Curriculum Vitae

Nadezhda B. Konyukhova
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Konyukhova Nadezhda Borisovna (**Lyalikova, N.B.** formerly, up to 1965), birth 20.10.1941, Tomsk, Russia; married, one daughter.

Speciality: Mathematics, Numerical Methods, Differential Equations (DEs), Mathematical Physics.

Current position: Leading research worker of the Department of Numerical Methods in the Institution of Russian Academy of Sciences Dorodnicyn Computing Centre of RAS (CC RAS).

Education: Diploma (MSc), Moscow Institute of Physics and Technology, 1959–1965; post–graduate studentship in the same Institute, 1965–1969.

Degree: Candidate of Sciences in Mathematics and Physics (certain analog of PhD), 1971. Thesis: On segregation of bounded solutions for some systems of ordinary differential equations (ODEs).

Academic rank: Senior research worker (RW), 1980.

Office (since 1969): Department of Numerical Methods, Institution of Russian Academy of Sciences Dorodnicyn Computing Centre of RAS (Acad. Sci. of USSR formerly), Vavilov str., 40, 119333 Moscow GSP–1, Russia.

Career: Junior RW 1969–1971; Junior RW Cand. of Sci. 1971–1978; Senior RW 1978–1986; Leading RW 1986–1991; Head of the Laboratory of Numerical Methods for ODEs 1991–2008; Leading RW 2008 – present.
  Among the pupils three ones are Cand. of Sci. and one was Prof. Dr. (in Hungary).

Publications: More than 200 publications since 1965 (as Lyalikova, N.B. in 1965, 1966); among them 98 papers are in the refereed mathematical and physical journals and transactions, namely in: Zh. Vychisl. Matem. i Matem. Fiz. (English transl. in (U.S.S.R.) Comput. Maths Math. Phys.); Dokl. Akad. Nauk SSSR (Sov. Math. Dokl.); Differents. Uravn. (Diff. Equ.); Matem. Zam. (Math. Notes); Soobsh. VTs Akad. Nauk SSSR (RAN); Yad. Fiz. (Phys. Atomic Nuclei); Zh. Eksp. i Teor Fiz. (Sov. Phys. JETP); Pis'ma v Zh. Eksp. i Teor. Fiz. (JETP Lett.); Teor. i Eksp. Khim.; Fiz. Plazmy; Radiotekh. i Elect.; Sov. J. Numer. Anal. Math. Modelling (VNU Sci. Press, Utrecht, The Netherlands); Studia Scient. Math. Hungarica; Numer. Anal. Math. Modelling Banach Center Publs. (Warsaw); Colloquia Math. Societatis Janos Bolyai (Hungary); Comput. Math. Banach Center Publs. (Warsaw); ASME (New York); World Scientific Publs. (Singapore, New Jersey, London, Hong Kong); Comput. Phys. Commun. (Elsevier Science, The Netherlands); Kluwer Academic/Plenum Publishers (New York, Boston, Dordrecht, London, Moscow); J. Comput. Methods in Sciences and Engineering (JCMSE; Cambridge Intern. Science Publishing); J. Comput. Appl. Math. (Elsevier Science);

Obozrenie prikladnoi i promyshlennoi matematiki (Surveys on Applied and Industrial Mathematics), etc.

Translation into Russian: Ortega, J.M. and Poole, W.G. An Introduction to Numerical Methods for Differential Equations. – Jr. Pitman Publ. Inc., 1981.

Communications to scientific meetings: More than 75 scientific meetings, including more than 50 Intern. Conf. and Schools (with the personal support by Russian Foundation for Basic Research (RFBR), Intern. Science Foundation (ISF), German Research Foundation (GRF), different Organizing Committees, etc.). The list of some selected Intern. Conf. (since 1995 only): "Differential–Algebraic Equations, Related Fields and Applications" (1995, Oberwolfach, Germany); "Fifth Colloquium on the Qualitative Theory of DEs" (1996, Szeged, Hungary); "Conf. on DEs and Their Applications" (1997, Brno, Czech Republic); "Partial DEs, Theory and Numerical Solutions" (1998, Praha, Czech Republic); "Tenth Intern. Colloquium on DEs" (1999, Plovdiv, Bulgaria; invited speaker); "Trends in Nonlinear Analysis" (2000, Heidelberg, Germany); "XXII. Dynamics Days Europe 2002" (2002, Heidelberg, Germany); "EQUADIFF 2003" (2003, Hasselt, Belgium); "Intern. Workshop on Analysis and Numerical Approximation of Singular Problems" (2004, Lisbon, Portugal; invited speaker); "Spectral and Evolution Problems" (1999–2010, Sevastopol, Ukraine; invited speaker in 2006–2009); "Days on Diffraction" (1998–2007, 2010, St. Petersburg, Russia; invited speaker in 2007), etc .

