

ILIA L. RASSKAZOV

theorist experienced in optics, photonics and light-matter interactions

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APPOINTMENTS

Scientist

The Institute of Optics, University of Rochester

Jul 2021 – Ongoing Rochester NY, USA

Postdoctoral Associate

The Institute of Optics, University of Rochester

Jul 2018 – Jul 2021 Rochester NY, USA

Postdoctoral Associate

**Beckman Institute for Advanced Science and Technology,
University of Illinois at Urbana-Champaign**

Jul 2016 – Jul 2018 Urbana-Champaign IL, USA

Visiting Scientist

Department of Bioengineering, University of Pennsylvania

Dec 2012 – Feb 2013 Philadelphia PA, USA

Laboratory Assistant

Siberian Federal University

Jan 2010 – Dec 2011 Krasnoyarsk, Russia

PROJECTS

Advanced Manufacturing of Photonic Smart Coatings for Utility-Scale PV Applications

NSF SBIR project #2014818

2020 – 2022 Rochester NY, USA

Standoff Illuminator for Measuring Absorbance and Reflectance Infrared Light Signatures

IARPA project #IARPA-BAA-15-07

2016 – 2017 Urbana-Champaign IL, USA

Computational Framework for Non-asymptotic Homogenization with Applications to Metamaterials

NSF project #1216970

2012 – 2013 Philadelphia PA, USA

EDUCATION

Ph.D. in Physics

Siberian Federal University

2011 – 2015 Krasnoyarsk, Russia

M.Sc. Engineering majoring in Physics

Siberian Federal University

2009 – 2011 Krasnoyarsk, Russia

B.Sc. Engineering majoring in Physics

Siberian Federal University

2005 – 2009 Krasnoyarsk, Russia

INVITED TALKS

Collective lattice resonances: Plasmonics, all-dielectric photonics and beyond

Skolkovo Institute of Science and Technology

Jul 28, 2020 Moscow, Russia

Light scattering from multilayered spheres

ITMO University

Jul 7, 2020 Saint Petersburg, Russia

Electromagnetic light scattering from particles

KTH Royal Institute of Technology

May 29, 2019 Stockholm, Sweden

Plasmon-enhanced upconversion

KTH Royal Institute of Technology

May 22, 2019 Stockholm, Sweden

REFEREES

Prof. P. Scott Carney

@ Chief Science and Technology Officer, Optica

✉ pscarney@optica.org

Prof. Rohit Bhargava

@ University of Illinois at Urbana-Champaign

✉ rxb@illinois.edu

Prof. Vadim A. Markel

@ University of Pennsylvania

✉ vmarkel@penmedicine.upenn.edu

CONFERENCE TALKS

- APS March Meeting 2022, Chicago IL, **United States**, March 2022
- Frontiers in Optics, Washington DC, **United States**, November 2021
- METANANO 2021, Tbilisi, **Georgia**, September 2021
- The 19th Electromagnetic and Light Scattering Conference, **Online**, 2021
- METANANO 2019, St. Petersburg, **Russia**, July 2019
- Advanced Photonics Congress, Zurich, **Switzerland**, July 2018
- The 17th Electromagnetic and Light Scattering Conference, College Station TX, **United States**, March 2018
- The International Conference on Coherent and Nonlinear Optics/ International Conference on Lasers, Applications and Technologies, Minsk, **Belarus**, September 2016
- The 15th Electromagnetic and Light Scattering Conference, Leipzig, **Germany**, June 2015
- Days on Diffraction 2015, St. Petersburg, **Russia**, May 2015
- Laser-light and Interactions with Particles (LIP2014), Marseille, **France**, August 2014
- International Conference on Coherent and Nonlinear Optics (ICONO 2013), Moscow, **Russia**, June 2013

