Curriculum Vitae

Abbas Momeni

Department of Mathematics and Statistics
Queen's University
Kingston, On, Canada

Personal Data.

Born	:	1977
Citizenship	:	Permanent resident of Canada, Iran, Soon to be a Canadian citizen (2010)
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Academic Positions

2004-2007 **University of British Columbia**,Vancouver, BC, Canada.
Postdoctoral Research Fellow
working with Prof. **Nassif Ghoussoub** and Prof. **Ivar Ekeland**.

2007-2010 **Queen's University**, Kingston, ON, Canada.
Coleman Fellow, Department of Mathematics and Statistics.

Education

2001-2004 Ph. D. in Mathematics. Sharif University of Technology.
Advisor: Prof. Mahmoud Hesaaraki.
Dissertation: "*Concentration and Blow-up phenomena for Nonlinear Hamiltonian Differential Equations.*"

1999-2001 M. Sc. in Mathematics. Sharif University of Technology.
Dissertation: "*Asymptotic behavior of Conservation laws.*"

1995-1999 B. Sc. in Mathematics. Teaching & Training University.

Publications.

[23] *Anti-symmetric Hamiltonians (II): Variational resolutions for Navier Stokes and other nonlinear evolutions.* Ann. Inst. H. Poincaré Anal. Non Linéaire 26 (2009) 223-255. With N. Ghoussoub.

[22] *Hamiltonian systems of PDEs and other evolution equations with self-dual boundary conditions.* Calc. Var. & PDE 36 (2009) 85-118. With N. Ghoussoub.

[**21**] *Semi-classical states for quasilinear Schrödinger equations arising in Plasma physics.* Comm. Contemp. Math. Vol. 11, No. 4 (2009) 547-583. With J. M. do Ó and U. Severo.

[**20**] *A variational principle associated with a certain class of boundary value problems.* Differential Integral Equations 23 (2010), no. 3-4, 253-264.

[**19**] *Solitary waves for quasilinear Schrödinger equations arising in plasma physics.* Adv. Non. Stu. 9 (2009), 479-497. With J. M. do Ó.

[**18**] *Solutions for singular quasilinear Schrödinger equations with one parameter,* to appear in Comm. Pure Appl. Anal. (2009) 11 pages. With J. M. do Ó.

[**17**] *On the existence of Hamiltonian paths connecting Lagrangian submanifolds.* C. R. Math. Acad. Sci. Soc. R. Can. 30 (2008), no. 3, 64-83. With N. Ghoussoub.

[**16**] *Soliton solutions for quasilinear Schrödinger equations involving supercritical exponent in* $\mathbb{R}^N$. Comm. Pure Appl. Anal. 7 (2008), no. 1, 89-105.

[**15**] *Homogenization via self-duality: A variational homogenization for Maximal Monotone operators,* submitted (2009) 36 pages. With N. Ghoussoub and R. Zarate.

[**14**] *Existence and concentration of solitary waves for a class of quasilinear Schrödinger equations,* to appear in Comm. Pure Appl. Anal. (2008) 30 pages. With J.M. do Ó and D. Cassani.

[**13**] *Selfdual Variational Principles for Periodic Solutions of Hamiltonian and Other Dynamical Systems.* Comm. in PDE 32 (2007) 771-795. With N. Ghoussoub.

[**12**] *Toland self-dual Lagrangians: New variational principles of self-adjoint boundary value problems,* submitted (2008) 46 pages.

[**11**] *On a class of periodic quasilinear Schrödinger equations involving critical growth in* $\mathbb{R}^2$. J. Math. Anal. Appl. 334 (2007) 775-786.

[**10**] *On the existence of standing wave solutions to quasilinear Schrödinger equations.* Nonlinearity, 19 (2006), no 4, 937-957.

[**9**] *Existence of soliton solutions for a quasilinear Schrödinger equation involving critical exponent in* $\mathbb{R}^N$, Journal of Differential Equations, Volume 229 (2006), no. 2, 570-587.

[**8**] *Blow-up and nonglobal solutions for a family of nonlinear higher-order evolution equations,* J. Mathematical Science and Information Vol. 1, No. 2 (2006), 9-30. With M. Hesaaraki and H. Assa.

[**7**] *Blow-up of positive solutions for a family of nonlinear parabolic equations in general domain in* $\mathbb{R}^N$, Michigan Math. J. 52 (2004), no 2, 375-389. With M. Hesaaraki.

[**6**] *Global existence and comparison theorems for a nonlinear equation,* Bull. Austral. Math. Soc. 67 (2003) , no. 3, 481-492. With M. Hesaaraki.

Submitted papers

[5] *Positive solutions for singular quasilinear Schrödinger equations with one parameter (II),* submitted. With D. C. Offin.

[4] *A new approach in convex Hamiltonian systems with nonlinear boundary conditions,* submitted. With M. Lewis.

[3] *variational principles and resolution of Semilinear Elliptic equations with nonlinear boundary conditions,* With M. Koslowsky.

[2] *A family of variational principles associated to a boundary value problem.* With N. Ghoussoub.

Textbook

[1] *Abstract Linear Algebra,* 244 pages, Farnaz Publication (2002). With Massoud Nikoukar.

