

Taras I. Lakoba

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EDUCATION

- **08/1996** Ph.D., Applied Mathematics, Clarkson University
Thesis: “Perturbations and Stability of Solitary Waves in Nonlinear Optics”.
Advisor: Prof. D.J. Kaup.
- **01/1989** M.Sc., Physics (Diploma with Honors), Moscow State University
Thesis: “Brownian Motion Induced by Noise with Nonzero Correlation Time”.
Advisor: Prof. Yu.L. Klimontovich.

PROFESSIONAL EXPERIENCE

- **05/2019 – present** Professor, Dept. of Mathematics & Statistics, Univ. of Vermont
- **05/2009 – 2019** Associate Professor, Dept. of Mathematics & Statistics, Univ. of Vermont
- **09/2003 – 04/2009** Assistant Professor, Dept. of Mathematics & Statistics, Univ. of Vermont
 - Mathematical modeling of optical propagation in telecommunication fibers and photonic devices;
 - Numerical methods for nonlinear wave equations.
- **08/2002 – 08/2003** Research Associate, Inst. for Simulation & Training, Univ. of Central Florida
Numerical modeling of collective behavior of crowds of pedestrians.
- **08/2000 – 07/2002** Member of Technical Staff, Bell Laboratories, Lucent Technologies
Responsible for transmission simulations of LambdaXtreme, a dense WDM ultra-long haul system.
 - Analysis of nonlinear signal transmission and signal-noise interaction in optical fibers;
 - Developed own package of codes for simulating the above phenomena;
 - Proposed novel methods to improve transmission quality at both 10 and 40 Gb/s.
- **09/1998 – 08/2000** Postdoctoral Fellow, Institute of Optics, University of Rochester
Theoretical and numerical studies of effects of polarization mode dispersion, higher-order chromatic dispersion, interchannel cross-talk, and Raman interactions in fiber-optic dispersion-managed systems.
- **08/1996 – 08/1998** Postdoctoral Fellow, Dept. of Math. & Comp. Science, Clarkson University
 - Inverse Scattering theory, Riemann-Hilbert and $\bar{\partial}$ -problems;
 - Asymptotic and perturbation methods, applied to Fiber Optics, Hydrodynamics, Plasma models;
 - Developed original perturbation theories for dispersion-managed solitons and internal water waves.
- **01/1995 – 07/1996** Research Assistant, Dept. of Math. & Comp. Science, Clarkson University
Nonlinear waves and Soliton theory; Perturbation methods; Stability of solitary pulses.
- **09/1986 – 05/1992** Graduate and Postgraduate Student, Dept. of Physics, Moscow State University
Wave propagation in periodic structures; Stochastic dynamics in complex systems.

TEACHING

- **2014** Kroepsch–Maurice Excellence in Teaching Award, UVM
- **09/2003–present** Assistant & Associate Professor, Dept. of Mathematics & Statistics, UVM
Calculus, Linear Algebra, Numerical Methods, Ordinary Differential Equations, Foundations of Geometry, Mathematical Models, Complex Analysis
- **09/2002–05/2003** Visiting Asst. Professor, Dept. of Mathematics, Univ. of Central Florida
Calculus I and II
- **01–05/1998** Visiting Asst. Professor, Dept. of Math. & Comp. Science, Clarkson University
Applied Linear Algebra
- **01–05/1996** Instructor, Dept. of Math. & Comp. Science, Clarkson University
Intermediate Differential Equations

CONFERENCE ORGANIZATION

- Organizer, 37th Annual Mathematical Problems in Industry Workshop (June 2021, virtual format).
- Organizer, 36th Annual Mathematical Problems in Industry Workshop (June 2020, virtual format).
- Co-organizer, Minisymposium on Advances in analytical and computational techniques for nonlinear waves *SIAM 8th International Congress on Industrial and Applied Mathematics* (Beijing, China, August 2015).
- Technical committee member, *IEEE Summer Topical Meeting on Nonlinear-Optical Signal Processing* (Nassau, Bahamas, July 2015).
- Technical committee member, *IEEE Summer Topical Meeting on Nonlinear-Optical Signal Processing* (Montreal, Canada, July 2014).
- Co-organizer, Minisymposium on Advances in numerical methods for nonlinear wave computations *VIIth IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena* (Athens, GA, March 2009).
- Co-organizer, Minisymposium on Advances in analytical and numerical techniques for nonlinear waves *SIAM Conference on Nonlinear Waves and Coherent Structures* (Seattle, WA, September 2006).
- Co-organizer, Minisymposium on Nonlinear wave phenomena in photonic lattices *SIAM Meeting on Nonlinear Waves and Coherent Structures* (Orlando, FL, October 2004).

FUNDING

- **2019–2022** Co-PI (with J. Marshall, V. Kotov, A. Del Maestro, D. Clougherty, J. Vanegas, A. Goodsell, N. Bigelow) NASA EPSCoR grant 80NSSC19M0143, Novel Quantum Materials as Laboratories for Fundamental Physics in Microgravity. \$750,000.
- **2012–2015** NSF grant DMS-1217006, Collaborative research: Instability analysis of the split-step method on spatially-varying backgrounds, with applications to optical telecommunications and Bose-Einstein condensation. \$181,836.
- **2009–2012** Co-PI (with M. Vasilyev and N. Stelmakh (UTA)), NSF grant ECCS-0925706, Collaborative research: Multi-channel all-optical signal-processing devices based on a group-delay-managed nonlinear medium. \$99,708 (UVM share).
- **2007–2008** UVM Instructional Incentive grant, Enhancement of web representation of the course “Applications of Undergraduate Mathematics to Problems in Science and Engineering”. \$2,900.
- **2005–2008** Co-PI (with M. Vasilyev (UTA)), NSF grant DMS-0507429, Collaborative research: Mathematical and engineering study of multi-channel all-optical regenerator. \$52,901 (UVM share).
- **2004–2005** Vermont-NASA EPSCoR travel-grant: Mathematical modeling of microstructured optical fibers for applications to sensors and beam delivery. \$2,400.

PATENTS AND PATENT APPLICATIONS

- **M.Vasilyev, T.I.Lakoba**, Multi-channel all-optical signal processor, US Patent 7,505,690 (March 2009).
- **T.I.Lakoba**, Method and system for reducing transmission penalties associated with ghost pulses, filed 09/2002.
- **L.Altman, S.Banerjee, D.F.Grosz, S.Hunsche, T.I.Lakoba**, Method and apparatus for controlling the extinction ratio of transmitters, US Patent 6,819,480 (November 2004).
- **D.A.Fishman, Y.H.Kao, T.I.Lakoba, F.Peragine**, Method and apparatus for optimization of dispersion-managed RZ transmission by employing optical pulses having variable widths, US Patent 7,251,417 (July 2007).

PUBLICATIONS

Book chapters: 2; papers in refereed journals: 68; talks at conferences: 76; invited talks at research institutions: 9.