

**Ph. D.** – Physics, Kharkov National University, Ukraine, 2001

**M. Sc.** – Physics, Kharkov National University, Ukraine, 1998

**Areas of research:**

Wave propagation and scattering in inhomogeneous media  
Geometric phases, polarization phenomena, singular optics  
Spin-orbit interactions in optics and quantum physics  
Dynamics of spins and vortices in external fields  
Adiabatic, semiclassical, WKB, geometrical optics theories  
Wave localization in disordered media  
Wave interaction and coupling, plasmonics and metamaterials.

**Publications in peer-reviewed journals:**

1. K.Y. Bliokh and Y.E. Lyubarskiy, Linear transformation and the escape of waves from pulsar magnetospheres, *Astron. Lett.* **22**, 482 (1996).
2. K.Y. Bliokh and Y.E. Lyubarskiy, Nonlinear wave conversion in the magnetosphere of pulsars, *Plasma Phys. Rep.* **23**, 416 (1997).
3. K.Y. Bliokh, Influence of plasma inhomogeneity on evolution of plasma–beam instability, *Radiophysics and Radioastronomy* **3**, 49 (1998).
4. K.Y. Bliokh, Development of plasma–beam instability in the periodically inhomogeneous plasma, *Radiophysics and Radioastronomy* **3**, 231 (1998).
5. K.Y. Bliokh and M.G. Lyubarskiy, Influence of longitudinal variation in plasma density on the growth rate of beam–plasma instability, *Plasma Phys. Rep.*, **25**, 420 (1999).
6. K.Y. Bliokh, Y.P. Bliokh, M.G. Lyubarskiy, and V.O. Podobinskiy, Automodulation regime of linear beam–plasma amplifier of UHF oscillations, which arouse by arising of ion-sound oscillations in plasma, *Izv. Vuz.: Appl. Nonlin. Dyn.* **7**, 29 (1999).
7. K.Y. Bliokh, The appearance of a geometric-type instability in dynamic systems with adiabatically varying parameters, *J. Phys. A: Math. Gen.* **32**, 2551 (1999).
8. K.Y. Bliokh and S.V. Grinyok, On the criterion for effectiveness of wave linear transformation in a smoothly inhomogeneous medium and of nonadiabatic transitions during atomic collisions, *J. Exp. Theor. Phys.* **93**, 71 (2001).
9. K.Y. Bliokh, The functional approach to non-autonomous dynamical systems: The problems of Hamiltonian nature, strong stability, quantizability and Berry’s phase, *Izv. Vuz.: Appl. Nonlin. Dyn.* **9**, 45 (2001).
10. K.Y. Bliokh and O.V. Usatenko, Two-scale geometrical resonance: From parametric resonance in an oscillator to thermodynamic cycles, *Int. J. Mod. Phys. B* **16**, 4865 (2002).
11. K.Y. Bliokh, Geometric amplitude, adiabatic invariants, quantization and strong stability of Hamiltonian systems, *J. Math. Phys.* **43**, 25 (2002).
12. K.Y. Bliokh, Generalization of Berry’s geometric phase, equivalence of the Hamiltonian nature, quantizability and strong stability of linear oscillatory systems, and conservation of adiabatic invariants, *J. Math. Phys.* **43**, 5624 (2002).
13. K.Y. Bliokh, Randomly layered active medium as a broadband amplifier, *J. Exp. Theor. Phys.* **94**, 8 (2002).
14. K.Y. Bliokh, Instability of oscillations in the flow moving through a random medium as the counterpart of the localization of waves in a passive random medium, *Wave Random Media* **13**, 1 (2003).

