

# Sergey KRASIKOV

Also known as Sergei Krasikov

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04 November 1994, Saint-Petersburg, Russia

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## LANGUAGES

Russian ●●●●●  
English ●●●●●

## RESEARCH INTERESTS

Bound States in the Continuum Intelligent Photonics  
Nonlinear Photonics RFID Computational Photonics  
Acoustic Metamaterials Hyperbolic Metamaterials  
Biomedical Signal Processing Electromagnetic Levitation

## EMPLOYMENT

- 2017** | **Engineer | ITMO University**  
Saint-Petersburg, Russia  
School of Physics and Engineering  
Bound States in the Continuum Computational Photonics RFID Acoustics Signal Processing Intelligent Photonics  
Machine Learning
- 2014** | **Research Assistant | ITMO University**  
Saint-Petersburg, Russia  
Department of Photonics and Metamaterials  
Electromagnetic Levitation Hyperbolic Metamaterials

## EDUCATION

- 2023** | **PhD (postponed) | Australian National University**  
Canberra, Australia  
> Specialization: Optics  
> Supervisor: Yuri Kivshar  
> Thesis (preliminary): Intelligent metaphotonics empowered by artificial intelligence.  
Intelligent Metaphotonics Machine Learning Inverse Design
- 2020** | **PhD (not completed) | ITMO University**  
Saint-Petersburg, Russia  
> Specialization: Optics  
> Supervisor: Andrey Bogdanov  
> Thesis: Bound states in the continuum in nonlinear photonic systems.  
Bound States in the Continuum Nonlinear Photonics Intelligent Metaphotonics
- 2018** | **Master of Science | ITMO University**  
Saint-Petersburg, Russia  
> Specialization: Nanophotonics and Metamaterials  
> Supervisor: Andrey Bogdanov  
> Thesis: Interaction of dark resonances with external electromagnetic field in systems with nonlinearity.  
Bound States in the Continuum Nonlinear Photonics Coupled Modes Theory

- 2011 | **Bachelor of Science | ITMO University**  
 📍 Saint-Petersburg, Russia
- 2016 | > Specialization: Photonics and Optoinformatics  
 > Supervisor: Ivan Iorsh  
 > Thesis: Method of Purcell factor and Lamb shift calculation for finite-size emitters in hyperbolic metamaterials accounting for strong frequency dispersion of effective parameters of metamaterial.
- Purcell factor | Lamb shift | Hyperbolic Metamaterials

## TEACHING EXPERIENCE

- 2022 | **Lecturer | ITMO University**  
 📍 Saint-Petersburg, Russia  
 present time | > Course “Introduction to Matlab”  
 > Charges: lectures; development of the course program
- 2021 | **Curator of course projects | ITMO University**  
 📍 Saint-Petersburg, Russia  
 2021 | > Course “Physics” for 1st year bachelor students  
 > Charges: supervision of the projects
- 2020 | **Course Assistant | ITMO University**  
 📍 Saint-Petersburg, Russia  
 2021 | > Course “Physics: electromagnetism” for 1st year bachelor students  
 > Charges: practical classes

## PERSONAL GRANTS AND AWARDS

2020 ANU PhD Scholarship (737/2018) and ANU HDR Fee Remission Merit Scholarship (271/2014)

## COMPUTER USE SKILLS

**Programming** Python, bash, machine learning  
**Computing software** Matlab, Comsol Multiphysics, Maple, Wolfram Mathematica  
**Other** LaTeX, MS Office, gnuplot, Inkscape, Linux, Windows

## HOBBIES

reading | crochet | travelling

## REFERENCES

### Andrey Bogdanov

*PhD, Senior Researcher*

SCHOOL OF PHYSICS AND ENGINEERING

ITMO University

📍 Russia, 191002, Saint-Petersburg, ul.Lomonosova 9

@ [a.bogdanov@metalab.ifmo.ru](mailto:a.bogdanov@metalab.ifmo.ru)

### Ivan Iorsh

*Professor, Chief Researcher*

SCHOOL OF PHYSICS AND ENGINEERING

ITMO University

📍 Russia, 191002, Saint-Petersburg, ul.Lomonosova 9

@ [i.iorsh@metalab.ifmo.ru](mailto:i.iorsh@metalab.ifmo.ru)

### Yuri Kivshar

*Professor, Head of Nonlinear Physics Center*

RESEARCH SCHOOL OF PHYSICS AND ENGINEERING

Australian National University

📍 Canberra ACT 0200 Australia

@ [ysk@internode.on.net](mailto:ysk@internode.on.net)

## PEER-REVIEWED PUBLICATIONS

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2022

11. Krasikov, S., Tranter, A., Bogdanov, A. & Kivshar, Y. Intelligent Metaphotonics Empowered by Machine Learning. *Opto-Electronic Advances* **5**, 210147. ISSN: 2096-4579. doi:[10.29026/oea.2022.210147](https://doi.org/10.29026/oea.2022.210147) (2022).

