

# CURRICULUM VITAE

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**Date and Place of Birth:** 16 November 1956, St. Petersburg, Russia

**Citizenship:** Russia

**Marital Status:** Married, wife Galina M. Aleshina, the only son

## Education and Degree:

**2009 Sci.D.**, "Charge carrier transport in conducting polymers near the metal-insulator transition", Semiconductor Physics, Ioffe Institute, Russian Academy of Sciences, St. Petersburg, Russia.

**1989 Ph.D.**, "Hopping conductivity of amorphous and polymer films near the metal-insulator transition", Semiconductor Physics, Ioffe Institute, Russian Academy of Sciences, St. Petersburg, Russia.

**1980 M.S.**, "Effect of photon recycling to the photoluminescence of GaAs:Si LED structures", Semiconductor Physics, St. Petersburg State Polytechnical University, St. Petersburg, Russia.

## Qualifications and Professional Experience:

45 years of experience in Materials Science, Semiconductor Physics and Polymer Physics: basic and applied research. Successful leadership and participation in the R&D projects related to basic research, strong background in experimental and theoretical physics.

## Current Positions:

**1983 - present** – Deputy Director of Division of Solid State Electronics (2014); Head of Laboratory of Nonequilibrium Processes in Semiconductors (2018) and Organic Electronics Group, Leading Staff Physicist, Senior Staff Physicist, Staff Physicist, Junior Staff Physicist of Ioffe Institute, Russian Academy of Sciences, St. Petersburg, Russia

**2012 – present** – Professor of Saint-Petersburg Electrotechnical University "LETI" (ETU), Faculty of Electronics; Department of Micro- and Nanoelectronics.

## Previous Positions:

**01.09.2003 – 31.08.2005** – Visiting Professor, School of Physics & Nano Systems Institute – National Core Research Center, Seoul National University, Seoul, Korea

**01.09.2000 – 20.08.2002** - Contract Professor, BK-21 Physics Research Division, Seoul National University, Korea.

**01.02.2002 - 28.06.2002** – Invited Professor, Department de Physique, Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland.

**1999** - Visiting Research Scientist, Department of Physics, Abo Academi University, Turku, Finland.

**1996 - 1997** - Visiting Research Scientist, Institute for Polymers and Organic Solids, University of California at Santa Barbara, Santa Barbara, USA

**1980 - 1983** - Junior Staff Physicist, S.I. Vavilov State Optical Institute, St. Petersburg, Russia.

## Awards and Professional Societies Membership:

**1997-1998; 1993 - 1994** - Material Research Society (USA) member

**2006** – Russian Innovations Competition 2006 winner with a project "New composite: polymer-inorganic nanoparticles active layers for OLEDs with color switching controlled by electric field".

**2012 - present** certified expert of Russian Ministry of Science and Education and Russian Academy of Sciences.

**2018 – present** - member of the Academic Councils of the Ioffe Institute and the Division of Solid State Electronics of the Ioffe Institute; member of the Dissertation Council D212.238.04 of the Electrotechnical University "LETI".

**2021** - awarded the medal "For contribution to the implementation of state policy in the field of scientific and technological development" by the Ministry of Science and Higher Education of the Russian Federation.

**2024** - awarded the medal "300 years of the Russian Academy of Sciences" by the Russian Academy of Sciences

## Professional Skills:

- Condensed matter physics experiment; electronic properties of conducting polymers; organic microelectronics based on polymers and hybrid (organic-inorganic) nanostructures; electronic and optical characterization of polymer/inorganic nanoparticles composites, biopolymers for OLEDs, OFETs, organic solar cells, memory chips.
- Charge carrier transport and mobility investigation of organic and non-organic disordered systems including low temperature (down to 0.1 K) dc and ac conductivity, the influence of high electric and magnetic fields.
- Charge carrier transport mechanisms investigation in doped conjugated polymer films and nanofibers and in other disordered systems on both insulator and metallic sides of the metal-insulator transition.

