

## Richard Kollár Curriculum Vitae

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### Education and Employment

- September 2005 – present. Post-doctoral Assistant Professor, Department of Mathematics, University of Michigan, Ann Arbor, MI.
- September 2004 – August 2005. Post-doctoral Fellow, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN.
- August 1998 – May 2004. PhD. student in Mathematics, University of Maryland at College Park, MD. Advisor: Dr. Robert L. Pego.  
Thesis: *“Existence and stability of vortex solutions of certain nonlinear Schrödinger equations”*
- December 2002 – January 2004. Visiting Researcher, Institute of Applied Mathematics, Faculty of Mathematics, Physics and Informatics, Comenius University, Bratislava.
- August 1997 – August 1998. PhD. student in Mathematics, Institute of Applied Mathematics, Faculty of Mathematics, Physics and Informatics, Comenius University, Bratislava. Advisor: Dr. Pavol Quittner.
- August 1997 – December 1997. Teaching Assistant, Department of Mathematics, Faculty of Chemical Engineering and Technology, Slovak Technical University, Bratislava.
- June 1997 – August 1997. Research Assistant, Department of Mathematical Education, Faculty of Mathematics, Physics and Informatics, Comenius University, Bratislava.
- September 1992 – June 1997. Mgr. (equivalent of MA. degree with thesis), with highest honors, in Mathematics, Department of Mathematical Analysis, Faculty of Mathematics, Physics and Informatics, Comenius University, Bratislava.  
Advisor: Dr. Michal Fečkan.  
Thesis: *“Discontinuous wave equations and a topological degree for some classes of multi-valued mappings.”*

### Publications and Papers in Preparation

- “*Slow damping of internal waves in a stably stratified fluid*” (with K.F.Gurski and R.L. Pego), *Proc. Royal Soc. London A*, 460 (2004), 2044, 977–994.
- “*Existence and stability of vortex solutions of certain nonlinear Schrödinger equations*” PhD thesis, University of Maryland, College Park, 2004.
- “*Discontinuous wave equations and a topological degree for some classes of multi-valued mappings*” (with M. Fečkan), *Appl. Math.* 44 (1999), no. 1, 15–32.
- “*On non-existence of vortex solutions to Landau-Lifshitz magnetization equation*”, submitted to *Trans. AMS*.
- “*Spectral stability of vortices in two-dimensional Bose-Einstein condensates via the Evans function and Krein signature*” (with R.L. Pego), preprint.
- “*Coherent structures generated by inhomogeneities in oscillatory media*” (with A. Scheel), submitted.

### Scholarly Papers

- “*Semilinear wave equation and degree theory for multifunctions*”, 1997, awarded by the first prize at Student Scientific Conference, Comenius University.
- “*On divergence preserving series*” (with V. Špitalský), 1995, awarded by the second prize at Student Scientific Conference, Comenius University.

### Invited Talks and Presentations

- “*Linear stability of stratified fluids and the associated nonlinear eigenvalue problem*” Differential Equations Seminar, University of Michigan, Ann Arbor, MI, November 2006.
- “*Stability of vortices in three dimensional Bose-Einstein condensates*”, SIAM Conference on Nonlinear Waves and Coherent Structures, Seattle, WA, September 2006.
- “*Linear stability of stratified fluids and the associated nonlinear eigenvalue problem*”, Differential Equations Seminar, NC State University, Raleigh, NC, March 2006.
- “*Linear stability of stratified fluids and the associated nonlinear eigenvalue problem*” IMA Postdoc seminar, IMA University of Minnesota, Minneapolis, MN, April 2005.
- “*Linear stability of stratified fluids and the associated nonlinear eigenvalue problem*” Applied Mathematics and Numerical Analysis Seminar, University of Minnesota, Minneapolis, MN, March 2005.

**Invited Talks and Presentations (cont.)**

- “*Existence and stability of vortex solutions to certain nonlinear Schrödinger equations*”, PDE/Analysis seminar, McMaster University, Hamilton, ON, February 2005.
- “*The Evans function – an introduction*”, Dynamical Systems Seminar (series of lectures), University of Minnesota, Minneapolis, MN, November 2004.
- “*Linear stability of rotating Bose-Einstein condensates*”, SIAM Conference on Nonlinear Waves and Coherent Structures, University of Central Florida, Orlando, FL, October 2004.
- “*Existence and stability of vortex solutions to certain nonlinear Schrödinger equations*”, Colloquium, Department of Applied Mathematics, University of Colorado, Boulder, CO, February 2004.
- “*Topologically nontrivial solutions of nonlinear Schrödinger equation*”, *Week of Faculty Graduates*, Comenius University, Bratislava, SK December 2002.
- “*Slow damping of internal waves in stably stratified fluid*”, Partial differential equations seminar, Comenius University, Bratislava, SK, May 2001.

