

Portfolio of potential scientific advisors of participants of the international Olympiad Open Doors: Russian Scholarship Project of the Association "Global Universities" on the track of postgraduate studies in 2022-2023.

University	Novosibirsk State University
English proficiency level	fluent
Proposed field of study	Differential equations
Code of the field of study	1.1.2 – differential equations and mathematical physics
List of research projects of the potential supervisor	<p>For last 5 years:</p> <ul style="list-style-type: none"> • Project “Stability of Solutions to Differential Equations with Distributed Delay”, supported by the Russian Foundation for Basic Research, no. 19-31-90149 (2019-2021; head); • Project “Theoretical and Numerical Methods for Solving Problems of Stability, Identification, and Control for Difference Equations”, supported by the Russian Foundation for Basic Research, no. 19-01-00754 (2019-2021; head); • Project “Systems of Differential Equations of High Dimension and Delay Equations. Theory and Applications”, supported by the Russian Foundation for Basic Research, no. 18-29-10086 (2018-2021; head); • Project “Theoretical and Numerical Methods for Study of Stability, Optimal Control and Identification for Some Classes of Differential-Difference Equations”, supported by the Russian Foundation for Basic Research, no. 16-01-00592 (2016-2018; head)
List of the potential topics for PhD	<ul style="list-style-type: none"> • Asymptotic properties of solutions to differential equations; • Interconnections between solutions to systems of ordinary differential equations of high dimension and solutions to delay differential equations; • Boundary value problems for partial differential equations not solvable with respect to the highest order derivative; • Properties of quasielliptical operators.
	<p>Supervisor’s research interests:</p> <ul style="list-style-type: none"> • Differential and difference equations; • Solvability of boundary value problems for partial differential equations not solvable with respect to the highest order derivative (Sobolev type equations, pseudoparabolic equations, pseudohyperbolic equations, etc.); • Conditions of stability and estimates for solutions to delay equations;

**Research supervisor:**

Dr. Prof. Gennadii V. Demidenko

Ph. D. (Candidate of Sciences),
Mathematics, Institute of Mathematics of
the Siberian Branch of the USSR Academy
of Sciences, Novosibirsk, USSR, 1981;

D. Sc. (Doctor of Sciences), Mathematics,
Steklov Mathematical Institute, Moscow,
Russia, 1993

- Dichotomy problems for differential and difference equations;
- Interconnection between solutions to systems of ordinary differential equations of high dimension and solutions to delay differential equations;
- Isomorphic properties of quasielliptic operators

Research highlights:

- Original methods developed by the supervisor will be used;
- PhD students will be involved in scientific projects headed by the supervisor;
- Financial support for PhD students;
- PhD students will be involved in the activity of the Mathematical Center in Akademgorodok.

Supervisor's specific requirements:

PhD students should know basic methods for investigations of ordinary differential equations and partial differential equations in the framework of university courses.

Supervisor's main publications:

More than 150 scientific articles and 6 books:

1. Demidenko G.V., Dulepova A.V., On stability of the inverted pendulum motion with a vibrating suspension point. *Journal of Applied and Industrial Mathematics*. 12, No. 4. P. 607–618 (2018).
2. Demidenko G.V., Matveeva I.I., Skvortsova M.A. Estimates for solutions to neutral differential equations with periodic coefficients of linear terms. *Siberian Mathematical Journal*. 60, No. 5. P. 828–841 (2019).
3. Bondar L.N., Demidenko G.V., On solvability of one class of quasielliptic systems. *Siberian Mathematical Journal*. 61, No. 6. P. 963–982 (2020).
4. Demidenko G.V. On one class of systems of differential equations with periodic coefficients in linear terms. *Siberian Mathematical Journal*. 62, No. 5, 805–821 (2021).
5. Demidenko G.V., Matveeva I.I. The second Lyapunov method for time-delay systems. In: *Functional Differential Equations and Applications* (Editors: Domoshnitsky A., Rasin A., Padhi S.). Series: Springer Proceedings in Mathematics & Statistics. Singapore: Springer Nature, 2021. V. 379. P. 145-167.