PUBLICATIONS

Journal Articles

- ³⁷W. Xu, I. L. Rasskazov, H. Liu, Y. Ji, J. Hu, D. Zhou, B. Dong, H. Ågren, and H. Song, Photonic crystal photoelectric devices based on perovskite materials, *submitted* (2022).
- ³⁶L. Wang, I. L. Rasskazov, and P. S. Carney, Clausius-Mossotti relation revisited: Media with electric and magnetic response, *submitted* (2022).
- ³⁵I. L. Rasskazov, N. Sonwalkar, and P. S. Carney, Light scattering by plasmonic disks and holes arrays: Different or the same?, *submitted* (2022).
- ³⁴I. L. Rasskazov and A. Moroz, Is there a proper figure of merit for a plasmonic structure involved in metal-enhanced fluorescence?, *Plasmonics* **17**, 1091–1094 (2022).
- ³³A. S. Kostyukov, I. L. Rasskazov, V. S. Gerasimov, S. P. Polyutov, S. V. Karpov, and A. E. Ershov, Multipolar lattice resonances in plasmonic finite-size metasurfaces, *Photonics* **8**, 109 (2021).
- ³²L. Wang, I. L. Rasskazov, and P. S. Carney, Clustering diffused-particle method for scattering from large ensembles of electromagnetically polarizable particles, *Physical Review B* **104**, 115418 (2021).
- ³¹R. Gaponenko, A. Moroz, I. L. Rasskazov, K. Ladutenko, A. Shcherbakov, and P. Belov, Harnessing superdirectivity in dielectric spherical multilayer antennas, *Physical Review B* **104**, 195406 (2021).
- ³⁰V. S. Gerasimov, A. E. Ershov, R. G. Bikbaev, I. L. Rasskazov, I. L. Isaev, P. N. Semina, A. S. Kostyukov, V. I. Zakomirnyi, S. P. Polyutov, and S. V. Karpov, Plasmonic lattice Kerker effect in ultraviolet-visible spectral range, *Physical Review B* **103**, 035402 (2021).
- ²⁹A. S. Kostyukov, A. E. Ershov, R. G. Bikbaev, V. S. Gerasimov, I. L. Rasskazov, S. V. Karpov, and S. P. Polyutov, Substrate-mediated lattice Kerker effect in Al metasurfaces, *Journal of the Optical Society of America B* **38**, C78–C83 (2021).
- ²⁸A. D. Utyushev, V. I. Zakomirnyi, and I. L. Rasskazov, Collective lattice resonances: Plasmonics and beyond, *Reviews in Physics* **6**, 100051 (2021).
- ²⁷I. L. Rasskazov, A. Moroz, and P. S. Carney, Extraordinary fluorescence enhancement in metal-dielectric core-shell nanoparticles, *Journal of Physical Chemistry Letters* **12**, 6425–6430 (2021).
- ²⁶I. L. Rasskazov, V. I. Zakomirnyi, A. D. Utyushev, P. S. Carney, and A. Moroz, Remarkable predictive power of the modified long wavelength approximation, *Journal of Physical Chemistry C* **125**, 1963–1971 (2021).
- ²⁵A. D. Utyushev, I. L. Isaev, V. S. Gerasimov, A. E. Ershov, V. I. Zakomirnyi, I. L. Rasskazov, S. P. Polyutov, H. Ågren, and S. V. Karpov, Engineering novel tunable optical high-Q nanoparticle array filters for a wide range of wavelengths, *Optics Express* **28**, 1426–1438 (2020).

SYNERGISTIC



Science Mentors Program
supporting junior scholars



Scientific Expert
French National Research Agency (ANR),
Generic Call 2019



Developer
STRATIFY: Open-access MATLAB software
for versatile modeling of light scattering
from multilayered spheres



Topic Editor
Photonics, Frontiers in Physics



Reviewer
130 manuscripts for major publishers: American Chemical Society (ACS), American Institute of Physics (AIP), Elsevier, Frontiers, Institute of Physics (IOP), MDPI, Nature Publishing Group (NPG), OPTICA (former OSA), Royal Society of Chemistry (RSC), SAGE Publishing, Springer, Wiley



