

Ivan Toftul

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Born: 24 March 1994, Volgograd, Russia
Citizenship: Russian
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| Basic info

PhD student in Theoretical Optics, [Faculty of Physics and Engineering @ ITMO University](#).
Advised by [Mihail Petrov](#).

| Research interests

Theoretical Nanophotonics, Spin and Angular Momentum, Optical and Acoustical Force, Metamaterials and Metasurfaces, Acoustics.

| Scientific tools

- Pen and paper
- Direct coding (Python, Julia, etc)
- COMSOL Multiphysics

| Education

2018 - now **PhD in Optics**
ITMO University, St. Petersburg, Russia
Optical torque and force, mode decomposition approach, orbital and spin momentum

2016 - 2018 **Master in Theoretical Physics**
Academic University, St. Petersburg, Russia
Theoretical physics, quantum optics, optical forces

2012 - 2016 **Bachelor in Physics**
Volgograd State Technical University, Volgograd, Russia
Plasma physics, numerical experiments

| Languages

- **Human**
Russian (native), English (fluent), Japanese (basic)
- **Machine**
Python, Julia, bash, gnuplot, C/C++, Matlab, Mathematica, Markdown, \LaTeX

Internships

2019 **RIKEN** (Tokyo, Japan) — Theoretical Quantum Physics Laboratory
(for 6 month) **Project:** Acoustic force and torque and its connection with canonical momenta
*Hosting professor: **Franco Nori***
*Local scientific adviser: **Konstantin Bliokh***

2018 **OIST** (Okinawa, Japan) — Light-Matter Interactions Unit
(for 6 month) **Project:** Optical force and torque near nanofibers. SAM and OAM of fiber modes
*Hosting professor: **Sile Nic Chormaic***
*Local scientific advisers: **Viet Giang Truong** and **Fam Le Kien***

Work experience

2017 - now Research assistant @ ITMO University

2014 - 2015 Research assistant @ Volgograd State Technical University

Publications & Conferences

• Papers

1. [Toftul ID](#), Bliokh KY, Petrov MI, Nori F. Acoustic Radiation Force and Torque on Small Particles as Measures of the Canonical Momentum and Spin Densities. **Physical Review Letters**. 123, 183901 (2019).
2. [Toftul ID](#), Kornovan DF, Petrov MI. Self-trapped nanoparticle binding via waveguide mode. arXiv preprint arXiv:1905.13039. 2019 May 30. (accepted to ACS Photonics)
3. Tkachenko G, [Toftul I](#), Esporlas C, Maimaiti A, Kien FL, Truong VG, Chormaic SN. Light-induced rotation of dielectric microparticles around an optical nanofiber. arXiv preprint arXiv:1907.13363. 2019 Jul 31 (accepted to Optica).
4. Kostina N, Petrov M, Ivinskaya A, Sukhov S, Bogdanov A, [Toftul I](#), Nieto-Vesperinas M, Ginzburg P, Shalin A. Optical binding via surface plasmon polariton interference. **Physical Review B**. 2019 Mar 13;99(12):125416.

• Proceedings

1. Truong VG, [Toftul ID](#), Le Kien F, Petrov MI, Chormaic SN. Angular momenta and negative azimuthal forces induced on a particle via guided light in ultrathin optical fibers. In *Optical Manipulation and Its Applications 2019* Apr 15 (pp. AM3E-5). Optical Society of America.
2. Kornovan DF, [Toftul ID](#), Chebykin AV, Petrov MI, Iorsh IV. Temporal dynamics of a quantum emitter with multiple excited states in the vicinity of an anisotropic metasurface. In *Journal of Physics: Conference Series 2018* Sep (Vol. 1092, No. 1, p. 012063). IOP Publishing.
3. [Toftul ID](#), Kornovan DF, Petrov MI. Particle binding over a nanofiber. In *Journal of Physics: Conference Series 2018* Mar (Vol. 993, No. 1, p. 012019). IOP Publishing.
4. [Toftul ID](#), Bogdanov AA, Petrov MI. The motion of nanoparticles under the non-conservative forces mediated by surface plasmon polaritons. In *Journal of Physics Conference Series 2017* Nov (Vol. 917, No. 6).
5. [Toftul I.D.](#) Simulation of hot plasma in GDL setup using molecular dynamics approach / I. D.Toftul, D. G. Kovtun //VNKSF-22 (Rostov-on-Don, 2016). — pp. 215–216. (no DOI, in Russian)

6. **Toftul I.D.** Simulation of blood flow in vessel with considering turbulation effects / I. D. Toftul, N. V. Gretsova //VNKSF-20 (Izhevsk, 2014) — pp. 389–390. (no DOI, in Russian)

- **Conferences & Schools**

2019

1. [ONNA: Optical Nanofibre Applications.](#)
2. [Conference on Nanophotonics: Foundations & Applications.](#)

2018

1. [International Winter School on Physics of Semiconductors.](#)
2. ITMO Summer school on photonics.
3. [Okinawa School in Physics: Coherent Quantum Dynamics.](#)
4. [JSAP photonics annual meeting.](#)

2017

1. [4th International School and Conference “St. Petersburg OPEN 2017”.](#)
2. [International Winter School on Physics of Semiconductors.](#)
3. [XIX All-Russian Youth Conference on the Physics of Semiconductors and Nanostructures, Semiconductor Opto-and Nanoelectronics.](#)

< 2017

1. [VNKSF22, 2016 \(Rostov-on-Don\).](#)
2. [VNKSF20, 2014 \(Izhevsk\).](#)

- **DOI of all papers & proceedings**

1. 10.1103/PhysRevB.99.1254162.
2. 10.1088/1742-6596/1092/1/0120633.
3. 10.1088/1742-6596/993/1/0120194.
4. 10.1088/1742-6596/917/6/062056.
5. 10.1021/acsp Photonics.9b01157
6. 10.1103/PhysRevLett.123.183901

| **Hobbies and passions**

Science, Photography, GNU/Linux, Theater (watch and play), Cosplay