



Prof. Dr. ANNA MASLOVSKAYA

PERSONAL INFORMATION

Date of birth: April 07, 1978

Place of birth: Kiev

Nationality: Russian

Gender: Female

Address: 21, Ignatyevskoe Shosse, Blagoveshchensk, 675027, Amur region, Russia

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Academic Field: Mathematical Modelling

EDUCATION

- **Full Professor Status** confirmed by Higher Attestation Commission of Ministry of Science and Higher Education of the Russian Federation, 2022
- **Doctor of Science in Math & Physics, Saint Petersburg, 2014**
*Doctoral degree dissertation: "Mathematical Simulation of the Processes of Electron Beam Interaction with Polar Dielectrics".
The scientific specialty – "Mathematical Modelling, Numerical Methods and Program Systems",
February 24, 2014, Saint Petersburg State University*
- **Ph.D. (Candidate of Science in Math & Physics), Blagoveshchensk, 2004**
*Ph.D. dissertation: "Simulation of the Electron Beam Interaction with Polar Dielectrics",
the scientific specialty – "Condensed-Matter Physics",
December 6, 2004, Amur Integrated Research Institute of Far Eastern Branch of Russian Academy of Sciences*
- **M.S., Applied Mathematics, Blagoveshchensk, 2000**
Thesis: "Numerical Estimation of Pyroelectric Response of Ferroelectric Crystal at Local Exposure of Heat Probe", Specialization – "Mathematical Simulation", Amur State University

PROFESSIONAL EXPERIENCE (ACADEMIC EMPLOYMENT)

- **Professor, Department of Mathematical Analysis and Simulation, Mathematics and Computer Sciences Faculty, Head of the Laboratory of Mathematical Modeling Complex Physical and Biological Systems, Amur State University, 2015 – present.**
In charge of following courses: "Numerical methods", "Mathematical Modelling and Computer Simulation" (bachelor degree programs: "Physics", "Applied mathematics and informatics"); "Mathematical Methods of Experimental Data Processing", "Mathematical Modelling and Computer Simulation of Physical Processes" (master degree program "Applied mathematics and physics"); "Mathematical and Computer Simulation of Complex Systems" (master degree program "Applied mathematics and Informatics"); "Basic Foundation of Mathematical Modeling" (PhD course).
- **Lecturer, Department of Mathematics and Computer Sciences, Amur State University, 2004 – 2015**
- **Senior lecturer, Department of Mathematics and Computer Sciences, Amur State University, 2000 – 2004.**

RESEARCH

General: Mathematical Modelling, Computer Simulation, Dynamic & Nonlinear

INTERESTS

Physical Systems, Partial Differential Equations, Numerical Methods (Finite Element Method, Finite Difference Methods), Complex Fractal Physical Systems, Methods of Fractal and Multifractal Analysis, Computational Experiments

Special: Mathematical modeling and computer simulation of nonlinear dynamic and fractal processes for problems of identification, analysis and predicting characteristics of complex biological and physical systems.

DISCRETE STOCHASTIC MODELS applied to electron transport in irradiated target (modelling by means of Monte-Carlo simulation, fitting experimental data, mathematical statistics)

CONTINUOUS DETERMINISTIC MODELS with application to field effects in polar dielectrics: heating, charging & switching processes (modelling using numerical methods (FDM, FEM) for PDE and DPDE)

VISUAL SIMULATION MODELS describing signal formation, ferroelectric domain growth and complex dynamics of domain structures (application of fractal analysis of time series and raster images, Monte-Carlo simulation of domain nucleation and growth, numerical methods for solving ODE, DODE and fractional ODE, PDE)

MODELS OF COMMUNICATION IN BACTERIAL POPULATIONS, COMPUTATIONAL SCHEMES & NUMERICAL EXPERIMENTS

- *Basic Nonlinear Reaction-Diffusion Model*
- *Time Lagging Reaction-Diffusion Model*
- *Time- and Space-Fractional Reaction-Diffusion Model*
- *Stochastic and Cellular Automata Simulation of Bacterial Nucleation and Growth*

RELATED SCILLS

- **Used approaches to mathematical modelling and computational methods**
Stochastic methods (Monte-Carlo simulation) and cellular automata simulation; Determined methods (finite difference methods and finite elements methods for PDE solution, finite difference methods for solution of PDE with time delay and fractional PDE); Fractal methods (methods of fractal and multifractal analysis, method of the wavelet-analysis of the raster images and of nonstationary time series, numerical methods for fractional order differential equations).
- **Computer Implementation**
Matlab (using functional of application package, scientific programming, algorithm development, design of user interface for scientific software); MathCad; COMSOL Multiphysics.

