

Dr. Alexander Poddubny

Senior Scientist, Department of Physics of Complex Systems,

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Date of Birth: August 23, 1985

Place of Birth: Leningrad, Soviet Union

Marital status: Married + 1

Education

2016: **Ioffe Institute of the Russian Academy of Sciences,**

Habilitation (Doctor of Sciences) in Theoretical physics,

Thesis title “Propagation, localization and generation of light in nanostructures and metamaterials”,

2008-2010: **Ioffe Institute of the Russian Academy of Sciences,**

PhD in Semiconductor physics,

Thesis title “Theory of resonant photonic crystals and quasicrystals”,

Advisor: Prof. E.L. Ivchenko

2007-2008: **St. Petersburg State Technical University,**

Master degree in Physics (with honors),

Thesis title “Resonant photonic crystals and quasicrystals”,

Advisor: Prof. E.L. Ivchenko

2002-2006: **St. Petersburg State Technical University,** Bachelor degree in Physics

Employment History

2023-current Senior Scientist (Assistant Professor), **Weizmann Institute**, Israel

2022 Visiting Scientist, Weizmann Institute, Israel

2006-2022: **Ioffe Institute of the Russian Academy of Sciences**, St. Petersburg, Russia

2006-2008: Intern, 2008-2010: PhD Student, 2010-2016: Researcher,

2016-2022: Senior Researcher, 2022: Chief Researcher

2018-2021: Future Fellow at the **Australian National University, Canberra**

2011-2022: Researcher at the **ITMO University, St. Petersburg, Russia** (part-time)

2016-2022: Lecturer at **St. Petersburg Academic University** (part-time)

Mentoring and teaching experience

Teaching

2016-2022, **St. Petersburg Academic University**

Designed and read original course on “Electrodynamics of continuous media” for 3rd year undergraduate students

2020-2022, **ITMO University**, St. Petersburg, Russia

Designed and read original course on “Optomechanics” for master students

Honors and Scholarships

2023 – The Sir Charles Clore Prize, Weizmann Institute
2020 – Letokhov Medal for Young Scientists by Rozhdestvensky Optical Society
2020 – Australian National University, Dean Commendation for Excellence in Supervision
2018 – Leonard Euler Prize for Young Scientists of the St. Petersburg Government
2018 – Professor of the Russian Academy of Sciences
2012,2014,2017 ,2021— Ioffe Institute awards for the best scientific work of Institute Researchers
2014-2015,2016-2017,2018-2019 Russian President Scholarships for Researchers in Physics
2010 – Award for best student work at the EMRS meeting in Strasburg, France
2009 – Award for the best work of Young Scientist at the IX Russian Conference on Physics of Semiconductors
2007, The Medal of the Russian Academy of Sciences for the best works by diploma students in Physics
2006 – 2008, 2009 – 2010,2014-2015: "Dynasty" Fellowship for young researchers in Theoretical Physics
2006, Young Scientist Award at Ioffe Institute Winter School on Semiconductor Physics

Scientific organization and membership in organizing committees

2021: International Conference on Nanophotonics and Metamaterials METANANO (Online).
Chair of the program committee
2020: Online Mini-Workshop on Waveguide Quantum Electrodynamics (Organizer)
2020: International Conference on Nanophotonics and Metamaterials METANANO..
Member of the Program Committee
2021, 2023: Topology light conference (part of CLEO Photonics Europe): member of the program committee

Doctoral committees and examination

Moscow State University (2013), University of Reykyavik (2018),
Technical University of Dortmund (2019), University of Clermont-Ferrand (2019) ,
National Technological University of Singapore (2020)
Australian National University (2020), ITMO University, St. Petersburg, Russia (2018-2021)

Refereeing (grant applications)

