

Sergei Avdonin

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ACADEMIC DEGREES

Doctorate Degree in Mathematics, St. Petersburg (Leningrad) State University, 1991
Ph.D. in Mathematics, St. Petersburg (Leningrad) State University, 1977
M.S. in Physics and Mathematical Physics, St. Petersburg (Leningrad) State University, 1972

EMPLOYMENT

2001–present *Professor* Department of Mathematics and Statistics
University of Alaska Fairbanks

2000–2001 *Visiting Professor* Department of Mathematics
University of Tennessee, Knoxville

1991–2001 *Professor* Department of Applied Mathematics
St. Petersburg State University, Russia

1998–2001 *Senior Research Fellow* Department of Mathematics and Statistics
The Flinders University of South Australia

1995–97 *Professor and Head* Department of Mathematics
St. Petersburg University of Economics and Engineering, Russia

1983–91 *Associate Professor*, **1980–83** *Assistant Professor*, **1977–80** *Research Associate*
Department of Applied Mathematics, St. Petersburg State University, Russia

SHORT TERM VISITING APPOINTMENTS

March–April, 2007 The Isaac Newton Institute, Cambridge
Program “Analysis on Graphs and its Applications”

June–August, 2002; January 2003 (grant of Australian Research Council) Department
of Mathematics and Statistics, The Flinders University of South Australia (host – Prof. Bill Moran)

February–March, 1999 Visiting Professor, Department of Mathematics
University of Nancy-I (host – Prof. Marius Tucsnak)

March–April, 1997; January–February, 1996 (grant NSF)
Department of Mathematics, Virginia Tech. (host – Prof. David Russell)
Department of Mathematics and Statistics, UMBC (host – Prof. Thomas Seidman)

February–March, 1993 (grant of the National Academy of Sciences, USA)
Department of Mathematics and Statistics, UMBC (host – Prof. Thomas Seidman)

January 1993 (grant of the Center for Optimization and Control, Germany)
Institute of Mathematics, University of Bayreuth (host – Prof. Guenter Leugering)

September 1983–August 1984 Senior Research Fellow
Department of Mathematics, Lorand Eötvös University, Budapest (host – Prof. István Joó)

AWARDS

1977 First Prize of St. Petersburg (Leningrad) State University for Young Scientists

GRANTS

2007–2010 NSF grant “Boundary Inverse Problems in Glaciology”, Co-PI

2004–2008 NSF grant “The Basal Velocity Field of a Glacier: An Inverse Approach”, PI
2003–2004 US National Academy of Sciences grant “Control and inverse problems for distributed parameter systems on graphs”, PI
2003–2004 DOD grant “Spintronics”, Senior Investigator
1998–2001 Grant of the Australian Research Council “Boundary control in sampling and interpolation of band-limited signals”, Senior Investigator
1997–2000 Grant of the Russian Foundation of Basic Research “Controllability problems for hybrid systems”, PI
1995–98 NSF International Research Grant, USA, “Bases of exponentials in control of distributed parameter systems”, Co-PI
1995–97 Grant of the Russian Foundation of Basic Research “Boundary control in inverse problems of mathematical physics”, PI
1994–96 ESPRIT grant of the Commission of the European Communities, Senior Investigator, group leader of the subproject “Control and inverse problems for partial differential equations”
1994–95 Grant of the International Science Foundation “Nonharmonic Fourier series in control theory”, PI
1993 Grant of the International Science Foundation “Riesz bases of vector-valued exponentials”, PI
1992–93 Grant of the University Research Program, Russia “Inverse problem for multi-channel acoustic system”, PI

RESEARCH AREAS

Control theory of distributed parameter systems

Nonharmonic Fourier series

Inverse problems of mathematical physics

Signal processing (sampling and interpolation of band-limited and multi-band signals, spectral estimation)

Partial differential and differential-difference equations

Control and inverse problems on graphs, mathematical modeling of nanodevices

TEACHING EXPERIENCE

UAF, graduate courses: Complex Analysis, Partial Differential Equations, Real Analysis, Mathematical Modeling, Control and Inverse Problems for PDEs, Mathematical Physics

UAF, undergraduate courses: Numerical Analysis, Calculus, Complex Analysis, Real Analysis, Advanced Calculus, Ordinary Differential Equations

UTK, undergraduate course: Ordinary Differential Equations

Flinders University: Precalculus for international students

St. Petersburg University, graduate courses: Inverse Problems of Mathematical Physics, Control Theory, Partial Differential Equations, Operator Theory

St. Petersburg University, undergraduate courses: Linear Algebra, Ordinary Differential Equations, Real Analysis, Complex Analysis

