-dielectrics**

A. A. Mikhailovskaya, A. V. Shchelokova, D. A. Dobrykh, I. V. Sushkov, A. P. Slobozhanyuk, A. Webb

*J. Magn. Reson.*,**291**,47-52, (2018)

[DOI: [10.1016/j.jmr.2018.04.010](https://doi.org/10.1016/j.jmr.2018.04.010)][IF: 2.586, SJR: 1.182]

1. **Locally enhanced image quality with tunable hybrid metasurfaces**  
   A.V. Shchelokova, A.P. Slobozhanyuk, I.V. Melchakova, S.B. Glybovski, A.G. Webb, Y.S. Kivshar, P.A. Belov, *Phys. Rev. Appl*., **9**, 014020 (2018)  
   [DOI: 10.1103/PhysRevApplied.9.014020][IF: 4.808, SJR: 2.072]
2. **Impact of wire metasurface eigenmode on the sensitivity enhancement of MRI system**

A.V. Shchelokova, E.I. Kretov, A.P. Slobozhanyuk, *Appl. Phys. Lett.*, **112**, 033501 (2018)

[DOI: [10.1063/1.5013319](https://doi.org/10.1063/1.5013319)][IF: 3.411, SJR: 1.132]

1. **Experimental investigation of a metasurface resonator for *in vivo* imaging at 1.5 T**

A.V. Shchelokova, A.P. Slobozhanyuk, P. de Bruin, I. Zivkovic, E. Kallos, P.A. Belov, A. Webb,

*J. Magn. Reson.*, **286**, 78-81 (2018)

[DOI: [10.1016/j.jmr.2017.11.013](https://doi.org/10.1016/j.jmr.2017.11.013)] [IF: 2.586, SJR: 1.182]

1. **Adjustable subwavelength metasurface-inspired resonator for magnetic resonance imaging**E.A. Brui, A.V. Shchelokova, M. Zubkov, I.V. Melchakova, S.B. Glybovskiy, A.P. Slobozhanyuk,

*Phys. Status Solidi A*,1700788 (2018)   
[DOI: [10.1002/pssa.201700788](http://onlinelibrary.wiley.com/doi/10.1002/pssa.201700788/full)] [IF: 1.775, SJR: 0.69]

1. **Experimental realization of invisibility cloaking**  
   A.V. Shchelokova, I.V. Melchakova, A.P. Slobozhanyuk, E.A. Yankovskaya, C.R. Simovski, P.A. Belov, *Phys. Usp.*,**58**(2), 167-190 (2015)  
   [DOI: [10.3367/UFNe.0185.201502e.0181](https://doi.org/10.3367/UFNe.0185.201502e.0181)] [IF: 2.606, SJR: 0.841]
2. **Magnetic topological transition in transmission line metamaterials**  
   A.V. Shchelokova, D.S. Filonov, P.V. Kapitanova, P.A. Belov, *Phys. Rev. B*, **90**, 115155 (2014)   
   [DOI: [10.1103/PhysRevB.90.115155](http://dx.doi.org/10.1103/PhysRevB.90.115155)] [IF: 3.813, SJR: 1.939]
3. **Effects of discreteness in the Green's function of a hyperbolic medium**  
   A.V. Shchelokova, A.N. Poddubny, P.A. Belov, *Phys. Rev. A*, **90**, 023854 (2014)  
   [DOI: [10.1103/PhysRevA.90.023854](http://dx.doi.org/10.1103/PhysRevA.90.023854)] [IF: 2.991, SJR: 1.647]
4. **Implementations and practical applications of hyperbolic metamaterials (in Russian)**  
   A.V. Shchelokova, P.V. Kapitanova, P.A. Belov  
   *Scientific and Technical Journal of Information Technologies, Mechanics and Optics*, **2**, 23-31 (2014)

[<http://ntv.ifmo.ru/en/article/9370/metody_realizacii_i_prakticheskoe_primenenie_giperbolicheskih_metamaterialov.htm>]

1. **Hyperbolic transmission-line metamaterials**  
   A.V. Chshelokova, P.V. Kapitanova, A.N. Poddubny, D.S. Filonov, A.P. Slobozhanyuk, Y.S. Kivshar, P.A. Belov, *J. Appl. Phys.*, **112**, 073116 (2012)  
   [DOI: [10.1063/1.4758287](https://doi.org/10.1063/1.4758287)] [IF: 2.185, SJR: 0.773]

