

## Dr. Sergey E. SKIPETROV

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### Research interests

- Waves in disordered media: fundamental aspects (Anderson localization of light, sound, and matter waves; topological wave physics), applications for medical imaging and noninvasive probing of complex materials
  - Lasers, nonlinear & quantum optics: random lasers, mesoscopic quantum optics, optics of cold atomic clouds
  - Mesoscopic solid state physics: thermal properties of nanosystems
  - Information theory: physics of information, wireless communication in disordered environments
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### Education

- March 2007: Habilitation to advise doctoral theses (Habilitation à diriger des recherches), thesis “[Dynamics of speckle patterns in disordered media](#)” (in French), Joseph Fourier University (Grenoble I), France
  - December 1998: Ph.D. degree in Physics & Mathematics, thesis “[Diffusing-wave spectroscopy in media with spatially heterogeneous scatterer dynamics](#)” (in Russian), Moscow State University, Russia
  - January 1997: Graduated with honor from the Department of Physics, Moscow State University, Russia
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### Professional experience

- Since 2013: 2<sup>nd</sup> class senior scientist (Directeur de recherche 2<sup>ème</sup> classe), Centre National de la Recherche Scientifique (CNRS), LPMMC, Grenoble, France
  - 2001–2013: 2<sup>nd</sup> and then 1<sup>st</sup> class junior scientist (Chargé de recherche 2<sup>ème</sup> et 1<sup>ère</sup> classe), Centre National de la Recherche Scientifique (CNRS), LPMMC, Grenoble, France
  - 2006: Visiting lecturer (Chargé de cours), University of Fribourg, Switzerland
  - July 2001–August 2001: Visiting scientist, University of Fribourg, Switzerland
  - 1999–2001: Staff scientist, Department of Physics, Moscow State University, Russia
  - 1999–2000: Postdoctoral fellow (Chargé de recherche associé), CNRS, LPMMC, Grenoble, France
  - 1994–1998: Undergraduate and Ph.D. student, Department of Physics, Moscow State University, Russia
  - 1995–1996: Undergraduate student, Laboratoire d’Expérimentation Numérique, Université J. Fourier, Grenoble, France
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### Ten recent representative publications (see [publons.com](https://publons.com) for the full list)

1. B.A. van Tiggelen and S.E. Skipetrov, Longitudinal modes in diffusion and localization of light, *Phys. Rev. B* **103**, 174204 (2021)
2. S.E. Skipetrov and I.M. Sokolov, Intensity of waves inside a strongly disordered medium, *Phys. Rev. Lett.* **123**, 233903 (2019)
3. S.E. Skipetrov, Localization transition for light scattering by cold atoms in an external magnetic field, *Phys. Rev. Lett.* **121**, 093601 (2018)
4. F. Riboli, F. Ucheddu, G. Monaco, N. Caselli, F. Intonti, M. Gurioli, and S.E. Skipetrov, Tailoring correlations of the local density of states in disordered photonic materials, *Phys. Rev. Lett.* **119**, 043902 (2017)
5. S.E. Skipetrov and I.M. Sokolov, Magnetic-field-driven localization of light in a cold-atom gas, *Phys. Rev. Lett.* **114**, 053902 (2015)
6. S.E. Skipetrov and I.M. Sokolov, Absence of Anderson localization of light in a random ensemble of point scatterers, *Phys. Rev. Lett.* **112**, 023905 (2014)
7. M.D. Birowosuto, S.E. Skipetrov, W.L. Vos, and A.P. Mosk, Observation of spatial fluctuations of the local density of states in random photonic media, *Phys. Rev. Lett.* **105**, 013904 (2010)

8. H. Hu, A. Strybulevych, J.H. Page, S.E. Skipetrov, and B.A. van Tiggelen, Localization of ultrasound in a three-dimensional elastic network, *Nature Physics* **4**, 945 (2008)
9. S.E. Skipetrov, A. Minguzzi, B.A. van Tiggelen, and B. Shapiro, Anderson localization of a Bose-Einstein condensate in a 3D random potential, *Phys. Rev. Lett.* **100**, 165301 (2008)
10. S.E. Skipetrov and B.A. van Tiggelen, Dynamics of Anderson localization in open 3D media, *Phys. Rev. Lett.* **96**, 043902 (2006)