15. K.Y. Bliokh, Generalized geometric phase of a classical oscillator, *J. Phys. A: Math. Gen.* **36**, 1705 (2003).
16. K.Y. Bliokh and Y.P. Stepanovskiy, On change of electromagnetic wave polarization in a smooth one-dimensionally inhomogeneous medium, *J. Exp. Theor. Phys.* **97**, 479 (2003).
17. K.Y. Bliokh and V.M. Kontorovich, On the evolution and gravitational collapse of a toroidal vortex, *J. Exp. Theor. Phys.* **96**, 985 (2003).
18. K.Y. Bliokh and V.M. Kontorovich, On the gravitational collapse and equilibrium conditions of a toroidal vortex allowing for thermal pressure, *Astron. Lett.* **29**, 724 (2003).
19. K.Y. Bliokh, Y.P. Bliokh, and V.D. Freilikher, Resonances in one-dimensional disordered systems: Localization of energy and resonant transmission, *J. Opt. Soc. Am. B* **21**, 113 (2004).
20. K.Y. Bliokh and Y.P. Bliokh, What are left-handed media and what is interesting about them? *Physics-Uspekhi* **47**, 393 (2004).
21. K.Y. Bliokh and Y.A. Kravtsov, Observation of sunlight enhanced backscattering from the sea bottom near the beach, *Wave Random Media* **14**, 479 (2004).
22. K.Y. Bliokh and Y.P. Bliokh, Optical Magnus effect is a consequence of Berry phase anisotropy, *JETP Letters* **79**, 519 (2004).
23. K.Y. Bliokh and Y.P. Bliokh, Modified geometrical optics of a smoothly inhomogeneous isotropic medium: the anisotropy, Berry phase, and the optical Magnus effect, *Phys. Rev. E* **70**, 026605 (2004).
24. K.Y. Bliokh and Y.P. Bliokh, Topological spin transport of photons: The optical Magnus effect and Berry phase, *Phys. Lett. A* **333**, 181 (2004).
25. K.Y. Bliokh and V.D. Freilikher, Localization of transverse waves in randomly layered media at oblique incidence, *Phys. Rev. B* **70**, 245121 (2004).
26. K.Y. Bliokh, V.D. Freilikher, and N.M. Makarov, Scattering by one-dimensional smooth potentials: Between WKB and Born approximation, *Physica E* **27**, 262 (2005).
27. K.Y. Bliokh and Y.P. Bliokh, Spin gauge fields: From Berry phase to topological spin transport and Hall effects, *Ann. Phys. (N.Y.)* **319**, 13 (2005).
28. K.Y. Bliokh and D.Y. Frolov, Spin-orbit interaction of photons and fine splitting of levels in ring dielectric resonator, *Opt. Comm.* **250**, 322 (2005).
29. K.Y. Bliokh and V.D. Freilikher, Topological spin transport of photons: “Magnetic monopole” gauge field in Maxwell equations and polarization splitting in periodically inhomogeneous media, *Phys. Rev. B* **72**, 035108 (2005).
30. K.Y. Bliokh, Weak antilocalization of ultrarelativistic fermions, *Phys. Lett. A* **344**, 127 (2005).
31. K.Y. Bliokh, Topological spin transport of a relativistic electron, *Europhys. Lett.* **72**, 7 (2005).
32. K.Y. Bliokh, On the Hamiltonian nature of semiclassical equations of motion in the presence of an electromagnetic field and Berry curvature, *Phys. Lett. A* **351**, 123 (2006).
33. P. Berczynski, K.Y. Bliokh, Y.A. Kravtsov, and A. Stateczny, Diffraction of a Gaussian beam in a 3D smoothly inhomogeneous media: An eikonal-based complex geometrical optics approach, *J. Opt. Soc. Am. A* **23**, 1442 (2006).
34. K.Y. Bliokh and Y.P. Bliokh, Conservation of angular momentum, transverse shift, and spin Hall effect in reflection and refraction of an electromagnetic wave packet, *Phys. Rev. Lett.* **96**, 073903 (2006).
35. K.Y. Bliokh, Geometrical optics of beams with vortices: Berry phase and orbital angular momentum Hall effect, *Phys. Rev. Lett.* **97**, 043901 (2006).
36. K.Y. Bliokh and V.D. Freilikher, Polarization transport of transverse acoustic waves: Berry phase and spin Hall effect of phonons, *Phys. Rev. B* **74**, 174302 (2006).
37. K.Y. Bliokh, Y.P. Bliokh, V. Freilikher, A.Z. Genack, B. Hu, and P. Sebbah, Localized modes in open one-dimensional dissipative random systems, *Phys. Rev. Lett.* **97**, 243904 (2006).

38. K.Y. Bliokh, D.Y. Frolov, and Y.A. Kravtsov, Non-Abelian evolution of electromagnetic waves in a weakly anisotropic inhomogeneous medium, *Phys. Rev. A* **75**, 053821 (2007).
39. K.Y. Bliokh and Y.P. Bliokh, Polarization, transverse shifts, and angular momentum conservation laws in partial reflection and refraction of an electromagnetic wave packet., *Phys. Rev. E* **75**, 066609 (2007).
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43. K.Y. Bliokh, A. Niv, V. Kleiner, and E. Hasman, Singular polarimetry: Evolution of polarization singularities in electromagnetic waves propagating in a weakly anisotropic medium, *Opt. Express* **16**, 695 (2008).
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45. K.Y. Bliokh, Y. Gorodetski, V. Kleiner, and E. Hasman, Coriolis effect in optics: Unified geometric phase and spin-Hall effect, *Phys. Rev. Lett.* **101**, 030404 (2008).
46. K.Y. Bliokh, Y.P. Bliokh, V. Freilikher, A.Z. Genack, and P. Sebbah, Coupling and level repulsion in the localized regime: From isolated to quasiextended modes, *Phys. Rev. Lett.* **101**, 133901 (2008).
47. K.Y. Bliokh, A. Niv, V. Kleiner, and E. Hasman, Geometrodynamics of spinning light, *Nature Photon.* **2**, 748 (2008).
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49. K.Y. Bliokh, I.V. Shadrivov, and Y.S. Kivshar, Goos-Hanchen and Imbert-Fedorov shifts of polarized vortex beams, *Opt. Lett.* **34**, 389 (2009).
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52. K.Y. Bliokh, Y.P. Bliokh, and A. Ferrando, Resonant plasmon-soliton interaction, *Phys. Rev. A* **79**, 041803(R) (2009).
53. I.V. Shadrivov, K.Y. Bliokh, Y.P. Bliokh, V. Freilikher, and Y.S. Kivshar, Bistability of Anderson localized states in nonlinear random media, *Phys. Rev. Lett.* **104**, 123902 (2010).
54. O. Rodriguez, D. Lara, K.Y. Bliokh, E.A. Ostrovskaya, and C. Dainty, Optical nanoprobng via spin-orbit interaction of light, *Phys. Rev. Lett.* (2010, to appear).