- Application of organic semiconductors, conjugated and non-conjugated polymers as temperature sensors, bolometers, field-effect transistors, elements of light emitting diodes, solar cells.

**Teaching:** Lecture courses for Ph.D. students: "Electronic processes in organic and polymeric materials" –School of Physics, Seoul National University, Seoul, Korea, 2001 (English); for magister students: "Organic electronics", Saint-Petersburg Electrotechnical University (LETI), Russia, 2013-2020; for Ph.D. students: «Polymer and hybrid electronics: physics and device applications» under the Program: Global Initiative for Academic Network (GIAN) of the Government of India Ministry of Human Resources Development in National Institute of Technology Calicut, Kerala, India (2017).

**Journal Editorials & Advisory Boards: 2021 - up to the present** - member of the Editorial Board of the Journal of Technical Physics; reviewer for Synthetic Metals; Organic Electronics; Journal of Materials Science: Materials in Electronics, Advanced Functional Materials, Semiconductors, Polymer Science, etc. (2000 - present).

**Publications: more than 200 articles in refereed scientific journals**, in particular:

1. L. Boudjemila, G.V. Nenashev, V.G. Malyshev, E.I. Terukov, A.N. Aleshin, Impedance dynamics in tandem solar cells based on c-Si with upper layers of CsPbBr<sub>3</sub> (CsPbI<sub>3</sub>) perovskite nanocrystals, *Optical Materials*, 156 (2024) 115925.
2. N.I. Alekseev, A.N. Aleshin, [The mechanism of resistive switching in memristors based on organometallic perovskites](#), *Phys. Solid State*, 66(3) (2024) 362.
3. L. Liu, H. Ge, Y. Wang, Z. Zhang, J. Piao, J. Qiu, B. Zhang, W. Shen, K. Cao, A.N. Aleshin, S. Chen, Multi-dentate Zwitterionic Ligand Assisted Formation of Pure Bromide-Based Perovskite Nanosheets and Their Application in Blue Light-Emitting Diodes, *The Journal of Physical Chemistry Letters*, **14** (2023) 2736.
4. G.V. Nenashev, A.N. Aleshin, I.P. Shcherbakov, V.N. Petrov, Effect of temperature variations on the behavior of a two-terminal organic–inorganic halide perovskite rewritable memristor for neuromorphic operations, *Solid State Commun.* **348–349** (2022) 114768 (6pp).
5. A.V. Andrianov, A.N. Aleshin, S.N. Abolsamov, E.I. Terukov, E.V. Beregin, Generation of Terahertz Radiation under the Femtosecond Laser Excitation of a Multilayer Structure Based on a-Si:H/a-SiC:H/c-Si, *JETP Letters* **116**(12) (2022) pp. 859.
6. A.N. Aleshin, I.P. Shcherbakov, O.P. Chikalova-Luzina, L.B. Matyushkin, M.K. Ovezov, A.M. Ershova, I.N. Trapeznikova, V.N. Petrov, Photo- and electroluminescence features of films and field effect transistors based on inorganic perovskite nanocrystals embedded in a polymer matrix, *Synth. Metals* **260** (2020) 116291(8pp.).
7. A.N. Aleshin, I.P. Shcherbakov, E.V. Gushchina, L.B. Matyushkin and V.A. Moshnikov, Solution processed field-effect transistors based on polyfluorene – cesium lead halide nanocrystals composite films with small hysteresis of output and transfer characteristics, *Organic Electronics*, **50** (2017) 213.
