Curriculum vitae

Sergey N. Shevchenko

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Business Address: B. Verkin Institute for Low Temperature Physics and Engineering (ILTPE), 47 Nauki Ave., Kharkov 61103, Ukraine.
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Official positions:

11.2016 – present: Head of Department of Superconducting and Mesoscopic structures, ILTPE: www.ilt.kharkov.ua/bvi/structure/d16/en
01.2008 – 10.2016: senior research fellow in ILTPE (also 06-10.2016: acting department head);
12.2004 – 12.2007: research fellow in ILTPE;
11.2002 – 12.2004: junior research fellow in ILTPE;
11.1999 – 11.2002: Ph.D. student in ILTPE;

09.2013 – present: professor in V. Karazin National University, Department of Physics and Technology; fall semester: Mathematical physics (practicals for third-year students), spring semester: Mathematical physics (practicals for second-year students) and "Quantum Engineering and Mesoscopic Physics" (lecture course for fifth-year students);

Research visits:
2007 – … – RIKEN (Wako, Japan);
2016 – University of Queensland (Brisbane, Australia);
2015, 2016 – Nikolaev Institute of Inorganic Chemistry (Novosibirsk, Russia);
2004, 2006 – 2014, 2018 – visits in F. Schiller University and IPHT (Jena, Germany);
1999-2002 – visits in Grenoble High Magnetic Field Laboratory CNRS&MPI (France).

Referee of the journals Phys. Rev. Lett., Phys. Rev. A and B, Low Temp. Phys., etc.

Member of the ILTPE Scientific Councils "Electronic properties of normal metals and superconductors" (since 2011) and "Theoretical Physics" (since 2014); member of the ILTPE Dissertation Defence Council (2015 – present).
Member of the Council of Young Scientists (YS) of ILTPE (2003-2010); In Organizing Committee of the YS Conferences "Low Temperature Physics" in ILTPE (2004-2010). In Program Committee of this conference (since 2010)

Education:

Institution of doctoral candidacy:
09.2008 – 08.2011: ILTPE, Kharkov, Ukraine.
Degree: Dr. Sci. (defended 23.04.2013, degree granted 10.10.2013) in speciality Theoretical Physics
Research Project: "Dynamical quantum effects in systems with Josephson qubits" (adviser: Prof. A.N. Omelyanchouk)

Graduate:
11.1999 – 11.2002: ILTPE, Kharkov, Ukraine.
Degree: Ph.D. (defended 08.07.2003, degree granted 12.11.2003) in speciality Theoretical Physics
Research Project: "Current-carrying states in mesoscopic normal and superconducting systems" (supervisor: Prof. Yu.A. Kolesnichenko)

Undergraduate:

09.1993 – 03.1999: Kharkov State University, Department of Physics and Technology.
Degree: Specialist Diploma with Distinction in Theoretical Physics
Thesis: "Influence of spin-orbit interaction and hyperfine magnetic field on currents in two-dimensional electron gas" (supervisor: DSc A.S. Rozhavsky, ILTPE);

Supervision:

Ivakhnenko Oleg
Bachelor's thesis (2017): "Membrane dynamics for creation of memcapacitance".
Summer internships in RIKEN (2017, 2018). First-rank diploma at the University competition of the student works and third-rank diploma at the all-Ukrainian competition of student works (2018).
Journal publications: 2 x Sci. Rep.

Karpov Denis
PhD thesis (*2018*): "Quantum-mechanical properties of mesoscopic systems based on superconducting qubits"
Master's thesis (2014): "Amplification of transmitted signal in doubly-driven qubit-resonator system".
Bachelor's thesis (2012): "Dressed states of the qubit in resonator".
First-rank diploma at the University competition of the student works and second-rank diploma at the all-Ukrainian competition of the student works (2013); President of Ukraine scholarship (2017); DAAD scholarship (2017-2018).
Journal publications (before PhD thesis): 2 x PRB, 2 x LTP, PRApplied.

Ryzhov Artem
Master's thesis (2018): "Resonant excitation and dynamics of the quantum four-level system".
Journal publication: arXiv.

Rubanov Dmitriy
Bachelor's thesis (2015): "Interaction of the electrically coupled quantum dot and nano-mechanical-resonator".
Journal publication: PRB.

Temchenko Evgeniy
Master's thesis (2010): "Multiphoton excitations and population inversion in the system of two flux qubits".
Yearly project (2009): "Theoretical study of dissipative dynamics of superconducting qubits systems".
First-rank diploma at the University competition of the student works and second-rank diploma at the all-Ukrainian competition of the student works (2009).
Journal publications: 2 x PRB, J. Phys. Conf. Ser.

Grants, Scholarships, and Awards:

In different years: participation in national and bilateral grants (together with Germany, Russia, and Japan).

2.2017: B.I. Verkin Prize of the National Academy of Sciences of Ukraine "for the theoretical and experimental study of Josephson qubits for quantum computation".

2016: Grant of President of Ukraine for Doctors of Sciences.

08.2010: DAAD Scholarship, Institute for Photonic Technologies (Jena, Germany).

05.2010: Award (decoration) of National Academy of Sciences "Talent, Inspiration, Labour".

04.2010: academic rank: "Senior Researcher" by High Attestation Commission of Ukraine

02.2010: NAS (National Academy of Sciences) of Ukraine Award for the young scientists for the best scientific works (together with Yuzephovich O.I. and Luzhbin D.A.; for the series of works: "New quantum and dimensional effects in superconducting and mesoscopic structures").