**LIST OF REFEREED PROCEEDINGS AND ORAL PRESENTATIONS**

15. **In Vivo Magnetic Resonance Imaging of Human Knee with Metasurface**

A. V. Shchelokova, A. P. Slobozhanyuk, S. Saha, I. Sotiriou, M. Koutsoupidou, G. Palikaras, E. Kallos, P. A. Belov, A. Webb

*Progress In Electromagnetics Research Symposium - Spring (PIERS), 2017*

[DOI: [10.1109/PIERS.2017.8262393](https://doi.org/10.1109/PIERS.2017.8262393)]

14. **Metasurface-based wireless coils for magnetic resonance imaging**

A.V. Shchelokova, D.A. Dobrykh, A.P. Slobozhanyuk, S.B. Glybovski, M.A. Zubkov, E.A. Brui, I.V. Melchakova, P.A. Belov   
*2017 IEEE International Conference on Microwaves, Antennas, Communications and Electronic Systems* (2017)[DOI: [10.1109/COMCAS.2017.8244854](https://doi.org/10.1109/COMCAS.2017.8244854)]

13. **A metasolenoid-like resonator for MRI applications**

A.V. Shchelokova, D.A. Dobrykh, S.B. Glybovski , I.V. Melchakova, P.A. Belov  
*Engineered Materials Platforms for Novel Wave Phenomena (Metamaterials), 2017 11th International Con*, 82-84 (2017)  
[DOI: [10.1109/MetaMaterials.2017.8107846](https://doi.org/10.1109/MetaMaterials.2017.8107846)]

12. **Enhancement of magnetic resonance imaging with metasurfaces: From concept to human trials**  
A. Shchelokova, R. Schmidt, A. Slobozhanyuk, T. Kallos, A. Webb, P. A. Belov  
*Proc. of 11th International Congress on Engineered Materials Platforms for Novel Wave Phenomena* (2017) [DOI: [10.1109/MetaMaterials.2017.8107800](https://doi.org/10.1109/MetaMaterials.2017.8107800)]

1. **Tunable hybrid metasurfaces for MRI applications**A.V. Shchelokova, A.P. Slobozhanyuk, I.V. Melchakova, S.B. Glybovski, A.G. Webb, Y.S. Kivshar, P.A. Belov  
   *AIP Conference Proceedings,* **1874**,30033 (2017)  
   [DOI: [10.1063/1.4998062](https://doi.org/10.1063/1.4998062)] [SJR: 0.163]
2. **Safety Aspects of the Metamaterial Resonator for Application in Magnetic Resonance Imaging**

A.V. Shchelokova, A.P. Slobozhanyuk, S.B. Glybovski, I.V. Melchakova, P.A. Belov

*2016 IEEE International Symposium on Antennas and Propagation (APSURSI)*, 1397-1398 (2016)

[DOI: [10.1109/APS.2016.7696405](https://doi.org/10.1109/APS.2016.7696405)]

9. **Advanced electromagnetic materials for magnetic resonance imaging**  
A. P. Slobozhanyuk, A. V. Shchelokova, P. A. Belov  
*IEEE Radio and Antenna Days of the Indian Ocean (RADIO)*

(2016)  
[DOI: [10.1109/RADIO.2016.7772007](https://doi.org/10.1109/RADIO.2016.7772007)]

8. **Usage of meta-resonators for improvement of magnetic resonance imaging**  
A.V. Shchelokova, A.N. Poddubny, A.P. Slobozhanyuk  
*Days on Diffraction (DD)*, 1-3 (2015)   
[DOI: [10.1109/DD.2015.7354880](https://doi.org/10.1109/DD.2015.7354880)]

1. **Annular wire metamaterial resonators for Magnetic Resonance Imaging**  
   A.V. Shchelokova, A.P. Slobozhanyuk, I.V. Melchakova, A.N. Poddubny, Yu.S. Kivshar, P.A. Belov, A.J.E. Raaijmakers, C.A.T. van den Berg  
   *Microwave and Optoelectronics Conference (IMOC), 2015 SBMO/IEEE MTT-S International*, 1-3 (2015)