Russian Science Foundation, Russian President Grant Foundation (2017-2021),
Russian Foundation For Basic Research (2012), Austrian Science Fund (2021) , UK Royal Society University Research Fellowship (2021), Dutch Research Council (2020),
Australian research council (2019), Polish National Science Centre (2016),
U.S.-Israel Binational Science Foundation (2023)

Refereeing (journals)

Physical Review Letters, Physical Review X, Physical Review A, Physical Review B, Nature Photonics, Nature Physics, Nature Communications, Optica, New Journal of Physics, Applied Physics Letters, Optics Express, Optics Letters, Solid State Communications, Semiconductors, Physics of Solid State, Journal of Experimental and Theoretical Physics

Invited talks at meetings and workshops

1. "Subradiant states in waveguide quantum electrodynamics", Quantum Control of Light WE-Heraeus-Seminar 28 Mar - 31 Mar 2023, Physikzentrum Bad Honnef/Germany.
2. "Multiple-excited subradiant states", 3rd workshop on waveguide QED, 8-13 May 2023, Erice, Italy
3. "Optomechanical exciton-polariton circulator", Meeting "Solid State Theory", St. Petersburg, 07-09 September, 2021
4. "Multiphoton quantum interactions in waveguides with atoms", XXXII All-Russian school-seminar "Wave phenomena: physics and applications" named after A.P. Sukhorukov ("Waves-2021"), Moscow (online), 06-11 July 2021
5. "Topological spin phases of Rydberg excitons in arrays of traps in Cu₂O", International Conference Optics of Excitons in Confined Systems OECS 17 Dortmund, Germany (online) 30 Aug-02 Sep. 2021
6. "Induced topological phases of photons in a waveguide with qubits", METANANO 2020, V International Conference on Metamaterials and Nanophotonics 14-18 September (2020), online
7. "Multipolar scattering of light on trembling particles", Metanano International Summer School on Nanophotonics and Metamaterials 06-10 July 2020 (online)
8. "A pair of photons in a waveguide with qubits: radiation, localization, topological states", XIX Scientific School "Nonlinear waves-2020" Nizhny Novgorod, Russia 29 Feb-03 Mar 2020
9. "Topological and localized phases of interacting excitons", Second International Conference on Nanophotonics, Metamaterials and Photovoltaics (ICNMP-2020), Trinidad, Cuba 25-31 January 2020
10. "Quadrupolar and higher-order topological insulators", Metanano International Summer School on Quantum Optics, St. Petersburg, Russia 08-12 July 2019
11. "Optomechanical Kerker effect for trembling nanoparticles and membranes", Terahertz Emission, Metamaterials and Nanophotonics, Lecce, Italy, 17-31 May 2019
12. "Subradiant bound photon pairs in arrays of qubits in a waveguide", V International Conference on Quantum Technologies, Moscow, Russia, 15-19 July 2019.
13. "Optomechanical Kerker Effect", The 13th International Congress on Artificial Materials for Novel Wave Phenomena, Rome, Italy, 16-29 September, 2019
14. "Topological spin phases of Rydberg excitons in arrays of traps in Cu₂O". Rydberg Exciton Workshop, Daresbury (UK), 16-17 July 2019
15. "Unidirectional Third Harmonic Generation from Photonic Topological States", International Conference on Metamaterials and Nanophotonics, METANANO 2018, 17 - 21 September 2018, Sochi, Russia
16. "Topological and nonreciprocal sound and light in quantum well structures", «META'17, the 8th International Conference on Metamaterials, Photonic Crystals and Plasmonics»,

