

Date of birth: 8 February 1994

Daria Markina

📞 mobile: +79213369288

✉ daria.markina@metalab.ifmo.ru

Scopus: [Daria I. Markina](#)

Google Scholar: [Daria Markina](#)

Education

- 2018 – Autumn 2022 **ITMO University St. Petersburg, Russia**
PhD in Optics
Research project: CsPbX₃ perovskite nanostructures generating laser emission in the visible wavelength range
- 2016 – 2018 **Peter The Great St.Petersburg Polytechnic University St. Petersburg, Russia**
MSc in Applied Physics
- 2012 – 2016 **Peter The Great St.Petersburg Polytechnic University St. Petersburg, Russia**
BSc in Applied Physics

Additional education and traineeships

- November 2, 2020 – May 2, 2021 **Laser research center, Vilnius University, Vilnius, Lithuania**
Research topic: "Investigation of photophysical properties of lasing nanostructures based on lead halide perovskites" under the supervision of prof. M. Vengris
- March 24 – April 21, 2019 **The State Research Institute of Physical and Technological Sciences (FTMC), Vilnius, Lithuania**
Research topic: "Optical and structural characterization of perovskite nanostructures of different stoichiometry" under the supervision of Dr. Marius Franckevičius
- November 17 – November 25, 2019 **CSIR – National Institute for Interdisciplinary Science and Technology (NIIST), Trivandrum, India**
Topic: "Synthesis of lead-halide perovskite nanostructures in low-dimensional optical grating" under the supervision of Dr. Vijayakumar C. Nair
- July 1 – August 31, 2018 **NIM Summer Research Program, Photonics and Optoelectronics Group, LMU Munich, Munich, Germany**
Research topic: "Nonlinear optical properties of halide perovskite nanocrystals with different size and passivation" under the supervision of Dr. A. Manzi, prof. J. Feldmann
- July 1 – July 11, 2017 **Short-term course on nanotechnology, Slovak University of Technology in Bratislava (STU), Bratislava, Slovakia**

Employment history

- June 2018 – Present **Laboratory of Hybrid Nanophotonics and Optoelectronics**
Faculty of Physics and Engineering, ITMO University – Junior Researcher
- November 2016 – June 2018 **Material Dynamics Laboratory**
Ioffe Institute of the Russia Academy of Science – Laboratory Assistant

Skills

- English** Advanced (C1)
- Methods and techniques**
- Perovskite nanostructures synthesis (including working in glove-box)
 - Laser spectroscopy (working with pulse and CW lasers and high-resolution spectrometers)
 - Optical dark-field spectroscopy
 - Raman spectroscopy
 - Back focal plane microscopy
 - Atomic force microscopy
 - Development and assembly of custom experimental setups
- Tools**
- MatLab
 - LaTeX
 - COMSOL Multiphysics
 - CST Microwave Studio
 - OriginLab