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## PhD students and postdocs

- Pierre Wulles, PhD since 2021: “Localization of light in disordered topological metamaterials”
- Manutea Candé, PhD 2011–2014: “Entangled photons in disordered media: From two-photon speckle patterns to Schmidt decomposition”. Has quit research.
- Arthur Goetschy, PhD 2008–2011: “Light in disordered atomic systems: Euclidean matrix theory of random lasing”. Now assistant professor at ESPCI ParisTech (since 2014), Institut Langevin, Paris, France.
- Nicolas Cherroret, PhD 2006–2009: “Coherent transport of waves in random media: from mesoscopic correlations to Anderson localization”. Now CNRS junior scientist (since 2013), Laboratoire Kastler Brossel, Paris, France.
- Jose Maria Escalante Fernández, postdoc 2015–2017: “Anderson localization of vector waves”. Now senior research technician at the Instituto Tecnológico de la Energía, Valencia, Spain.
- Vladimir Yu. Fedorov, postdoc 2008–2009: “Quantum optics of disordered media”. Now researcher at the Lebedev Physical Institute, Moscow, Russia.
- Vitalie Eremeev, postdoc 2008–2009: “Cold atoms for random optical laser”. Now associate professor at the Faculty of Engineering, Universidad Diego Portales, Santiago de Chile, Chile.

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## Teaching

- Lecture course “Optics of random media” (Master level), University of Fribourg, Switzerland (2006)
- Internship supervision of 12 Master students at Moscow State University, J. Fourier University, and University Grenoble Alpes
- Tutorials in physics for mathematics students (1st and 2nd years); tutorials in computational physics for physics students (4th year), Moscow State University (2000–2001)
- Participation in thesis committees (22):
  - S. Balog, Ph.D. thesis “Scattering and propagation of light in mesoscopic random media”, University of Fribourg, Switzerland, 12/06/2007 (reviewer)
  - R. Pierrat, Ph.D. thesis “Propagation and emission of radiation in diffuse media. Applications to imaging of complex media”, École Centrale de Paris, France, 26/10/2007 (reviewer)
  - B. Grémaud, *Habilitation* thesis “Quantum transport in complex systems”, Université Pierre et Marie Curie—Paris VI, France, 30/06/2008 (reviewer)
  - P. Barthelemy, Ph.D. thesis “Anomalous transport of light”, University of Florence, Italy, 2009 (external reviewer)
  - G. Labeyrie, *Habilitation* thesis “Mesoscopic physics with cold atoms”, Université de Nice—Sophia Antipolis, France, 18/03/2010 (reviewer)
  - F. Lemoult, Ph.D. thesis “Focusing and controlling waves in complex and locally resonant media”, Université Diderot—Paris 7, France, 09/12/2011
  - S. Gigan, *Habilitation* thesis “Wavefront control in complex media”, Université Pierre et Marie Curie—Paris VI, France, 19/09/2012 (reviewer)
  - D. Hernangómez Pérez, Ph.D. thesis “Spin-orbit coupling and strong interactions in the quantum Hall regime”, Université de Grenoble, France, 20/11/2014
  - V. Rossetto, *Habilitation* thesis “Statistical physics of diffuse waves”, Université de Grenoble, France, 07/10/2015 (committee president)
  - A. Marruzzo, Ph.D. thesis “Statistical mechanics of continuous spin models and applications to nonlinear optics in disordered media”, Sapienza—University of Rome, Italy, 2015 (external reviewer)
  - Ya. Beltukov, Ph.D. thesis “Random matrices and vibrational properties of amorphous solids in terahertz domain”, Université Montpellier, France, 21/03/2016 (reviewer)
  - Ch. Jonin, *Habilitation* thesis “De l’usage LASER à l’imagerie de bio-molécules”, Université Claude Bernard Lyon 1, France, 16/12/2016 (reviewer)