Visits to institutions with the personal invitations to consult, read lectures or/and take part in the joint works (since 1995 only): Humboldt–University, Berlin (1995); Weierstrass Inst. of the Applied Analysis and Stochastics, Berlin (1997); Computer and Automation Research Inst. of HAS, Budapest (1998); Center of Applied Math. of Inst. Superior Tecnico, Lisbon, Portugal (1999, 2001, 2003).

Principal subject of research at present: Stable initial manifolds (SIMs) and singular nonlinear boundary value problems (BVPs) for ODEs; accompanying singular Cauchy problems (CPs) for the systems of quasilinear partial DEs. Singular CPs and without initial data problems for systems of nonlinear ODEs and functional–differential equations (FDEs), including integro–differential equations (IDEs) and differential–delay equations; SIMs for FDEs. Analysis and numerical solution of singular nonlinear BVPs, arising in the nonlinear physics models and in the modern models of actuarial and financial mathematics.

Scientific interests: Analytical research in DEs and FDEs with degeneracies or on infinite interval; numerical methods in the problems of mathematical and theoretical physics reduced to singular BVPs; numerical–analytical investigations in the problems of acoustics, electrodynamics, quantum physics, theory of shells, nonlinear theory of field, relativistic cosmology models, theory of superconductivity, hydromechanics, actuarial and financial mathematics and other fields, connected with the solution of singular DEs (including spectral problems and computing complex special functions) and FDEs (including IDEs and differential–delay equations), etc.

Scientific research Projects and Grants, Prizes:

1) Stipend of G.Soros, 1993–1994 (ISF and Russian Academy of Natural Sciences); Individual Grant of G.Soros, 1993 (ISF); Principal Investigator (PI) of the Project No.

J8K100, 1995 (ISF with RFBR and Russian Government).

2) Participation in the NATO project PST/CLG.976878 (NATO Physical and Engineering Science and Technology Collaborative Linkage Grant), 2001; grant NATO PST.EV.979657 (NATO Science Programme – Expert Visit), 2003.

3) State Stipend for Russian Scientists, 1997–2000 and 2000–2003 (RAS).

4) Responsible Investigator to the Projects of Russian Ministry of Science, Higher Schools and Technical Policy: "Numerical Techniques and Software for Numerical Treatment of Physical Processes in Modern Technical Systems (1056, "Tekhnika")" and "Development of Parallel Algorithms for Mathematical Modelling and Solving Complicated Problems of Applied Mathematical Physics (9d-125/3, "Bystrodeistvie")", 1992–1996.

5) PI (co–PI with A.A.Abramov) to the RFBR Projects: No. 94–01–01495, 1994–1995; No. 96–01–00951, 1996–1998; No. 99–01–00331, 1999–2001; No. 02–01–00050, 2002–2004; No. 05–01–00257, 2005–2007; No. 08–01–00139, 2008–2010; No. 11–01–00219, 2011–2013.

6) Prizes for the best scientific works of the CC RAS in 1975, 1980, 1995, 2002–2006, 2010.

Awards: Medals "The Work–Veteran" and "In the Memory to 850th Anniversary of Moscow"; "Gratitude" from President of RAS to 275th Anniversary of RAS.

Numerous **nominations of IBC and ABI** since 1993; **the invitation** to the Membership of New York Academy of Sciences, 1998. Numerous invitations to submit the articles in the various international physical and mathematical journals.

Membership of professional societies: Member of the AMS in 1994–1998 and since 2004 – present; numerous invitations to the membership of the other international professional societies since 1993 – present.

List of selected publications (1965 – 2010)

[1] Birger, E.S. and Lyalikova (Konyukhova), N.B. Discovery of the solutions of certain systems of differential equations with a given condition at infinity. I// U.S.S.R. Comput. Maths. Math. Phys., 1965, **5**(6), 1–17.

[2] Birger, E.S. and Lyalikova (Konyukhova), N.B. On finding the solutions for a given condition at infinity of certain systems of ordinary differential equations. II// U.S.S.R. Comput. Maths. Math. Phys., 1966, **6**(3), 47–57.

[3] Birger, E.S. and Konyukhova, N.B. Calculation of molecules in a one–electron one–center approxomation// Teoretical and and Experimental Chemistry, 1970, **4**(1), 16–21.

[4] Konyukhova, N.B. On numerical isolation of the solutions tending to zero at infinity of certain two–dimensional non–linear sets of ordinary differential equations// U.S.S.R. Comput. Maths. Math. Phys., 1970, **10**(1), 95–111.

[5] Konyukhova, N.B. On solution of boundary value problems in an infinite interval for some non–linear sets of ordinary differential equations involving singularities// U.S.S.R. Comput. Maths. Math. Phys., 1970, **10**(5), 106–121.