[DOI: [10.1109/IMOC.2015.7369199](https://doi.org/10.1109/IMOC.2015.7369199)]

1. **Capacitively-loaded metasurfaces and their application in magnetic resonance imaging**  
   S.B. Glybovski, A.V. Shchelokova, A.V. Kozachenko, A.P. Slobozhanyuk, I.V. Melchakova, P.A. Belov, A.V. Sokolov, A.Yu. Efimtcev, V.A. Fokin  
   *Radio and Antenna Days of the Indian Ocean (RADIO)*, 1-2 (2015) [DOI: [10.1109/RADIO.2015.7323400](https://doi.org/10.1109/RADIO.2015.7323400)]
2. **Transmission-Line Metamaterials with Topological Transitions**

A.V. Shchelokova, D.S. Filonov, P.V. Kapitanova, A.N. Poddubny, P.A. Belov, Y.S. Kivshar

*Radio and Antenna Days of the Indian Ocean (RADIO) 2014*, 07.04.14-10.04.14, Mauritius .

1. **Discrete Ripples in Green Function of Hyperbolic Medium**

A.V. Shchelokova, A.N. Poddubny, P.A. Belov

*Days on Diffraction’2014*, 26.05.14-30.05.14, St. Petersburg, Russia.

3. **Hyperbolic Metamaterials with Topological Transitions**

A. V. Chshelokova, D. S. Filonov, P. V. Kapitanova, A. N. Poddubny, A. P. Slobozhanyuk, Yu. S. Kivshar, P. A. Belov

*Days on Diffraction’2013*, 27.05.13-31.05.13, St. Petersburg, Russia.

2. **Modeling of hyperbolic metamaterials with two-dimensional transmission lines**  
A.V. Chshelokova, P.V. Kapitanova, A.N. Poddubny, P.A. Belov, Y.S. Kivshar  
*Microwave Integrated Circuits Conference (EuMIC)*, 838-840 (2012)  [<http://ieeexplore.ieee.org/document/6483931/>]

1. **Hyperbolic Metamaterials formed by artificial transmission lines**

A.V. Chshelokova, P.V. Kapitanova, A.N. Poddubny, P.A. Belov, Y.S. Kivshar

*Days on Diffraction’2012*, 28.05.12-01.06.12, St. Petersburg, Russia.

**PATENTS**

Patent for utility model №183997, ‘RF coil for magnetic resonance imaging’,

the authors A.P. Slobozhanyuk, A.V. Shchelokova, S.B. Glybovski, A.A. Hurshkainen, P.A. Belov, M.R.B. Abdeddaim, S. Enoch, A.V. Nikulin (2018) <https://patents.google.com/patent/RU183997U1/ru>

**SCHOLARSHIPS/FELLOWSHIPS/AWARDS**

22. **St. Petersburg Government Fellowship** for Ph.D. students (Russia, 2018)

21. **The IEEE Photonics Society 2018 Graduate Student Fellowship** (USA, 2018)

20**. Best Student Paper Award** (Second Prize) for the paper ‘Metasurfaces for Improvement Magnetic Resonance Imaging Characteristics: Novel Designs and In Vivo Studies’ at the Progress In Electromagnetics Research Symposium (PIERS 2018), 01-04 August 2018, Japan.

19. **The ISMRM Magna Cum Laude Merit Award** for work entitled ‘Demonstration of a new volumetric wireless coil for extremities imaging’ presented at the Joint Annual Meeting ISMRM-ESMRMB, 16-21 June 2018, Paris, France.

18. **ISMRM Research Exchange Grant**(US$ 5,000; 2018): research traineeship in Leiden University Medical Centre for the period of three months.

17. **ISMRM Educational Stipend and conference fee grant** for students on joint Annual Meeting ISMRM-ESMRMB, 16-21 June 2018, Paris, France.

16. **Physical Review Journals Best Poster Award** for work entitled ‘A Metasolenoid-like Resonator for MRI Applications’ presented at the 11th International Congress on Engineered Material Platforms for Novel Wave Phenomena*–*Metamaterials' 2017, 28-31 August 2017, Marseille, France.