- V.D. Nguyen, Ph.D. thesis “Normal modes of superconducting phase oscillations in Josephson junction chains”, Université Grenoble Alpes, France, 05/11/2018
- B. Reznichenko, Ph.D. thesis “Quantum optics of 1D atoms with application to spin-photon interfaces”, Université Grenoble Alpes, France, 13/12/2018 (committee president)
- B. Evano, Ph.D. thesis “Semiclassical analysis of oscillation modes in rotating stars”, Université de Toulouse, France, 15/10/2019 (reviewer)
- Wasim Raja Mondal, Ph.D. thesis “A quantum cluster approach to vibrational spectra and Anderson localization of phonons in disordered harmonic lattices”, Jawaharlal Neheru Center for Advanced Scientific Research, Bangalore, India, 01/2020 (reviewer)
- M. Hamidouche, Ph.D. thesis “Spectral analysis of random geometric graphs”, Université Côte d’Azur, Sophia Antipolis, France, 29/05/2020 (reviewer)
- F. Stellin, Ph.D. thesis “Anderson localization in interacting quantum systems”, Université de Paris, France, 15/06/2020 (reviewer)
- T. Bardou-Brun, Ph.D. thesis “Light propagation in complex media: Optical spin-Hall effect in the presence of disorder and Casimir force in Kerr media”, Sorbonne Université, France, 13/01/2021 (reviewer)
- J.-F. Clément, *Habilitation* thesis “Simulation quantique du modèle d’Anderson: Variations expérimentales sur le rotateur frappé quantique”, Université de Lille, France, 25/10/2021 (reviewer)
- T. Sépulcre, Ph.D. thesis “Superconducting simulators for quantum impurity models”, Université Grenoble Alpes, France, 19/11/2021 (committee president)
- A. Cipris, Ph.D. thesis “Long-lived collective modes of light in cold atoms: Experimental and numerical studies on subradiance and Anderson localization”, Université Côte d’Azur, Nice, France, 07/03/2022 (reviewer)
- R. Monsarrat, Ph.D. thesis “Propagation of light waves in correlated disordered media: Density of state, transport, localisation”, Université PSL, Paris, France, 14/03/2022 (reviewer)
- D. Gaspard, Ph.D. thesis “Quantum scattering, transport, and decoherence in disordered media. An application to gaseous particle detectors”, Université Libre de Bruxelles, Belgium, 09 & 28/06/2022

### Distinctions

- [CNRS Bronze Medal \(2006\)](#)
- 1<sup>st</sup> Young Scientist Prize for the best scientific work (doctoral thesis) in optics and spectroscopy, Center for Fundamental Optics and Spectroscopy, Ministry of Education and Research, Russia (1998)
- 3<sup>rd</sup> Young Scientist Prize for the best scientific work (doctoral thesis) in physics, Moscow State University, Russia (1998)
- 3<sup>rd</sup> Prize for the best diploma work in physics, Moscow State University, Russia (1997)

### Funding

- French National Research Agency—ANR, project “[Localization of Light in Disordered Topological Metamaterials](#)” ([LOLITOP](#)), principal investigator (2020–2024)
- French National Research Agency—ANR, project “[Anderson Localization of Vector Waves](#)” ([LOVE](#)), principal investigator (2014–2018)
- CNRS PICS project “Ultrasound at the Anderson Localization Transition” (France-Canada), principal investigator (2014–2016)
- Russian Ministry of Education and Research, program of cooperation with foreign scientists, project “Collective Effects in Optics of Cold Atom Gases”, French coordinator (2012–2013)
- French Ministry of Foreign Affairs, *Germaine de Staël* program (France-Switzerland), project “Optics of Disordered Materials”, French coordinator (2009–2010)
- French National Research Agency—ANR, project “[Cold Atoms for Random Optical Laser](#)” ([CAROL](#)), coordinator of one of the 3 partner teams (2006–2010)
- French Ministry of Education and Research, Research-Educational Network RFR “Quantum Optics of Disordered Media”, coordinator (2006–2009)
- Institute of Condensed Matter Physics (Grenoble), project “Thermal Studies of Phase Coherent Phenomena” (2005)
- INTAS Young Scientist Fellowship (2001)
- Young Scientist Fellowship of the International Center for Fundamental Physics in Moscow (1998)