[6] Konyukhova, N.B. On the behavior of the solutions inside and outside of stable manifold for certain two–dimensional nonlinear systems of ordinary differential equations// Math. Notes, 1970, **8**(3), 632–638.

[7] Konyukhova, N.B. Segregation of stable manifolds for some nonlinear systems of ordinary differential equations with a singularity// U.S.S.R. Comput. Maths Math. Phys., 1973, **13**(3), 91–113.

[8] Birger, E.S., Kerbikov, B.O., Konyukhova, N.B. and Shapiro, I.S. On bound quasinuclear states of 2n 2anti-n system// Yad. Fiz., 1973, **17**(1), 178–185 [in Russian].

[9] Konyukhova, N.B. The iterative solution of non–linear boundary value problems, selecting small solutions of some systems of ordinary differential equations with a singularity// U.S.S.R. Comput. Maths Math. Phys., 1974, **14**(5), 127–137.

[10] Abramov, A.A., Birger, E.S., Konyukhova, N.B. and Ulyanova, V.I. Numerical segregation of the bounded solutions for systems of ordinary differential equations// Differential equations (Colloq., Keszthely, 1975), pp. 17–26. Colloq. Math. Soc. János Bolyai, **15** (Amsterdam–New York: North–Holland Publ. Co., 1977).

[11] Voronov, N.A., Kobzarev, I.Yu. and Konyukhova, N.B. On possibility of the existence of new type mesons// JETP Lett., 1975, **22**(11), 290–294.

[12] Birger, E.S., Vainshtein, L.A. and Konyukhova, N.B. Diffraction of a wave bunch on a plasma cylinder// U.S.S.R. Comput. Maths Math. Phys., 1976, **16**(6), 143–155.

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[14] Abramov, A.A., Birger, E.S, Konyukhova, N.B. and Ulyanova, V.I. On methods of numerical solution of boundary value problems for systems of linear ordinary differential equations// Numerical methods (Third Colloq., Keszthely, 1977), pp. 33–67. Colloq. Math. Soc. János Bolyai, **22** (Amsterdam–New York: North–Holland Publ. Co., 1980).

[15] Belova, T.I., Voronov, N.A., Kobzarev, I.Yu. and Konyukhova, N.B. Particle–like solutions of the scalar Higgs equation// Sov. Phys. JETP, 1977, **46**(5), 846–852.

[16] Dikman, S.M. and Konyukhova, N.B. Numerical investigation of the skin effect in a plasma columnm // U.S.S.R. Comput. Maths Math. Phys., 1978, **18**(2), 96–105.

[17] Abramov, A.A., Ditkin, V.V., Konyukhova, N.B, Pariiskii, B.S. and Ul'yanova, V.I. Evoluation of eigenvalues and eigenfunctions of ordinary differential equations with singularities// U.S.S.R. Comput. Maths Math. Phys., 1980, **20**(5), 63–81.

(Chinese transl. in: Abramov, A.A., Dytkin, V.V., Konyukhova, N.B, Pariiskii, B.S. and Ul'yanova, V.I. The calculation of eigenvalues and eigenfunctions of ordinary differential equations with singularities// Appl. Math. Math. Comput., 1983, **5**, 1–10.)

[18] Belova, T.I., Voronov, N.A., Konyukhova, N.B. and Pariiskii, B.S. Numerical investigation of the stability of particle–like solutions of the scalar field equations// U.S.S.R. Comput. Maths Math. Phys., 1981, **21**(1), 89–107.

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[21] Abramov, A.A., Dyshko, A.L., Konyukhova, N.B, Pak, T.V. and Pariiskii, B.S. Evoluation of prolate spheroidal functions by solving the corresponding differential equations// U.S.S.R. Comput. Maths Math. Phys., 1984, **24**(1), 1–11.

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[30] Konyukhova, N.B. Existence and uniqueness of solutions of singular Cauchy problems for systems of nonlinear functional–differential equations// Sov. Math. Dokl., 1988, **36**(1), 126–128.

[31] Konyukhova, N.B. On the existence of the stable initial manifolds for systems of nonlinear functional–differential equations// Sov. Math. Dokl., 1989, **39**(3), 519–523.

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[35] Konyukhova, N.B. On the existence and uniqueness of time–bounded solutions of systems of evolution quasilinear partial differential equations of first order// Sov. Math. Dokl., 1991, **42**(3), 871–875.

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[41] Abramov, A.A., Konyukhova, N.B., Kurochkin, S.V., Pariiskii, B.S. and Prikhod'ko, V.Yu. Numerical investigation of axisymmetric free oscillations in a vacuum and excitation in a compressible medium of a prolate cylindrical shells with hemispherical ends// Comput. Maths Math. Phys., 1993, **33**(10), 1365–1390.

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in the de Sitter space// Comput. Maths Math. Phys., 2001, **41**(3), 435–456.

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