Seoul, South Korea, July 25-28, 2017

17. "Topological states of interacting light, sound and excitons with multiple quantum wells", Workshop "Physics of Exciton-Polaritons in Artificial Lattices", Daejeon, Korea, May 15-19 2017.
18. "Generation of entangled photon states in nonlinear nanostructures and metamaterials", American Physical Society March Meeting, March 13-17, New Orleans (2017)
19. "Topological light and nonreciprocal sound", Workshop on Topological and nonreciprocal Photonics, Sydney, 9 November 2016
20. "Topological edge states of interacting photon pairs", META'16, the 7th International Conference on Metamaterials, Photonic Crystals and Plasmonics, Torremolinos, Spain, 25-28 July 2016
21. "Topological States of Photons in Nanostructures", XII Russian Conference on Semiconductor Physics, Ershovo, September 2015/21.
22. "Nonlinear topological phases of light", Workshop: Topological States of Light and Beyond, June 20 - 24 2016, Daejeon, Korea
23. "Photonics crystals and metamaterials as topological insulators", International young scientists conference Fizika.SPb, St. Petersburg, 2015
24. "Generation of quantum entangled states in nonlinear plasmonic structures and metamaterials", SPIE Optics+Photonics meeting, San Diego, USA, August 2015
25. "Topological Edge States of Photons, Plasmons and Photon Pairs in Nanostructures", Frontiers in Optics/Laser Science meeting, San Jose, California, USA, October 2015
26. "Effect of dielectric environment on the optical processes in Si quantum dots", Workshop on Silicon Nanophotonics, Tossa del Mare, Spain, September 2014
27. "Topological States of Photons in Nanostructures", Frontiers in Optics/Laser Science meeting, Tucson, Arizona, USA, October 2014
28. "Inelastic scattering of light and polaritons in nanostructures", International Conference on Metamaterials and Nanophysics, Varadero, Cuba, April 2015
29. International Conference "Days of Diffraction", St Petersburg, May 2014
30. Russian-British Workshop on Polariton Devices, St-Petersburg, March 2014
31. International Conference of Computational Methods in Sciences and Engineering, Athens, Greece, March 2014
32. "Topological states in resonant plasmonic and photonic nanostructures", 11th International Symposium on Photonic and Electromagnetic Crystal Structures PECS-XI, Shanghai, May 2014
33. "Light-matter coupling in hyperbolic and epsilon-near-zero metamaterials", The 5th International Conference on Metamaterials, Photonic Crystals and Plasmonics META 14, Singapore, May 2014
34. "Non-Elastic Light Scattering in Hyperbolic Medium", SPIE Optics+Photonics meeting, San Diego, USA, August 2014
35. "Topological insulators in photonics", XIV International Symposium "Nanophysics and Nanoelectronics", Nizhnii Novgorod, March 2014
36. Topological edge states in plasmonic and polaritonic nanostructures, International Russian-British Workshop on Polariton Devices, St. Petersburg, Russia, 26 March 2014
37. "Spontaneous radiation in hyperbolic media", Progress In Electromagnetics Research Symposium PIERS 2013 Stockholm, Sweden, 12-15 August, 2013
38. "Spin and valley-orbit splittings in lead salt nanocrystals", International Workshop on Relativistic Phenomena in Solids, Mont-Dore, France (2012)
39. "Purcell effect in hyperbolic media", International Workshop on Hyperbolic Metamaterials Hyperbolic Fest Canberra, Australia, 2012
40. "Resonant photonic crystals and quasicrystals", International Symposium Photonics in

Europe 2012 (SPIE Photonics Europe 2012) Brussels, Belgium, 2012

41. “Collective radiance from semiconductor quantum wells and quantum dots”, International Symposium "Physics of Quantum Electronics" Physics of Quantum Electronics Snowbird, Utah, USA, Jan 2-6, 2011

42. “Theory of Light Coupled Exciton Polaritons in Nonperiodic Quantum Wells”, International Symposium "Physics of Quantum Electronics" Physics of Quantum Electronics Snowbird, Utah, USA, Jan 3-8, 2009

Languages

Russian: Native speaker

English: Fluent reading, writing, speaking.

German: Fluent reading and speaking, intermediate writing

Italian: Fluent reading and speaking, intermediate writing

French: Fluent reading, basic speaking.

Hebrew: Beginner

Other

Hobbies: freediving, long-distance open-water swimming