St. Petersburg University of Economics and Engineering, undergraduate courses: Calculus, Probability Theory, Financial Mathematics, History of Mathematics

In 1983 – 1997 supervised five Ph.D. theses and more than ten M.S. research projects. The theses and projects dealt with control theory for distributed parameter systems, partial differential equations,

inverse problems of mathematical physics, and nonharmonic Fourier series

Currently supervise three Ph.D. students at UAF, three my M.S. students graduated in 2005 – 2007

INVITED TALKS AT THE INTERNATIONAL CONFERENCES (1998 – present)

“Boundary control approach to sampling and interpolation of band-limited and multi-band signals”, International Workshop on Sampling Theory and Applications, Thessaliniki, Greece, June 1–5, 2007

“On control and inverse problems for the wave and heat equations on graphs”, An Isaac Newton Institute Workshop “Quantum Graphs, their Spectra and Applications, Cambridge, UK, April 2–5, 2007

“Boundary controllability and inverse problem for the wave equation on graphs”, 14th Mediterranean Conference on Control Automation, Ancona, Italy, June 28–30, 2006

“Inverse problems on graphs”, International Conference on Differential Equations, Nagoya, Japan, May 23–28, 2005

“Controllability of the Schrödinger equation on graphs”, International Conference on Control Theory and Applications, Irkutsk, Russia, June 29–July 1, 2004

“Control and inverse problems for the Schrödinger equation”, International Conference “Progress in Partial Differential Equations and Applications”, WSU, Pullman, WA, May 23–25, 2002

“Exponential divided differences in control of distributed systems”, International Conference “Control of Distributed Parameter Systems”, University of Twente, Netherlands, July 2–6, 2001

“Dynamical inverse problem for the Schrödinger equation, International Workshop on Inverse Problems, St. Petersburg, Russia, June 18–23, 2001

“Simultaneous control of flexible systems”, International Conference on Control and Inverse Problems for Distributed Systems, Ekaterinburg, Russia, May 30–June 2, 2000

“Controllability of a circular membrane with rotationally symmetric data”, International Conference on Control in Partial Differential Equations, Nancy, France, February 12–17, 1999

“Exponential families in controllability of structurally damped systems”, International Conference “Geometry of Hilbert Spaces and Spectral Analysis”, Raglan, New Zealand, January 5–12, 1999

“Boundary control methods in signal processing”, International Conference on Optimal Control of Partial Differential Equations, Chemnitz, Germany, April 21–26, 1998

INVITED AND COLLOQUIUM TALKS

Imperial College, London; Cambridge University; University of Alabama, Birmingham; Texas A&M University; Texas Southern University; University of Missouri, Columbia; University of California Berkeley; University of California Los Angeles; University of Virginia; Virginia Tech; Georgia Tech; Georgetown University; University of Maryland Baltimore County; University of Tennessee, Knoxville; University of Tennessee, Chattanooga; University of Paris VI; University of Strasbourg; University of Nancy I; University of Madrid; University of Darmstadt; Bolyai Mathematical Institute, Szeged; Lorand Eötvös University, Budapest; Moscow State University

PROFESSIONAL MEMBERSHIPS / ORGANIZATIONS / JOURNALS

1991–present Member of the American Mathematical Society

1991–present Reviewer for *Mathematical Reviews*

2000–present Referee for *Journal of Math. Anal. Appl.*; *SIAM Journal of Control and Optimization*; *Applied Mathematics and Optimization*; *Int. Journal of Applied Math. and Computer Science*; *Journal of Comput. Optimiz. and Applications*; *Automatica*; *Control, Optimization and Calculus of Variations*; *Asymptotic Analysis*; *Portugalaie Matematica*; *Inverse Problems*

Grant proposals referee for NSF, CRDF

ADDITIONAL SKILLS

Strong educational background in Physics. M.S. in Physics and Mathematical Physics

Ability to work in a group setting. Worked in different groups of mathematicians, scientists, and engineers: on project “ESPRIT” in the frameworks of the European Communities–Russia collaboration (1994–96), on NSF supported project on control of distributed systems (Virginia Tech. and UMBC, 1995–98) on ARC supported project on sampling of spectrally constrained data (Flinders University, 1998–2001), on inverse problems for the Schrödinger equation (University of Tennessee and Oak Ridge National Laboratory, 2000–01), on DOD supported project “Spintronics” and in other groups at St. Petersburg State University, St. Petersburg Technical University, Clark Atlanta University

Management experience. Head of Mathematics Department (20 faculty) of St. Petersburg University Economics and Engineering