Comisión Interministerial de Ciencia y Tecnología

Curriculum Vitae

Name: Prof. Evgeny Sherman

Date: October 20, 2022

Professional Situation:

Department of Physical Chemistry, Faculty of Science and Technology University of the Basque Country UPV-EHU, 48940 Leioa, Spain

Speciality: Theorerical Physics

Research lines

Spintronics, physics of semiconductors and semiconductor nanostructures, Bose-Einstein condensates, cold atomic gases, quantum control.

Academic Education

Degree	Research Center	Time
Diploma (M.Sc.) in Theoretical Physics	Landau Institute for Theoretical Physics, USSR Academy of Sciences	30-06-1987

Doctorado	Centro	Fecha
Ph.D. in Theoretical Physics	Landau Institute for Theoretical Physics, USSR Academy of Sciences	26-10-1990

Professional Activities

Position	Institution	Period
Assistant Professor Associate Professor	Moscow Institute of Physics & Technology (State University)	Sept. 1990 – Sept. 2001
visiting researcher (a fellow of the Alexander-von-Humboldt Foundation)	Institute of Physics, J.-Gutenberg University, Mainz, Germany	April 1994- November 1995
visiting researcher (a fellow of the Alexander-von-Humboldt Foundation)	Physics Institute, RWTH-Aachen (Technical University), Germany	June 1998- July 1999
visiting researcher (Lise-Meitner fellow) visiting Professor	Institute for Theoretical Physics, Karl-Franzens University of Graz, Austria	August 1999- December 2003
research associate	Department of Physics, University of Toronto, Canada	January 2004- May 2008

Selected Scientific Publications
(published in 2016-2022)

Jing Li, E. Ya. Sherman, and Andreas Ruschhaupt *Quantum heat engine based on a spin-orbit- and Zeeman-coupled Bose-Einstein condensate* Phys. Rev. A **106**, L030201 (2022)

P. V. Pyshkin, E. Ya. Sherman, and Lian-Ao Wu *Polaron formation in a spin chain by measurement-induced imaginary Zeeman field* Phys. Rev. B **104**, 075136 (2021)

D. Maryenko, M. Kawamura, A. Ernst, V. K. Dugaev, E. Ya. Sherman, M. Kriener, M. S. Bahramy, Y. Kozuka, and M. Kawasaki *Interplay of spin–orbit coupling and Coulomb interaction in ZnO-based electron system* Nature Communications **12,** 3180 (2021)

M. A. Semina, M. M. Glazov, and E. Ya. Sherman *Interlayer exciton-polaron in atomically thin semiconductors* Ann. der Physik **532,** 2000339 (2020)

J. Wätzel, E. Ya. Sherman, and J. Berakdar, *Nanostructures in structured light: Photoinduced spin and orbital electron dynamics* Phys. Rev. B **101**, 235304 (2020)

E.V. Kirichenko, V. A. Stephanovich, and E. Ya. Sherman *Chaotic Cyclotron and Hall Trajectories Due to Spin-Orbit Coupling* Ann. der Physik 2000012 (2020)

P.V. Pyshkin, E.Ya. Sherman, and L.-A. Wu *Quantum mechanics and speed limit of ultrafast local control in spin chains* Phys. Rev. A **100**, 063401 (2019)

Y. V. Kartashov, V. V. Konotop, M. Modugno, and E. Ya. Sherman *Solitons in Inhomogeneous Gauge Potentials: Integrable and Nonintegrable Dynamics* Phys. Rev. Lett. **122**, 064101 (2019)

Y.-C. Li, Xi Chen, J. G. Muga, and E. Ya. Sherman *Qubit gates with simultaneous transport in double quantum dots* New J. Phys. **20**, 113029 (2018)

P. V. Pyshkin, E. Ya. Sherman, J. Q. You, and L.-A. Wu *High-fidelity non-adiabatic cutting and stitching of a spin chain via local control* New J. Phys. **20**, 105006 (2018) , invited paper for special issue "Focus on Shortcuts to Adiabaticity"

Sh. Mardonov, V. V. Konotop, B. A. Malomed, M. Modugno, and E. Ya. Sherman *Spin-orbit-coupled soliton in a random potential* Phys. Rev. A **98**, 023604 (2018)

V.A. Stephanovich and E.Ya. Sherman *Chaotization of internal motion of excitons in ultrathin layers by spin-orbit coupling* Phys. Chem. Chem. Phys. **20**, 7836 (2018)

M. Inglot, V. K. Dugaev, J. Berakdar, E. Ya. Sherman, and J. Barnaś *Charge and spin currents in graphene generated by tailored light with orbital angular momentum* Appl. Phys. Lett. **112**, 231102 (2018)

V. A. Stephanovich, E. Ya. Sherman, N. T. Zinner, and O. V. Marchukov *Energy-level repulsion by spin-orbit coupling in two-dimensional Rydberg excitons* Phys. Rev. B **97**, 205407 (2018)

Sh. Mardonov, M. Modugno, and E. Ya. Sherman *Effects of anomalous velocity in spin-orbit coupled systems* Book: Spin Orbitonics and Topological Properties of Nanostructures **178**, World Scientific (2018)