STUDENT SUPERVISION

- **PhD thesis**
Barabash Tatyana (PhD) "Fractal regularities and model expressions of polarization switching processes in ferroelectrics at SEM techniques diagnostics" (2015); Pavelchuk Anna (PhD) "Mathematical modelling of charging processes of polar dielectrics under electron irradiation" (2018); Moroz Lubov (PhD) "Fractional-differential approach to dynamic responses numerical simulation of ferroelectrics as fractal physical systems" (2021).
- **Current PhD students**
Shuai Yixuan "Reaction-diffusion approach for numerical prediction of quorum sensing characteristics of evolving bacterial communities"
Sarukhanian Samvel "Hybrid agent-based approach to modeling the dynamics of populations of communicating bacteria"
Salmiyanov Vladislav "Multifractal algorithms for intelligent analysis of medical images"
- **Masters Graduates**
(32 persons were graduated with degrees in Applied Mathematics & Computer Sciences)

INVITED LECTURES AND PAPER PRESENTED

2021 – Technical University of Munich, Germany.
2020 – Technical University of Munich, Germany.
2019 – Technical University of Munich, Germany.
2013 – Duisburg-Essen University, Duisburg, Germany.
2008 – Harbin Institute of Technology, Harbin, China.
2004 – University of Applied Sciences, Berlin, Germany.

PROFESSIONAL

Key oral presentations (since 2013)
International Workshop on "Mathematical Modeling & Scientific Computing – Focus on Complex

PRESENTATIONS

Processes and Systems (Munich, Germany, 2020, 2022);
IX International Conference "Mathematical Biology and Bioinformatics" (Moscow, Russia, 2022);
International science-technical conference "Problems of applied mathematics, informatics and mechanics" (Voronezh, Russia, 2017, 2021, 2022);
International Workshop on "Computational technologies and Applied Mathematics" (Vladivostok, Russia, 2022);
"Joint Annual Conference of the German Mathematical Society and the Austrian Mathematical Society" (Pasau, Germany, 2021);
International conference "Days on Diffraction" (St. Petersburg, Russia, 2020, 2021, 2022);
International Conference on "Computer Simulation in Physics and beyond" (Moscow, Russia, 2018);
Asia-Pacific Conference on Fundamental Problems of Opto- and Microelectronics (Khabarovsk, Russia, 2017);
International Conference "Piezoresponse Force Microscopy and Nanoscale Phenomena in Polar Materials" (Ekaterinburg, Russia, 2014);
Asian School-Conference on Physics and Technology of Nanostructured Materials (Vladivostok, Russia, 2013).

GRANTS & AWARDS

- The project No 122082400001-8 "Mathematical models, algorithms, software tools for control and diagnosis of complex biological and physical systems", research grant of Ministry of Science and Higher Education
- Award of the Programme of "GLOBAL CHALLENGES FOR WOMEN IN MATH SCIENCE" (TUM, Germany, 2021)
- The project No 20-31-90075 "Fractional differential approach to numerical modeling of dynamic responses in complex self-similar physical systems", research grant of Russian Foundation for Basic Research (2020–2022)
- The project No 57507437 "Nonlinear dynamic and fractal models of reaction-diffusion processes in complex biological and physical systems", research grant of the DAAD programme of Research Stays for University Academics and Scientists (2020)
- The project No 1.13421.2019/13.2.2019 "Mathematical Modeling of Reaction-Diffusion Processes Applied to Biological and Physical Systems", research grant of the DAAD programme of "Mikhail Lomonosov" (2019)
- The project No 11.7127.2013 "Simulation of multilayers consisting of magnetocaloric and electrocaloric films", research grant of the DAAD programme of "Mikhail Lomonosov" (2013)
- The project No 2.1.2/9665 "The Influence of thermal fields and high-concentration energy fluxes on inorganic materials" of the analytical departmental program "Scientific potential development of a higher school (2009-2011 years)"
- The project No 4247 "The study of relaxation and injection processes of electron bunches into polar materials" of the analytical departmental program "Scientific potential development of a higher school (2005–2006 years)"
- Grant of Potanin Foundation to young lecturers in 2010

LANGUAGES

English (advanced level)
German (beginners level)

MARITAL STATUS

Family status: married

Children: Maslovskii Gleb, October, 26 2006 (male).

Maslovskaya Glafira, October, 21 2016 (female).

Periods of academic career interruption for childcare purposes:

August 2006 – October 2008, August 2016 – October 2018.

Signature



Date November 25, 2023