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## Administrative duties

- Since 2021: Director of the [Laboratoire de Physique et Modélisation des Milieux Condensés—LPMMC UMR 5493](#) of CNRS & Université Grenoble Alpes
- 2016–2021: Member of the French [National Committee for Scientific Research](#) (section 5 “Condensed matter physics: structure and dynamics”)
- 2020: Deputy director of the [Laboratoire de Physique et Modélisation des Milieux Condensés—LPMMC UMR 5493](#) of CNRS & Université Grenoble Alpes
- 2015–2019: *Adjoint à la direction* of the [Laboratoire de Physique et Modélisation des Milieux Condensés—LPMMC UMR 5493](#) of CNRS & Université Grenoble Alpes
- 2009–2016: Director of the national research network GDR 3219 of CNRS “[Mesoscopic Physics of Waves for Imaging in Complex Media](#)”—MésImage

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## Services to the academic community

- Referee for scientific journals published by APS, AIP, NPG, IOP, EPS, OSA, etc. (see [publons.com](#) for recent review activity)
- Referee for funding agencies: ERC—European Research Council, ANR (France), DFG (Germany), U.S.–Israel Binational Science Foundation
- Co-organizer of the [workshop “Disorder and Chaos”](#) (Grenoble, France, November 14–15, 2019)
- Organizer of the [workshop “Multiple Scattering and Localization of Light”](#) (Grenoble, France, November 22, 2018)
- Co-organizer of the [workshop “Strongly Disordered Optical Systems: From the White Paint to Cold Atoms”](#) (Cargèse, Corsica, September 26–30, 2016)
- Organizer of the [Roger Maynard Memorial Workshop](#) (Grenoble, France, March 10–11, 2016)
- Organizer of the [workshop “Waves and Imaging in Random Media”](#) (Institut Henri Poincaré, Paris, November 9–10, 2015)
- Co-organizer of the [summer school “Waves and Disorder”](#) (Cargèse, Corsica, July 1–11, 2014)
- Co-organizer of the [Workshop on Coherent Phenomena in Disordered Optical Systems](#) (Trieste, Italy, May 26–30, 2014)
- Organizer of the [workshop “Waves in Complex Media”](#) (Grenoble, France, December 11–13, 2013)
- Organizer of the [workshop “Recent Developments in Wave Propagation and Imaging in Complex Media”](#) (Institut Henri Poincaré, Paris, November 7–9, 2012)
- Co-organizer of the [mini-colloquium “Wave Propagation in Disordered Media”](#) in the framework of the 13<sup>th</sup> Condensed Matter Days of the French Physical Society (Montpellier, August 27–31, 2012)
- Co-organizer of the [workshop “Random Matrix Theory for Wave Propagation in Disordered Media”](#) (Paris, December 12, 2011)
- Co-organizer of the [workshop “Correlations, Fluctuations and Disorder”](#) (Grenoble, December 13–15, 2010)
- Co-organizer of the [summer school “Mesoscopic Physics in Complex Media”](#) (Cargèse, Corsica, July 12–16, 2010)
- Organizer of the [workshop “Mesoscopic Physics of Waves for Imaging in Complex Media”](#) (Institut Henri Poincaré, Paris, October 29–30, 2009)
- Planning group member of the [French-US symposium “Frontiers of Science”](#) (Roscoff, November 20–22, 2008)
- Project leader of the French-German International Research Training Group “Soft Condensed Matter Physics of Model Systems”, Strasbourg–Konstanz–Grenoble (2006–2009)
- Co-director of the summer school “Imaging, Communication and Disorder” (Cargèse, Corsica, June 12–17, 2006)
- Co-organizer of the workshop “Waves in Complex Media: Soft Matter and Granular Materials” (ESPCI, Paris, December 8–9, 2004)
- Co-organizer of the workshop “Communication in Disordered Media” (Henri Poincaré Institute, Paris, June 20, 2003)
- Co-director of the NATO Advanced Study Institute “Wave Scattering in Complex Media: From Theory to Applications” (Cargèse, Corsica, June 10–22, 2002)