8. A.N. Aleshin, I.P. Shcherbakov, A.S. Komolov, V.N. Petrov and I.N. Trapeznikova, Poly(9-vinylcarbazole) - graphene oxide composite field-effect transistors with enhanced mobility, *Organic Electronics* **16** (2015) 186.
9. A.N. Aleshin, A.S. Berestennikov, P.S. Krylov, I.P. Shcherbakov, V.N. Petrov, I.N. Trapeznikova, R.I. Mamalimov, A.K. Khripunov, A.A. Tkachenko, Electrical and optical properties of bacterial cellulose films modified with conductive polymer PEDOT/PSS, *Synth. Metals* **199** (2015) 147.
10. A.N. Aleshin, Organic optoelectronics based on polymer-inorganic nanoparticle composite materials, *Physics-Uspekh* **56** (2013) 627.
11. A.N. Aleshin, I.P. Shcherbakov, V.N. Petrov and A.N. Titkov, Solution-processed polyfluorene-ZnO nanoparticles ambipolar light-emitting field-effect transistor, *Organic Electronics*, **12** (2011) 1285.
12. A.N. Aleshin and Y.W. Park, One-dimensional charge transport in conducting polymer nanofibers, in *Handbook of Conducting Polymers*, ed. by T.A. Skotheim, J.R. Reynolds. 3rd Ed., CRC Press (2007) Chap. **16**, pp.16-1 – 16-25.
13. A.N. Aleshin, Polymer nanofibers and nanotubes: charge transport and device applications, *Adv. Mater.*, **18**(2006) 17.
14. A.N. Aleshin, H. J. Lee, S.H. Jhang, H.S. Kim, K. Akagi, and Y.W. Park, Coulomb-blockade transport in quasi-one dimensional polymer nanofibers, *Phys. Rev. B*, **72** (2005) 153202.
15. A.N. Aleshin, H.J. Lee, Y.W. Park, and K. Akagi, One-dimensional transport in polymer nanofibers, *Phys. Rev. Lett.* **93** (2005) 196601.
16. A.N. Aleshin, J.Y. Lee, S.W. Chu, J.S. Kim and Y.W. Park Mobility studies of field-effect transistor structures based on anthracene single crystals, *Appl. Phys. Lett.* **84** (2004) 5383.
17. A.N. Aleshin, J.Y. Lee, S.W. Chu, S.W. Lee, B. Kim, S.J. Ahn, Y.W. Park, "Hopping conduction in polydiacetylene single crystals, *Phys. Rev. B* **69** (2004) 214203.
18. A.N. Aleshin, V.I. Kozub, D.-S. Suh, and Y.W. Park, Low-temperature saturation of dephasing in heavily doped polyacetylene, *Phys. Rev. B* **64** (2001) 224208.
19. A.N. Aleshin, H. Sandberg, and H. Stubb, Two-dimensional charge carrier mobility studies of regioregular P3HT, *Synth. Metals*, **121** (2001) 1449.
20. V.I. Kozub and A.N. Aleshin, Transport anomalous in highly doped conjugated polymers at low temperatures, *Phys. Rev. B* **59** (1999) 11322.
21. A.N. Aleshin, Kwanghee Lee, J.Y. Lee, D.Y. Kim, C.Y. Kim, Comparison of electronic transport properties of soluble polypyrrole and soluble polyaniline doped with dodecylbenzene-sulfonic acid, *Synth. Metals*, **99** (1999) 27.
22. A.N. Aleshin, S.R. Williams, A.J. Heeger, Transport and magnetic properties of poly(3,4-ethylenedioxythiophene)/poly(styrenesulfonate) films, *Synth. Metals*, **94** (1998) 173.
23. A. Aleshin, R. Kiebooms, Reghu Menon, F. Wudl A.J. Heeger, Metallic conductivity at low temperatures in poly(3,4-ethylenedioxythiophene) doped with PF<sub>6</sub>, *Phys. Rev. B* **56** (1997) 3659.

24. A. Aleshin, R. Kiebooms, Reghu Menon, A.J. Heeger, Electronic transport in doped poly(3,4-ethylenedioxythiophene) near the metal-insulator transition, *Synth. Metals*, **90** (1997) 61.