2021

10. Chukhrov, A., Krasikov, S., Yulin, A. & Bogdanov, A. Excitation of a Bound State in the Continuum via Spontaneous Symmetry Breaking. *Physical Review B* **103**, 214312. doi:[10.1103/PhysRevB.103.214312](https://doi.org/10.1103/PhysRevB.103.214312) (2021).
9. Dobrykh, D. *et al.* Long-Range Miniaturized Ceramic RFID Tags. *IEEE Transactions on Antennas and Propagation* **69**, 3125–3131. ISSN: 1558-2221. doi:[10.1109/TAP.2020.3037663](https://doi.org/10.1109/TAP.2020.3037663) (2021).
8. Krasikov, S. *et al.* Multipolar Engineering of Subwavelength Dielectric Particles for Scattering Enhancement. *Physical Review Applied* **15**, 024052. doi:[10.1103/PhysRevApplied.15.024052](https://doi.org/10.1103/PhysRevApplied.15.024052) (2021).
7. Krasikov, S. *et al.* Erratum: Multipolar Engineering of Subwavelength Dielectric Particles for Scattering Enhancement [Phys. Rev. Applied 15, 024052 (2021)]. *Physical Review Applied* **16**, 039901. doi:[10.1103/PhysRevApplied.16.039901](https://doi.org/10.1103/PhysRevApplied.16.039901) (2021).
6. Mikhailovskaya, A. *et al.* Omnidirectional Miniature RFID Tag. *Applied Physics Letters* **119**, 033503. ISSN: 0003-6951. doi:[10.1063/5.0054740](https://doi.org/10.1063/5.0054740) (2021).
5. Mikhailovskaya, A. *et al.* Anapole-Enabled RFID Security against Far-Field Attacks. *Nanophotonics* **10**, 4409–4418. ISSN: 2192-8614. doi:[10.1515/nanoph-2021-0394](https://doi.org/10.1515/nanoph-2021-0394) (2021).

2020

4. Dobrykh, D. *et al.* Multipole Engineering for Enhanced Backscattering Modulation. *Physical Review B* **102**, 195129. doi:[10.1103/PhysRevB.102.195129](https://doi.org/10.1103/PhysRevB.102.195129) (2020).

2018

3. Krasikov, S. D., Bogdanov, A. A. & Iorsh, I. V. Nonlinear Bound States in the Continuum of a One-Dimensional Photonic Crystal Slab. *Physical Review B* **97**, 224309. doi:[10.1103/PhysRevB.97.224309](https://doi.org/10.1103/PhysRevB.97.224309) (2018).

2016

2. Krasikov, S. & Iorsh, I. V. Self-Consistent Purcell Factor and Spontaneous Topological Transition in Hyperbolic Metamaterials. *en. physica status solidi (RRL) – Rapid Research Letters* **10**, 769–773. ISSN: 1862-6270. doi:[10.1002/pssr.201600232](https://doi.org/10.1002/pssr.201600232) (2016).

2014

1. Krasikov, S., Iorsh, I. V., Shalin, A. & Belov, P. A. Levitation of Finite-Size Electric Dipole over Epsilon-near-Zero Metamaterial. *en. physica status solidi (RRL) – Rapid Research Letters* **8**, 1015–1018. ISSN: 1862-6270. doi:[10.1002/pssr.201409396](https://doi.org/10.1002/pssr.201409396) (2014).

## SELECTED CONFERENCE PROCEEDINGS

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5. Krasikova, M. *et al.* Broadband Noise Mitigation Using Coupled Helmholtz Resonators: A Numerical Study. *INTER-NOISE and NOISE-CON Congress and Conference Proceedings* **263**, 3999–4007. doi:[10.3397/IN-2021-2573](https://doi.org/10.3397/IN-2021-2573) (2021).
4. Krasikov, S. D. *et al.* Superscattering for Non-Spherical Objects. *en. Journal of Physics: Conference Series* **2015**, 012073. ISSN: 1742-6596. doi:[10.1088/1742-6596/2015/1/012073](https://doi.org/10.1088/1742-6596/2015/1/012073) (2021).
3. Krasikov, S., Chukhrov, A., Yulin, A. & Bogdanov, A. *Excitation of a Bound State in the Continuum in Nonlinear Systems from the Far Field in Nonlinear Optics and Applications XII* **11770** (SPIE, 2021), 211–217. doi:[10.1117/12.2591938](https://doi.org/10.1117/12.2591938).
2. Dobrykh, D. *et al.* Compact Ceramic Resonators for RFID Applications. *AIP Conference Proceedings* **2300**, 020023. ISSN: 0094-243X. doi:[10.1063/5.0031922](https://doi.org/10.1063/5.0031922) (2020).
1. Krasikov, S. D., Bogdanov, A. A. & Iorsh, I. V. Nonlinear Bound States in the Continuum in One-Dimensional Photonic Crystal Slab. *en. Journal of Physics: Conference Series* **1092**, 012068. ISSN: 1742-6596. doi:[10.1088/1742-6596/1092/1/012068](https://doi.org/10.1088/1742-6596/1092/1/012068) (2018).

## PATENTS AND OTHER PUBLICATIONS

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2. Krasikova, M. *et al.* Metahouse: noise-insulating chamber based on periodic structures. *arXiv preprint arXiv:2204.01572*. doi:[10.48550/arXiv.2204.01572](https://doi.org/10.48550/arXiv.2204.01572) (2022).
1. Krasikov, S. & Kivshar, Y. Seeing Is Believing. *Light: Science & Applications* **11**, 45. ISSN: 2047-7538. doi:[10.1038/s41377-022-00737-4](https://doi.org/10.1038/s41377-022-00737-4) (2022).

## MENTIONS IN MEDIA

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- > Press-release: “Metaphotonics gains intelligence”, 25 March 2022, <https://www.ojournal.org/index/news/2576>.