15.**The ISMRM Summa Cum Laude Merit Award** for work entitled ‘Wireless coil based on meta technologies for MRI implementations’ presented at the ISMRM 25th Annual Meeting, 22-27 April 2017, Honolulu, USA.

14. **ISMRM Educational Stipend and conference fee grant** for students on ISMRM 25th Annual Meeting & Exhibition, 22-27 April 2017, Honolulu, USA.

13. **Russian Federation President Scholarship to study abroad** (US$ 11,350; Russia, 2016): research traineeship in Australian National University, Canberra for the period of six months.

12. **State Scholarship** (Russia, September 2014 – August 2018).

11. **Best Student Paper Award** (Third Prize)for the paper ‘Annular Wire Metamaterial Resonators for Magnetic Resonance Imaging’ at the International Microwave and Optoelectronic conference (IMOC 2015), 03-06 November 2015, Brazil.

10. **Best Student Paper Award** (First Prize)for the paper ‘Transmission-line metamaterials with topological transitions’ at the International conference Radio and Antenna Days of the Indian Ocean (RADIO 2014), 07-10 April 2014, Mauritius.

9.**Travel grant** for students on EUPROMETA – 24th Doctoral School on Metamaterials, 24-27 March 2014, Rome, Italy.

8.**Travel and conference fee grant** for students on 42nd European Microwave Conference (Amsterdam 2012, The Netherlands)

7. **Russian Federation President Scholarship** for students **2013 (Russia, Sept. 2013 – Aug. 2014)**

6. **SPIE Optics & Photonics Education Scholarship** 2013 (USA, 2013)

5. **‘Dynasty’ Foundation Scholarship** for students 2013 (Russia, Jan. 2013 – Dec. 2014)

4. **Best Student Paper Award** at the ‘Photonics and Optical Information Technologies’ workshop of the ‘I Russian Congress of young scientists’ (Russia, 2012).

3. **ITMO University Distinguished** **Bachelor's Thesis Award** in the Physical Sciences/Engineering (Russia, 2012).

2. **ITMO University scholarship** **for excellent achievement in scientific research** (Russia, Sept. 2012 – Dec. 2013)

1. **St. Petersburg Government Scholarship** (Russia, Sept. 2010- Jun. 2011)

**MEMBERSHIPS**

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| A trainee member of the International Society for Magnetic Resonance in Medicine (ISMRM)  <https://www.ismrm.org/>  *ID: 85083* | **2017 –**  **present time** |
| A student member of The International Society for Optics and Photonics (SPIE)  <http://spie.org/?SSO=1>  *ID: 3519915* | **2013 – 2018** |
| A student member of The Institute of Electrical and Electronics Engineers (IEEE)  <https://www.ieee.org/index.html?WT.mc_id=head_bm>  *ID: 91247325* | **2011 – 2018** |

**TEACHING AND SUPERVISING EXPERIENCE**

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| L[ecture](http://www.multitran.ru/c/m.exe?t=4622928_1_2&s1=%F7%E8%F2%E0%F2%FC%20%EB%E5%EA%F6%E8%E8) on Invisibility and cloaking within the course Metamaterials  (Master's degree program ‘Nanophotonics and Metamaterials’, ITMO University) | **February 2016** |
| L[ectures](http://www.multitran.ru/c/m.exe?t=4622928_1_2&s1=%F7%E8%F2%E0%F2%FC%20%EB%E5%EA%F6%E8%E8) on Scientific career (Business ethics) within the course Metamaterials  (Master's degree program ‘Nanophotonics and Metamaterials’, ITMO University) | **fall semester of** **2015, 2016** |
| Supervising of MSc student Anna Mikhailovskaya  (<https://metalab.ifmo.ru/people/~mikhailovskaya>)  Research topic: ‘New hybrid radio-frequency devices based on metamaterials and high permittivity materials for magnetic resonance imaging’ | **December 2016–**  **present time** |

**REFERENCES:**

**Prof. Pavel A. Belov**,

Dean of Physics and Engineering Faculty,

Head of Department of Nanophotonics and Metamaterials,

Head of Metamaterials Laboratory [http://metalab.ifmo.ru](http://metalab.ifmo.ru/)

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**LANGUAGES**

* Russian: native speaker
* English: upper intermediate