**Contributed Talks and Presentations**

- “*A single localized vortex trapped in an harmonic trap in the two-dimensional approximation*”, contributed talk *AIMS Intl. Conf. on Dynamical Systems, Diff. Equations and Applications*, Poitiers, France, June 2006.
- “*Stability of vortices in two and three dimensional Bose-Einstein condensates*”, poster, *Recent Advances in Nonlinear PDEs and Applications*, Toledo, Spain, June 2006.
- “*Stability of vortices in Bose-Einstein condensates*”, contributed talk *Frontiers of Applied Analysis*, Carnegie Mellon University, Pittsburgh, PA, September 2005.
- “*Stability of vortices in Bose-Einstein condensates*”, contributed talk *Equadiff 2005*, Comenius University, Bratislava, SK, July 2005.
- “*Slow damping of internal waves in stably stratified fluid*”, contributed talk, MAA MD-DC-VA Sectional Meeting, University of Maryland, College Park, MD, November 2002.
- “*Slow damping of internal waves in stably stratified fluid*”, contributed talk, Graduate Student Conference, Department of Mathematics, University of Maryland, College Park, MD, March 2002.

## Professional Training

- Workshop on *Stability and instability of nonlinear waves*, University of Washington, Seattle, September 2006
- *IMA Thematic Year on Mathematics of Materials and Macromolecules: Multiple Scales, Disorder and Singularities*. Participant in various workshops and tutorials on Mathematics of Materials, Modeling of Soft Matter, Singularities in Materials, Future Challenges in Multiscale Modeling and Simulation, Composites, Atomic Motion to Macroscopic Models, Experiments in Physical Biology, modeling the Dynamics of Liquid Crystal Elastomers, Effective Theories for Materials and Macromolecules, IMA University of Minnesota, Minneapolis, MN, September 2004 – June 2005.
- AIM Research Workshop *Stability Criteria for Multi-Dimensional Waves and Patterns*, AIM, Palo Alto, CA, May 2005.
- *Material Sciences and Fluid Dynamics* Research Interaction Groups (organized by B. Li, R.L. Pego, D.C. Levermore). University of Maryland, 2002.
- *Fluid Dynamics Reading Seminar* (organized by D.C. Levermore, R.L. Pego, R. Nochetto and J.-G. Liu). University of Maryland, 1999–2001.
- *Mathematical Theory of Fluid Mechanics*, Summer School. Paseky, Czech Rep., 2001.
- State Diploma in Mathematical Education, Comenius University, Bratislava, 1997.
- International Summer School in Mathematics, Jyväskylä, Finland, *Nonlinear analysis and wavelet theory* (supported by Open Society Foundation Fellowship). 1995.

## Professional Societies:

- Society for Industrial and Applied Mathematics.
- Union of Slovak Mathematicians and Physicists.

## Honors and Awards

- University of Michigan Rackham Fellowship, 2006.
- University of Maryland Graduate School Dissertation Fellowship, 2002–2003.
- Award for Best Graduate Student Talk, MAA MD-DC-VA Meeting, University of Maryland, 2002.
- Honorary Letter for Achievement in Mathematical Education, Ministry of Education and Culture, Bratislava, Slovakia, 2000.

### Honors and Awards (cont.)

- University of Maryland Graduate School Two Year Fellowship, awarded 1998.
- University of Maryland Department of Mathematics Two Year Summer Fellowship, awarded 1998.
- Rector Prize, Comenius University, 1997.
- First Prize, Comenius University Student Scientific Conference, 1997.
- Second Prize, Vojtěch Jarník University Students International Mathematical Competition, Ostrava, Czech Republic, 1997.
- Silver Medal, International Mathematical Olympiad, Sweden, Team Slovakia, 1991.

