

Daria Barma

 @DariaBarma |  dashabarma@mail.ru

Summary

Master's degree graduate of the Skolkovo Institute of Science and Technology with honors (2023), 3 years of work experience in the laboratory of the Russian Academy of Sciences, 2 scientific publications, work on a joint program with IPG Photonics. Technical skills: Solidworks, Matlab, Python, Origin. Research interests: computational material science, nonlinear optical materials.

Education

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|----------------|--|----------|
| 2023 - present | PhD Skolkovo Institute of Science and Technology Program "Material Science and Engineering" | |
| 2021 - 2023 | MSc Skolkovo Institute of Science and Technology Program "Photonics and Quantum Materials" | 5.0/5.0 |
| 2017 - 2021 | BSc, Bauman Moscow State Technical University, Laser and Optoelectronic Systems Department | 4.78/5.0 |

Skills

Programming: Matlab, Python
Engineering programs: Autocad, Solidworks
Specialized programs: Zemax, Origin, VASP, LCD TDK
Additional programs: Photoshop, Figma
Language skills: Russian, English (C1)

Experience

Co-founder of Fiber Pipe startup, (2024 - present time)

Skolkovo Institute of Science and Technology, Moscow region, Russia (2024- present tme)

Research Intern at the Materials Discovery Laboratory,

Project: Prediction, design and synthesis of new borate nonlinear optical crystals;

Contribution to the work: construction of database with borate-based nonlinear optical crystals with outlined properties: susceptibility optical coefficient of the second order and birefringence. These parameters were calculated for previously unexplored materials.

Co-founder of Fiber Flight startup, Skolkovo Foundation resident (2023 - present time)

IPG Photonics, Fryazino, Moscow region, Russia (2022 - 2023)

Joint program with IPG Photonics,

Industrial Imerrision (June - July 2022) in the Metrology laboratory

Project: Calculation of properties of nonlinear crystals using specialized software (VASP), during the practice, measurements of crystal parameters were carried out using devices such as a spectrophotometer, ellipsometer, diffractometer, and optical electron microscope.

Results: it was shown that theoretical calculations make it possible to predict the properties of nonlinear materials with high accuracy; the results were compared with experiment and literature data. In this way, it is possible to reduce the cost of producing new materials by calculating their properties as an initial stage of research.

Federal Research Center "Crystallography and Photonics" RAS, Moscow, Russia (2020 - 2023)

Junior engineer in the Crystallography laboratory.

Projects: Development of diffraction gratings based on liquid crystals; Preparation of a deformed lying helix in a chiral LC on a periodically aligned surface prepared by two-step optical processing; Creation of Dammann diffraction gratings using a combined method of photoalignment and ion beam etching.

Results: The result of the first project is the defense of an excellent thesis on the topic of undergraduate work and the publication of an article in a Russian journal. The second project also resulted in the publication of an article in the journal Liquid Crystals. The result of the third project is the preparation for publication of an article and a report on the RSF grant.

Contribution to the work: mathematical modeling of the distribution of the liquid crystal director and the diffraction properties of the stated structures, as well as the preparation of experimental samples.

Publications

- A. R. Geivandov; I. V. Simdyankin; **D. D. Barma**; N. M. Shtykov; S. P. Palto, "High-quality deformed lying helix in chiral LC on surface with periodic alignment prepared by two-step optical treatment", Liquid Crystals, (2022)
- **D. D. Barma**, A. R. Geivandov and D. G. Denisov, "Development of diffraction gratings based on liquid crystals", Advances in Applied Physics, 2(9), 144-152 (2021)

Honors/ Awards

- Winner as part of the Fiber Pipe team of the Energotechnohub Incubator (2024)
- 3rd place in TriplePoint Accelerate'24 competition, Energy and ESG track (2024)
- Scholarship for Development, E&I track (2024)
- 2nd place in TriplePoint PITCH'23 competition, Energy and ESG track (2023)
- Winner of the student scientific work competition Institute of Crystallography and Photonics RAS (2022)
- Winner of the third prize in the student scientific competition of the Institute of Crystallography and Photonics of the Russian Academy of Sciences (2021)
- Winner of the "Student Scientific Spring" conference (2021)
- Winner of the Exhibition "Polytechnics" (2020)

Conferences

- XV exhibition "Polytechnic", Moscow, Oral online session (2020)
- X International Conference on Photonics and Information Optics, Moscow, Poster session (2021)
- All-Russian Conference "Student Scientific Spring", Moscow, Oral session (2021)
- All-Russian scientific conference with international participation "Nevskaya Photonics - 2023", Oral session (2023)

Grants

- Participation as a researcher in grant No. 18-12-00361 of the Russian Science Foundation (RSF) "Optical metasurfaces with high-speed liquid crystal control", 2021-2022.
- Participation as an executor in research grant No. 23-42-00091 of the Russian Science Foundation (RSF) "Maximally chiral linear and nonlinear transformations of light by quasi-bound states in the continuum of dielectric metasurfaces," 2023-2026.
- Participation as an executor in research grant No. 1-RSCF-6064 "Prediction, design and synthesis of new borate nonlinear optical crystals", 2023-2025.