
Martin Sandomirskii

Born: 20 March, 2003, Tel Aviv-Yafo, Israel

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My research interests span a broad spectrum of topics in applied nanophotonics with the main focus on the development of systems for optical anti-counterfeiting as well as chiral biosensing. To this date, I have already co-authored several scientific contributions published in peer reviewed journal papers and conference proceedings.

Education

Undergraduate student, Department of Physics and Engineering, ITMO University

Sep 2021 – Present

Third year bachelor student, Faculty of Physics

Presidential Physics and Mathematics Lyceum 239

Sep 2017 – Jul 2021

Graduated with honors

Work Experience

Laboratory assistant, Department of Physics and Engineering, ITMO University

Feb 2022 – Present

Optical laboratory

Professional Interests

All-dielectric nanophotonics, Plasmonics, Hybrid nanostructures, Biosensing, Physical unclonable functions, Structural coloration, Dewetting, Acoustic levitation, Machine learning

Professional Skills

Modeling in COMSOL Multiphysics of light scattering on nanostructures and metasurfaces.

Experimental optical characterization methods: Dark-field scattering spectroscopy, Raman

spectroscopy, Photoluminescence spectroscopy. Fabrication of micro- and nanostructures through the direct laser writing technique. Basic programming in Matlab, Python including computer vision methods and machine learning

Scholarships/Awards

- Russian Federation President and Government Scholarship (Sept. 2023 - Aug. 2024)
- St. Petersburg Government Grant Competition winner (Jun. 2023)
- ITMO University scholarship for excellent achievement in scientific research (Sept. 2022 – Aug. 2024)
- St. Petersburg Government Scholarship (Sept. 2021 - Aug. 2023)

Conferences and Science Schools

- The 23rd IEEE International Conference on Nanotechnology ([IEEE-Nano](#)), 2023 (Jeju, Korea) **Oral talk** and the **session chair**.
- METANANO school on optical biosensing, 2022 (Saint Petersburg, Russia)
- The 5th School on Advanced Light-Emitting and Optical Materials SLALOM, 2022 (Saint Petersburg, Russia)

Publications

- 1) E. Ponkratova, E. Ageev, P. Trifonov, P. Kustov, **M. Sandomirskii**, M. Zhukov, A. Larin, I. Mukhin, T. Belmonte, A. Nominé, S. Bruyère and D. Zuev, "Coding of non-linear white-light luminescence from gold-silicon structures for physically unclonable security labels", *Advanced Functional Materials* [32.41\(2022\): 2205859](#)
- 2) P. Kustov, E. Petrova, M. Nazarov, A. Gilmullin, **M. Sandomirskii**, E. Ponkratova, V. Yaroshenko, E. Ageev and D. Zuev, "Mie-Resonant Silicon Nanoparticles for Physically Unclonable Anti-Counterfeiting Labels", *ACS Applied Nano Materials* [5.8\(2022\): 10548-10559](#)

Conference proceedings

- 1) **M. Sandomirskii**, E. Ponkratova, E. Petrova, P. Kustov, A. Larin, E. Ageev, D. Zuev., "Femtosecond Direct Laser Writing on Bi-Layer Gold-Silicon Films for Hidden Data Storage and Random Key Generation", *IEEE 23rd International Conference on Nanotechnology (NANO), Jeju City, Korea, Republic of*, [\(2023\): 1090-1094](#)
- 2) E. Petrova, P. Kustov, **M. Sandomirskii**, Y. Sun and D. Zuev, "Multiphoton Luminescence in Resonant Silicon Nanoparticles for Physically Unclonable Anticounterfeiting Labels", *IEEE 23rd International Conference on Nanotechnology (NANO), Jeju City, Korea, Republic of*, [\(2023\): 754-75](#)
- 3) P. Kustov, E. Petrova, E. Ponkratova, **M. Sandomirskii**, A. Larin, E. Ageev, D. Zuev., "Laser methods for the fabrication of nanophotonic security labels", *Neva Photonics-2023, Saint Petersburg, Russia* [\(2023\): 139](#)

4) P. Kustov, E. Petrova, **M. Sandomirskii** and D. Zuev, “All-dielectric silicon nanoparticles on flexible substrate for anticounterfeiting labels”, *2022 Sixteenth International Congress on Artificial Materials for Novel Wave Phenomena (Metamaterials)* ([2022](#)): [244-246](#)

Patents (in Russian)

1) D. Zuev, E. Ageev, P. Kustov, E. Petrova, **M. Sandomirskii**, V. Yaroshenko, A. Larin, “A way to prevent counterfeiting of valuable products and ensure their authenticity”, 2023

2) E.Petrova, **M.Sandomirskii**, P.Kustov and D.Zuev, “A program for multi-level authentication of physically unclonable security labels based on silicon nanoparticles by their Raman and far-field scattering spectra, as well as by images of their clusters”, 2022