### Related Professional Activities

- Member of Editorial Board: *International Journal of Mathematics and Mathematical Sciences*.
- Co-organizer of minisymposia on *Stability of Nonlinear Waves in Pontryagin Space*, SIAM Conference on Nonlinear Waves and Coherent Structures, University of Washington, Seattle, September 2006.
- Reviewer: *Physica D*, *International Journal of Mathematics and Mathematical Sciences*, *SIAM Journal on Mathematical Analysis*, *Chaos: An Interdisciplinary Journal of Nonlinear Science*, *Journal of Differential Equations*.
- Founder and main organizer of the annual conference “*Week of Faculty Graduates*”, Comenius University, Bratislava, SK, 2002–2006. (Speakers from Princeton University, Cornell University, CalTech, CERN, Accenture, Slovak National Bank, etc.).
- Co-founder and elected Board Member of *TROJSTEN Foundation*. Foundation for Support of High School Mathematical Competitions and Education in Slovak Republic, 2000–present.
- Team Leader. Vojtěch Jarník University Students International Mathematical Competitions, Ostrava, Czech Republic, 2003.
- Co-founder and Leader of Team Slovakia. Czech-Slovak International Mathematical Competition, 1996–1997.
- Deputy Team Leader. International Mathematical Olympiad, Hong-Kong, Toronto (Canada), Mumbai (India), Mar del Plata (Argentina), 1994–1997.
- Member of Board of Slovak Committee for Mathematical Olympiad, 1993–1998.

## Teaching Experience

- Assistant Professor. Department of Mathematics, University of Michigan, Ann Arbor, MI. 2005–present. Teaching Calculus I, Principles of Real Analysis, Boundary Value Problems for Partial Differential Equations, Problem Seminar (preparation for the Putnam Exam).
- Teaching Assistant. Faculty of Mathematics, Physics and Informatics. Comenius University, 1996-1998, 2003. Teaching all levels of courses Mathematical Analysis (Calculus I–IV). Leading a Graduate Student Nonlinear Waves Reading Seminar.
- Graduate Teaching Assistant. Department of Mathematics, University of Maryland, College Park, 1998-2000, 2002. Teaching Calculus I,II, Pre-calculus. Close contact sessions. Tutoring.
- Teaching Assistant. Department of Mathematics, Faculty of Chemical Engineering and Technology, Slovak Technical University, 1997. Teaching Calculus I, II.

## Related Teaching Activities

- Member of a Mathematical Education PhD. dissertation committee for Ravin Pan (chair D.L. Ball), School of Education, University of Michigan, 2005–present.
- Co-author of a material “Forms of Instruments for Enhancement of Children Talent in Sciences, Engineering and Art.” A part of the Modern Education Policy in Strategy of Competitiveness of Slovak Republic in years 2006–2010 (European Union Lisboa Strategy). Ministry of Education and Sport of Slovak Republic. 2006.
- Invited Lecturer. Mathematical Education Workshop VISNA, organized by INGENIUM Foundation, Trenčín, Slovakia. 2003.
- Intern. High School with Enhanced Mathematical Education, Bratislava, 1996–1998. Teaching Statistics, Algebra.
- Chief-organizer. Prep-camps for International Mathematical Olympiad, 1993–2006. Organizing and lecturing on various topics from Geometry, Algebra and Analysis.
- Chief-editor. “The Annual Year-Book of Slovak Mathematical Olympiad” (in Slovak). ISBN 80-967-454-1-7 (117 p.), ISBN 80-967-454-3-3 (145 p.), ISBN 80-88893-18-6 (150 p.), 1994–1997.
- Organizer and Chief-organizer. Winter and Summer Camps for Talented High School Students, Bratislava Mathematical Correspondence Seminar. 1993–2005. Organizing and lecturing on various math topics.

### **Research Interests**

- Coherent structures and their stability in nonlinear systems.
- Partial differential equations.
- Dynamical systems.
- Numerical analysis.
- Fluid dynamics.
- Mathematical biology.

### **Further References**

- UPA Ultimate Frisbee Regional Championship, Central Region. 2006.
- Ann Arbor Ultimate Frisbee League. 2005–2006.
- Trend, Slovak national business weekly. Interview, a part of an analytic article on brain-drain (in Slovak language), June 15, 2006.
- Med-City Marathon, Rochester, MN. 2005.
- Honolulu International Marathon. 2004.
- Prague International Marathon. 2004.
- Pravda, Slovak national newspaper. Interview, one full page and a cover page announcement (in Slovak language), December 31, 2003.

November 7, 2006