

PHYSICS OF ELECTRONIC PROCESSES IN LOW-DIMENSIONAL SYSTEMS

Founded in 1998.

*Head of the research group: **Vladimir Dmitrievich KREVCHIK**, Doctor of Physical and Mathematical Sciences, Professor, Honoured Worker of Science of the Russian Federation, Dean of the Faculty of Information Technologies and Electronics*

Members of the research group: **M. B. Semenov**, Doctor of Physical and Mathematical Sciences, Professor; **A. B. Grunin**, Doctor of Physical and Mathematical Sciences; R. V. Zaytsev, PhD in Physics and Mathematics, Associate Professor; A. V. Razumov, PhD in Physics and Mathematics, Associate Professor; **V. V. Evstifeev**, PhD in Physics and Mathematics, Associate Professor; S. V. Yashin, PhD in Physics and Mathematics; A. A. Marko, PhD in Physics and Mathematics, Associate Professor; A. A. Kindaev, PhD in Physics and Mathematics, Associate Professor; A. V. Levashov, PhD in Physics and Mathematics; E. N. Kalinin, PhD in Physics and Mathematics, Associate Professor; L. N. Tumanova, PhD in Physics and Mathematics; E. V. Groznaya, PhD in Physics and Mathematics; S. A. Gubina, PhD in Physics and Mathematics; V. A. Grishanova, PhD in Physics and Mathematics; Z. A. Gavrina, PhD in Physics and Mathematics; A. V. Kalinina, PhD in Physics and Mathematics; V. A. Rudin, PhD in Physics and Mathematics; S. E. Kozenko, PhD in Physics and Mathematics; E. L. Bit-David, PhD in Pedagogy, Associate Professor; V. A. Proshkin, PhD in Physics and Mathematics; V. G. Mayorov, PhD in Physics and Mathematics; N. E. Artemova, PhD in Engineering, Associate Professor; E. A. Gubin, PhD in Physics and Mathematics; V. N. Kalinin, PhD in Physics and Mathematics; E. I. Kudryashov, PhD in Physics and Mathematics; S. E. Igoshina, PhD in Physics and Mathematics, Associate Professor; N. Yu. Cherepanova, PhD in Physics and Mathematics, Associate Professor; P. V. Krevchik, PhD Student; P. S. Budyanskiy, PhD Student; I. A. Egorov, PhD Student; M. A. Sultanov, Master's Student.

Many of the research group's members became winners of prestigious research contests and grants, namely the *U.M.N. I.K.* Grants in 2007-2009, a grant of the Russian Foundation for Basic Research in 2009, and a grant within the federal target programme 'Scientific and Scientific-Pedagogical Personnel of the Innovative Russia' in 2012-2013. Some members received 1st and 2nd class diplomas at prestigious youth research contests and conferences, including the *Young Physicians of Russia* Contest in the fundamental physics section. Those are V. A. Rudin and P. V. Krevchik (1st class diploma, 2011), I. A. Egorov (2nd class diploma, 2015), and M. A. Sultanov (2nd class diploma, 2016).



■ The meeting, where V. D. Krevchik and M. B. Semenov signed an agreement on research cooperation with the Research Institute at the International Medical Centre in Tokyo and with Tokyo Instruments, Inc. as part of the *Iryokikicentre* and *Nano Medicine Supporting Program* Grants

V. D. Krevchik is an author of over 350 scientific works, including 14 monographs, 35 articles indexed in the Web of Science database, 37 articles indexed in the Scopus database, 12 training and methodological manuals, and 10 patents.

The research group's main research areas are as follows:

1. Controlled modulation of parameters in tunnel-coupled nanostructures.
2. Electro- and magneto-optics of semiconductor nanostructures with impurity centres of atomic and molecular types.

Fundamental scientific results obtained in the works of **V. D. Krevchik** are widely recognised among Russian and international scientists, including Prof A. J. Leggett, a 2003 Nobel laureate in Physics from the USA, Prof H. Dekker from the Institute of Theoretical Physics in the Netherlands, Prof S. Huant from France, Prof S. Rakityansky from the University of Pretoria in South Africa, Prof K. Yamamoto from the Research Institute of the International Medical Centre in Tokyo, Japan, as well as colleagues from M. V. Lomonosov MSU, Moscow Institute of Physics and Technology, the Laboratory of Electronics of Organic Materials and Nanostructure of the Institute of Biochemical Physics RAS, National Research Lobachevsky State University of Nizhni Novgorod, and Ulyanovsk State Technical University and specialists from Tokyo Instruments Inc.

The collective monograph 'Controlled Dissipative Tunnelling: Tunnelling Transport in Low-Dimensional Systems' (a work dedicated to the memory of RAS Academician A. I. Larkin), edited by the 2003 Nobel Laureate in Physics, Prof A. J. Leggett, is well known within the academic community. One of its co-authors is **V. D. Krevchik**.

The theoretical findings achieved within the framework of the research group are of considerable importance for advancing physical understanding of the influence of H(–)-like impurity centres and their complexes on the optical properties of nanostructures; for the further development of the physics of electronic processes in low-dimensional systems in conjunction with multidimensional dissipative tunnelling; and for shaping a new scientific direction — defect engineering in semiconductor device technology.

29 dissertations were defended in the group's research field, including 3 Doctor of Science dissertations.



■ Members of the research group of V. D. Krevchik