Publications and accepted journal papers

1. Gallium Phosphide Nanowires in a Free-Standing, Flexible, and Semitransparent Membrane for Large-Scale Infrared-to-Visible Light Conversion, V. V. Fedorov, A. Bolshakov, O. Sergaeva, V. Neplokh, D. Markina, S. Bruyere, G. Saerens, M. I. Petrov, R. Grange, M. Timofeeva, S. V. Makarov, I. S. Mukhin, **ACS Nano**, 14(8), 10624–10632 (2020) [IF = 14.588]
2. Efficient emission outcoupling from perovskite lasers into highly directional and long-propagation-length Bloch surface waves, K.R. Safronov, A.A. Popkova, D.I. Markina, A.P. Pushkarev, S.V. Makarov, V.O. Bessonov, A.A. Fedyanin. **Laser & Photonics Reviews**, (2022) accepted [IF = 13.138]
3. Single-step Microfluidic Synthesis of Halide Perovskite Nanolasers in Suspension, I. Koryakina, M. Naumochkin, D. Markina, S. Khubezhov, A. Pushkarev, A. Evstrapov, S. Makarov, M. Zyuzin. **Chem. Mater.**, 33(8), 2777–2784 (2021) [IF = 9.567]
4. A Few-Minute Synthesis of CsPbBr₃ Nanolasers with a High Quality Factor by Spraying at Ambient Conditions, A. P. Pushkarev, V. I. Korolev, D. I. Markina, F. E. Komissarenko, A. Naujokaitis, A. Drabavičius, V. Pakštis, M. Franckevičius, S. A. Khubezhov, D. A. Sannikov, A. V. Zasedatelev, P. G. Lagoudakis, A. A. Zakhidov, S. V. Makarov. **ACS Appl. Mater. Inter.**, 11(1), 1040-1048 (2019) [IF = 8.758]
5. Excitonic versus Free-Carrier Contributions to the Nonlinearly Excited Photoluminescence in CsPbBr₃ Perovskites, D. Khmelevskaia*, D.I. Markina*, P.A. Tonkaev, M. Masharin, A. Peltek, P. Talianov, M. A. Baranov, A. Nikolaeva, M.V. Zyuzin, L.E. Zelenkov, A.P. Pushkarev, A.L. Rogach, S.V. Makarov. **ACS Photonics**, 9 (1), 179-189 (2021) [IF = 8.31]
6. Perovskite nanowire lasers on low-refractive-index conductive substrate for high-Q and low-threshold operation, D.I. Markina, A. P. Pushkarev, I. I. Shishkin, F. E. Komissarenko, A. S. Berestennikov, A. S. Pavluchenko, I. P. Smirnova, L. K. Markov, M. Vengris, A. A. Zakhidov, S. V. Makarov. **Nanophotonics**, 9(12), 3977–3984 (2020) [IF = 7.491]
7. Recrystallization of CsPbBr₃ Nanoparticles in Fluoropolymer Nonwoven Mats for Down- and Up-Conversion of Light, V. Neplokh, D. I. Markina, M. Baeva, A. M. Pavlov, D. A. Kirilenko, I. S. Mukhin, A. P. Pushkarev, S. V. Makarov, A. A. Serdobintsev. **Nanomaterials**, 11(2), 412 (2021) [IF = 4.034]
8. Directly grown crystalline gallium phosphide on sapphire for nonlinear all-dielectric nanophotonics, D. Khmelevskaia*, D.I. Markina*, V.V. Fedorov, G.A. Ermolaev, A.V. Arsenin, V.S. Volkov, A.S. Goltaev, Yu. M. Zadiranov, I.A. Tzibizov, A.P. Pushkarev, A.K. Samusev, A.A. Shcherbakov, P.A. Belov, I.S. Mukhin, S.V. Makarov. **Appl. Phys. Lett.**, 118, 201101 (2021) [IF = 3.597]

9. Photophysical properties of halide perovskite $\text{CsPb}(\text{Br}_{1-x}\text{I}_x)_3$ thin films and nanowires, [D.I. Markina](#), E. Yu. Tiguntseva, A.P. Pushkarev, M.A. Samsonov, M. Vengris, B. Munkhbat, T. Shegai, G.B. Hix, A.A. Zakhidov, S.V. Makarov, **J. Lumin.**, 20, 116985 (2020) [IF = 3.280]

Patents and textbook

1. **Patent RUS 2705082** "Method of fabrication of inorganic perovskite nanowhiskers of the CsPbBr_3 type" A.P. Pushkarev, [D.I. Markina](#), V.I. Korolev, S.V. Makarov
2. K.S. Frizyuk, [D.I. Markina](#). **General physics. Optics: Study guide.**- St. Petersburg: ITMO University, p. 57 (2020)

Scholarships, grants and awards

- May 20, 2021 **SPIE Optics and Photonics Education Scholarship**
- 2020-2021 **Scholarship of the President of Russian Federation for study abroad**
Research traineeship in Laser Research Center of Vilnius University (Vilnius, Lithuania) for the period of six months
- 2021-2023 **Scholarship of the President of Russian Federation for young scientists and graduate students**
- 2020-2022 **Grant of Russian Fund of Fundamental Research for the best fundamental research projects carried out by young scientists in graduate school No.20-33-90212** Lead halide perovskite nanolasers for optical sensing of low-concentration vapors of organic solvents. Principal investigator
- November 29, 2019 **Best oral presentation** at XI Nation Conference on Physics of Semiconductors and Nanostructures, Semiconductor Optoelectronics and Nanoelectronics, St. Petersburg, Russia
- 12 December, 2019 **Best poster** at School on Advanced Light-emitting and Optical Materials (SLALOM), St. Petersburg
- July 1, 2018 **Research Award for the 11th NIM Research Program 2018 at the Nanosystems Initiative Munich (NIM)**. Award covered the full tuition fee, the cost of accommodation, and travel expenses.

Teaching and supervision experience

- Spring semester 2019, 2020 Lecturer assistant within the course "Additional physics sections" (optics and quantum mechanics) for bachelor students.
- May 2020 - June 2021 Supervision of MSc student Daria Khmelevskaia with research topic "Enhanced up-conversion photoluminescence efficiency from halide perovskites materials coupled with resonant nanostructures"

Volunteering

- September 14-18, 2020 Assistance in organizing of V International Conference on Metamaterials and Nanophotonics "METANANO 2020"
- March 2017 - January 2020 Presenter of the scientific shows for kids in the project "Smart Petersburg" <https://sciencely.ru/>
- June, 2017 Organization of an excursion to the laboratory of optical holography (Peter The Great St. Petersburg Polytechnic University) for schoolchildren as part of the "Smart Petersburg" summer camp