Papers in Preparation

[1] *A variational principle associated to a certain class of boundary value problems II (nonlinear case).*

Referee and Reviewer.

Refereeing for

- Journal of Differential Equations
- Canadian Journal of Mathematics
- Journal of Mathematical Analysis and Applications
- Modern Mathematics
- Mathematical and Computer Modeling

Reviewer for

- Mathematical Reviews of American Mathematical Society - MathSciNet.

Graduate students.

Martin Koslowsky (M. Sc., 2008-), in co-supervision with D. C. Offin.
Thesis: *Variational principles and resolution of Semi-linear Elliptic equations with nonlinear boundary conditions.*

Research Interests. Partial Differential Equations and Mathematical Physics

- Fluid equations: Existence and regularity of Compressible Navier-Stokes with nonhomogeneous boundary conditions.
- Calculus of variation: Existence, concentration and qualitative behavior of solutions, asymptotic analysis.
- ASD Hamiltonians: Schrödinger equations and Hamiltonian Systems.
- Homogenization: Maximal Monotone operators

Teaching Experience.

[1] Graduate Courses

- Queen's University, Kingston, ON, Canada.
  Course instructor for the following list of courses.

  1. Variational Methods and Optimization (January 2008).
  2. Weak Kam theorem in Lagrangian Dynamics, seminar course (September 2008).
  3. Topics in Nonlinear Analysis (Homogenization, Young measures, Mass transportation), seminar course (September 2009).

[2] Undergraduate Courses

- Queen's University, Kingston, ON, Canada.
  Course instructor for the following list of courses.

  1. Differential Calculus with Applications to Commerce and Social Sciences (September 2009).
  2. Integral Calculus with Applications in Physics. (January 2009).
  3. Differential Calculus with Applications in Physics. (September 2008).
  4. Differential Calculus (July 2008).
- University of British Columbia, Vancouver, B.C., Canada.
  Course instructor for the following list of courses.

  1. Differential Calculus with Physical Applications (May 2007).
  2. Differential Calculus with Applications to Life Sciences (September 2006).
  3. Partial Differential Equations (June 2006).
  4. Integral Calculus with Applications to Commerce and Social Sciences (January 2006).
  5. Integral Calculus with Applications to Life Sciences (June 2006).
  6. Integral Calculus with Applications to Physical Sciences and Engineering (January 2005).

[3] Mathematics Olympiad

- Mathematics Olympiad Instructor at YMA (2002).

Awards and Scholarships

2007	Coleman Fellowship at Queen's University, Kingston, On, Canada.
2003	Sharif University special Scholarship for Outstanding and Brilliant graduate students.
Jan- Jun 2004	Ministry of Science Scholarship to visit University of British Columbia.
2000-2004	Faculty of Mathematics Graduate Scholarship, Sharif University of Technology.
1998	Silver medal, 21th Mathematics Olympiad for University Students.

Invited talks (selection).

- *Toland self-dual Lagrangians: New variational principles of self-adjoint boundary value problems.* Canadian Mathematical Society (**CMS**), Meeting, Ottawa, ON, December 2008.
- *A new approach in convex Hamiltonian systems with nonlinear boundary conditions.* Wilfrid Laurier University , January 2009.
- *Variational principles and resolution of Semilinear Elliptic equations with nonlinear boundary conditions.* Brandon University, January 2009.
- *Toland self-dual Lagrangians and Applications in Partial Differential Equations* University of Ottawa, November 2008.
- *Semi-state solutions and concentration for quasilinear Schrödinger equations.* Canadian Mathematical Society (**CMS**), Meeting, Toronto, ON, December 10-12, 2007.
- *Remarks on some new variational principles.* Colloquium talk, Queen's University, January 2008.
- *Variational formulation and resolution for certain class of PDE's.* Series of talk at Queen's University, Fall 2008.
- *Variational resolution for Navier-Stokes and infinite dimensional Hamiltonian Systems.* University of British Columbia in Okanagan, May 2007.
- *Anti-selfdual Lagrangians and variational resolutions for periodic Schrödinger equations.* Canadian Mathematical Society (**CMS**), Meeting, Victoria, BC, December 10-12, 2005.
- *Multiplicity of solutions for a quasilinear Schrödinger equation.* Partial Differential Equations Seminars. University of British Columbia, , Vancouver, December 03, 2004.
- *Blow-up in finite time for Hamilton Jacobi Equations.* Workshop on New developments on Variational Methods and their applications, Banff International Research Station (BIRS), July, 2004.

Funded Conferences and Workshops (selection).

- Northwest PDE Meeting. University of British Columbia, Vancouver, BC, December 2005.
- Summer School Frontiers in Mathematics and Economics. Vancouver BC, July 2006.
- Dynamical Systems, Mathematical Billiards and Related Problems in Complex Geometry. Köln, Germany , July 2007.
- Summer school on Partial Differential Equations, UBC, Vancouver, July-August 2009.

Professional Contributions.

- Co-founder of Young Mathematicians Association (YMA) in 1999 (www.anjoman.ir).
- In charge of Educational Outreach and Publications at YMA (2001- 2003).
- Editor of the YMA magazine published for high school students (October 2000-October 2003). (It is published quarterly by YMA)

See my Teaching Statement for more details about my duties at YMA and activities related to Mathematics Olympiad.

References.

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