01.2008: Third prize for the paper [Low Temp. Phys. 2006] at the open competition for the best YS's papers in theoretical physics within the framework of the seminar "Problems of theoretical physics" dedicated to the centenary of L.D. Landau.

03.2006 – 03.2008: INTAS YS Fellowship Grant.

2005: YS Grant of President of Ukraine.

10.2004 – 01.2005: DAAD Scholarship, F. Schiller University, Institute for Solid State Physics (Jena, Germany).

10.2002 – 10.2004: Scholarship of President of Ukraine.

10.1999 – 01.2000: CIES Scholarship of French Government, Grenoble High Magnetic Field Laboratory (France).

Prizes of the ILTPE at the annual competition for the best articles: Phys. Rev. B (2014); Low Temp. Phys. (2010); Phys. Rep. (2010); Phys. Rev. B (2008); Phys. Rev. B (2006); Low Temp. Phys. (2005); Phys. Rev. B (2003).

Languages: Russian (native), Ukrainian, English, French.

About **research** see at http://www.ilt.kharkov.ua/bvi/structure/d16/en/dynamics_mesoscopic.html

Selected publications:

(Full list of publications is available at https://scholar.google.com.ua/citations?user=TfSG1KoAAAAJ&hl=ru)

1) S. N. Shevchenko and D. S. Karpov, Thermometry and memcapacitance with qubit-resonator system, Phys. Rev. Applied 10, 014013 (2018).
2) R. D. Yamaletdinov, O. V. Ivakhnenko, O. V. Sedelnikova, S. N. Shevchenko, Y. V. Pershin, Snap-through transition of buckled graphene membranes for memcapacitor applications, Sci. Rep. 8, 3566 (2018).
3) S. N. Shevchenko, Y. V. Pershin, and F. Nori, Qubit-based memcapacitors and meminductors, Phys. Rev. Applied **6**, 014006 (2016).
4) M. F. Gonzalez-Zalba, S. N. Shevchenko, S. Barraud, J. R. Johansson, A. J. Ferguson, F. Nori, and A. C. Betz, Gate-sensing coherent charge oscillations in a silicon field-effect transistor, Nano Lett. **16**, 1614 (2016).
5) S. N. Shevchenko, G. Oelsner, Ya. S. Greenberg, P. Macha, D. S. Karpov, M. Grajcar, U. Hübner, A. N. Omelyanchouk, and E. Il'ichev, Amplification and attenuation of the transmitted signal by doubly-dressed states, Phys. Rev. B **89**, 184504 (2014).

6) A.N. Omelyanchouk, E.V. Il'ichev, S.N. Shevchenko, Quantum coherent phenomena in Josephson qubits, Naukova Dumka, Kiev, 2013 (monograph, in Russian).
7) S.N. Shevchenko, A.N. Omelyanchouk, and E. Il'ichev, Multiphoton transitions in Josephson-junction qubits (Review Article), Low Temp. Phys. **38**, 283 (2012).
8) S.N. Shevchenko, S. Ashhab, and F. Nori, Landau-Zener-Stuckelberg interferometry, Phys. Rep. **492**, 1 (2010).
9) S.N. Shevchenko, S.H.W. van der Ploeg, M. Grajcar, E. Il'ichev, A.N. Omelyanchouk, H.-G. Meyer, Resonant excitations of single and coupled flux qubits connected to tank circuit, Phys. Rev. B **78**, 174527 (2008).
10) A. Izmalkov, S.H.W. van der Ploeg, S.N. Shevchenko, M. Grajcar, E. Il'ichev, A.N. Omelyanchouk, and H.-G. Meyer, Consistency of ground state and spectroscopic measurements on flux qubits, Phys. Rev. Lett. **101**, 017003 (2008).
11) S.N. Shevchenko, Impedance measurement technique for quantum systems, Eur. Phys. J. B **61**, 187 (2008).
12) V.I. Shnyrkov, Th. Wagner, D. Born, S.N. Shevchenko, W. Krech, A.N. Omelyanchouk, E. Il'ichev, and H.-G. Meyer, Multiphoton transitions between energy levels in a phase-biased Cooper-pair box, Phys. Rev. B **73**, 024506 (2006).
13) S.N. Shevchenko, A.S. Kiyko, A.N. Omelyanchouk, W. Krech, Dynamic behaviour of Josephson-junction qubits: crossover between Rabi oscillations and Landau-Zener transitions, Low Temp. Phys. **31**, 569 (2005).
14) Yu.A. Kolesnichenko, A.N. Omelyanchouk, and S.N. Shevchenko, Josephson and spontaneous currents at the interface between two *d*-wave superconductors with transport current in the banks, Low Temp. Phys. **30**, 213 (2004).
15) Yu.V. Pershin, S.N. Shevchenko, I.D. Vagner, and P.Wyder, Electronic transport through nuclear-spin-polarization-induced quantum wire, Phys. Rev. B **66**, 035303 (2002).
16) S.N. Shevchenko and Yu.A. Kolesnichenko, Conductance of the elliptically shaped quantum wire, JETP **92**, 811 (2001).
17) V.A. Cherkassky, S.N. Shevchenko, A.S. Rozhavsky, I.D. Vagner, Hyperfine-driven spontaneous persistent currents in mesoscopic rings, Low Temp. Phys. **25**, 541 (1999).