Professional Societies
OPTICA, ACS

- ²⁴I. L. Rasskazov, P. S. Carney, and A. Moroz, STRATIFY: a comprehensive and versatile MATLAB code for a multilayered sphere, *OSA Continuum* **3**, 2290–2309 (2020).
- ²³A. D. Utyushev, V. I. Zakomirnyi, A. E. Ershov, V. S. Gerasimov, S. V. Karpov, and I. L. Rasskazov, Collective lattice resonances in all-dielectric nanostructures under oblique incidence, *Photonics* **7**, 24 (2020).
- ²²V. I. Zakomirnyi, I. L. Rasskazov, L. K. Sørensen, P. S. Carney, Z. Rinkevicius, and H. Ågren, Plasmonic nano-shells: atomistic discrete interaction versus classic electrodynamics models, *Physical Chemistry Chemical Physics* **22**, 13467–13473 (2020).
- ²¹S. Sun, I. L. Rasskazov, P. S. Carney, T. Zhang, and A. Moroz, Critical role of shell in enhanced fluorescence of metal-dielectric core-shell nanoparticles, *Journal of Physical Chemistry C* **124**, 13365–13373 (2020).
- ²⁰I. L. Rasskazov, P. S. Carney, and A. Moroz, Intriguing branching of the maximum position of the absorption cross section in Mie theory explained, *Optics Letters* **45**, 4056–4059 (2020).
- ¹⁹I. L. Rasskazov, A. Moroz, and P. S. Carney, Electromagnetic energy in multilayered spherical particles, *Journal of the Optical Society of America A* **36**, 1591–1601 (2019).
- ¹⁸V. I. Zakomirnyi, S. V. Karpov, H. Ågren, and I. L. Rasskazov, Collective lattice resonances in disordered and quasi-random all-dielectric metasurfaces, *Journal of the Optical Society of America B* **36**, E21–E29 (2019).
- ¹⁷I. L. Rasskazov, R. Singh, P. S. Carney, and R. Bhargava, Extended multiplicative signal correction for infrared microspectroscopy of heterogeneous samples with cylindrical domains, *Applied Spectroscopy* **73**, 859–869 (2019).
- ¹⁶V. S. Gerasimov, A. E. Ershov, R. G. Bikbaev, I. L. Rasskazov, I. V. Timofeev, S. P. Polyutov, and S. V. Karpov, Engineering mode hybridization in regular arrays of plasmonic nanoparticles embedded in 1D photonic crystal, *Journal of Quantitative Spectroscopy and Radiative Transfer* **224**, 303–308 (2019).
- ¹⁵A. S. Kostyukov, A. E. Ershov, V. S. Gerasimov, S. A. Filimonov, I. L. Rasskazov, and S. V. Karpov, Super-efficient laser hyperthermia of malignant cells with core-shell nanoparticles based on alternative plasmonic materials, *Journal of Quantitative Spectroscopy and Radiative Transfer* **236**, 106599 (2019).
- ¹⁴V. I. Zakomirnyi, A. E. Ershov, V. S. Gerasimov, S. V. Karpov, H. Ågren, and I. L. Rasskazov, Collective lattice resonances in arrays of dielectric nanoparticles: a matter of size, *Optics Letters* **44**, 5743–5746 (2019).
- ¹³V. Zakomirnyi, I. Rasskazov, V. Gerasimov, A. Ershov, S. Polyutov, S. Karpov, and H. Ågren, Titanium nitride nanoparticles as an alternative platform for plasmonic waveguides in the visible and telecommunication wavelength ranges, *Photonics and Nanostructures - Fundamentals and Applications* **30**, 50–56 (2018).
- ¹²I. L. Rasskazov, L. Wang, C. J. Murphy, R. Bhargava, and P. S. Carney, Plasmon-enhanced upconversion: engineering enhancement and quenching at nano and macro scales, *Optical Materials Express* **8**, 3787–3804 (2018).
- ¹¹A. E. Ershov, V. S. Gerasimov, A. P. Gavrilyuk, S. V. Karpov, V. I. Zakomirnyi, I. L. Rasskazov, and S. P. Polyutov, Thermal limiting effects in optical plasmonic waveguides, *Journal of Quantitative Spectroscopy and Radiative Transfer* **191**, 1–6 (2017).
- ¹⁰V. S. Gerasimov, A. E. Ershov, S. V. Karpov, A. P. Gavrilyuk, V. I. Zakomirnyi, I. L. Rasskazov, H. Ågren, and S. P. Polyutov, Thermal effects in systems of colloidal plasmonic nanoparticles in high-intensity pulsed laser fields [Invited], *Optical Materials Express* **7**, 555–568 (2017).
- ⁹V. I. Zakomirnyi, I. L. Rasskazov, V. S. Gerasimov, A. E. Ershov, S. P. Polyutov, and S. V. Karpov, Refractory titanium nitride two-dimensional structures with extremely narrow surface lattice resonances at telecommunication wavelengths, *Applied Physics Letters* **111**, 123107 (2017).
- ⁸V. I. Zakomirnyi, I. L. Rasskazov, S. V. Karpov, and S. P. Polyutov, New ideally absorbing Au plasmonic nanostructures for biomedical applications, *Journal of Quantitative Spectroscopy and Radiative Transfer* **187**, 54–61 (2017).
- ⁷I. L. Rasskazov, N. Spegazzini, P. S. Carney, and R. Bhargava, Dielectric sphere clusters as a model to understand infrared spectroscopic imaging data recorded from complex samples, *Analytical Chemistry* **89**, 10813–10818 (2017).
- ⁶I. L. Rasskazov, S. V. Karpov, G. Y. Panasyuk, and V. A. Markel, Overcoming the adverse effects of substrate on the waveguiding properties of plasmonic nanoparticle chains, *Journal of Applied Physics* **119**, 043101 (2016).
- ⁵I. L. Rasskazov, S. V. Karpov, and V. A. Markel, Waveguiding properties of short linear chains of nonspherical metal nanoparticles, *Journal of the Optical Society of America B* **31**, 2981–2989 (2014).
- ⁴I. L. Rasskazov, S. V. Karpov, and V. A. Markel, Surface plasmon polaritons in curved chains of metal nanoparticles, *Physical Review B* **90**, 075405 (2014).
- ³I. L. Rasskazov, S. V. Karpov, and V. A. Markel, Nondecaying surface plasmon polaritons in linear chains of silver nanospheroids, *Optics Letters* **38**, 4743–4746 (2013).
- ²S. V. Karpov and I. L. Rasskazov, Simulation of conditions for fabrication of optical nanowaveguides in the form of chains of spherical metal nanoparticles by electrostatic functionalization of the process substrate, *Colloid Journal* **75**, 279–288 (2013).
- ¹I. L. Rasskazov, V. A. Markel, and S. V. Karpov, Transmission and spectral properties of short optical plasmon waveguides, *Optics and Spectroscopy* **115**, 666–674 (2013).