TATIANA KARPOVA

karpova.tk@phystech.edu ◇ github.com/ithilwing ◇ +7(901)704-76-99

SKILLS

Languages	Russian (native), English (C1), German (B1)
Programming	C++, Mathematica, Python
Engineering	Arduino, 3D modelling, soldering
Lab work	assembling fiber laser systems (fusion splicing, cleaving), experimental data processing (Origin, Mathematica), preparing biological tissues samples (NADH-dehydrogenase dyeing, cutting with microtome), testing medical laser systems

EDUCATION

Moscow Institute of Physics and Technology
Phystech-School of Electronics, Photonics and Molecular Physics
B.Sc. in Applied Mathematics and Physics GPA: 8.46/10.0 *September 2016 – June 2020*
M.Sc. in Fiber and Laser Optics GPA: 8.57/10.0 *September 2020 – Present*

General physics: mechanics, thermodynamics & molecular physics, electricity & magnetism, optics, quantum physics, solid state physics
Mathematics: calculus, linear algebra, probability theory, differential equations, mathematical physics equations
Theoretical physics: field theory, quantum mechanics, statistical physics
Faculty courses: general chemistry, vaccuum electronics, quantum electronics, photonics

Photonics department, MIPT *September 2019 – Present*
Partner company: IPG Photonics (NTO IRE-Polus)
Thesis topic: Mathematical modeling of thermal processes in biological tissues under the conditions of heating by laser radiation
Special courses: fiber lasers, non-linear optics, mathematical modelling in photonics, laser-tissue interactions, optical communications

WORK EXPERIENCE

Laboratory of Biophotonics, Photonics department, MIPT *September 2019 – Present*
Junior researcher

Research on interaction of infrared laser radiation with biological tissues: measuring optical properties of turbid media during infrared laser irradiation, modelling of thermal processes in biological tissues during heating

Publications

- **T. K. Karpova**, N. V. Kovalenko, G. A. Aloian and O. A. Ryabushkin, "Determination of egg yolk optical properties at various temperatures using modified integrating spheres method,"2020 International Conference Laser Optics (ICLO), 2020, pp. 1-1 (see poster)
- Ivan Khramov, Renat Shaidullin, Nikita Kovalenko, Renata Ismagilova, **Tatiana Karpova**, and Oleg Ryabushkin "Modeling of optical absorption and scattering of laser radiation in silicone polymers used in fiber optics Proc. SPIE 11783, Modeling Aspects in Optical Metrology VIII, 1178306 (20 June 2021)

· *Projects*

- Laser-Tissue Interaction Engine (C++, based on multilayer Monte Carlo and inverse adding-doubling algoritms) for moveable integrating spheres (see github project)
- Moveable integrating spheres setup for measuring steady-state and dynamical optical properties of biological tissues (designing optical and electrical circuits, modelling and assembling setup details)

Medtronic Russia *July 2020 – June 2021*
Web & Digital intern

Web design (medtronic.ru website), website traffic analysis

Laboratory of Nanocarbon Materials, MIPT *September 2018 – May 2019*
Trainee

Research on low-dimensional materials (graphene, carbon nanotubes, fullerens, gallium selenide): working with laboratory equipment (Raman spectrograph, spectrophotometer, thermogravimeter); processing of experimental results