P. V. Bondarenko and E. Ya. Sherman *Uniform magnetization dynamics of a submicron ferromagnetic disk driven by the spin-orbit coupled spin torque* Journ. of Phys. D: Applied Physics **50,** 265004 (2017)

Jan R. Bindel, Mike Pezzotta, J. Ulrich, M. Liebmann, E. Ya. Sherman, and M. Morgenstern *Probing variations of the Rashba spin-orbit coupling at the nanometer scale* Nature Physics **12,** 920 (2016)

P. V. Pyshkin, E. Ya. Sherman, Da-Wei Luo, J. Q. You, and Lian-Ao Wu *Spatial compression of a particle state in a parabolic potential by spin measurements* Phys. Rev. B **94**, 134313 (2016)

A. V. Shumilin, E. Ya. Sherman, and M. M. Glazov *Spin dynamics of hopping electrons in quantum wires: Algebraic decay and noise* Phys. Rev. B **94,** 125305 (2016)

Xiayu Linpeng, Todd Karin, M. V. Durnev, Russell Barbour, M. M. Glazov, E. Ya. Sherman, S. P. Watkins, S. Seto, and Kai-Mei C. Fu *Longitudinal spin relaxation of donor-bound electrons in direct band-gap semiconductors* Phys. Rev. B **94**, 125401 (2016)

I. V. Tokatly and E. Ya. Sherman S*pin evolution of cold atomic gases in SU(2)*x *U(1) fields* Phys. Rev. A **93**, 063635 (2016)

J. A. Budagosky, D. V. Khomitsky, E. Ya. Sherman, and Alberto Castro *Shaped electric fields for fast optimal manipulation of electron spin and position in a double quantum dot* Phys. Rev. B **93**, 135432 (2016)

Supervised Ph. D. Theses

Topic: Effects of spin-orbit coupling in quantum semiconductor systems
Doctorand: Yue Ban
University of the Basque Country UPV-EHU, Department of Physical Chemistry
Degree obtained: June 2013
Received Chinese Government Award for Outstanding Self-Financed Students Abroad (2012) by China Scholarship Council of Ministry of Education (one out of two awards in Spain that year).

Topic: Spin-related phenomena in magnetic and spin-orbit coupled Bose-Einstein condensates
Doctorand: Shuhrat Mardonov
University of the Basque Country UPV-EHU, Department of Physical Chemistry
Degree obtained: June 2015

Supervised Master Theses

Topic: Localization in systems with random spin-orbit coupling
Master student: Ander Garcia Rodriguez
University of the Basque Country UPV/EHU
Degree obtained: September 2020

Topic: Electric dipole spin resonance at shallow donors in quantum wires
Master student: Ekaterina Lavrukhina
University of Nizhny Novgorod, Russia, Department of Physics, co-supervised with Prof. D. Khomitsky
Degree obtained: June 2019

Topic: Collapse of spin-orbit coupling in Bose-Einstein condensates
Master student: Jing Li
University of Shanghai, Department of Physics, co-supervised with Prof. X. Chen
Degree obtained: June 2017

Topic: Spin-orbit coupling in Bose-Einstein condensates
Master student: Hong-Wei Wang
University of Shanghai, Department of Physics, co-supervised with Prof. X. Chen
Degree obtained: June 2015

Relevant Merits

Selected invited book contributions

Authors: Sh. Mardonov, M. Modugno, and E. Ya. Sherman
Title: *Effects of anomalous velocity in spin-orbit coupled systems*
Book chapter in: *Topology, Spin Dynamics, and the Properties of Nanostructures*
Publication year: 2017 Publisher: World Scientific

Authors: E. Ya. Sherman, D.V. Khomitsky, and V.K. Dugaev
Title: *Spin Dynamics in One-Dimensional Semiconductors: Unusual Relaxation and Resonances*
Book chapter in: *Advances in Semiconductor Research: Physics of Nanosystems, Spintronics and Applications*
Publication year: 2014 Publisher: NOVA Science Publishers

Selected research projects and grants

Title: Supporting diversification of research groups in condensed matter physics
Position: scientific advisor
Duration: 01/01/2016-29/12/2017, funded by: Swiss National Foundation SCOPES
Total subvention – 160 000 Euro

Title: Theory of semiconductor structures with random spin-orbit field
Position: principal investigator
Duration: 11/04/2013-11/04/2016, funded by: National Science Fund of Poland
Total subvention: 100 000 Euro

Title: Quantum field theory approaches for Bose-Einstein condensates
Position: director
Duration: 01/09/2012-30/06/2015, funded by: eAstana Erasmus Mundus Program of European Union
Total subvention: 55 000 Euro

Other science-related activities

- Board member of international conferences on theoretical and applied physics
- Reviewer of manuscripts for leading scientific journals including Nature Group and Physical Review Letters
- Outstanding reviewer of the American Physical Society
- National and international reviewer of Ph.D. and Habilitation Theses
- National and international reviewer of research project proposals for funding agencies
- Invited speaker at leading Universities and research centers and international conferences
- Editorial Board member, MDPI Journal Physics